THE UNIVERSITY OF HULL

PHYSICAL SELF-PERCEPTIONS AND PARTICIPATION IN PHYSICAL ACTIVITIES AMONG GREEK ADOLESCENTS

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REBECCA BESBEA,

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ABSTRACT

The study investigated the physical self concepts and the physical activity levels and patterns of a sample of Greek adolescents. It also provided information about the associations between physical self concepts and physical activity participation. The sample consisted of 405 Greek adolescents (207 boys and 198 girls) aged 14 to 15. The PSDQ instrument (Marsh et al., 1994) was chosen to measure the physical self-concepts and the Four by One-Day Recall questionnaire (Cale, 1993) to measure the physical activity levels and patterns of the adolescents. Analyses of responses were used to explore the sample's physical self-concept and physical activity responses for gender groups separately. An examination of the relationship between physical self-concept and physical activity was conducted using correlation analyses, M-W tests between activity groups and multiple regression analysis. In order to examine the direction of the relationship an extension of the linear regression analyses and the development and test of two structural equation models was conducted.

Analyses of the physical self-perceptions showed that boys had slightly higher self-concepts than girls. Zero-order and partial correlation coefficients, principal and confirmatory factor analyses provided support to the existence of a multidimensional and a hierarchical organisation of self perceptions in the physical domain. The findings supported the Shavelson et al., (1976) model of differentiated physical concepts and indicated that the self concept hierarchy is probably more complicated than originally anticipated.

Results indicated low activity levels in the adolescents' physical activity involvement. Boys were more active than girls, and adolescents were more physically active on weekdays than at weekends. A daily average of about 2 hours of activity was revealed. Only a small percentage of the sample (23%) was engaged in Moderate and Hard activities. A stereotypical profile for the two genders over the patterns of physical activities, and a lack of variety of activities was also evident. In a second phase of the study, interviews were used to a small size sample to confirm the validity of the questionnaire findings and to explore the current activities and opportunities for adolescents physical activity involvement.

Findings indicated that self-perception scores were related to amount of physical activity participation and were able to distinguish between groups of Active and Inactive individuals. The correlation analyses provided evidence that self-perceptions are significantly related to the types of chosen activities. Physically active individuals had significantly higher scores on physical self-concept scales and active males were significantly higher in perceived physical self-concepts than active females. Testing for the direction of the relationship between physical self perceptions and participation in physical activities, no causal relationship was found between the two variables.

Key words: physical activities participation, physical self-concepts, Greek adolescents

DEDICATION

This dissertation is dedicated to my husband Claus and our children, little Anna Maria and baby Konstantine. Their existence, love and support gave me hope in times of seeming hopelessness.

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CHAPTER ONE

INTRODUCTION

The Importance of Physical Activity

Evidence highlighting the importance of physical activity to health is now stronger than ever and the benefits of physical activity to health is an increasing source of public interest (Department of Health, 1993). Studies have consistently shown a relationship between regular participation in physical activity and increased longevity. Regular physical activity leads to an increase in mineral content and greater mechanical strength of bone. Muscular and weight-bearing activities are indeed essential for normal growth and development of the skeleton and muscular strength which are important for joint stability and good posture. Exercise benefits the heart and cardiovascular system, improving stamina and functional capacity and reduces the likelihood of heart disease (Fentem et al. 1988). Such conclusions have been drawn following substantial studies from many researchers. In a position statement made in 1992 the American Heart Association (AHA) stated that there is a proved association between physical inactivity and cardiovascular health; inactivity is a major risk factor for the development of coronary heart disease.

In addition, physical activity has been shown to have a number of psychological benefits. An extensive literature has developed which links exercise with affective and emotional changes such as reductions in anxiety, tension and depression and increases a feeling of well-being, mood and improved self-concept (Petruzzelo et al., 1991). The major health benefits of physical activity are summarised in Table 1.1.

Table 1.1 Health Benefits of Physical Activity

Physical Activity can:
1. Increase longevity
2. Decrease the risk of coronary heart disease
3. Prevent and/or help in the management of non insulin-dependent diabetes mellitus.
4. Prevent and/or help in the management of osteoporosis.
5. Decrease rates of stroke
6. Improve lipid profiles
7. Reduce levels of diastolic blood pressure
8. Reduce levels of obesity
9. Reduce back pain
10. Prevent or be useful in the treatment of osteoporosis
11. Reduce anxiety/tension
12. Reduce depression
13. Increase feelings of well-being
14. Provide a sense of achievement
15. Offer exciting experiences and euphoria
16. Improve self-concept

(Adapted from Cale, 1993 p.3)

Recent Phenomenon of Inactivity Among Youngsters

Recently a number of researchers have acknowledged that physical activity has many physiological and psychological effects that influence the health of youngsters and the future adult participation in physical activity (Health Education Authority, HEA, 1997). Regular physical activity has been shown to improve cardiovascular and other components of health fitness in youngsters and there is an increasing number of studies which indicate an inverse relationship between physical activity in young people and coronary heart disease risk factors such as blood pressure and obesity (Clark & Blair, 1988; Walberg & Ward, 1985). The recognised associations between physical activity and such health risk factors appear to be similar in both adults and children (Sallis et al., 1988b). Furthermore active children will develop skills, enjoyment and habits that will increase the likelihood that they will be active as adults (Blair et al., 1989). Two major reports published in Britain, The Health of the Nation

(1992) and the Allied Dunbar National Fitness Survey (1992) emphasised the need to establish active lifestyles at a young age.

Despite acknowledgements of the significance of physical activity to physical health, review of related literature reveals that the physical activity levels of children, adolescents and adults have declined in past decades. Several international studies have indicated that physical activity levels especially in youngsters are low [(Huenemann et al. (1967), Seliger et al. (1974), Shephard et al. (1980), The Australian Health and Fitness Survey (1985), The National Children and Youth Fitness Study (McGinnis, 1987)]. Similar findings have also been reported by British researchers [(Dickenson (1987), The Northern Ireland Fitness Survey (1989), HEA (1989), Armstong et al. (1990a, 1991), Allied Dunbar National Fitness Survey, (1992)]. A number of bodies responsible for public health are now concerned that levels of activity have declined to such an extent that they are likely to be detrimental to health. Morris, (1988) summarises such concerns: "*For lack of exercise we are bringing up a generation of children less healthy than it could be and many of whom are likely to be at high risk in later life of serious disease and shortened life expectancy*".

European Union Programme Dealing with the Problem

The problem of inactivity of youngsters is also considered an important issue in contemporary European society. At an informal Council meeting, in Athens in 1988, the Ministers for Sport stressed that certain aspects, concerning the participation in physical activities, require a Community approach:

- ". ...active participation in sport should be encouraged as far as possible, partly for reasons of public health, and specific attention should be paid to certain groups such as the disabled, old people and minorities,
- ... more women should be actively encouraged to take up sport and exercise as a vital part of the Community policy on equal opportunities,
- ...children should be encouraged to take part in sport and exercise and to develop a sporting mentality from an early age and proper teaching of sport in schools is of the outmost importance,...." (European Committee on Youth, Culture, Education, Information and Sport, 1988, p. 6).

In 1991 in Brussels, the Community decided that "given the growing importance attached by Community citizens to sport, the economic impact and the beneficial influence on young people, the Commission feels it must develop specific activities and better integrate sport into Community policies" (Commission of the European Communities, 1991, p.14). Since then, the European Community has promoted and financially supported programmes that encourage participation in exercise among the citizens of its country members, the development of sport centres and recreation facilities. More specifically in 1995 the European Commission launched the Eurathlon programme with the clear remit of providing a sports and exercise framework for the European Union. The programme's overall objective is "to use sport and exercise as a means of improving ties between Community citizens especially young people, in the context of sport for fun and *sport for all"* (European Commission, 1996, p.4). Many of the schemes have a specific aim such as campaigns encouraging public participation in sport and exercise as a means of promoting health;

others develop training programmes for managers and sports people and encourage sport exchange.

Motivating and promoting participation in sport, exercise and physical activities is also a central issue in UK government policy. Various approaches have been used including researches in an attempt to explain and deal with this contemporary inactivity which, as will be shown later, characterises today's young people. In September 1993, the British government established a national Physical Activity Task Force with the responsibility of developing a national strategy for promoting physical activity. The Task Force was set up following the publication of the Allied Dunbar National Fitness Survey (1992), which showed that physical activity levels in England are low. This initiative was part of the government's overall national health strategy, Health of the Nation, issued in July 1992. In particular, increasing levels of physical activity is essential for achieving the national targets for reduction in coronary heart disease and stroke, and obesity (Health of the Nation, 1992). In 1995, The Physical Activity Task Force published a consultative document - More People More Active More Often - which proposed a national strategy for promoting physical activity. The aim of such a strategy is to encourage the majority of the population, who are currently inactive, to make regular physical activity of moderate intensity a part of their daily routine.

Interest arose by the researcher given the importance of physical activity to adolescents' health and following concerns over Greek adolescents' low activity levels (Atsalakis, 1994; Kafatos et al., 1991). Furthermore the literature review revealed limited information available on the activity levels of Greek youth and it

therefore became evident that more information was required to determine current levels of activity. The assessment of the activity levels of a sample of Greek adolescents was one of the aims of this thesis.

The Greek Educational System

Formal education in Greece is mainly provided by the state, under a highly centralised and uniform system. State education is free, in terms of tuition fees and the supply of textbooks. By law the private schools have to follow the same curriculum as the state ones. Compulsory schooling extends from the age of six to the age of fifteen. Throughout the compulsory years, education is comprehensive with all children of each district attending the same school. The general aims of national education, according to the 1975 constitution, are: "The ethical, intellectual, vocational and physical training of the population; the development of national and religious identity; and the creation of self-sufficient and responsible citizens" (quoted in UNESCO, 1980, p. 91).

Educational levels

In Greece, education is provided at three levels: primary, secondary and tertiary. The primary level encompasses the nursery and primary schools. The secondary level has two cycles: the lower and the upper. Tertiary education is offered by universities and other institutions of lower grade.

Primary Education

a. Nursery School (Nipiagogio). The Nursery school caters for infants between the ages of three-and-a-half and five-and-a-half years, and attendance is gradually

being made compulsory. The role of the nursery school is to help infants develop physically, emotionally, intellectually and socially within the context of the general aims of national education.

b. Primary school (Dimotiko). Attendance here is compulsory and lasts six years. Children enrol at the age of five-and-a-half years. The syllabus and the textbooks are uniform throughout the state sector. The subjects taught in primary school are: Religion, Greek Language, Environmental Studies, History, Arithmetic, Elements of Science, Geography, Handicrafts, Music, and Physical Education.

Secondary education

The lower cycle is concerned with rounding off the general education begun in primary school, while the upper cycle is intended to promote studies leading eventually to specialised careers.

a. Lower cycle (Gymnasium). The Gymnasium period concludes the end of the nine-year compulsory schooling. After completing the six years of primary school, pupils are admitted to Gymnasium without examination. Studies last for three years (age 12-15) and the pupils graduating are awarded a leaving certificate (apolytirio).

Mainstream lower-secondary education is provided in the daytime gymnasiums. For pupils with special interests (sports, music, employment) three other types of gymnasiums are in operation: the Sport Gymnasium, the Music Gymnasium and the Evening Gymnasium; the last caters for persons in employment who are 14 years of age or over.

The course of tuition in the Gymnasium is uniform for all pupils. Subjects taught include: Ancient Greek Language and Literature, Modern Greek Language and

Literature, History, Religion, Mathematics, Physics, Biology, Technology, Arts, Music, Home Economics, Foreign Language and Physical Education.

b. Upper cycle (Lyceum). The mainstream upper-secondary education is provided in four institutions: the General Lyceum, the Integrated Multifarious Lyceum, the Technical-Vocational Lyceum and the Technical-Vocational School. Students with special interests attend other educational establishments such as the Classical Lyceum, the Ecclesiastical Lyceum, the Sports Lyceum, the Music Lyceum and the Evening Lyceum.

Studies in all types of lyceums last for three years except in the case of the Evening Lyceum and the Technical-Vocational School where studies extend over four and two years respectively. Admission to any of the upper-secondary institutions is without examination and is free to all holders of the Gymnasium Certificate.

In the General Lyceum, all students pursue the same subjects for the first two years. During the third year, they receive ten hours of general education and 20 hours per week of preparation for entrance into tertiary education. They have to choose one from the four preparatory streams, each of which corresponds to an area of tertiary studies.

The Technical-Vocational Lyceum combines general education with vocational training. During the third year, the students follow either a vocational specialisation stream or a preparatory stream for tertiary-education.

Tertiary education

Tertiary education is offered in Universities and Polytechnics where courses last from four to six years, and in Institutes of Technological Education where studies take three-and-a-half years. Access to tertiary education is free for everyone who

possesses the Lyceum Leaving Certificate and has completed one of the four preparatory streams in the third year of the Lyceum. Admission to tertiary institutions is regulated by a system of national examinations. Competition is high due to the great demand and to the limited number of places available.

The Greek National Curriculum of Physical Education

At the Ministry of Education, the physical education committee has produced a printed syllabus which clearly states the aims and which also acts as a guide to the running of the physical education programme. According to the committee the aims of teaching physical education at school are (Hellenic Ministry of Education/Physical Education Committee, 1990):

a) to promote the normal growth and development of each pupil according to her/his own capacity
b) to provide each pupil with a wide range of movement
c) to encourage and develop skills in chosen specialised forms of movement
d) to develop awareness of others, cooperation with others and individual determination
e) to arouse in the pupils a desire to continue active participation in physical activities after leaving school.

Physical Education as a school subject is taught to Greek children throughout their compulsory education years. In the first and second year (12-14 years old) of the Gymnasium all pupils have two 45-minute periods of various physical activities per week. In the third year (15 years old) all pupils have one 45-minute period of participation in physical education activities per week (Hellenic Ministry of

Education/Physical Education Committee, 1990). According to the National Physical Education Curriculum there are four areas of activity

1. Athletic activities which include experiences of running, jumping, throwing activities and competitive walking.

2. Team games, basketball, football, handball, and volleyball.

3. Dance, dances of the time and dances of the past.

4. Gymnastic activities aerobics, rhythmic gymnastics.

Each activity requires the learning of knowledge and skills across a range of levels. Outdoor and adventurous activities and swimming are not included in the Greek National Curriculum.

Physical Education is taught as follows, the academic year begins in September and finishes at the end of June, and is divided in three terms. In the first term of the first year the pupils are taught volleyball and athletics. In the second term basketball, athletics and dance and in the third term football, athletics and gymnastics. In the second year in the first term the students are taught volleyball, athletics and gymnastics; in the second term basketball, athletics and dance; and in the third term handball, football and athletics.

In the third year of gymnasium the pupils have in the first term volleyball and athletics; in the second term basketball athletics and dance and in the third term handball, athletics and gymnastics.

The following Tables 1.2 and 1.3 summarises the curriculum in Physical Education in the three years of the gymnasium. Note the prevalence of team games (Basketball, Volleyball, Football, Handball) and competitive athletics.

Table 1.2 Physical Education in Greek Gymnasium according to the National PE Curriculum

Activities	1st year	2nd year	3rd year
	First Term		
	Hours per term	Hours per term	Hours per term
Volleyball	12	11	9
Athletics	12	8	6
Gymnastics	-	7	-
Evaluation, tests	2	2	2
Sum	26	28	17
	Second Term		
Basketball	12	11	9
Athletics	6	7	4
Dance	6	6	4
Evaluation, tests	2	2	1
Sum	26	26	18
	Third Term		
Football	11	8	-
Handball	-	12	7
Athletics	8	4	4
Gymnastics	7	-	5
Evaluation, tests	2	2	2
Sum	28	26	18
TOTAL SUM	80	80	53

Table 1.3 Summary of Activities, Hours and Percent in Physical Education in the Three years at the Gymnasium.

Activities	Hours	Percent %
Basketball	32	15
Volleyball	32	15
Football	19	9
Handball	19	9
Athletics	59	27
Gymnastics	19	9
Dances	16	8
Evaluation	17	8
SUM	213	100%

As we can see from the Tables 1.2 and 1.3, the Educational Curriculum, by including physical education (PE) as part of the curriculum, ensures that all boys and girls participate and learn skills of sports and physical activities that might be continued after leaving school. It also guarantees a certain minimum level of physical activity per week for each adolescent.

Promotion of physical activity in a local level

Responsibility for the promotion of physical activity rests partly within the school curriculum and also with a variety of agencies, including the local authorities. Even a brief examination of any Greek community today reveals a number of initiatives concerned with the promotion of physical activity. Many of the schemes have specific aims such as encouraging participation in physical activities by children and adolescents, developing programmes for women and over 60's, promoting equality of exercise opportunities for persons with special needs (Hellenic Committee of Culture and Sports, 1996). These schemes can take place in schools, community facilities, local authority and private sport and leisure centres. Promoting physical activity at a local level is not an easy task. Strategies to promote physical activity at local level aim to direct enthusiasm and activities into programmes to promote physical activity, so that a greater number of people can enjoy the associated health benefits.

Self-Concept as a Determinant of Participation in Physical Activities

The pattern of adolescent's involvement in physical activities is not a simple one and depends on many factors. As Hendry (1978) wrote: "As a result of a very limited exploration of factors associated with involvement in sport and physical activity, it was found that a variety of behavioural, dispositional and situational variables were significantly related to ...different forms of involvement . Involvement tends to be the result of a rather complex set of factors ... Greater success in the exploration of involvement awaits further research based upon a more definite theory of involvement and involvement socialisation" (p. 40).

Today a variety of social-psychological factors have been identified and various theories have been developed to show how they may influence physical activity participation in youth. Sport psychologists have emphasised the role of self-concept characteristics as critical influences upon sport motivation and behaviour. In this respect, the study of self-concept may yield important findings for the motivational determinants of participation in physical activities.

The importance of self-concept as a major determinant of behaviour has been recognised throughout the history of psychology. Since the work of James (1890), one of the first to highlight its importance, researchers have published many studies regarding the nature of self-concept and its relation to other constructs.

Self-concept has also been theorised to be an important factor influencing one's level of motivation. Thus the status of a person's self-concept or perception of ability either enhances or diminishes the persons desire to participate or continue participating in an activity. White (1959) proposed that one's self-concept is associated with a basic mastery or competence motive that impels the individual to engage in mastery attempts. The role of self as an important motivation agent has also been emphasised by Bandura (1977, 1981, 1982, 1986). Bandura (1986) has introduced the concept of self efficacy noting that feelings of personal efficacy influence both one's choice of activity and coping behaviours, such as effort, and persistence after the activity is initiated. He also explained that people "take pride" in their accomplishments when they ascribe their success to their own abilities and efforts.

The relationship between one's self-perceptions of ability or competence and behaviour has become a heavily researched topic among psychologists including social psychologists, educational psychologists and researchers in the area of physical

education and sport psychology. In general physical educators and sport practitioners have supported the notion that perceptions influence participation in physical activity. That is individuals choose to participate in sport and physical activity programmes only when their perception of their physical abilities is already at a high level.

An important aim of this thesis was to investigate the physical self-perceptions of adolescents and their relationship with participation in physical activities.

The Origin of the Study

It is believed that physical activities enrich the quality of life and enhance well-being by providing a variety of experiences. There is therefore a great need to encourage participation in physical activities among adolescents.

Self-concept (self-perception) has been theorised to be an important factor influencing one's level of motivation. The relationship between one's self-concept and behaviour has become a heavily researched topic among psychologists (Erikson, 1968; Ferguson et al., 1983) and it seems that a behaviouristic position has also been adopted by the majority of practitioners in the area of physical activity.

Todays research (e.g. Fox & Corbin, 1989) is investigating the commonly held assumption that participation in physical activities is determined at least in part by the physical self-perceptions the youngsters hold of themselves.

While physical self-perception studies in relation to participation in physical activities have formed an important area of research in other countries (U.S.A, Australia), they have received little attention in Greece. There was therefore a need for such a study to be undertaken in a Greek context.

Objectives of The Study

This thesis has addressed three objectives: The first was to investigate the physical self concepts of a sample of Greek adolescents; the second was to provide information about the physical activity levels and patterns of the sample; and the third was to examine the associations between the physical self-concept and physical activity participation of the sample.

The Structure of the Thesis

The thesis is divided into two parts and seven chapters.

Part One contains chapters One to Three. The First, current, chapter is the introduction of the thesis. Chapter Two is a review of the literature relevant to the studies associated with physical self-concepts, patterns and levels of physical activities of adolescents and the association between physical self-concept and physical activities involvement. In Chapter Three, the two instruments used in the study are described and the methodology is presented.

Part Two describes the findings of the research and contains Chapters Four to Seven. In Chapter Four the statistical analyses and the results from the use of the two questionnaires are presented in tables and figures and are described. In Chapter Five the conducted interview study and its findings are presented. Chapter Six discusses the results and makes comparisons with findings of other studies. Chapter Seven is the final chapter, it summarises the research findings and it proposes recommendations for further research in the area.

CHAPTER TWO

LITERATURE REVIEW

The review of literature presented in this chapter deals with studies of physical self-concept, of physical activity involvement and of their relationship. The chapter is divided into sections. In the first section definitions occurring in self-concept research are summarised and various measurements and questionnaires of the physical self-concept are examined. The second section presents studies on the patterns and level of physical activity of adolescents and examines the approaches researchers have engaged in attempts to measure physical activity involvement. The third section discusses the relation between physical self-concept and participation in physical activities and presents relevant research.

Section One: Self-Concept

Definition and Nature of Self-Concept

Over the past three decades, self-concept has been considered an important variable for interpreting and predicting human behaviour in a wide variety of educational and psychological settings (Calsyn & Kenny, 1977; Phillips,1984).

Carl Roger's (1951) definition of self was concerned with how the individual thinks about him or herself. Rogers believed a person's behaviour and adjustments are dependent on the way the person perceives him or herself. Included in Roger's understanding of self is the concept that a person is not only aware of those characteristics that make up the self, but is also able to control those characteristics.

When a person's ability to preserve the organisation of self is threatened, anxiety occurs. If however, the environment fosters positive feelings in a person, the individual will grow and self-actualise.

In 1992 in a review of literature Hattie defined self-concept "...as both a structure and a structure/process. For some individuals it can be a structure and set of beliefs that dominate processes and actions, whereas for others it can be structure/process that involves a set of beliefs that are hierarchical, multifaceted, latent and can guide, mediate and regulate behaviour in various social settings. The saliency of self-concept as a guide to behaviour varies across situations, but self-concept is not chameleon. Very few individuals can explicitly describe their concept of self, the relationships between their implicit models that can regulate and may guide both behaviours and impressions" (p.117). The differences between Roger's and Hattie's definitions reflect some of the research that has been carried out in the 40 years between them. Nowadays the structured and multifaceted idea of the self-concept is well established as is its application to studies in a wide variety of social settings.

Despite a plethora of research studies on the content and structure of self-concept, an operational definition has not been accepted by all self-theorists. In a review paper, Shavelson, Hubner, & Stantonk (1976) found that self-concept was defined differently in more than seventeen studies. In general a most acceptable definition among self-theorists is that self-concept is a person's perception of herself or himself, that includes attitudes, appearances, feelings and knowledge of one's ability, skills, and social acceptability. According to Shavelson et al., (1976), there is a close association between one's perception of himself or herself and the way she or he acts. As they have explained "one's perceptions of himself are thought to influence the way in which he acts, and his acts" (p.411). The issue of the relationship between

self-concept and actions (for example participation in physical activities) will be taken up again later in this chapter in the context of sports studies.

Another concern referring to the definition of self-concept is that many researchers have used different terms when studying its nature. For example, terms such as self-esteem, self-perception, self-evaluation have been used to describe the global notion of self-concept. As a result, in most studies, the term self-concept and self-esteem have been used interchangeably. Although these terms are used as if synonymous, others suggest that only the term self-esteem emphasises the evaluative dimension of a person's self-concept (Coopersmith, 1967).

The Hierarchical, Multifaceted Nature of Self-Concept

Within the large number of studies being published in the self-concept area, there has been controversy over whether the self-concept is captured by a single score (global self-concept) or whether it is multidimensional in nature. Some researchers (e.g. Coopersmith, 1967; Marx & Wine, 1980) argued that self-concept is a unidimensional construct. Coopersmith (1967) viewed self-concept as a "differentiated aggregate of evaluations". He postulated that one's self-concept varies across different areas of experience; and he constructed items to measure school, friends, family, and self-confidence. In analysing the data in preliminary research, Coopersmith (1967) concluded that "either preadolescent children make little distinction about their worthiness in different areas of experience or, if such distinctions are made, they are made within the context of the over-all, general appraisal of worthiness that the children have already made" (p.6). However Coopersmith worked with young children whose self-concept may not yet become

differentiated. If so, this is one reason why he might not have found the multifaceted and hierarchical relationship later confirmed by others. Overall, self-concept researchers who have relied primarily on the global self-concept, have not provided strong support for their interpretations (Coopersmith, 1967; Piers, 1977).

Other researchers have proposed a multidimensional structure for the self-concept. Shavelson et al. (1976), in an extensive review of the self-concept literature, hypothesised that the self-concept structure is both multidimensional and hierarchical. Specifically, Shavelson et al. (1976) have proposed a model (see Figure 2.1.1) in which general self-concept is at the apex of the hierarchy with academic self-concept, social self-concept, emotional self-concept, and physical self-concept as second-order factors. Academic self-concept is further subdivided into subject specific subdomains English, history, math, science etc. Social self-concept is subdivided into peer and family self-concepts; Emotional self-concept is subdivided into particular emotional states; whilst Physical self-concept is subdivided into physical ability and physical appearance self-concepts. Shavelson and his colleagues contended that the organisation of the hierarchy changes as an individual approaches adulthood. Furthermore, they proposed that the facets of self-concept at higher levels of the hierarchy will be more stable over time and situation than the facets found in lower levels of the hierarchy.

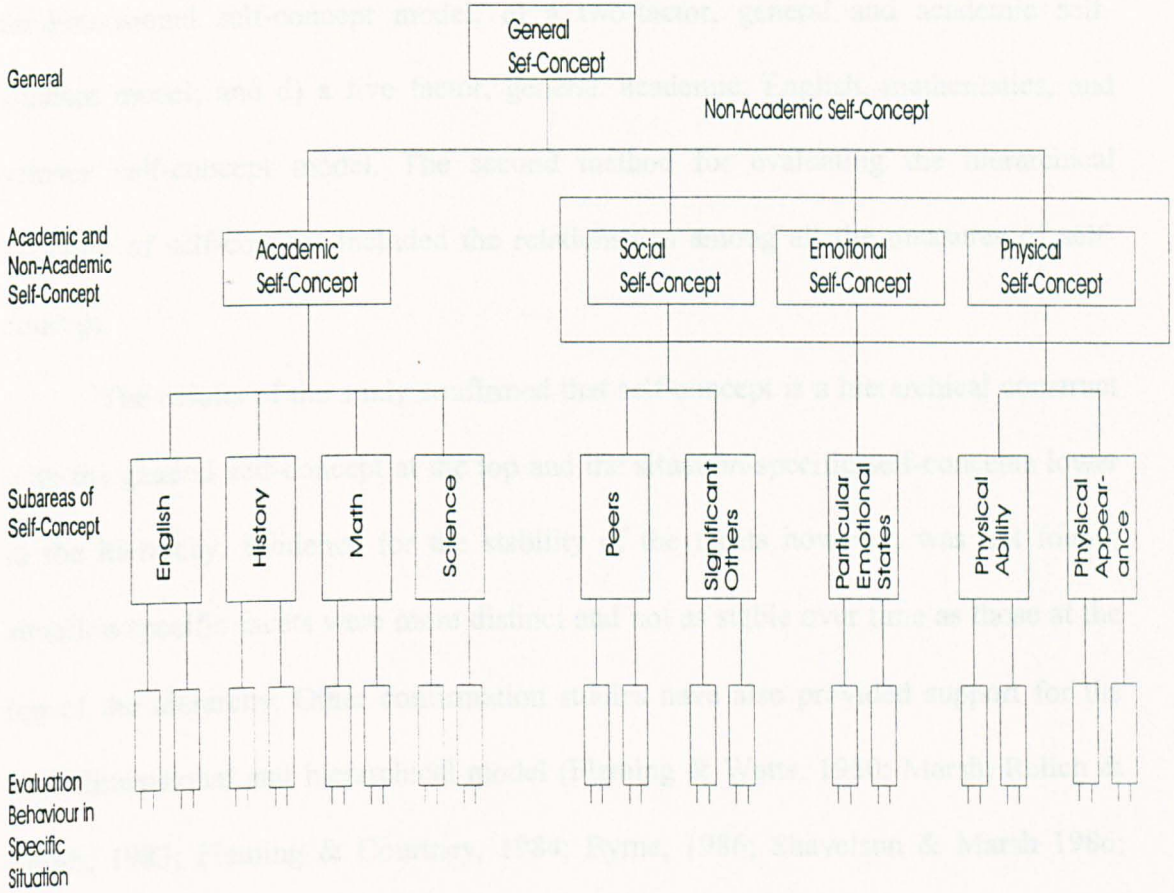


Figure 2.1.1 A Multidimensional Model of Self-Concept (Shavelson, Hubner, & Stanton, 1976).

The self-concept literature predominately supports a multidimensional and hierarchical model. Shavelson & Bolus (1982) demonstrated construct validity for both global and academic self-concepts in addition to a strong evidence for the hierarchical structure of the facet model with junior high school students. Specifically, 99 seventh and eighth grade students responded to a battery of self-concept tests - general self-concept and academic achievement in English, maths and science - over a four month interval. The multidimensional hierarchical structure of self-concept was evaluated with two methods. First, a nested model was examined. This comprised a) a

"null" model that provided a measure of the total covariation in the data; b) a unidimensional self-concept model; c) a two-factor, general and academic self-concept model; and d) a five factor, general, academic, English, mathematics, and science self-concept model. The second method for evaluating the hierarchical structure of self-concept included the relationships among all the measures of self-concept.

The results of the study confirmed that self-concept is a hierarchical construct with the general self-concept at the top and the situation-specific self-concepts lower in the hierarchy. Evidence for the stability of the facets however, was not found; situation-specific facets were more distinct and not as stable over time as those at the top of the hierarchy. Other confirmation studies have also provided support for the multidimensional and hierarchical model (Fleming & Watts, 1980; Marsh, Relich & Smith, 1983; Fleming & Courtney, 1984; Byrne, 1986; Shavelson & Marsh 1986; Marsh, Byrne & Shavelson, 1988).

Fleming & Watts (1980) tested the Shavelson et al. (1976) model. They distributed an adapted form of the Feelings of Inadequacy Scale (Janis & Field, 1959) to 106 university students. Using a principal components analysis they found that three components accounted for 46% of the total variance of self-concept. The components were labelled social confidence, self-evaluation of scholastic abilities and self-regard. These, they claimed, were akin to Shavelson et al.'s three second order factors: social, academic, and emotional self-concept respectively. After scanning the interrelations of these three components, Fleming & Watts concluded that the "results do seem consistent with an academic-non-academic dichotomy, and with a hierarchical branching of the latter in to two conceptually distinct and correlated dimensions" (p.920). Similar findings were found by Marsh, Smith & Barnes, 1983;

Fleming & Courtney, 1984 and Byrne & Shavelson, 1986. These researches agreed that, the multidimensional self-concept taps all the important distinctions that children make about themselves as they undergo various developmental changes. They argue that as children age, their concept of self becomes more complex; in other words, at a younger age children may have a "single self-concept" and as they mature their sense of self broadens and grows. The age-related development of hierarchical self-concept has been mentioned earlier in a description of work by Coopersmith (1967).

Song & Hattie (1984) introduced modifications to Shavelson's model. According to these researchers academic self-concept was subdivided into achievement, ability, and classroom self-concept, an idea introduced earlier by Wylie (1979). Ability self-concept denotes the extent to which individual believes he or she is capable of achieving, whereas achievement self-concept relates to feelings or perceptions of actual achievement. Achievement self-concept is the perception of a person's actual academic achievement at a particular time and was measured by items such as "I am satisfied with my school work". Ability self-concept was measured by items such as "I think that I have the ability to get good grades in schoolwork". Classroom self-concept relates to confidence in classroom activities and was measured by items such as "I feel left out of things in class"(a negative item). Under achievement and ability self-concepts are both subject specific self-concepts. These subject self-concepts are most likely to be situation specific, sensitive to change, and probably can be grouped into arts/verbal and science/mathematics factors.

Other modifications to the Shavelson et al. (1976) model made by Song & Hattie (1984) relate to the non-academic self-concept. In the Song & Hattie (1984) model this is reformulated as two second-order factors: social self-concept and self-regard self-concept. Social self-concept is divided into two factors, family and peer

self-concepts, and these relate to the most significant others in a person's life. Self-regard self-concept is divided into two factors: confidence in self and physical self-concept, and these relate to how people present themselves to others. Confidence in self relates to emotional self-concept as it was defined by Shavelson et al. and was measured by items such as " I have respect for myself" and "I certainly feel useless at times" (negative item). Physical self-concept was divided into physical ability and physical appearance and was measured by items such as "I am an attractive person" and "My looks bother me" (negative item) (Hattie 1992).

Marsh and his colleagues (Marsh, 1985; 1987; Marsh, Barnes, Cairus & Tidman, 1984; Marsh & O'Neil 1984; Marsh, Richards & Barnes, 1986), have also provided strong empirical support for the multidimensionality and structure of self-concept, as proposed by Shavelson et al. (1976). Specifically, support for the model came from work with the Self-Description Questionnaire (SDQ). The SDQ was constructed to assess both non-academic facets (Physical Ability, Physical Appearance, Relations with Peers, Relations with Parents) and three academic facets (Reading, Mathematics and General School) of self-concept. These seven factors have been consistently extracted in factor analyses of responses involving diverse populations of preadolescent children (Marsh, Barnes, Cairus & Tidman; 1984; Marsh, Parker & Smith, 1983).

The strongest evidence, however, for the model concerning the internal structure of self-concept, as hypothesised by Shavelson et al. (1976), has been accomplished with the application of confirmatory factor analysis and hierarchical confirmatory factor analysis (Marsh, 1987; Marsh, Byrne & Shavelson, 1988; Marsh & Shavelson, 1985; Shavelson & Marsh, 1986). The results of these investigations

provided support for Shavelson's et al. (1976) multifaceted, hierarchical model of self-concept for adolescents and a more unitary structure for younger children.

The model by Shavelson et al. provides the basis for a possible division of physical self-concepts in an analogous manner to the division of academic self-concept. It may be hypothesised that a number of levels exist for physical self-concepts. Fox (1987) developed a hypothetical structure of how Shavelson's model might apply to the physical domain, "physical self-assessments can be categorised by their relative generality over situations, the degree to which they are enduring or stable, and the nature of their content" (p.28). In the Fox model (1987) Level 1 highest of the structure, is represented by a global measure of self-esteem. Level 2 acts as a global outcome of concepts restricted to the physical domain. Level 3 characterises the assessment of different physical subdomains and, as in the case of Shavelson's model, includes both physical abilities and physical appearance.

In summary, this section has reviewed developments in self-concept research. The work of Shavelson and his colleagues on the multidimensionality and hierarchical order of the subdomains of self-concept has created a new interest in this area and has caused researchers to examine more systematically the nature of self-concept. According to a modern view, self-concept may be described as organised, multifaceted, hierarchical, stable, developmental, evaluative, and differentiable from other constructs (Hattie, 1992). The proposed model by Shavelson et al. presented the global self-concept at the apex of the hierarchy, it can be divided into two facets: academic and non-academic self-concept. In turn, these second order facets can be subdivided. One of the facets of the non-academic self-concept is the physical self-

concept. The physical dimensions of self-concept have been structured by Fox (1987) and it's these ideas that will be used within this study.

The next section reviews the physical self-concept inventories that have been included as subscales of broader self-concept instruments, as well as those which have been developed to measure physical self-concept with reference to the physical domain only.

Measures of Physical Self-Concept

Measures of physical self-concept can be divided into two categories; those which are subscales of broader based instruments and those which are designed to measure in the physical domain only.

Measurements of Physical Self-Concept as Part of Global Self-Concept

Many theorists examining the self-concept have recognised the importance of physical self-conceptions in the overall development of an individual. White (1959), for example, proposed that physical competence plays an important role in the personality development and functioning of young children. Developmental psychologists, notably Erikson (1963) and Piaget (1951), have commented on the importance of body perceptions in the development of children's general self-concept. In Wylie's (1968) words "it seems likely that developing an accurate knowledge of the kind of reaction one can elicit in the physical environment and in others increases the chances of attending to many kinds of primary and secondary positive reinforcements" (p.745).

Rosenberg (1979) also emphasised the positive influence of physical self-perceptions on overall self-concept. He argued that social identities, personal dispositions, and physical characteristics are the major components of one's self-concept. Specifically, he proposed that a person's view about his or her physical appearance (the terms body image, and attractiveness are also used) is important in the development of self-concept. Reinforcing the view of the importance of appearance Wylie (1979) stated, "it seems intuitively obvious that attitudes toward the body are important aspects of self-regard" (p.240).

As a result of a belief in the positive contribution of physical self-attributes to the "build-up" of global self-concept, many researchers have incorporated physical self-perception subscales, such as physical self, physical ability, and physical appearance, within instruments designed for the measurement of overall self-concept. One of the oldest, and often used, global self-regard instruments is the Tennessee Self-Concept Scale (TSCS; Fitts, 1964). The instrument has eight dimensions of self-concept including a subscale which measure perceptions of the physical self. The physical subscale is made up of the following content: a) healthy body, feeling well, taking care physically, sleep patterns; b) sex appeal; c) attractiveness, looks, satisfaction with body fatness and height; d) dexterity, sports and games skill.

Another frequently used self-concept scale, which includes subscales for physical self-perceptions, is the Piers-Harris Children's Self-Concept Scale (Piers, 1969), which includes attractiveness, strength, clumsiness, and sports and games items. The Piers-Harris instrument has been extensively used (Platten & Williams, 1979, 1981; Hattie & Cooksey, 1984) with primary school children and as a consequence, there is much psychometric data available. According to Hattie (1992) "there are no age or gender differences on the scales, and the consistency and stability

estimates of reliability are very reasonable" (p.153). The instrument also has significant correlations with other reliable self-concept tests. Its validity is encouraging, and the analysis of the dimensionality provides support for its separate scales of behaviour, intellectual and school, and physical appearance and attributes (Hattie, 1992).

Marsh and O'Neill (1984) developed the Self Description Questionnaire III (SDQ III) which includes subscales of physical self-perceptions, including physical ability and physical appearance. Individuals' perceptions of their skills and interest in sports and physical activities are assessed by items such as "I'm not very good at any activities that require physical ability and coordination" (negative item), "I have a high energy level in sports and physical activities", and "I hate sports and physical activities" (negative item). Also, individuals' perceptions of their physical appearance are assessed with items such as "My body weight is about right (neither too fat nor too skinny)", "I have a good body build", and "I wish that I were physically attractive" (negative item). Marsh & O'Neil used a chi square test on their data. The reported results supported their model. From the correlations between the factors and a multitrait-multimethod (MTMM) analysis of the self and other scales, they concluded that there was extremely strong support for both the convergent and divergent validity of self-concept as measured by the SDQ III (p.172).

Harter (1982) developed the Perceived Competence Scale for Children (PCSC) that consists of three domains; cognitive, social, and physical. Each of these domains is represented by a subscale of seven items. In addition, seven items are designed to assess the child's general sense of self-worth. Harter's physical domain measures children's perceptions of physical competence, particularly athletic ability.

To assess feelings of physical competence, children respond to statements such as

Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
☐	☐	Some kids do very well at all kinds of sports,	BUT	Others don't feel that they are good when it comes to sports	☐	☐

First the respondents have to choose which half of the sentence is true for them and then indicate whether the statement is "sort of" or "really" true for them. Recently, Harter (1985a) has developed a revision of the (PCSC), the Self-Perception Profile for children that includes two physical domains: sport competence and physical appearance. The scheme adopted by Harter for construction of the scales consisted of first identifying conceptually important domains or subdomains of self, and then constructing scales which assess a general component within each domain. Specific items were avoided. In Harter's words "this allows the subjects to respond to the domain within his/her own terms of reference rather than be limited by a group of specific items identified by previous analysis. In this way, as long as the domain is clearly defined within the items, as in the case of having an attractive body, the individual is free to make an assessment according to what he/she specifically feels an attractive body is" (Harter, 1985a, p.7).

Instruments that Measure Physical Self-Concept as a Stand Alone Entity

Although the notion of multidimensionality is implicitly supported by the acknowledgement of an independent physical self-concept, psychologists and physical educators seem to agree on a need to develop also psychological instruments that focus solely on the physical domain and to evaluate such instruments for their construct validity.

Physical self-concept within the physical domain has been assessed with a variety of instruments. Ryckman, Robbins, Thorton & Cantrell (1982) developed the Physical Self-Efficacy Scale (PSE) to measure individuals' perceived physical self-confidence within a wide variety of situations requiring physical skills. The scale consists of two components, or subscales; perceived physical ability (PPA) and physical self-presentation confidence (PSPC). The PPA subscale measures individuals' perceptions of their abilities (e.g. strength, endurance and agility), while the PSPC subscale assesses their confidence levels in the presence of evaluative others. Research studies (Ryckman et al. 1982) with the PSE have reported that individuals who scored high in Physical Self-Efficacy scale, had higher self-esteem and were more likely to participate in sports and adventurous activities that required speed or had an element of danger. However, MacAulley & Gill (1983) found that measures of task-specific self-efficacy are more powerful in predicting exercise behaviour and performance rather than the more stable measures of global physical self-efficacy used by Ryckman et al. (1982).

Sonstroem (1974, 1976, 1978) devised the Physical Estimation and Attraction Scales (PEAS), in association with a psychological physical activity model (see Figure 2.3.1 p. 62). Based on this model, the Estimation Scale (EST), assesses self-perceptions of physical abilities and the Attraction Scale (ATTR) measures attitudes towards physical activity and sports. The PEAS instrument has been used in a variety of settings within the area of sport and exercise psychology. Sonstroem (1974, 1976) using the scales found that physical self-perceptions were related to global self-esteem and physical fitness in boys aged 12 to 18.

Recently, Fox & Corbin (1989) have conducted an extensive investigation of the content and structure of physical self-perceptions with 1191 college students

(mean age = 19.7 years). Fox and Corbin's research was similar to Marsh and Shavelson's multidimensional and hierarchical structure of self-concept. They have presented a psychological model in which global self-esteem is at the apex of a hierarchy, followed by the physical self-worth at first domain, and sport competence, attractive body, physical strength, and physical condition at the subdomain levels (see Figure 2.1.2). According to this model, the physical self-perception subdomains influence the overall self-esteem as well as physical activity involvement (see Figure 2.1.3).

In association with this physical activity and participation model, Fox & Corbin (1989) have developed the Physical Self-Perception Profile (PSPP). The PSPP assesses the four subdomains of physical self-perceptions: sport competence, attractive body, physical strength and physical condition. In addition, they have constructed two additional scales to measure general physical self-worth and perceived importance of the physical self. The PSPP has met the rigours of psychometric scrutiny with a college age population. Fox & Corbin (1989), claim that "subscales have shown that they are sensitive to a wide range of individual differences, do not appear susceptible to social desirability, and are stable at least over a 3-week period. In addition, subscale internal consistency, means and standard deviations have proven stable across two independent samples, which encourages confidence in the normative properties of the profile" (p.425). Factor analyses confirmed the four subdomains and the self-concept responses have a relationship with physical activity involvement. Also the pattern of relations among the self-concept scales supported a hierarchical model of physical self-concept and provided further support for the Shavelson et al. (1976) model.

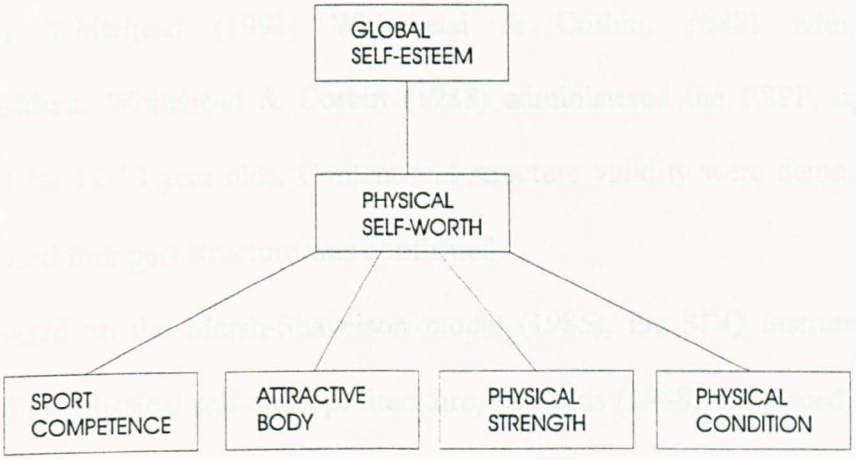


Figure 2.1.2 Fox Hierarchical Model of Physical Self-Perception (1987).

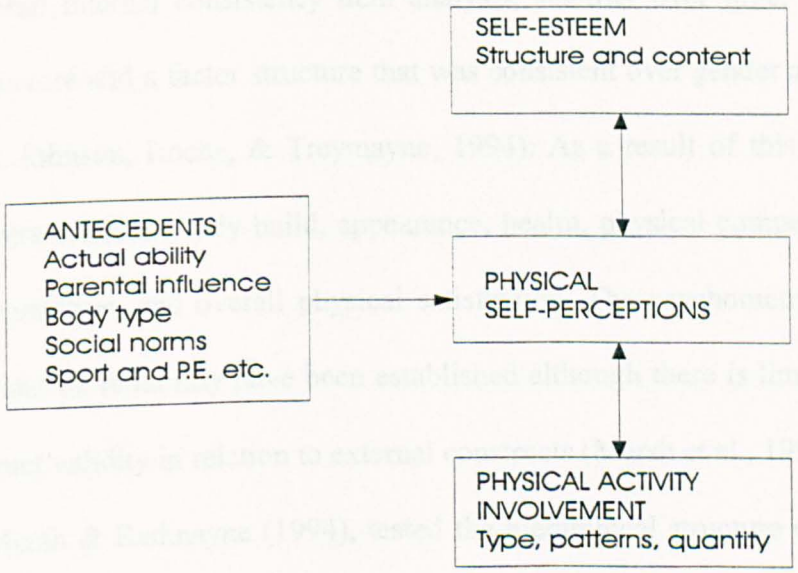


Figure 2.1.3 Fox Physical Self-Perception Model (1987)

Recently the PSPP has been modified for use with children (PSPP-C) through the work of Whitehead (1991; Whitehead & Corbin, 1988) with American schoolchildren. Whitehead & Corbin (1988) administered the PSPP, appropriately reworded for 12-13 year olds. Content and structure validity were demonstrated and the proposed four part structure was confirmed.

Based on the Marsh-Shavelson model (1985), the SDQ instruments, and a review of the physical self-concept literature, Richards (1988) developed the Physical Self-Concept Scale (PSC). The instrument was able to measure multiple dimensions of physical self-concept appropriate for females and males over the age of 12. The PSC was initially developed to define eight factors. Items were revised according to four criteria: internal consistency item analysis, stability over time, a well defined factor structure and a factor structure that was consistent over gender and age (Marsh, Richards, Johnson, Roche, & Treymayne, 1994). As a result of this revision seven factors were retained: body build, appearance, health, physical competence, strength, action orientation, and overall physical satisfaction. The psychometric properties of the PSC and its reliability have been established although there is limited support for its construct validity in relation to external constructs (Marsh et al., 1994).

Marsh & Redmayne (1994), tested the hierarchical structure of physical self-concept using the Physical Self-Description Questionnaire (PSDQ) a multidimensional inventory that measures six facets of physical self-concept (physical appearance, physical ability, strength, balance, flexibility, and endurance). A more recent version of the PSDQ (Marsh et al., 1994) is designed to measure nine specific components of physical self-concept (Strength, Body Fat, Activity, Endurance/Fitness, Sport Competence, Coordination, Health, Appearance, Flexibility), together with two further scales, Global Physical Self-Concept and Global Esteem. Each of the 11 scales

is intended to measure a stable, relatively independent physical self-concept trait. Consistent with the Shavelson et al. model (Figure 2.1.1), there is a hierarchical ordering in which global self-concept is at the apex, global physical self-concept is at the next level, and the specific components of physical self-concept are at the third level. The psychometric properties of the PSDQ and the construct validity have been successfully measured and tested; they support the idea that the PSDQ is a comprehensive instrument in that it measures a broad range of physical self-concept. This promising new instrument has been used in this thesis for studying the physical self-perceptions of Greek adolescents and it will be described and discussed in detail in Chapter Three.

Summary of Section One

The first part of this section has reviewed the latest theoretical developments in self-concept research. Despite the plethora of research studies on the content and structure of self-concept an operational definition has not been accepted by all self theorists. Nowadays, the structure and multifaceted idea of the self-concept seems to be established as is its application to a wider variety of social settings. The hierarchical and multifaceted nature of self-concept has been supported by the findings of many researchers. Shavelson et al. (1976) have proposed a model in which general self-concept is at the apex of the hierarchy with academic, social, emotional, and physical self-concept as second order factors. These second order factors are subdivided into subject specific subdomains (third order). Many confirmatory and modification studies supported the Shavelson's multidimensional and hierarchical model. Fox (1987) developed a hypothetical structure of how Shavelson's model might apply to the physical domain.

The second part dealt with the measurements of the physical self-concept in the physical domain. Approaches can be divided into two categories: a) instruments of physical self-concept as part of global self concept; the Piers-Harris Children's Self-Concept Scale (1969), the Harter Perceived Competence Scale for children (1982) the Marsh & O'Neill Self Description Questionnaire III (SDQIII) (1984); and b) instruments that measure the physical domain alone: the Physical Self Efficacy Scale (PSE) (Rycknam et al.,1982), the Physical Estimation and Attraction Scale (PEAS) (Sonstroem, 1974, 1976, 1978), the Physical Self-Perception Profile PSPP (Fox & Corbin, 1989), the Physical Self Description Questionnaire PSDQ (Marsh et al., 1994). From the instruments which measure solely the physical dimension of self-concept, the work by Marsh et al. (1994) has opened the way for more detailed conceptualisation and measurement of physical self-perceptions.

Section Two: Adolescence and Physical Activity

Because many researchers have claimed that the physical activity levels of adolescents have declined during past decades e.g. Gortmaker et al., 1987; Ross et al., 1985, there was a need to determine the physical activity levels and patterns in Greek adolescents. This part first considers adolescence as a physical and psychological developmental period, then provides a review of both international and British studies which have measured and reported the levels of physical activity of young people.

Adolescence

Adolescence is a developmental period that has been said, "begins in biology and ends in culture" (Keough & Sugden, 1985). Many physiological, psychological and social changes occur in this period. Physiologically and biologically adolescence brings many alterations to the human body. The development of muscle and body fat, and alterations in skeletal structure are important changes that take place during adolescence. In both girls and boys muscular development proceeds as height increases. This increase varies widely in intensity, duration, and age of onset from one child to another. At the same time other important changes are also taking place. Increases in many properties such as physical strength, power, physical endurance, the development of athletic skills (reaction time, co-ordination etc.), are followed by greater exercise tolerance.

Dramatic physical growth during adolescence makes teenagers stronger and more physically competent than children. By age 14, adolescents can perform many motor activities to the same standards as adults (Keough & Sugden, 1985). Rapid muscle development over the adolescent years makes both boys and girls (but

especially boys) noticeably stronger than they were as children (Faust, 1977). Their performance of large-muscle activities continues to improve: an adolescent can throw a ball farther, cover more ground in the standing long jump, and run much faster than a child (Keough & Sugden, 1985). As the adolescent years progress, the physical performances of boys continue to improve, while that of girls often levels off or sometimes declines (Sigelman & Shaffer, 1991). Adolescents differ widely in their physical abilities. Some are awkward, uncoordinated and accident prone, while others are already setting world records or winning professional tournaments. Those adolescents who excel in sports undoubtedly have sound biological systems but they are also motivated presumably through development of self-concept to develop their physical abilities and to train and practise hard.

The physical changes of adolescents are significant for three main reasons: a) they are crucially related to changes in skeletal mass, strength, and co-ordination, which have important implications for the development of motor skills b) they reflect a greater emphasis in participation on exercise activities c) they alter crucial aspects of body form and appearance such as height, weight, and body proportions, which may have a profound effect upon the individual's self-concept and identity (Sigelman & Shaffer, 1991).

Simultaneously adolescence is a period which brings with it both consolidation and change for the existing self-concept. Erikson (1963) has claimed that the major task confronting the adolescent is to develop a sense of identity, to find answers to the questions 'who am I?' and 'where am I going?'. The search for personal identity involves deciding what is important or worth doing and formulating standards of conduct for evaluating one's own behaviour as well as the behaviour of others. This search necessarily involves feelings about one's own self-worth and self-competence.

Adolescents' sense of identity develops gradually out of various identifications of childhood. Adolescence is a period of transition between childhood and adulthood and a number of factors promote self-concept modification during this period. They include: a) the physiological and physical changes in appearance and physique which lead to changes in body image; b) the maturing of cognitive and intellectual skills which bring a more complex and differentiated self-concept; c) the changing demands of various aspects of society such as parents, peers, and school which may cause conflict and create a status of ambiguity (Clausen, 1975; Peterson & Taylor, 1980).

The contribution of perceptions of physical self to global perception of self-concept during adolescence is frequently observed in research. Theorists emphasise the association of a positive physical self-concept to a greater degree of self-confidence and higher level of independence (Coopersmith, 1967; Erikson, 1968). Thus a major developmental task during this period has to do with adolescents coming to accept their appearance and physique and learning to use their physical abilities effectively. Some may choose to do this by engaging in appropriate physical activity. Unfortunately, adolescence for many means the beginning of a trend toward sedentary habits that is perhaps the most characteristic psychological datum of the ageing process.

Measuring Physical Activity

Before something can be measured, it needs to be defined (Hensley et al., 1993). Physical activity has been defined as "any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen et al., 1985, p.127). Exercise is a specific type of physical activity that has been defined as "planned, structured and repetitive bodily movement done to improve or maintain one or more components of physical fitness" (Caspersen et al. 1985, p.127). According to these definitions, physical activity is a very broad construct that includes almost all kinds of movement, but exercise is a much narrower and more purposeful construct (Pate et al., 1994).

Researchers have also been concerned with the meaning of appropriate physical activity. Some definitions of "appropriate activity" adopted by different researchers are shown in Table 2.2.1. A noticeable feature of several of the definitions of "activity" and "exercise" is the "medical" character of what they describe. This no doubt, reflects the fact that much of the research on children's activity has a medical or health concern background and that the largest studies (indeed nearly all studies of all kinds) have been funded by government or private health foundations. The medical aspect of these studies is their justification for ignoring all levels of "light" activity. This is just one example of how the physiological rather than the psychological objectives of the studies have shaped the kind of data they have collected.

Table 2.2.1 Various Definitions of 'Appropriate' Activity

STUDY	DEFINITION OF 'APPROPRIATE' ACTIVITY
Durnin (1967)	activity of moderate, heavy or very heavy intensity
The Canada Fitness Survey (1983)	average of 3 or more hours of physical activity per week for 9 months of the year or more
Vershuur & Kemper (1985)	the (1978) ACSM recommendation*
The Australian Health and Fitness Survey (1985)	activity 3-4 times a week which makes the child 'huff and puff' and lasts for 30 minutes
Kannas et al., (1986)	20-30 minutes of exercise, 3-4 times a week
The Sports Council for Wales (1987)	20 minutes of vigorous activity 3 times a week
The National Children and Youth Fitness Study, McGinnis (1987)	the ACSM (1978) recommendation
The Northern Ireland Fitness Survey (1989)	exercise versus no exercise, defined as any activity that causes a degree of breathlessness
Armstrong (1989; Armstrong et al., 1990c)	activity involving large muscle groups in dynamic movement, for a period of 20 minutes or longer, 3 or more times a week, at an intensity producing a heart rate of at least 140 beats per minute

*The American College of Sports Medicine (1978) recommend that for exercise to develop and maintain fitness, it should involve using large muscle groups for a period of between 20-45 minutes for a minimum of three times a week , at an intensity of 50-60 % of maximum capacity.

(Adapted from Cale & Almond, 1992, p.98)

Methods of assessing physical activity range from physiological, mechanical, observational and self-report measures to combination of measures, with each method having a range of different instruments or techniques from which to choose.

Given the concerns about and the importance of participation in physical activities by young people, there are relatively few studies describing physical activity behaviour in adolescence. For Pate et al. (1994) the pertinent studies can be grouped into two categories based on the types of instruments that were used to measure physical activity behaviour. The first major methodology used to study physical activity and behaviour in youth involves objective monitoring of activity with motion

sensors or heart rate monitors. These methods are expensive and time consuming but their results can be used as a cross reference to "validate" the findings of other studies. The second more common method used to measure physical activity behaviour is the self-report instrument (Pate et al., 1994). In epidemiological studies of physical activity, self- report is the recommended method of assessment (Sarris, 1985; Wilson et al., 1986; Cale, 1993).

Self-Report Measures

Self-report measures are probably the most commonly used type of measure of young people's physical activity due to their convenience of administration, low cost, and ability to collect a variety of physical activity variables over time (Cale, 1993). Sallis (1991) believes "it is reasonable to ask subjects to report their own physical activity because they have experienced it and many physical activities are salient events that even children are likely to remember to some extent" (p.216). Physical activity self-reports have been used for numerous purposes. Specifically, self-report instruments for physical activity assessment have been used in three areas of investigation. These are epidemiological, behaviour change and correlation studies (Baranowski, 1988). Researchers interested in describing patterns of children's physical activity, relating children's physical activity to physiological variables, and evaluating physical activity promotion programmes have found the self-report instrument convenient. Because physical activity self-reports are used for many purposes, investigators have developed measures that suit special study objectives.

Four types of self-report measures are common:

a) Self-administered recall. Young people report their own activities using a structured form. Responses may be open-ended or close-ended, this format typically is used for mass administration;

b) Interview-administered recall. Interviewers administer a structured interview with a child in a one-on-one session;

c) Diary. Children code physical activity throughout the day on a diary form;

d) Proxy reports. Parents or teachers report the children's activity using any of the three previous mentioned formats. Some measures use parent reports to supplement child reports, and are classified as proxy measures (Sallis, 1991).

Many adult self-report measures have been developed and used in physical activity research. In contrast, relatively few self-report measures of physical activity exist for children. Some studies have adopted existing adult self-reports, while others have developed alternative procedures. However, a number of studies have been cited which have used self-report measures with children and which have provided information with regard to the reliability and validity of the measures. These include Godin & Shephard (1984); Sallis et al. (1988a); Biddle et al. (1991); Sallis (1993). Some of these measures gather exact information about participation in specific activities making calculations of energy expenditure from the activities reported, while others tend to gather more general information and provide a less quantitative appraisal of physical activity. In an assessment of three self-report measures, Sallis et al. (1993) concluded that physical activity recalls of children are of adequate reliability and validity.

Some problems are posed by the self-report questionnaires. These problems include:

a) Recall problems, children may omit important activity information simply because they are unable to remember what activities they have done.

b) Insufficient detail and accuracy may be gained if the measure is too short. But equally inaccurate information may be gained if the measure is too long. If the questionnaire form is long and laborious, respondents may deliberately cut responses short, rush them and therefore make mistakes, or respond inaccurately through boredom. (Cale, 1993, p.65).

c) There is also the problem of social bias; we all know that exercise is good for us and wish to make out and report that we do more than we really do.

d) Another problem is of recognising the different levels of participation in activities. Children may either overlook activities, not classifying them into any of the categories provided or they may misclassify activities.

e) Further problems may arise in self-report if respondents are asked to make precise judgements of time and report duration of physical activity.

f) Language can be another problem; the researchers should always ensure that language is both exact and understandable by young respondents without, for example, knowledge of medical terminology.

Recently a promising self-report measure has been developed. The Four by One-Day Recall physical activity questionnaire (Cale, 1993) is an interview-administered instrument. It has been designed for British youth aged 11 years and upwards and was developed with the aim of reducing many of the problems associated with current self-report measures. The development process involved the systematic design of the measure as well as a rigorous evaluation including validity and

reliability assessment. The Four by One-Day Recall physical activity questionnaire was used in this thesis as most appropriate for our aim, a more detailed description of the instrument and its characteristics that make it promising will follow in the Methodology Chapter.

Physical Activity Patterns and Levels in Adolescents

This part of the review brings together results of some measurements of the physical activity levels of adolescents that have been made world-wide. It is convenient to group them in two sections; those carried out in the UK and those carried out in the rest of the world. We begin with the latter. Many of the studies described here used self-report instruments as the sole or principal data gathering tool. Two features of physical activity research are mentioned: the provision of funding by medical and health groups that allowed large samples to be used, and a focus, in many instances, on the cardiovascular aspects of the activities. First the physical activities patterns of adolescents will be discussed.

Physical Activity Patterns in Adolescents

The types of activities that young people favour is a major concern. There have been only a few studies that report the actual types of physical activities in which adolescents participate. In general bicycling, swimming, and ball sports are the predominate physical activities reported (Ross & Gilbert, 1985). Williams (1988) using a questionnaire to a sample of 921 fourth year secondary pupils found that soccer, swimming and weight training were the most popular activities. The three

most popular sports found in a survey undertaken with 14-15 year olds secondary school students in Manchester, UK were badminton, swimming and tennis and the three least popular were gymnastics, dance and aerobics (Kincey et al., 1993).

Naul & Neuhaus (1996) adopted the design of a previous Czech research study (Naul et al., 1991) with 92 German students to investigate the active lifestyles and physical activities of 12-14 years old students. They found that girls were predominantly involved during their leisure time activities in individual sports such as swimming, walking, dancing, and not in games. About 50% of the girls who participated in club sports preferred games, particularly tennis. It was found that boys preferred to engage in new types of bicycling, and team games in their self-organised leisure activities, and that about 65% of the boys who participate in sport club activities again prefer games, predominately tennis and soccer. Traditional German sports and sport club activities like gymnastics and track and field activities were almost completely missing from the students daily physical records. Instead new active lifestyles which include sport activities from Japan like judo and karate are being adopted by boys and girls, and also American motor activities such as skateboarding and baseball.

The types of activities promoted recently by government and health bodies have broadened beyond leisure-time activities to include active forms of travel and active social activities. For many adolescents, setting aside a particular time and getting to a special place are the main difficulties experienced in getting exercise. The new recommendations stressed in Table 2.2.2, place more emphasis on activities of moderate intensity, and move away from the need to define separate times and go to specialist settings for exercise. The importance now is on "active living" and making "active choices" - by making existing routines more active (for example, by walking

to the school or shops instead of using a bus) or by introducing physical activities into everyday working and social life (for example, dancing, cycling, swimming). Furthermore, it seems to be generally accepted that non-team activities, such as aerobics, swimming and dance are especially suitable for adolescents since they can be continued into adulthood (Thirlaway & Benton, 1993). The settings for physical activity promotion now include not only the specialist, supervised setting of the sports or leisure centre and Physical Education classes, but also public open spaces and the community-based settings of the home, streets and parks (Wimbush, 1994).

Table 2.2.2 shows the newly lifestyle and moderate to vigorous physical activity that have emerged from the new recommendations (Harris & Cale, 1997).

Table 2.2.2 Exercise Guidelines for Adolescents

	ACSM (1988)	Physical Activity Guidelines for Adolescents (Sallis & Patrick 1994)	
		Guideline 1	Guideline 2
		Adolescents (11-21 years)	
Frequency	every day	daily or nearly every day	3 or more sessions a week
Intensity	vigorous	intensity not as important as fact that energy is expended	moderate to vigorous
Time	20-30 minutes	time not as important as fact that energy is expended	20 minutes or longer
Type		variety of activities which are enjoyable, involve a range of muscle groups and include some weight bearing activities	range of activities using large muscle groups

Adapted from Harris & Cale, 1997 p.60

Guideline 1 of the physical guidelines for adolescents encourages involvement in physical activities as part of the every day life by doing such things as walking upstairs, walking or riding a bicycle for errands or doing household chores (Sallis & Patrick, 1994). The rationale provided for this guideline is daily weight-bearing activities are critical for enhancing bone development that affects skeletal health throughout life and that substantial daily energy expenditure is expected to reduce risk of obesity and may have positive health affects (Sallis & Patrick, 1994). Guideline 2 refers to moderate and vigorous activities which are defined as activities which require at least as much effort as brisk or fast walking. A diversity of activities is recommended as part of sports, recreation, chores, transportation, work, school physical education or planned exercise. The rationale for this guideline is that regular participation in continuous moderate to vigorous physical activity during adolescence enhances psychological health, increases high-density lipoprotein cholesterol, and increases cardiorespiratory fitness (Sallis & Patrick, 1994).

Non-UK Studies of Adolescent's Physical Activity Levels

As early as 1967, Huenemann et al. examined the activity levels of a sample of American children. A self-report method was employed to collect activity information from 16-17 year olds. The adolescents completed activity diaries over four separate 7-day periods. Each participant discussed their diary for the previous day with an interviewer. The time spent at levels of activity of different intensities was then added together to create a total for the week. The results from this study showed teenagers to be inactive. For the mean of the 4 weekly periods, the girls spent more than 95% and

the boys over 90% of their time in sleep, very light or light activity. These findings suggest that adolescents of 20 years ago were inactive.

In another American study Seliger et al. (1974) used heart rate counters to investigate the physical activity patterns of 11-12 year old boys. The adolescents were also interviewed. The findings revealed that only 3% of the boys' time was spent in activities of a moderate intensity and that there was no reported participation in "heavy intensity" activity. Seliger et al., concluded that "all of the subjects in this sample exhibited a sedentary lifestyle".

An extensive study of young people's physical activity was carried out by Shephard et al. (1980) in Quebec. Young adolescents, 10-12 years old, were asked to complete a 24 hour activity diary twice during the year, (March and September), for a typical Wednesday and a typical Saturday. They were also asked to complete a self-report daily activity questionnaire for a week. The results showed that the sample spent an average at 2.15 hours in light to moderate activity and 0.44 hours a day in vigorous activity outside of school. It was further reported that the specific Quebec adolescents spent more time in very light to light activity and less time in light to moderate and vigorous activity than European youngsters (see in Chapter Four for definitions of light, moderate, hard activities).

As part of a National Health and Fitness Survey carried out in Australia (The Australian Health and Fitness Survey, 1985), a self-report questionnaire was administered to determine how much physical activity children had done in the previous week in school and at leisure. The findings revealed low levels of physical activity, especially activity of an intensity necessary to promote cardiovascular health. Approximately 30% of all students under the age of 12 were found to have engaged in no school sport in the preceding week. This percentage increased to about 40% at 12

years and to about 50% for boys and 51.5% for girls at 15 years. Furthermore, more than one in five boys and one in four girls had done no physical activity of any kind outside school in the previous week. The survey also attempted to establish an aerobic rating score for each child. Children were asked, "in most weeks do you get exercise or activity three to four times which makes you 'huff and puff' and lasts at least thirty minutes each time?" Fifty percent of the boys and 61% of the girls said they did not. These results show the low level of activity of the Australian youth, not only during their leisure time but probably also during school sports.

The World Health Organisation (WHO) conducted a cross-national study which examined habitual physical activity and social influences in 11 European countries including England (Wold & Aar ,1985). A questionnaire was administered to adolescents aged 11 to 16. Adolescents were asked how many times and for how long a week they usually exercised to the extent that they were short of breath or were sweating. Findings from the study suggested that there were some significant differences in physical activity and sports participation by country, age and gender. Although differences between activity levels by country were found, they were not systematic and it was not possible to place any one country far ahead of the others in terms of physical activity. With respect to age, however, the number of adolescents reporting that they were not physically active was larger in the older groups. These older adolescents (approximately 15 years) were reported as being significantly less involved in sports of all kinds. Boys were generally reported to be more physically active than girls with respect to both the number of hours and frequency of exercise per week. Boys also participated more frequently in competitive sports activities such as football, volleyball.

The National Children and Youth Fitness Study, (McGinnis, 1987) is another large national survey which has been carried out with young people, in the United States. In this study a self-report method was employed with a large sample of 10-17 years olds in order to collect information of all everyday activities in which the children took part. Recognising that it is year round participation in appropriate physical activity that is important for an individual to obtain health benefits, and to keep fit, seasonal variations were also taken into account. The results from the survey showed that less than half of the surveyed youth performed the weekly time requirement of vigorous activity needed to maintain an effectively functioning cardiorespiratory system. Within the pattern of low involvement in physical activity exercise patterns were found to vary greatly from season to season, with the lowest activity figures being obtained in the winter.

No relevant research about the level of participation in physical activities is reported about Greek adolescents. However limited research has been done with primary school children (Atsalakis, 1994) and adults (Kafatos et al., 1991).

Table 2.2.3 (p.55) is a summary of the major findings of the international studies of physical activity levels.

British Studies of Adolescent's Physical Activity Levels

One of the original studies to monitor British adolescent's activity levels conducted by Durnin (1967) involved the completion of activity diaries. Activity levels were assessed in 13-15 year olds from one week of diary information. All reported activity was classified as being of moderate, heavy or very heavy intensity. Light activity was intentionally excluded on the basis that such exercise does not

cause any significant health benefits. Low levels of activity amongst adolescents, particularly girls were reported. Boys were found to spend on average 29 minutes per day in heavy physical activity and an average 12 minutes a day in very heavy activity. The corresponding figures for girls were 10 minutes in heavy activity and 3 minutes in very heavy activity.

In Scotland an 18 month investigation was carried out in 1975. Findings revealed low levels of activity in a group of 15-16 year olds (Hendry, 1978). A large sample of over 3,000 pupils from 15 comprehensive schools in central Scotland was examined. Data was collected by questionnaires and inventories, teacher ratings and assessments, and by direct observations and recordings. More than half of the boys and two thirds of the girls were characterised as "non-participants", which means that they were found to have no voluntary involvement in sports or physical activities during their leisure time.

Dickenson (1987) investigated the physical activity habits of 300 11-16 year - olds from six large comprehensive schools in the West Midlands. All adolescents were asked to complete a daily questionnaire for a week and 100 of the sample were also interviewed. Over the study week, between 80 and 85% of the adolescents were found to have done less than 5 minutes vigorous activity on any day. The questionnaire results were verified by the interviews which classified 83% of the sample as inactive during the week and 82% as inactive at weekends. Inactivity increased with age, and generally boys did more vigorous exercise than girls.

In a study conducted by the Sports Council for Wales (1987), insufficient levels of physical activity were again evident. The sample comprised more than 6,500 children aged 11-16 from 80 secondary schools. Respondents were asked to complete a questionnaire reporting the amount of time they spent in activities which made them

breathless or sweaty. The amount of activity considered to confer health benefits was taken to be 20 minutes of vigorous activity three times a week. Teenage boys were found to be active, but it was revealed that less than half of them participated in "sufficient" vigorous exercise. In this study too, there was a marked difference between the activity levels of boys and girls, with girls being less active than boys. Only 19% of 12-17 year old girls were classified as very active, or as performing sufficient mounts of "appropriate" activity. For both sexes there was a significant decrease in activity levels with age.

The Northern Ireland Fitness Survey (1989) is one of the largest and most extensive studies which has been conducted on British youth. The survey measured the fitness, physical activity levels, attitudes and lifestyles of 3,211 adolescents from a total of 16 schools from different regions of the country. Physical activity levels were measured by means of a lifestyle questionnaire. To summarise the results, approximately 33% of boys and 34% of girls reported that they had done no exercise outside of school during the preceding 7 days and approximately 8% of boys and 12% of girls had not done any exercise at all during the preceding 7 days. Exercise was defined simply "as any activity that caused a degree of breathlessness". At all ages, boys were more active than girls and there was a marked decline in activity levels after the age of 13-14 years. The rate of decline was similar in both sexes but the decline in vigorous activity was greater in girls than in boys. Indeed, it was found that by the age of 17-18 years, the vigorous exercise of the boys was similar to the total exercise of the girls.

The Health Education Authority in 1989 has conducted a study on British youth. The results of the survey gave insights into the health related factors affecting the lifestyles of young people including alcohol, drugs, smoking and exercise. Over

10,000 children aged between 9 and 15 from 475 schools in England participated in the survey. Two separate self completion questionnaires were devised and used in the survey, one for 9-10 year old pupils and one for 11-15 year olds. The questionnaire contained many questions, only three of which related to exercise. The three questions asked about time spent in physical education lessons per week, time spent on sports and exercise outside of school per week and pupils self-perception of fitness. The survey revealed that young adolescents were getting a average of 4.7 hours exercise both in and out of school per week. These figures assumed that PE lesson lasted for up to 45 minutes. Boys were reported to do more exercise than girls (5.2 hours versus 4.2 hours) and both boys and girls showed an increase in the amount of weekly exercise they did until the age of 12 or 13, after which there was a decline.

Armstrong, Balding, Gentle & Kirby (1990a) conducted a study with two hundred adolescents. The objective of this study was to examine the patterns of physical activity among British school adolescents and to assess whether the adolescents experienced the intensity and duration of physical activity believed to be needed to stress the cardiopulmonary system appropriately. A sample of young adolescents (aged 11-16), from two communities in Devon was randomly selected to participate in the study. Physical activity was estimated from continuous monitoring of heart rate over 3 weekdays and a Saturday. It was found that these adolescents had low levels of habitual physical activity; few regularly undertook the volume of physical activity of the type and duration believed necessary to benefit the cardiopulmonary system. In this study too the boys were more active than the girls.

In a linked study the same authors (1990b) investigated the cardiopulmonary fitness, physical activity and selected coronary risk factor variables in 11 to 16 year old adolescents. The heart rates of 199 boys and 164 girls were monitored for 3

weekdays. In analysing the physical activity data, low levels of activity were again evident. Results showed that 36% of the sample did not manage a single 10 minute period of activity when their heart rates were above 139 bpm.

Cale (1993) conducted a study with 119 English adolescents. The Four by One-Day Physical Activity Recall questionnaire was used to assess the levels of physical activity of 11 to 14 years old adolescents. The findings revealed the majority of the youngsters to be inactive. Approximately 65% of youngsters were classified as inactive or very inactive while 35% were classified as moderately active or active. Low activity levels were found in the adolescents' activity scores (energy expenditure) and in the time they spent in hard/very hard activity in particular. While the sample was found inactive, girls were particularly inactive. A significant difference was found between the activity levels of the boys and girls in the study. More boys than girls were found to be active or moderate active (50% of boys versus 21% of girls). Boys were found to spend daily averages of 23.86 minutes while the girls were found to spend almost half the amount of time (10.31 minutes daily average) in hard / very hard activity compared to boys. It was also found, however, that most pupils (97.5%) had engaged in some moderate activity over the period of the study, though it was declared that this was insufficient to have any significant impact on total physical activity and the activity scores obtained by the pupils. 'Huff and puff' activity was an additional source of aerobic information in Cale's study and it was found to be quite common amongst pupils, however for many the duration of the bouts of 'huff and puff' activity were short.

A summary of the studies, the methods used and a brief outline of the major findings in Britain are presented in Table 2.2.4 (p.56).

Comments On The Studies

Tables 2.2.3 and 2.2.4 present summaries of the non-UK and British studies. The methods, the sample and also a brief outline of the major findings about the level of physical activity in adolescents are given. It is clear from this review that there are certain common trends which are consistent across both the international and British studies. These are:

- many of the studies described here use self-report instruments as the sole or principal data gathering,
- they focus in many instances is on the cardio-vascular aspects of the activities,
- it can be noticed that the provision of funding by medical and health groups that allowed large samples to be used to assess how active their child populations are, characterises studies in USA, Canada and Australia but not those in Britain and other European countries,
- the majority of the studies reviewed reveal that children are not very active and the activity levels in adolescents are low and decreases with age,
- nearly all studies reported that boys are more active than girls,
- they have adopted different criteria as to what constitutes 'appropriate' physical activity (see Table 2.2.1); children therefore active in one study may be categorised as inactive by another researcher's standards.

Table 2.2.3 Summary of the Major Findings of the Non-UK Studies of Physical Activity Levels

STUDY	METHOD	SAMPLE	FINDINGS
Huenemann et al 1967	Activity diary	16-17 year old American adolescents	Teenagers were found to be inactive. Over 4 weekly periods, girls spent more than 95% and boys over 90% of time in very light or light activity.
Seliger et al., (1974)	Heart rate and interview	11-12 year old Belgian adolescents	Three percent of the boys' time was spent in activities of a moderate or medium intensity. At no time did the boys engage in heavy intensity activity
Shephard et al., (1980)	Activity diary and questionnaire	10-12 year old Canadian adolescents	Vigorous activities accounted for only 0.44 hours per day for Quebec young adolescents
The Australian Health and Fitness Survey (1985)	Self-report	Australian adolescents	1 in 5 boys and 1 in 4 girls had not done any activity at all outside of school.
Wold & Aar (1985)	Self-report	Adolescents 11-16 years old from 11 European countries	Physical activity levels varied by age, gender and country. The older adolescents were found to be less active and boys reported to be more active than girls.
The National Children and Youth Fitness Study (1987)	Survey questionnaire	10-17 year old American adolescents	Fewer than half of the American adolescents performed the weekly requirement of vigorous activity.

Adapted from Cale, 1994

Table 2.2.4 Summary of the Major Findings of the British Studies of Physical Activity Levels

STUDY	METHOD	SAMPLE	FINDINGS
Dickenson (1987)	Interviews and questionnaires	11-16 year old English adolescents	80 to 85% of adolescents did less than 5 mins of vigorous activity over the study week.
The Northern Ireland Fitness Survey (1989)	Survey questionnaire	N.Irish post-primary school adolescents	32.9% of boys and 34.4% of girls reported that they had done no exercise outside of school during the preceding 7 days.
HEA (1989)	Survey questionnaire	English adolescents aged 9-15	Adolescents were found to get an average of 4.7 hours per week. Activity decreased after the age of 12 or 13.
Armstrong et al., (1990a)	Heart rate	11-16 year old adolescents from Devon, England	British adolescents had low levels of physical activity.
Armstrong et al. (1990b)	Heart rate	11-16 year old English adolescents from two communities in S. England	35.9% of the boys and 47.8% of the girls failed to registered to do a 10 mins period of activity with heart rate above 139 bpm.
Cale (1993)	Interview	11-14 year old English adolescents	55% of those studied were inactive and 10% very inactive. The majority of the active pupils were boys, and a large proportion of the inactive and very inactive were girls

Adapted from Cale, 1994

Summary of Section Two

Adolescence is a developmental period in which many physiological, psychological and social changes occur. Physical growth makes adolescents stronger and more physically competent than children. Simultaneously psychological and social changes bring development of adolescents' sense of identity and their existing self-concept. Many researchers emphasise the contribution of physical self to global self-concept during adolescence. A positive physical self-concept during this period leads to participation in physical activities. Unfortunately, research shows that at this critical period many adolescents adopt increasingly sedentary habits.

Methods of assessing physical activity levels include from physiological, mechanical, observational, self-report measures. The most commonly used type of measure, is the self-report measure even though its disadvantages are well known. Recently a fresh promising self-report measure has been developed, the Four by One-Day Recall physical activity questionnaire (Cale,1993).

The types of activities in which young people choose to participate can give valuable information. Researchers have found that, ball sports, bicycling, swimming, are predominately the physical activities reported. The types of activities promoted recently give emphasis to 'active living' and making 'active choices' by making existing routines more active or by introducing physical activities into every day life.

It is clear from the review of the Non-UK and British studies that there are certain common trends which are consistent across them. The majority of the studies

found that children are not very active, or they have activity levels too low to promote health. Other consistent finding across studies is the difference in activity levels between boys and girls, with girls being less active than boys. Caution must however, be exercised when considering such findings. The studies which have been conducted have adopted a number of different methods and approaches to measuring physical activity levels. Furthermore, in a number of instances the studies have adopted different criteria for what constitutes 'appropriate' activity. Examples of some of the different definitions of appropriate activity adopted by a number of researchers were highlighted in Table 2.2.1.

Section Three: Correlation Studies of Physical Self-Concept and Physical Activity

This section reviews some of the correlational studies that have been conducted in the areas of physical education and sport psychology in order to investigate the relationship between self-concept and physical activity.

Correlation Studies

Motivational theories have focused on the role of evaluative self-concept on behavioural mediators. Theories due to Bandura (1982), White (1959), Harter (1978) have generated a great deal of research and the clear conclusion can be drawn that in most aspects of our lives, our evaluative self-concepts operate to influence our choice of behaviours and the quality of our performance and persistence in them. Evidently therefore these same conceptions have great significance for participation and achievement in the physical domain (Fox, 1987).

According to Fox (1987) the systematic study of self-concept is of interest to sport psychologists because of the implications for "a) the promotion of physical performance, b) the possible enhancement of regular involvement in a range of physical activity and exercise and c) a possibility for a better understanding of the mechanisms of involvement of global self-concept" (p.39, 40).

In this section we review some correlation studies done on this area. Over the years the significant correlation between self-concept and physical activity involvement has attracted various researchers' attention. Within the field of sport and exercise psychology, several investigators have found a strong relationship between physical self-concept and participation in fitness and sport activities (Roberts et al.,

1981; Feltz & Petlichkoff, 1983; Ryckman et al., 1982). Roberts et al. (1981) investigated the relationship between perceived physical competence and sport participation. Specifically, they hypothesised that fourth and fifth-grade children (N=143) who participate in organised sports would posit higher levels of perceived physical competence (physical self-competence) than nonparticipants. The sample completed Harter's Perceived Competence Scales (1982) and were also interviewed to determine their involvement in organised sports activities. Results revealed that the children's level of perceived physical competence was significantly related to their sport participant status. Children with higher perceived physical competence, had higher general self-worth, and were more likely to be participants than children with lower physical competence levels. It is possible that children who perceive their competence in physical skills as being high choose sport and physical skill environments to demonstrate their competence.

Feltz & Petlichkoff (1983) examined the relationship between perceived physical competence and length of involvement in sport of young participants (N=239) and dropouts (N=43) ranging in age from 12 to 18 years. The sample completed the Perceived Competence Scale for Children, (Harter, 1982). As in the study by Roberts et al. results demonstrated that participants in school-sponsored sports were higher in perceived physical competence than were dropouts. An overall gender difference was also found on perceived physical competence with males having higher scores than females.

Within the physical activity literature there are some data to support the view that one's self-perceptions of physical fitness mediate the relationship between general self-esteem and fitness achievement (Sonstroem, 1984). Some studies (e.g., Heaps, 1978; Sonstroem, 1974, 1976; Fox, Corbin & Couldry, 1985;) have reported no direct

relationship between global self-esteem and fitness. However, their results indicated that self-perceptions of fitness competence were significantly related to physical fitness and global self-esteem.

Heaps (1978) examined the relation between global self-esteem, fitness self-perceptions and actual fitness with 56 male undergraduate physical education students. Global self-esteem was measured by several personality inventories, including the Dominance scale of the California Psychological Inventory (Gough, McClosky, & Meehl, 1951) and the Taylor Manifest Anxiety Scale (Taylor, 1953). Self-perception of physical fitness was measured by an inventory in which students were asked to rate their physical fitness. Physical fitness was measured by the 12-minute run-walk test (Cooper, 1968). Heaps found that students' global self-esteem was positively related to their self-perceptions of physical fitness. It was also found that actual fitness was moderately related ($r=.27$) to self-perceptions of fitness but not significantly related to global self-esteem.

Research with the PEAS instrument (Sonstroem 1974, 1976) has also developed conclusions regarding male adolescents self-perceptions, participation in physical activities and general self-esteem: a) physical ability is not related to global self-esteem; b) self-perceptions of physical ability are positively related to global self-esteem; c) self-perception of physical ability are positively related to measured physical performance; d) self-perceptions of physical ability are positively related to interest in vigorous physical activity. These findings using the PEAS instrument were based on a psychological physical activity model (see Figure 2.3.1). The proposed model is one of the few psychologically based exercise specific-models. The model focuses on a general measure of physical self-concepts (Physical Estimation) and its association with global self-esteem and physical activity participation. The model is

characterised by "a cyclical and reciprocal relationship" between perceived physical self-perceptions and actual physical activity involvement.

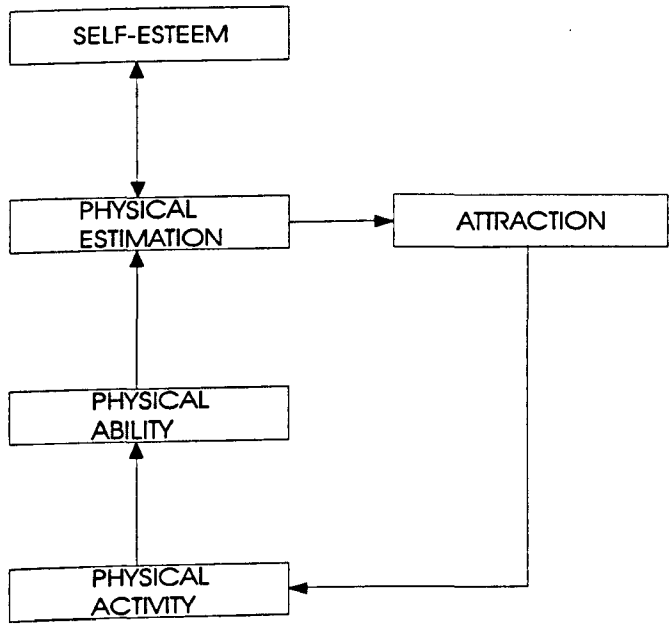


Figure 2.3.1 The psychological Model for Physical Activity Participation (Sonstroem, 1978).

Sonstroem's model (Figure 2.3.1), "admittedly incomplete" (Sonstroem, 1978, p.101), proposes that Physical Estimation (physical self-perceptions) leads to an increased Attraction (interest) to physical activity. Physical Activity participation is then established. Following the cycle, Physical Activity participation produces Physical Ability which in turn leads to higher level of Physical Estimation and Self-Esteem. Because the person high in Self-Esteem has pride in his or her body, exercise behaviour persists, ability is increased or maintained and the cycle continues.

Construct validity measures of Estimation (EST) and Attraction (ATTR) carried out by Sonstroem (1978) indicated that Estimation was significantly related to both Physical Ability and Self-Esteem and may constitute a mediating variable

between Physical Ability and Self-Esteem, in relatively large numbers of adolescent males. An interpretation of Physical Ability, Estimation, Self-Esteem, relationships within the paradigm affirms that it is not how fit or healthy your body really is that counts. Rather, it is how healthy you think it is that leads to feeling of security. A practical application of these conclusions suggests that exercise leaders who desire to encourage sport participation among adolescents should also work to develop more positive physical self perceptions of ability.

However, when relationships between Estimation and Self- Esteem and between Estimation and Physical Ability were tested by controlling for Attraction influences, the significant relationships persisted, showing that the correlation between Estimation and Physical Ability is independent of Attraction. These results are substantiated by the literature in that little relationship has been found between interests and corresponding abilities (Darley & Hagenah, 1955). However, interests have related significantly to perceptions of ability (McCall & Moore, 1965). The one Attraction relationship that has remained significant in these studies has been that with the extent of voluntary physical activity.

The improvement of physical ability by means of physical activity is well documented and universally recognised. Based on a moderate amount of PEAS research directed at this question, it is concluded that the possession of Physical Ability does not of itself lead to increased Physical Activity. The significance was extinguished when controlling for the influence of either Estimation or Attraction. It is concluded that Estimation and Attraction exert mediating influence in physical fitness, physical activity self-esteem relationships.

It is observed that the arrow between Estimation and Self- Esteem in the model (Figure 2.3.1) points in both directions. The proposition is tenable that Self-

Esteem may influence the development of levels of Estimation as well as being influenced by them. Emphasis must be placed on the fact that the relationships above are based on correlational rather than individual prediction. It is posited here that Estimation rather than Physical Ability or Self-Esteem influences one's Attraction to or interest in physical activity.

Further research has been conducted using the PEAS instrument. A number of researchers have found that self-perceptions of physical ability, as measured with the Estimation Scale, are associated with physical activity and fitness (Dishman, 1978; Morgan & Horstman, 1976; Sonstroem, 1974, 1976) and general self-esteem (Fox, Corbin & Couldry, 1985). Fox, Corbin & Couldry (1985), using also the PEAS, found evidence for the mediating role of perceived physical competence in the relationship between physical fitness and global self-esteem. The measured correlations were r=.30 for males and r=.53 for females. Further, physical self-perceptions were strongly related to physical fitness with r=.50 for males and r=.52 for females.

Others however have failed to establish strong predictive validity for the Estimation Scale. For example, Dishman & Gettman (1980) and Morgan & Pollock (1978) were not able to predict exercise involvement or adherence using the PEAS. Researchers in the area of exercise adherence have attributed the inability of the model to predict exercise involvement to the fact that the model and its scales were developed using only adolescent male subjects. According to these other researchers, the PEAS instrument is not capable of predicting physical activity and exercise involvement for various other populations (Fox et al. 1985; Safrit et al., 1985).

Fox & Corbin (1989) after developing the PSPP instrument, investigated the relationship between PSPP scores and level and type of involvement in physical activities. On a sample of 219 college student (mean age 19.7 years) the four

subdomains of the physical self (Body Attractiveness, Sports Competence, Physical Strength, Physical Condition) were used to discriminate the level of involvement between Active and Inactive and Low and High Active. The results of discriminant analyses produced canonical correlation coefficients of .43 for males and .47 for females ($p<.001$). The researchers claimed that a correct activity/non-activity classification of 70.4% for males and 70.7% for females represents a substantial improvement on chance. The relationship between self perception and type of involvement in physical activities was examined using canonical correlational analysis. Activities were categorised as Ball-sports, Aerobic endurance, Weight training, Callisthenics and Other Activities. Analyses produced four significant canonical functions two for females ($r=.52$ $p<.01$, $r=.35$ $p<.05$) and two for males ($r=.62$ $p<.01$, $r=.49$ $p<.01$). These results indicate that there are two types of active female and male: an athletic type one with high levels of perceived sports competence and sport involvement and an exercising type. Also of interest were the results from the perception scores and the logically related physical activities. It was found that Endurance activities and Callisthenics are closely associated with the Condition and Body subscales for females and that the Weight training of males is closely related to Strength, Condition and Body subscales. All these findings are consistent with competence motivation and suggest that high perceptions in a domain may lead to participation in behaviours that can be practised successfully.

Zacharopoulos & Hodge (1991) using the Self Description Questionnaire III (Marsh & O'Neill, 1984), examined differences between adolescent athletes and non-athletes and gender, in levels of multidimensional self-concept. A total of 113 students (51 males and 62 females) from New Zealand were randomly selected. Their ages varied from 13 to 17 years. Of these students 63 were sport participants (28

males and 35 females) and 50 were non-participants (23 males and 27 females). Results from the study revealed large group differences in physical ability self-concept with athletes being significantly higher than non-athletes. Also it was found that athletes did not differ significantly from non-athletes in levels of global self-concept. More interestingly no gender differences were found in the physical ability self-concept.

Biddle & Armstrong (1992) examined the extent to which activity levels were related to selected psychological factors. Seventy two (72) English children (35 girls and 37 boys) aged 11 and 12 years participated in the study. The volume (frequency, intensity, and duration) of physical activity was estimated from continuous heart rate monitoring over three weekdays during the school summer term. A self-contained computerised telemetry system (Sport Tester 3000) was used to record continuously minute by minute heart rates. Two psychological inventories the Physical Self-Perception Profile (PSPP-C) modified for use with children (Whitehead & Corbin, 1988) and the Motivational Orientation in Sport Scale, MOSS (Weiss et al. 1986) were administered in the classroom at the end of the period of the activity assessments. Results showed that children had quite low levels of physical activity from a physical fitness/health perspective, and this was particularly so for girls. Based on the sustained periods of elevated heart rate, the sample was classified as either 'active' or 'less active'. Discriminant analyses were conducted separately for boys and girls to examine whether active and less active children could be discriminated from each other on the basis of their PSPP-C. Results showed that for boys it was not possible to discriminate active from less active. For girls the discriminant function was significant and showed that the best discriminators between active and less active girls were the PSPP-C measures of perceived Body Attractiveness, Physical Self

Worth, and Global Self Esteem. The direction of the coefficients suggested that membership in the active group for girls was best predicted when higher scores on Physical Self Worth, Global Self Esteem and Body Attractiveness was found.

Page et al., (1993), using the Fox & Corbin (1989) PSPP instrument, conducted a study with 249 British college students. The researchers investigated the relationship between PSPP scales and low and high level of participation in physical activities. Two samples were used. Sample I participants were 80 males and 52 females attending a sport and recreation degree course in England with mean age of 19.42 years. Sample II participants were 117 female postgraduate students whose mean age was 21.12 years. The subdomain constructs measured in the PSPP were related to behaviours of sports and exercise participation. Stepwise discriminant analysis showed that the PSPP could correctly classify 74.1% of participants as low and 83.3% as high in physical activity. A significant canonical function emerged for the analyses (Canonical Correlations =0.56 to 0.66, $p<0.001$). These examinations of the structure coefficients reveals that the dominant contributor in each case was the Condition subscale score. From the above study it was confirmed that specific scales of the PSPP instrument could correctly classify a percentage of participants as low or high in physical activity.

Judging from the review of the correlation studies in the area of physical education and sport psychology, there is empirical evidence for a positive relationship between physical self-concept and physical achievement.

Summary of Section Three

Correlational studies on the relationship between physical self-concept and physical activity are based on theories by White (1959) Bandura (1982) and Harter (1978) that self-concept is a mediating variable that facilitates the attainment of desired outcomes such as involvement and achievement in physical activities. Over the years the relationship between physical self-concept and involvement in physical activities has captured researchers attention.

Specifically, Roberts et al. (1981) study revealed that children with higher physical self-concept had higher general self worth and were more likely to be participants in sports than children with lower physical self-concepts. Similar results were found by Feltz & Petlichkoff (1983), participants in school sponsored sports had higher perceived physical competence than drop-outs. Heaps (1978) found that students' global self-esteem was positively related to their self-perceptions of physical fitness furthermore fitness achievements were moderately related to self-perceptions of fitness but not related to global self-esteem. Sonstroem's researches (1974, 1976) based on a psychological physical activity model, showed that physical self-perceptions are positively related to measured physical performance and global self-esteem. A research from Fox et al. (1985) revealed that physical self-perceptions were strongly related to physical fitness. A significant study by Fox & Corbin (1989) showed that high physical self perceptions could distinguish a significant percentage of physical activity involvement, also interesting were their results that specific physical self-perceptions correlated with their logically related physical activities. Biddle & Armstrong (1992); Page et al. (1993) confirmed the results of Fox & Corbin

(1989) and found that specific scales of PSPP instrument could correctly classify a small percentage of participants as low or high in physical activity.

To conclude, these studies show that higher than average values of physical self-concept are generally associated with high levels of involvement in a variety of forms of physical activity. However when studying physical self-concept as a predictor of physical activity participation the amount of explained variance has been low. This low degree of prediction is not surprising. Biological, environmental, social and other psychological factors will also influence an individual's decision to participate and maintain participation in sports and physical activities.

The Methodology chapter will follow, where the hypotheses of the study will be presented and the two self-report measurements which have been employed in this study will be described:

1. the Physical Self Description Questionnaire (PSDQ) (Marsh, Richards, Johnson, Roche & Tremayne, 1994),
2. the Four by One-Day Recall Physical Activity Questionnaire (Cale, 1993).

CHAPTER THREE

METHODOLOGY

This chapter describes the approach that was utilised to examine the physical self-concept, the physical activities and their relationship in a sample of Greek adolescents. First the objectives of the research and the sample used in the study will be presented. The description of the instruments which were used to gather the data needed to answer the objectives, will follow. Finally the administration procedures will be described.

Research Objectives

The objectives of the study was for a sample of Greek adolescents:

1. to investigate their self concepts within the physical domain;
2. to find out the patterns and levels of physical activity for the two genders;
3. to investigate the hypothesis that physical self-concepts are associated with types and levels of involvement in physical activities including possible gender differences.

When describing the instruments it was convenient to start with the description and analyses of the Physical Self Description Questionnaire as it was distributed and collected before the use of the Four by One-Day Recall Questionnaire.

The Sample

Respondents (N=405) were students (198 boys and 207 girls) of the third year from six Gymnasium public schools, located in Nea Smyrmi a suburb of west Athens. Gymnasium schools, as already mentioned in Chapter One, have three grades and educate adolescents between ages of 12 and 15 years with final year students progressing to a General or Vocational Lyceum. Participants in the study were all the students in attendance on the two days the questionnaires were administered in their school. The six schools contained a range of socio-economic backgrounds, although no assessment was made of the exact composition.

The 14-15 age group was selected for the following reasons. First, adolescence is a critical period of an individual's development - an important time for the formation of behaviours and habits of the young persons and it was of our interest and experiences in education. Second, it was felt that students of this age would be able to provide realistic and accurate responses on psychological and physical activity inventories without encountering significant problems associated with understanding and interpretation. Third, it was believed that at this age the physical self-concept of the adolescents would have been developed. Finally, it was assumed that this age group would be more active compared to older adolescents (as seen in Chapter Two, there is generally a decrease in participation in physical activities with age) and thus comparisons with the physical self-perceptions would be more likely to be interesting.

Instrumentation

The Physical Self-Description Questionnaire (PSDQ)

Scales and Item Content

To identify scales of physical self-concept within the physical domain and measure the specific components of the physical self-concept, the current version of Physical Self-Description Questionnaire (PSDQ) (Marsh et al., 1994), successfully used in previous studies, (see Marsh et al., 1994; Marsh, 1996) was employed (Appendix A). This instrument was considered to have the content and psychometric properties needed in an instrument used in an exploratory study. The PSDQ instrument is designed to measure nine specific domains of physical self-concept (Strength, Body Fat, Activity, Endurance/Fitness, Sports Competence, Coordination, Health, Appearance, and Flexibility) and two global components of self-concept (Global Physical Self-Concept and Global Self-Esteem).

The hierarchical nature of the PSDQ scales is explicit in the design of the items: items in each of the nine scales refer to a specific domain of physical self-concept; the Global Physical items refer to super-ordinate physical self-perceptions and not to any particular physical domain; and the Global Esteem scale refer to general qualities that are not specific to any particular domain of self-concept (Marsh et al., 1994).

The development of the PSDQ, has been described by Marsh et al. (1994). Briefly, first a large item pool was constructed to represent the eleven scales. After administration of the items, preliminary analyses (item analysis, reliability analysis, and factor analysis) were used to reduce the initial item pool to the seventy items used in the final instrument. Each item is a simple declarative statement identified with a

single scale. A description of the eleven physical self-concept scales is given in Table 3.2.1.

Table 3.2.1 Description of the PSDQ Physical Self-Concept Scales.

Subscales	Description of underlying concept
Appearance	Being good looking, having a nice face
Strength	Being strong, having a powerful body with lots of muscles
Endurance	Being able to run a long way without stopping, not tiring easily when exercising hard
Flexibility	Being able to bend and turn your body easily in different directions
Health	Not getting sick often, getting well quickly when you are sick
Coordination	Being good at coordinated movements, being able to do physical movements smoothly
Physical Activity	Being physically active, doing lots of physical activities regularly
Body Fat	Not being overweight, not being too fat
Sport Competence	Being good at sports, being athletic, having good sports skills
Global Physical	Feeling positive about one's physical self
Global Esteem	Overall positive feelings about self

Adapted from Marsh (1996)

The items of PSDQ eleven scales, are shown on Table 3.2.2. An example of the presentation of the items of the questionnaire is given to show the response format. The students are asked to think about themselves physically and then choose their answer to each sentence scored from 1 'false' to 6 'true' by putting a circle around the number under the response they chose. It might be worth pointing out that the PSDQ has no mid-point (neutral, 'do not know') response and this may have helped to improve reliability.

	FALSE	MOSTLY FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	MOSTLY TRUE	TRUE
1. When I get sick I feel so bad that I cannot even get out of bed.	1	2	3	4	5	6
2. I feel confident when doing coordinated movements.	1	2	3	4	5	6
3. Several times a week I exercise or play hard enough to breathe hard (to huff and puff).	1	2	3	4	5	6

Table 3.2.2 The Physical Self Description Questionnaire

Health
1. When I get sick I feel so bad that I cannot even get out of bed,
12. I usually catch whatever illness (flu, virus, cold, etc.) is going around,
23. I am sick so often that I cannot do all the things I want to do,
34. I hardly ever get sick or ill,
45. I get sick a lot,
56. When I get sick it takes me a long time to do sports and activities,
67. I have to go to the doctor because of illness more than most people my age,
69. I usually stay healthy even when my friends get sick

Coordination
2. I feel confident when doing coordinated movements,
13. Controlling movements of my body comes easily to me,
24. I am good at coordinated movements,
35. I can perform movements smoothly in most physical activities,
46. I find my body handles coordinated movements with ease,
57. I am graceful and coordinated when I do sports and activities

Physical Activity
3. Several times a week I exercise or play hard enough to breathe hard,
14. I often do exercise or activities that makes me breathe hard,
25. I get exercise or activity three or four times a week that makes me huff and puff and lasts at least 30 minutes,
36. I do physically active things (like jogging, dancing, bicycling, aerobics, gym, or swimming) at least three times a week,
47. I do lots of sports, dance, gym, or other physical activities,
58. I do sports, exercise, dance or other physical activities almost every day

Body Fat
4. I am fat,
15. My waist is too large,
26. I have too much fat on my body,
37. I am overweight,
48. My stomach is too big,
59. Other people think that I am overweight

Sport Competence
5. Other people think that I am good at sports,
16. I am good at most sports,
27. Most sports are easy for me,
38. I have good sports skills,
49. I am better at sports than most of my friends,
60. I play sports well

Global Physical
6. I am satisfied with the kind of person I am physically,
17. Physically, I am happy with my self,
28. I feel good about the way I look and what I can do physically,
39. Physically I feel good about myself,
50. I feel good about who I am and what I can do physically,
61. I feel good about who I am physically

Appearance
7. I am attractive for my age,
18. I have a nice looking face,
29. I'm better looking than most of my friends,
40. I am ugly,
51. I am good looking,
62. Nobody thinks that I am good looking

Strength
8. I am a physically strong person,
19. I have a lot of power in my body,
30. I am stronger than most people of my age,
41. I am weak and have no muscles,
52. I would do well in a test of strength,
63. I am good at lifting heavy objects

Flexibility
9. I am quite good at bending, twisting, and turning my body,
20. My body is flexible,
31. My body is stiff and inflexible,
42. My body parts bend and move in most directions well,
53. I think I am flexible enough for most sports,
64. I think I would perform well on a test measuring flexibility

Endurance
10. I can run a long way without stopping,
21. I would do well in a test of physical endurance and stamina,
32. I could jog 5 Kilometres without stopping,
43. I think I could run a long way without getting tired,
54. I can be physically active for a long period of time without getting tired,
65. I am good at endurance activities like distance running, aerobics, bicycling, swimming, or cross-country skiing

Global Esteem
11. Overall, most things I do turn out well,
22. I don't have much to be proud of,
33. I feel that my life is not very useful,
44. Overall, I am not good,
55. Most things I do, I do well,
66. Overall, I have a lot to be proud of,
68. Overall, I am a failure,
70. Nothing, I do ever seems to turn out well.

For ease of reference the 11 physical self perceptions, the random position, and the items of the questionnaire are also shown in tabular form, in Table 3.2.3.

Table 3.2.3 The Position and Items of the PSDQ

	Physical Self Perceptions	Place in the Questionnaire	No of Items
1	Health	1*, 12*, 23*, 34, 45*, 56*, 67*, 69	8
2	Coordination	2, 13, 24, 35, 46, 57	6
3	Physical Activity	3, 14, 25, 36, 47,58	6
4	Body Fat	4*, 15*, 26*, 37*, 48*, 59*	6
5	Sport Competence	5, 16, 27, 38, 49,60	6
6	Global Physical	6, 17, 28, 39, 50, 61	6
7	Appearance	7, 18, 29, 40*, 51, 62*	6
8	Strength	8, 19, 30, 41*, 52, 63	6
9	Flexibility	9, 20, 31*, 42, 53, 64	6
10	Endurance	10, 21, 32, 43, 54, 65	6
11	Global Self-Esteem	11, 22*, 33*, 44*, 55, 66, 68*,70	8

Items marked with * were negatively worded thus they required reverse scoring.

Preliminary analyses (Marsh et al., 1994) summarised psychometric properties of the PSDQ responses for two samples of Australian high school students. Sample 1 contained 315 students aged 12-18 years who completed three physical self-concept instruments the Physical Self Description Questionnaire (PSDQ), the Physical Self Perception Profile (PSPP) (Fox, 1990), and the Physical Self Concept Scale (PSC) (Richards, 1988). Sample 2 consisted of 395 students aged 12 to 18 years who completed the PSDQ instrument only (i.e. not the PSPP or PSC instruments). Exploratory and confirmatory factor analysis demonstrated clear support for the 11 components of physical self-concept that the PSDQ was designed to measure, the replicability of its psychometric properties, and the replicability of the factor structure over gender. Table 3.2.2 shows the descriptive statistics and gender differences for the

PSDQ instrument, for the two samples of the 1994 Australian study. In the analyses scale scores and coefficient alpha estimates of reliability were computed for both samples. Of particular interest is the comparison of coefficient alpha estimates of reliability in Sample 1 used to develop the PSDQ and the cross-validation Sample 2. Although the PSDQ reliabilities are good in Sample 1 (.82 to .92, median = .88), they are consistently somewhat higher in Sample 2 (.87 to .96, median = .91). The high values of reliability maintained in the second sample support the view that the instrument is not sample specific. These results indicate that the PSDQ is an appropriate instrument for use with adolescent males and females.

In addition to this confirmation of the scale reliabilities, Marsh et al. (1994) concluded that there are differences between scale means for males and females, "responses by females, compared to males, are somewhat more reliable (less measurement error), somewhat more variable (standard deviations are higher), and somewhat more differentiated (factor correlations are smaller)"(p.283) (Table 3.2.4).

Table 3.2.4 Descriptive Statistics and Gender Differences for Sample 1 and 2 for the PSDQ Instrument

	Sample 1									Sample 2								
	Total (n=315)		Coeff.	Males (n=208)		Coeff.	Females (n=107)		Coeff	Total (n=395)		Coeff.	Males (n=217)		Coeff.	Females (n=178)		Coeff.
	M	SD	alpha	M	SD	alpha	M	SD	alpha	M	SD	alpha	M	SD	alpha	M	SD	alpha
Strg	4.19	1.13	.88	4.26	1.07	.86	4.04	1.21	.92	4.15*	1.22	.92	4.36	1.19	.92	3.89	1.20	.92
Bfat	4.51*	1.31	.89	4.76	1.16	.85	4.02	1.45	.93	4.45*	1.57	.96	4.81	1.50	.96	4.01	1.55	.95
Pact	4.43*	1.25	.88	4.53	1.15	.84	4.21	1.41	.92	4.29	1.32	.90	4.35	1.32	.89	4.22	1.31	.91
Endr	3.93*	1.29	.90	4.16	1.19	.87	3.48	1.36	.92	3.83*	1.36	.92	4.12	1.33	.92	3.48	1.30	.92
Sprt	4.29*	1.12	.91	4.49	.98	.86	3.90	1.27	.94	4.20*	1.23	.94	4.46	1.16	.94	3.88	1.25	.94
Cord	4.29*	1.08	.88	4.46	1.03	.86	3.97	1.10	.89	4.38	1.08	.91	4.48	1.05	.90	4.27	1.11	.91
Heal	4.55	.96	.82	4.50	.97	.79	4.64	.93	.87	4.79	.98	.87	4.80	1.01	.87	4.78	.95	.87
Appr	3.99*	1.12	.90	4.33	.94	.86	3.34	1.17	.90	3.76*	1.21	.91	4.05	1.09	.91	3.40	1.25	.90
Flex	4.28*	1.08	.86	4.38	1.00	.80	4.09	1.20	.93	4.34	1.13	.90	4.37	1.10	.89	4.31	1.17	.92
Gpsc	4.37*	1.18	.92	4.62	1.06	.88	3.87	1.25	.93	4.21	1.39	.96	4.49	1.31	.95	3.86	1.40	.96
Gse	4.72*	.95	.86	4.85	.90	.84	4.46	.98	.89	4.63*	1.05	.91	4.79	1.01	.91	4.44	1.07	.90

Note. M=means; SD=standard deviations; Strg = Strength; Bfat = Body Fat; Pact = Physical Activity; Endr = Endurance/fitness; Sprt = Sport Competence; Cord = Coordination; Heal = Health; Appr = Appearance; Flex = Flexibility; Gpsc = Global Physical Self-Concept; Gse = Global Self-Esteem. Responses to the PSDQ instrument vary along a 1-6 response scale; * Male/female means differ $p<.05$, two tailed.

Marsh et al. (1994) reported that responses to the Global Physical and Global Esteem scales were highly correlated and that although the nine specific scales on the PSDQ were highly correlated with both Global Physical and Global Esteem, the correlations with Global Physical tended to be systematically higher.

Marsh (1996) in his investigation of PSDQ responses in relation to 23 external criteria (including Body Composition, Physical Activity, Endurance, Strength, Flexibility) evaluated the validity of the PSDQ instrument. In support of the convergent validity of the PSDQ responses, every predicted correlation was statistically significant. There was also reasonable support for the discriminant validity of the PSDQ responses in that most of the predicted correlations were larger than other correlations involving the same external validity criteria. Taken together these results provide good support for the construct validity of the PSDQ responses.

The good validity of the PSDQ instrument made Marsh et al. (1994) state that the PSDQ "is a comprehensive instrument in that it measures a much broader range of physical self-concept components and provides a quick reliable measure of a limited number of components of physical self-concept that were widely applicable across gender and across a very wide age range" (p.299). It is claimed that the 'psychometric theoretical and pragmatic considerations' led to the recommendation of the PSDQ in a wide variety of research and applied settings.

Summarising, the PSDQ instrument (Marsh et al. 1994) was considered appropriate in this study, because:

- it is designed for adolescents 12-18 years of age and is appropriate for both females and males
- its psychometric properties have been evaluated in detail, were cross-validated in samples of adolescents and were found both reliable and valid
- it is a comprehensive instrument in that it measures a broad range of physical self-concept components, a broad instrument is more useful when surveying an unknown or relatively an unknown area
- it has easy to use response formats suitable for adolescents of a wide range of ability.

The Four By One Day Recall Questionnaire

The most commonly used measures of physical activity are self-report questionnaires and, as discussed in Chapter Two, they have advantages but also various problems. After consideration of alternatives, a modified form of the Four by One Day Recall interview-administered questionnaire (Cale, 1993) was chosen to measure patterns and levels of physical activity participation of Greek adolescents.

The Format of the Questionnaire

According to Cale (1994) 'one day's activity can hardly be representative of a child's habitual activity pattern' (p.448). Simons-Morton et al. (1990) took three days of activity information as representative of patterns of participation in physical activity, while Durant et al. (1993) reported that they found four days of recording

were necessary to achieve an acceptable level of reliability in physical activity measurement. It was therefore decided that more than one day's activity information would be collected.

Cale (1993) designed the Four by One-Day Recall interview-based questionnaire to provide information about activity on four days, one weekday, and a weekend day (a Saturday or a Sunday) twice in the year, in order to account for possible seasonal variations. To meet these different times of the week two separate questionnaire forms were developed. The weekday form is concerned with the adolescents' school day activities. The weekend form is concerned with the types of activities adolescents engage in on either a Saturday or a Sunday.

Each form is segmented into parts of the day. The weekday form is divided into; Before School activities, At School activities and After School in the evening activities. The weekend form is divided into Morning, Afternoon, and Evening activities (Cale, 1993). Cale (1993) suggested that each questionnaire should be administered twice in a year to allow for possible seasonal variations in activity patterns.

Sample items of the physical activity questionnaire are presented below in Table 3.2.5. The respondents had to answer the interviewer's questions and report activities that they did the previous day only. A checklist of activities from which the respondents would select which activities have done the previous day was provided by the interviewer. Adolescents had also to report the time they were actually doing the activity and whether they "huffed and puffed" whilst doing the activity.

Table 3.2.5 An Example of Part of the Activities Checklist of the Four by One-Day Recall Questionnaire

4) Did you do any of these activities?

watched television ☐
listened to music ☐
talked with friends ☐

5) Did you do any light household chores, wash-up, tidy-up etc. ?
If so, for how long?

		TOTAL TIME hours	minutes
light household chores	☑	1	20

6) Did you do any of these activities? If so, for how long?
Did you "huff and puff"

		TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
played football in the playground	☑	☐	20	☐	☑
played other ball games in the playground	☑	☐	10	☑	☐

7). Did you do any other activity?
If so, What?

	TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
----------	☐	☐	☐	☐

In the analysis of results from use of the Four by One-Day instrument, Cale (1993) used an energy-expenditure based scoring system. The activities from the checklists were given a code number and were grouped according to their intensity in five levels: Very Light activities, Light activities, Moderate activities, Hard, Very Hard activities (see Appendix D). Raw data from the questionnaires (hours in the various physical activities) were used to calculate energy expenditure. The basis of these calculations is that resting metabolism (one MET) requires 3.5 ml of O_2 per kilogram of body weight per minute. This is equal to approximately one kilocalorie (kcal) per kilogram per hour ($kcal \cdot kg^{-1} \cdot hour^{-1}$). Thus, activities rated as requiring three

METS would expend 3 $kcal \cdot kg^{-1} \cdot hour^{-1}$. The activity categories and associated MET values used by Cale for the Four by One-Day Recall Physical Activity Questionnaire were as follows: Very Light activity = 1.5 METS, Light activity = 2.5 METS, Moderate activity = 4.0 METS, Hard activity = 6.0 METS, Very Hard activity = 10.0 METS. To calculate energy cost in (kcal·kg), Cale (1993) multiplied the hours spent in an activity category by the MET value for that category and summed over all categories.

Reliability and Validity

The reliability of the Four By One-Day Recall Physical Activity Questionnaire was examined by Cale (1993) by a test-retest method on a sample of 12 children aged 14 to 15. Children completed the instrument twice over a period of four weeks. A test -retest correlation of $r=0.62$ ($p<0.05$) was obtained between the test and retest activity scores. It was concluded that the questionnaire was a fairly stable measure of physical activity (Cale, 1994).

A heart rate monitoring method and an observational method were used with a sample of 20 children (aged 11-14) to assess the validity of the instrument. The findings from these studies were very encouraging. The validation study revealed a strong relationship between the interview questionnaire and heart rate monitoring ($r=0.61$) and an even stronger relationship between the interview-questionnaire and the observational method ($r=0.79$).

It therefore seems that the Four by One-Day Recall Physical Activity questionnaire is capable of collecting reliable and valid activity reports from young people.

The Four by One Day Recall Questionnaire was chosen for use in the present study because this instrument:

- was designed to measure physical activity levels for secondary aged children (11 years and upwards)
- measured physical activity in a variety of settings (i.e. physical activity at school, sport at school, physical activity during leisure time, and sport during leisure time) and in the occasion of the activity (weekday, weekend)
- measured both major dimensions of physical activity: total physical activity (energy expenditure) and aerobic activity (time spent in Moderate, Hard activity); these measures provide a more detailed, comprehensive and accurate activity profile
- gathered information from the previous day's activities only and may therefore be more accurate since it overcomes problems in memory.

Adaptations of the Questionnaire

The Four By One-Day Recall Activity questionnaire was originally an interview administered instrument. In this study for practical reasons the instrument was adapted for use in a self-administered group-response context.

In an attempt to achieve a balance between economy and reliable measurement it was decided that two days of activity information would be collected for each adolescent. In order to take possible weekly variations in activity levels into account, the two separate questionnaire forms devised by Cale (1993) were used. The weekend form included activities that it was believed the sample would participate in during the weekend (e.g. be more physically active, go out) and the weekday form included activities it was believed the sample would participate in during the weekday (e.g. school PE, homework).

The Four By One-Day Recall Activity questionnaire was designed specifically for British children, thus it needed to be further adapted to the Greek context. The modifications were kept to the minimum necessary to take account of the needs of the new environment where it was to be distributed. First the questionnaire was translated into Greek, confirmation of the translation was provided by the Greek lecturer of the language institute, University of Hull. The lunch time and afternoon part of the weekday form were adapted to fit to the local after school activities because Greek school children spend their lunch and afternoon at home. Finally some of the activities mentioned in the English version (netball, badminton) were replaced by other activities chosen to fit to the Greek adolescents likely lifestyle (handball, going to the gym).

Blair (1984) recommended that, "calculation of daily caloric expenditure may give false security and too much confidence in methods that are imprecise. Classifying individuals into categories is probably easier than attempting precise quantification" (p.425). Following this advice, and for keeping the classification simple, the activities were grouped into four categories according to their intensity: Sedentary, Light, Moderate, and Hard.

Sedentary activities included 'stationary' activities characterised by little or no movement, such as watching T.V. and reading. Activities involving translocation and slow movement such as shopping, light households tasks were classified as Light activities. Moderate activities were defined as those physical activities which are non-strenuous and can be sustained for long periods, example walking and (slow) cycling. Hard activities were strenuous activities which "make you 'huff and puff". 'Huff and

puff' is associated with activities that make the breathing harder and make the person involved hot or sweaty.

The Scoring Procedure

In the present study, raw data from the questionnaires were to be used to describe the participation in physical activities for each adolescent. An appropriate scoring procedure therefore had to be developed. As already mentioned before the activities were categorised into four groups, Sedentary, Light, Moderate, and Hard. The responses of adolescents were also divided into these four groups. This was done using the 'aerobic rating' ('huff and puff' indication) question.

The first task in preparing the scoring system was the analysis of the time estimations the adolescents reported to have spent in any Light, Moderate and Hard activities according to the checklist of activities. The respondents were asked to report how many minutes they had been active and engaged in a particular activity for. Looking on the given example on p.82 on question 5 the respondent reported that she/he did 1 hour and 20 minutes of Light Household chores; for calculating time spent in Light activities, 80 minutes of Light activity were recorded. In a similar way, the respondent's time estimations for the Moderate and Hard activities were also coded.

In order to distinguish Moderate from Hard activity level, the aerobic rating was used. Physical activities which adolescents reported that did <u>not</u> make them 'huff and puff' were classified as Moderate activities, whilst physical activities that did make them 'huff and puff' were classified as Hard activities. For example question 6 on p. 82 for the physical activity p*layed football in the playground* was classified as a

Moderate activity since the respondent ticked the 'No' response under the 'huff and puff' indication. On the other hand the physical activity p*layed other/ball games in the playground* was classified as a Hard activity because the respondent ticked the 'Yes' response under the 'huff and puff' indication.

For the calculation of the level of physical activities of the sample, the responses of the adolescents were grouped into three categories: Inactive, Moderately active and Hard active. Inactive respondents were involved in Sedentary and Light activities only, Moderate active respondents participated in Moderate activities but not Hard activities, and Hard active respondents were the ones who reported they engaged in Hard activities.

Administration of the Questionnaires

After obtaining consent from the schools, the questionnaires were administered during school hours. In order to encourage good quality responses, all data collection was completed in class units of between 20 to 25 students at each time. The questionnaires were personally administered by the researcher with great care. In all cases the students were informed of the importance of their role in the study, the need for honest and accurate answers and the confidentiality of their responses. Full instructions were given with regard with they would be required to do and a sample item in each questionnaire was fully explained (see Appendix A and B). All students in attendance at the schools on the days the questionnaires were administered completed the forms. The study was undertaken during May 1995. The distribution of the questionnaires had two phases.

In the first phase an explanation was given to the students of what the study was about; the students were also informed about the purpose of the study. The researcher administered the PSDQ and the weekend form of the Four by One-Day Recall. This was done as early as possible on a Monday morning in order to obtain the most accurate information possible for the physical activities the adolescents were involved during the weekend (Saturday or Sunday). The PSDQ instrument was first distributed and took 15-20 minutes for the students to complete it. After collecting and checking the questionnaires the researcher introduced the Four by One-Day Recall activity questionnaire, weekend form. It took 10-15 minutes for the students to complete this questionnaire.

In the second phase the researcher visited the schools again and administered the weekday form of the Four by One-Day Recall questionnaire, on a convenient day of the week (Tuesday, or Wednesday, or Thursday, or Friday), in order to obtain accurate information about the physical activities the students were involved in, on the previous day. Again it took 10-15 minutes for the students to complete the second form of the questionnaire. The purpose of visiting different schools on different days for Phase 2 was in order to gather information that was as representative as possible on the patterns and levels of adolescents involvement in physical activities. Spreading the survey responses through the week was one way of increasing the likely representativeness of the data. Similarly in some schools the students were asked to report their activities on the previous Saturday and some others to report their activities on the previous Sunday. It had already been decided that it was not feasible to return to the schools and repeat the study as Cale (1993) suggested. However, in order to evaluate the findings of the Four by One-Day Recall activity questionnaire an interview study was undertaken three years later, to a small sample of twelve

adolescents 15-16 years old. The interviews were conducted to a playground close to one of the schools where the questionnaires were distributed.

The analyses of the data and the results of the two questionnaires and the interview study are described and presented in the next chapters.

PART TWO

CHAPTER FOUR

RESULTS OF THE QUESTIONNAIRE STUDY

The design of the study and the collection of data were carried out as described in Chapter Three. To facilitate the recording and presentation of the results this chapter has been divided into sections. The first section contains information and results describing the physical self-concepts of the sample obtained using the Physical Self Description Questionnaire. The second section contains information describing involvement of the sample in physical activities. Patterns and levels of the Greek adolescents physical activity behaviours were calculated and are presented in table form. The third section describes analyses carried out to identify relations between the adolescents' physical self-perceptions and physical activity participation.

SPSS-PC+ and the AMOS programmes were employed to code, manipulate and analyse the data.

Sample

Data consisted of responses from 405 adolescents 198 boys and 207 girls aged 14 to 16 years (M=14.7, SD=0.41 years). As mentioned earlier in Chapter Three the adolescents were selected from six Gymnasium of Nea Smyrni a suburb of Athens. The schools themselves were randomly selected from the chosen district. In each school, all pupils of the chosen ages were asked to complete the questionnaires. Tables 4.1 and 4.2 presents a description of sample by gender and age.

Table 4.1 Description of the Sample by Gender

Gender	N	%
Boys	198	48.9
Girls	207	51.1
Total	405	100

Table 4.2 Description of the Sample by Age and Gender

Age Group	Boys		Girls		Total	
	N	%	N	%	N	%
14	102	61.1	122	67.8	224	64.6
15	61	36.5	56	31.1	117	33.7
16	4	2.4	2	1.1	6	1.7
Total	167	48.1	180	51.9	347	100

The figures in Table 4.2 differ from those in Table 4.1 because 58 of students did not report their age group. Because no across-age comparisons of the responses were made, it was possible to include all 405 students in the following descriptions and analyses.

Section 1. Data Analysis Of The Physical Self Perceptions Questionnaire (PSDQ)

According to Marsh (1989) and Fox (1990) self-perception analysis should be systematically conducted by gender. For this reason all analyses in this section were conducted for separate gender groups. PSDQ subscales appear to be sensitive to a wide range of individual gender differences and are not, according to Marsh et al. (1994), susceptible to either 'ceiling or bottom effects'.

As described in Chapter Three, the PSDQ instrument contains eleven self-concept scales and a total of 70 items, with each scale measuring a distinct physical self-concept trait (Marsh et al., 1994). In the PSDQ, item responses are made on a 6 point true / false scale (1=False, 2=Mostly False, 3=More False than True, 4=More True than False, 5=Mostly True and 6=True).

In Table 4.1.1, the frequency of responses to items for each scale are shown calculated by gender. For clarity the items, while they were presented randomly in the PSDQ instrument, are here grouped by scale. The Kolmogorov-Smirnov test (K-S test) was used to check any gender differentiated responses on the perceptions. The K-S test is a goodness-of-fit test and it is the appropriate test to use in this study, since it examines whether an observed distribution of ordinal variables (in this case physical self-perceptions) is the same in the two samples. The test "works" by comparing the maximum difference in the cumulative scores of the two observed distributions (here males and females) and comparing the probability of this value with chance expectation (Siegel, 1956, p.128). The final, right hand, column of the table shows the patterns of significance values.

In some scales (Physical Activity, Sport Competence, Strength, Endurance) each item shows a significant gender difference ($p<0.05$), in three scales (Body Fat,

Health, Appearance) almost none of the items show a gender difference ($p>0.05$) and in others (Coordination, Flexibility, Global Esteem, Global Physical) there is a mixed response with many, but not all, items of each scale showing significant male-female differences.

Table 4.1.1. Frequency of Responses of the Sample to Items for Each Scale and the Kolmogorov-Smirnov value.

Perception Scales	**Gender**	**Responses**						**K-S**	
		False					**True**	**value**	**sign**
		1	**2**	**3**	**4**	**5**	**6**		
Physical activity									
Item 3	boys	17	14	22	19	41	84	3.34	.00
	girls	30	40	42	32	34	28		
Item 14	boys	15	8	18	30	50	75	2.98	.00
	girls	25	36	43	24	41	36		
Item 25	boys	26	17	17	18	41	78	3.38	.00
	girls	65	31	30	25	21	34		
Item 36	boys	50	20	15	18	15	78	2.28	.00
	girls	89	31	16	12	23	35		
Item 47	boys	18	13	22	23	39	81	3.15	.00
	girls	53	38	29	15	31	39		
Item 58	boys	30	20	24	27	39	54	3.70	.00
	girls	91	36	18	17	19	21		
Body Fat									
Item 4	boys	11	11	6	10	32	128	1.20	.11
	girls	13	11	14	26	27	114		
Item 15	boys	16	20	25	30	38	67	2.04	.00
	girls	9	14	16	17	37	112		
Item 26	boys	7	14	7	16	26	127	0.34	1.00
	girls	11	4	12	19	22	139		
Item 37	boys	22	17	13	18	20	106	0.86	.46
	girls	27	16	10	7	17	129		
Item 48	boys	10	9	11	8	25	134	0.22	1.00
	girls	10	12	7	10	31	135		
Item 59	boys	15	13	4	13	26	126	0.32	1.00
	girls	12	10	8	21	27	122		

Table 4.1.1 (continued)

Perception Subscale	Gender	Responses False 1	2	3	4	5	True 6	K-S value	sign
Coordination									
Item 2	boys	3	9	20	51	62	52	1.34	.05
	girls	3	19	39	47	66	32		
Item 13	boys	-	4	8	32	66	85	1.40	.39
	girls	3	15	15	42	65	65		
Item 24	boys	3	9	16	49	63	57	1.54	.17
	girls	5	18	38	47	62	36		
Item 35	boys	3	6	13	28	76	70	1.92	.00
	girls	6	6	20	60	66	48		
Item 46	boys	1	9	10	25	84	66	1.74	.00
	girls	6	21	19	37	81	41		
Item 57	boys	2	5	18	30	80	59	2.74	.00
	girls	20	22	26	46	58	32		
Health									
Item 1	boys	21	34	27	55	31	30	1.08	.19
	girls	21	54	33	43	39	17		
Item 12	boys	6	16	8	23	62	80	0.42	.99
	girls	14	4	18	29	62	80		
Item 23	boys	5	9	3	8	41	131	0.79	.55
	girls	4	4	5	7	33	154		
Item 34	boys	29	28	25	18	40	55	0.39	.99
	girls	28	28	23	19	41	66		
Item 45	boys	2	10	7	9	45	123	0.81	.53
	girls	7	14	10	15	34	126		
Item 56	boys	7	14	13	25	63	73	1.06	.21
	girls	9	17	9	27	44	98		
Item 67	boys	8	11	15	19	44	101	0.83	.49
	girls	7	8	9	21	38	121		
Item 69	boys	10	30	13	28	64	52	0.79	.55
	girls	14	23	22	27	48	70		

Table 4.1.1 (continued)

Perception Subscale	Gender	Responses False 1	2	3	4	5	True 6	K-S value	sign
Sport Competence									
Item 5	boys	8	10	23	28	61	66	2.53	.00
	girls	28	28	39	30	51	31		
Item 16	boys	2	9	8	25	61	90	3.28	.00
	girls	19	20	38	37	62	30		
Item 27	boys	9	10	5	24	54	96	3.51	.00
	girls	14	29	37	42	51	33		
Item 38	boys	-	5	4	25	61	99	3.25	.00
	girls	6	21	30	41	70	38		
Item 49	boys	8	11	28	44	71	35	3.33	.00
	girls	44	36	37	37	30	21		
Item 60	boys	1	7	9	26	60	93	3.07	.00
	girls	21	19	35	32	57	39		
Appearance									
Item 7	boys	2	6	15	60	70	45	0.97	.30
	girls	12	11	23	50	71	42		
Item 18	boys	2	10	21	55	74	35	0.61	.84
	girls	11	9	20	39	84	42		
Item 29	boys	7	12	33	67	63	13	1.66	.01
	girls	26	21	41	57	40	18		
Item 40	boys	2	7	10	25	50	102	0.50	.96
	girls	9	9	12	22	40	112		
Item 51	boys	4	9	13	51	87	34	1.06	.21
	girl	11	12	23	40	77	42		
Item 62	boys	4	8	13	32	66	74	1.05	.22
	girls s	9	14	15	22	47	99		
Strength									
Item 8	boys	2	6	19	43	77	49	2.67	.00
	girls	12	27	45	46	51	27		
Item 19	boys	2	6	12	45	75	56	3.00	.00
	girls	15	33	35	42	50	32		
Item 30	boys	8	14	39	51	59	26	1.93	.00
	girls	25	28	50	43	41	18		
Item 41	boys	6	4	11	13	41	118	2.25	.00
	girls	11	23	19	26	47	79		
Item 52	boys	11	8	18	46	68	46	3.18	.00
	girls	32	33	39	42	64	16		
Item 63	boys	5	3	11	39	77	63	2.94	.00
	girls	22	24	34	39	58	29		

Table 4.1.1 (continued)

Perception Scales	Gender	Responses False					True	K-S value	sign
		1	2	3	4	5	6		
Flexibility									
Item 9	boys	6	17	17	35	54	67	0.42	.99
	girls	5	13	33	32	51	73		
Item 20	boys	-	8	8	28	72	80	1.61	.01
	girls	5	15	19	40	55	71		
Item 31	boys	-	8	8	13	35	126	0.65	.78
	girls	1	8	15	20	43	119		
Item 42	boys	6	10	11	20	64	86	0.92	.37
	girls	6	18	19	25	58	80		
Item 53	boys	1	8	7	28	54	99	2.90	.00
	girls	9	16	31	43	63	44		
Item 64	boys	6	17	22	47	55	50	0.94	.34
	girls	8	26	30	51	58	33		
Endurance									
Item 10	boys	8	11	30	27	59	62	2.30	.00
	girls	35	23	48	35	43	22		
item 21	boys	4	15	15	39	64	60	2.62	.00
	girls	23	25	41	40	51	25		
Item 32	boys	33	26	28	28	30	53	2.90	.00
	girls	85	34	31	19	20	17		
Item 43	boys	16	20	23	25	55	60	3.33	.00
	girls	50	30	39	35	33	18		
Item 54	boys	4	11	17	36	66	61	2.80	.00
	girls	20	25	41	43	51	25		
Item 65	boys	6	17	22	47	55	50	2.55	.00
	girls	32	29	47	38	40	19		

Table 4.1.1 (continued)

Perception Scales	**Gender**	**Responses**						**K-S**	
		False					**True**	**value**	**sign**
		1	**2**	**3**	**4**	**5**	**6**		
Global Esteem									
Item 11	boys	2	3	16	74	65	35	1.69	.01
	girls	8	15	34	58	73	18		
Item 22	boy s	35	20	41	35	28	38	0.77	.59
	girls	42	31	29	21	41	41		
Item 33	boys	3	2	6	7	11	169	1.02	.25
	girls	9	10	6	7	19	155		
Item 44	boys	12	7	11	19	59	90	1.48	.02
	girls	6	5	13	18	40	124		
Item 55	boys	2	6	16	62	77	32	0.85	.45
	girls	7	18	17	66	73	24		
Item 66	boys	2	7	11	51	61	69	0.97	.30
	girls	7	15	19	49	68	48		
Item 68	boys	1	4	6	9	16	161	0.77	.59
	girls	4	5	11	14	19	151		
Item 70	boys	4	4	4	9	45	132	0.98	.29
	girls	4	10	7	21	43	121		
Global Physical									
Item 6	boys	7	5	14	28	74	70	1.50	.02
	girls	14	18	26	25	73	51		
Item 17	boys	8	2	12	37	72	66	1.30	.07
	girls	16	6	28	32	72	53		
Item 28	boys	4	2	10	31	95	56	1.58	.01
	girls	10	11	23	37	78	46		
Item 39	boys	8	6	22	37	77	47	.87	.43
	girls	15	14	26	28	71	50		
Item 50	boys	2	3	9	27	59	93	3.31	.00
	girls	28	28	25	31	54	40		
Item 61	boys	4	2	12	32	74	73	1.66	.01
	girls	13	16	24	24	67	62		

From Table 4.1.1 we conclude that there are significant gender differences as we expected in the areas of Physical Activity, Sport Competence, Strength, and Endurance. According to a well-known pattern, boys perceive themselves as more physically capable than girls. It seems that differences between boys' and girls' physiques are reflected here in their physical self-perceptions.

As already mentioned, the ordinal character of the responses led to the choice of the K-S test for the testing of responses to individual items. It is common practice however to treat responses to Likert-type instruments (such as the PSDQ) as interval for the purpose of calculating scale means and other statistics. This practice was followed for analysis at the scale level. Table 4.1.2 shows the descriptive statistics for the 11 PSDQ scales for boys and girls. All scales drew a wide range of scores. In many instances scores of scale maximum (36 for a 6-item scale) and scale minimum (6 for a 6-item scale) were found. For many of the scales (Physical Activity, Health, Appearance, Strength, Endurance, Global Esteem) the mean score is close to the scale mean. For example the first scale, Physical Activity, has a total sample mean of 22.2 which is close to the scale mean of 21 (6*3.5). Thus for these scales the evidence supports the view of Fox (1990) that physical self-concept subscales are not subject to 'ceiling or bottoming effects'. The one exception to these satisfactory descriptions is the Body Fat scale. Here the observed mean is 12.4 only, closer to the minimum of the scale than to the mid point of 21. It appears that for the current sample too many of the items of this scale attracted False or Mostly False responses. (It is observed however that at least one respondent scored 36, the scale maximum, and must therefore have given a 'True' response to every item.)

The Mann-Whitney test was employed to identify significant differences in the distributions of the responses of boys and girls for the eleven scales. The Mann-

Whitney test is one of the most powerful non-parametric tests, and it is a very useful alternative to the parametric t-test, when the researcher wishes to avoid assumptions of normality of distributions and equality of variances for the two samples that are required by the t-test (Siegel, 1956). Table 4.1.2 shows significant gender differences for eight of the eleven scales. Similar gender differences in the scale means were also found by Marsh et al. (1994). Here, significantly higher scores from boys for scales of Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance and Global Physical were all as anticipated. It was surprising however to find that boys had a significantly higher score on the Appearance scale ($p=0.01$). Equally surprising was the finding that boys and girls had, statistically speaking, equal Body Fat, Health and Global Esteem scores ($p>0.05$).

Table 4.1.2. Means and Standard Deviations of Physical Self-Perception Scales by Gender using the Mann-Whitney test

Scale	Group	N	mean	S.D.	Observed Max	Observed Min	M-W value	sig
Physical Activity no of items: 6	Boys	188	25.77	8.12	36.00	6.00	-7.70	.00
	Girls	196	18.78	8.28	36.00	6.00		
	Total	384	22.20	8.91	36.00	6.00		
Body Fat no of items: 6	Boys	192	12.66	8.12	36.00	6.00	-.91	.36
	Girls	196	12.07	7.73	36.00	6.00		
	Total	388	12.36	7.92	36.00	6.00		
Coordination no of items: 6	Boys	186	29.19	4.47	36.00	13.00	-6.60	.00
	Girls	198	25.88	5.60	36.00	9.00		
	Total	384	27.49	5.34	36.00	9.00		
Health no of items: 8	Boys	186	21.44	4.57	33.00	10.00	-.33	.60
	Girls	199	21.68	4.53	37.00	10.00		
	Total	385	21.56	4.55	37.00	10.00		
Sport Competence no of items: 6	Boys	187	29.38	5.83	36.00	8.00	-8.57	.00
	Girls	201	22.92	7.61	36.00	7.00		
	Total	388	26.03	7.53	36.00	7.00		
Appearance no of items:6	Boys	189	21.81	2.82	31.00	13.00	-2.35	.01
	Girls	197	20.95	3.50	29.00	11.00		
	Total	386	21.37	3.21	31.00	11.00		
Strength no of items: 6	Boys	187	24.71	4.54	36.00	7.00	-6.79	.00
	Girls	203	20.88	5.77	34.00	8.00		
	Total	390	22.72	5.55	36.00	7.00		
Flexibility no of items: 6	Boys	191	25.92	4.14	34.00	13.00	-3.29	.00
	Girls	203	24.13	5.15	33.00	10.00		
	Total	394	25.00	4.77	34.00	10.00		
Endurance no of items: 6	Boys	193	26.46	7.39	36.00	6.00	-7.90	.00
	Girls	199	19.96	7.58	36.00	6.00		
	Total	392	23.16	8.15	36.00	6.00		
Global Physical no of items: 6	Boys	192	29.27	5.13	36.00	6.00	-4.61	.00
	Girls	202	25.90	7.21	36.00	6.00		
	Total	394	27.54	6.50	36.00	6.00		
Global Esteem no of items: 8	Boys	188	23.76	3.70	36.00	12.00	-1.86	.06
	Girls	199	23.15	3.98	44.00	14.00		
	Total	387	23.44	3.85	44.00	12.00		

In the further analysis of the properties of the individual scales, the internal consistency, (Cronbach alpha value), was calculated for each. This measure of reliability of the scale provides an indication of the degree to which all the items tap the same construct. The calculated alphas for the PSDQ scales shown in Table 4.1.3 range between .74 to .92 for the total sample, .54 to .92 for boys, and .78 to .91 for girls. These are encouragingly high values for scales of about six items only. It is noted that the scale Body Fat, mentioned earlier for its low mean score and possible 'bottoming effect' has an alpha value comparable with that of the other scales. The values of alpha for the separate responses of boys and girls suggest that generally girls have answered the questionnaire more reliably and consistently than the boys. Marsh et al. (1994) reported an identical effect.

Table 4.1.3 Physical Self-Perception Scale and Alpha Reliability Coefficients.

Physical Self-Perception Scale	Cronbach's Alpha		
	Total Sample (N=405)	Boys (N=198)	Girls (N=207)
Physical Activity	.88	.85	.85
Body Fat	.91	.92	.90
Coordination	.80	.77	.78
Health	.75	.67	.80
Sport Competence	.92	.89	.90
Appearance	.87	.79	.91
Strength	.88	.87	.85
Flexibility	.83	.79	.86
Endurance	.92	.91	.89
Global Esteem	.74	.54	.80
Global Physical	.87	.84	.87

The Structure of Physical Self-Concept: A Factor Analytic Approach

The PSDQ was designed with eleven subscales each for the measure of a separate facet of self-perception within the physical domain. Therefore it was necessary to find evidence of subscale discrimination. For this reason we applied factor analysis.

Factor analysis of the PSDQ scales was performed in order to examine the structure of the physical self perception responses given by the Greek sample and identify the eleven scales. This is especially necessary when all scales represent perceptions within one domain; in this case the physical domain. Table 4.1.4 shows the results of the principal components factor analysis for the whole sample. Factor loadings of .4 are generally accepted as a criterion value (Lindeman et al., 1980). Those values of .4 or higher on intended factors were considered good contributes to the factor structure. The data revealed an eleven-factor structure, which explained 61.5% of the variance in the scales. Eigenvalues for the 11 factors are at least 1.3. All items representing Sport Competence, Body Fat, Appearance, Endurance, Physical Activity, Strength, Flexibility, and Health loaded with a value of above .5 on their intended factor. Items representing Global Self-Esteem, Global Physical Concept and Coordination loaded higher than .4 on their nonintended factor. The evidence from the exploratory factor analysis clearly indicates that the eleven-factor construction provided a satisfactory solution for the data. Furthermore the item construction of these factors corresponds with that of the indended content of the PSDQ scales.

The Greek data indicate strong support for the dominant 11 factor structure proposed by Marsh et al. (1994) with the resultant 11 factors explaining over 61% of

the variance in the items. Almost all items loaded only on their intended factor with only a small number of different loading occuring.

The purpose of the study was to establish the validity of the PSDQ with a Greek population. The instrument has indicated that it is equally valuable for use with Greek adolescents. From the evidence presented here, the factor structure appears to be robust across populations and subscales are internally consistent.

Table 4.1.4 Principal components factor loadings for PSDQ items

Items	FACTORS & FACTOR LOADINGS										
	1	2	3	4	5	6	7	8	9	10	11
Sp. Competence											
Item 16	.76										
Item 27	.64										
Item 38	72										
Item 49	.64										
Item 5	.69										
Item 60	.74										
Body Fat											
Item 15		.70									
Item 26		.86									
Item 37		.79									
Item 4		.87									
Item 48		.76									
Item 59		.84									
Appearance											
Item 18			.82								
Item 29			.54								
Item 40			.73								
Item 51			.84								
Item 7			.83								
Item 62			.53								
Endurance											
Item 10				.73							
Item 21				.67							
Item 32				.76							
Item 43				.80							
Item 54				.62							
Item 65				.71							
Ph. Activity											
Item 14					.61						
Item 25					.70						
Item 3					.64						
Item 36					.75						
Item 47					.72						
Item 58					.68						
Strength											
Item 19						.79					
Item 30						.70					
Item 41						.48					
Item 52						.72					
Item 63						.68					
Item 8						.78					

Table 4.1.4 (continued)

Items	FACTORS & FACTOR LOADINGS										
	1	2	3	4	5	6	7	8	9	10	11
Flexibility											
Item 20							.64				
Item 42							.61				
Item 9							.77				
Item 31							.55				
Item 53							.43				
Item 64							.69				
Health											
Item 1								.40			
Item 12								.78			
Item 23								.67			
Item 34								.67			
Item 45								.79			
Item 56								.62			
Item 67								.79			
Item 69								.60			
Self-Esteem											
Item 55									.69		
Item 66									.63		
Item 11									.62		
Item 22				.66							
Item 33								.67			
Item 44											.66
Item 68											.58
Item 70											.72
Gl. Physical Concept											
Item 17										.57	
Item 28			.48							.46	
Item 39										.40	
Item 6										.69	
Item 50	.60										
Item 61										.60	
Coordination											
Item 2											
Item 24											.74
Item 57	.42										
Item 13							.48				
Item 46							.50				.44
Item 35					.75						

Eigenvalue	18.2	6.6	4.0	3.2	2.2	2.1	2.0	1.6	1.4	1.3	1.2
% variance	26.0	9.5	5.7	4.6	3.2	2.9	2.8	2.3	2.1	1.9	1.8
Cum. % Variance	8.6	16.3	23.1	29.7	35.5	41.3	46.7	51.3	54.7	58.2	61.5

The Hierarchical Structure of Physical Self-Concept

The PSDQ instrument provided the means of investigating the hierarchical structural relationship among different aspects and levels of physical self perception. The measurement of Global Self-Esteem, Global Physical Self-Concept and the nine separate subdomains of physical self-perception allowed a partial test of a possible hierarchical structure of the Greek data. The model to be tested can be seen in Figure 4.1.1. At the third order perceptions are represented by the nine scales of Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance, Body Fat, Health and Appearance. These are hypothesised to result in a generalised construct of the Global Physical scale. Global Physical is associated with Global Esteem at the apex of the hierarchy. In order to investigate this hierarchical structure with the Greek data, zero-order and partial correlation analyses were used.

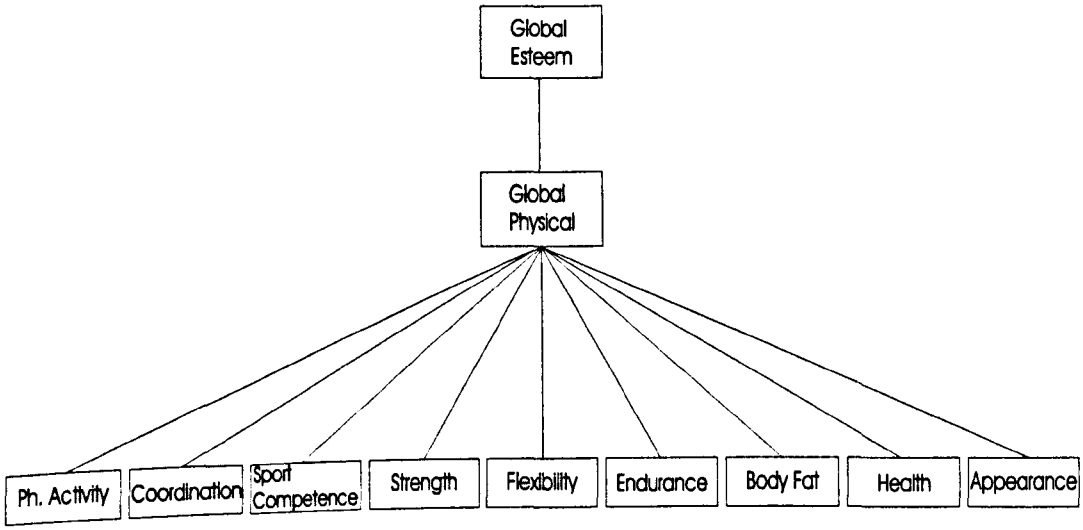


Figure 4.1.1. A Hypothesised Hierachical Organisation of Physical Self Concept

Zero-order correlations

According to Fox (1990), in order to establish the hierarchical structure of the physical self-concept two conditions should be met. First, Global Esteem scale should correlate higher with Global Physical than any of the other nine scales. An examination of the first column of Table 4.1.5 shows this to be the case, with a correlation of .40 between Global Esteem and Global Physical. The rest of the scale correlations with the Global Esteem range between .05 and .39. Second, each of the nine scales should be more closely related to Global Physical scale than the Global Esteem scale. A comparison of the coefficients in column 1 with their equivalent in column 2 of Table 4.1.5 clearly shows this, with the exception of the Health perception scale. In summary, the zero-order correlations are evidently consistent with a hierarchical organisation among the variables.

Table 4.1.5 Zero-order Correlation Coefficients for PSDQ scales

Scales	Gl.Est	Gl.Phys	Ph.Act	Appea	B. Fat	Comp	Coord	Endur	Flexib	Health	Stren
Global Esteem	1										
Global Physical	.40**	1									
Physical Activity	.11*	.33**	1								
Appearance	.39**	.55**	.19**	1							
Body Fat	.20**	.42**	.02	.30**	1						
Sp. Competence	.21**	.51**	.57**	.29**	.11*	1					
Coordination	.31**	.55**	.43**	.33**	.25**	.55**	1				
Endurance	.20**	.46**	.49**	.19**	.26**	.63**	.52**	1			
Flexibility	.19**	.49**	.35**	.29**	.35**	.44**	.61**	.54**	1		
Health	.15**	.05	.08	.05	.01	.12	.12	.13**	.03	1	
Strength	.25**	.40**	.40**	.26**	-.09	.55**	.35**	.42**	.27**	.17**	1

** significant at .01 level

Partial correlation analysis

A key issue in this structure is the role of Global Physical Self-Concept as a mediator between the nine scales and Global Esteem. In order to assess the intermediary status of the Global Physical variable a comparison of zero-order correlation of each subdomain to Global Esteem can be made to the same correlations with the effects of Global Physical partialled out. In Table 4.1.6, the zero-order correlations between each of the subdomains and Global Esteem can be compared with the same relationships when the influence of Global Physical is partialled out. It can be clearly seen that all significant Esteem relationships, with the exception of the Appearance are totally extinguished. These data support the hypothesised hierarchical structure.

Table 4.1.6 Comparison of Zero-Order and Partial Correlation Coefficients Controlling for Global Physical Concept. Correlations between Scales Scores with Global Esteem

	Global Esteem	
	Zero	Partial
Physical Activity	.10**	-.06
Coordination	.31**	.16
Sp. Competence	.21**	-.03
Strength	.25**	.13
Flexibility	.19**	-.05
Endurance	.20**	.02
Appearance	.41**	.30**
Health	.15**	.10
Body Fat	.20**	.09

** significant at .01 level

To summarize, the zero-order and partial correlation analyses provided support for the hierarchical organisation of self-perceptions (Figure 4.1.1). Three levels are represented in this hierarchy (Figure 4.1.1). On the first level the nine scales which refer to a specific domain of physical self-concept, on the second level the Global Physical scale which refers to specific physical self perceptions, and on the third level,

the Global Esteem scale which refers to general qualities of the self-concept. In addition, these results support the validity of the PSDQ scales.

Principal components factor analysis had already identified a factor structure reflecting the eleven PSDQ scales. However in order to explore the possible structure among the physical self perception scales themselves, a second principal factor analysis was conducted. The results of the principal components factor solution for the sample can be examined in Table 4.1.7.

Table 4.1.7. Principal components factor loadings for PSDQ scales

Scale	Factor		
	1	2	3
Physical Activity	.76		
Sp. Competence	.82		
Coordination	.68		
Endurance	.79		
Flexibility	.65		
Strength	.59		
Body Fat		.67	
Global Physical		.60	
Global Self-Esteem		.68	
Appearance		.73	
Health			.63
Eigenvalue	4.3	1.4	1.1
% variance	39.8	13.2	10.3
Cum. % variance	31.1	52.9	63.3

The analysis of the data reveals that three factors explain 63.3% of the variance among the scales. In the first factor the Physical Activity, Sport Competence, Coordination, Endurance, Flexibility and Strength scales were heavily loaded. These scales could be identified with the ability structure of the physical self-concept. The Body Fat, Appearance, Global Physical and Global Esteem scales are heavily loaded

in the second factor. As we notice, it is probably the more general nature of the physical self concept that these scales represent, that make them differ from the rest of the scales. Furthermore, Health appears to stand alone in one factor. One explanation might be that adolescents do not consider Health as part of the ability or fitness physical self perceptions since they are young and mainly healthy.

Testing for Evidence of Hierarchical Structuring

Confirmatory factor analysis (CFA) is a superior approach to exploratory analysis for examining the dimensionality and structure of approaches to physical self-concept. The researcher, by using CFA, can test the validity of a priory factorial structure and related hypotheses of the proposed structure of the instrument under study. Specifically, it is possible to determine to what extent the items designed can actually measure a particular dimension of the instrument. The technique makes it possible to examine alternative models and gives a measure of how well each fits the data. This provides a rational basis for deciding between alternative hypothesised models (Marsh et al., 1994).

A confirmatory factor analysis using the full sample was conducted to examine the fit of the eleven factor model to the data.

The Shavelson et al. model posits that self-concept is ordered hierarchically as well as being multidimensional. In this study structural modelling was used to test alternative models for the data from the PSDQ instrument. Two models were tested to examine their fit to the data.

The correlations of the PSDQ factors were examined previously (Table 4.1.5), but no special assumptions about the pattern of correlations were made. However,

both the Shavelson et al. model and the design of the PSDQ instrument assume there is a systematic hierarchical ordering of the facets of physical self concept, so that one reasonable hypothesis would be that the nine scales would form one-order factor and that the Global Physical and Esteem perceptions will form higher levels of hierarchy, a finding that would be consistent with the Fox model (Figure, 2.1.3). However, results from principal factor analysis of the PSDQ scales (Table, 4.1.7) suggest complications for this model. In particular, the nine physical activity perception factors did not seem to belong to the same 'cluster'. This data suggest that the second-order structure underlying the PSDQ factors may be more complicated than was previously assumed.

In order to examine the hierarchical structure of physical self-concept, two models were tested: The first hierarchical model (Model 1, Figure 4.1.2) posited three hierarchical components. Global Esteem is at the apex of the hierarchy and is associated with the Global Physical Self Concept and with the nine scales as third orders. Model 2 (Figure 4.1.3) was designed based on the factor analysis results (Table 4.1.7) and literature recommendations (Marsh, et al. 1994). As in model 1, it was hypothesised that the nine scales belonged together and at the lowest level formed two unobservable third-order factors, named as Physical Ability and Physical Fitness. *Physical Ability* is represented by six scale scores of Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance. *Physical Fitness* is represented by Appearance, Health, and Body Fat. These two third-order factors are postulated to be correlated and to form the second hierarchical factor, named Global Physical. At the apex of the hierarchy is the Global Esteem.

The AMOS (1997) programme was used to obtain the parameter estimates and assess the adequacies of the models proposed. Several useful indicators,

recommended by Hoyle &Panter (1995), were utilised to evaluate the goodnes-of-fit of the hypothesised models. Hoyle & Panter (1995) give references to the original models and a discussion of their relative merits, the indices quoted here are those recommended for general use. They are: chi-square value, χ^2, with its degrees of freedom (d.f.); the goodness-of-fit index (GFI), the Bentler's comparative fit index (CFI) and the expected cross-validation index (ECVI). Typically, as the ability of a model to account for the covariation among the test variables increases, the magnitude of χ^2, becomes smaller, and the values of GFI and CFI approach unity. The p-value given by a formal test of significance is not considered as a criterion for model checking as models that can fit the real data will always be rejected when there is a sufficiently large sample size as in this case (Joreskog & Sorbom, 1983).

Table 4.1.8 Goodness-of-fit indices for alternative models

Analyses	χ^2	df	GFI	CFI	ECVI
Model 1	737.37	45	.70	.56	1.29
Model 2	270.74	42	.88	.85	.78

Note. GFI = Goodness-of-fit index; CFI = Comparative fit index; ECVI = Expected cross validation index

The summary results presented in Table 4.1.8 show that Model 1 gives the poorer fit, but it might be considered satisfactory given its parsimony. Model 2 provides a much better fit of the data. Each indicator of goodness-of-fit shows that Model 2 is better than the other. Consistent improvements are obtained when the model moves away at the second hierarchical order from the original discrete one-factor towards a two-factor structure. Test of an intermediate model with the Health perception being separated from the Body Fat and Appearance self perceptions

showed goodness-of-fit indices intermediate between those of Model 1 and Model 2. It is concluded that Model 2 is the preferred representation of the hierarchy for this sample. To facilitate a clear picture of these analyses, the two models complete with standardised estimates are presented schematically in Figures 4.1.2 and 4.1.3.

In this section, the factor analyses have shown a clear pattern of inter-variable relationships, fitting with those of previous researchers. A satisfactory representation of the hierarchy has been produced.

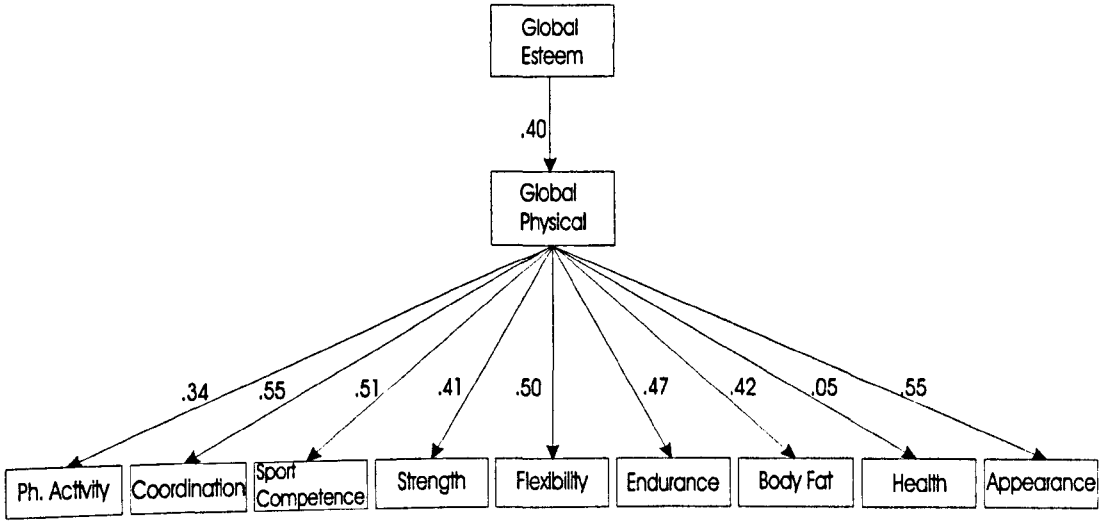


Figure 4.1.2. Hierachical Model 1 of Physical Self Concept

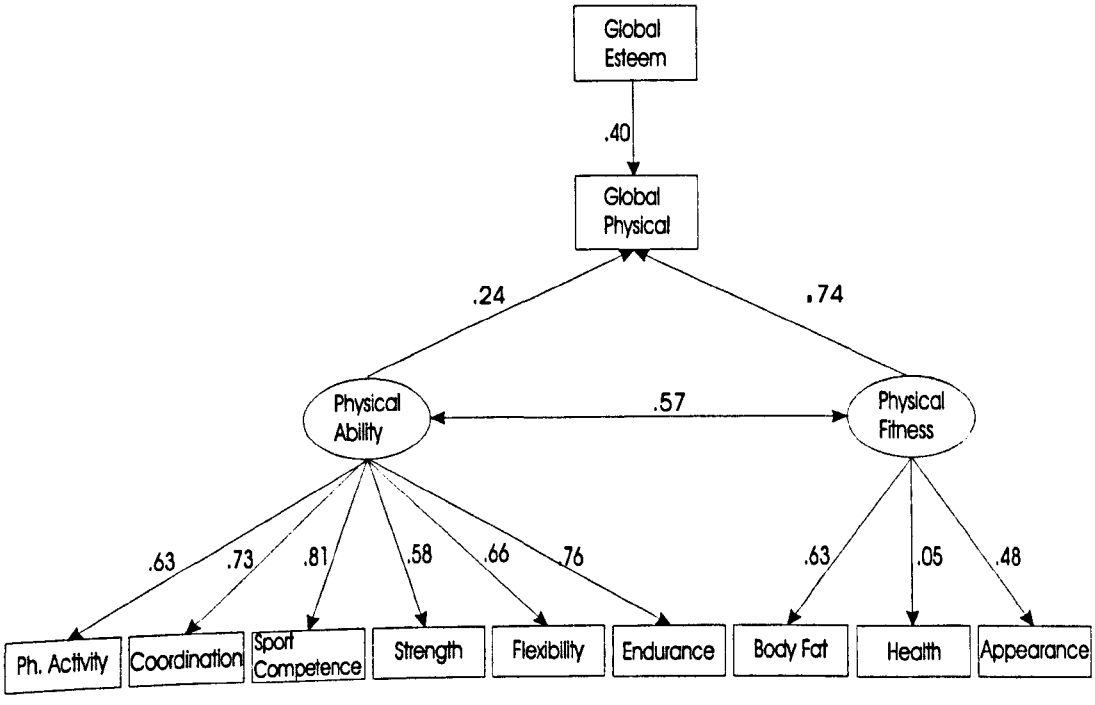


Figure 4.1.3. Hierachical Model 2 of Physical Self Concept

Summary of Findings of the PSDQ Instrument

The PSDQ instrument consists of eleven physical self-concept scales, which correspond to the nine specific domains of physical self-concept (Physical Activity, Body Fat, Coordination, Health, Sport Competence, Appearance, Strength, Flexibility, Endurance) and the two global components (Global Self Esteem, Global Physical). The PSDQ was distributed to a sample of 405 Greek adolescents. Basic analyses based on the frequencies, means, standard deviations were conducted to explore the sample's responses. Because the literature indicates that gender differences in specific components of self-concept may be lost when a total score is formed, the analyses were conducted for gender groups separately. The Cronbach alpha statistic was used to confirm the reliability of the eleven scales instrument. Factor analysis was used in order to provide evidence of the validity for the scales. The hierarchical structure of the Physical Self Concept of the data was tested and a hierarchical model was presented.

The frequency of responses of the sample to items of the eleven scales are shown in Table 4.1.1 by gender. The Kolmogorov-Smirnov test (K-S test) was applied to the frequencies of responses to reveal gender differences. For the present sample boys and girls perceptions differ towards Physical Activity, Sport Competence, Strength, and Endurance perceptions. Generally the scales items on Body Fat, Health, Appearance showed that boys and girls have closely similar perceptions whereas for the rest of the scales, items showed that the feelings in both gender groups were mixed with some items of each scale showing significant male-female differences and some not.

Results for the means, standard deviations and the range (maximum and minimum) of the scores (Table 4.2.2), showed that the scale responses were not subjected to 'ceiling or bottoming' effects. The only exception was the scale of Body Fat with the majority of the adolescents perceiving themselves in a favourable manner. The Mann-Whitney test was applied to test gender differences in the eleven scales. As was expected boys, had higher Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance, Global Physical mean scores compared to girls. It was surprising to find that the boys had a higher self-concept on the Appearance scale. It was also found that boys and girls of the sample had similar Global Self Esteem scores.

In the further analysis the psychometric properties of the PSDQ instrument were examined. Cronbach alpha statistic (Table 4.1.3) showed that the scales of PSDQ have good reliability for use with the present sample of adolescents. Validity was examined using a factor analytic approach (Table 4.1.4). Results indicated a eleven-factor structure, which explained most of the variance in the scales. In the process of this validation, zero-order and partial correlation analyses provided further support to the existence of a hierarchical organisation of self perceptions in the physical domain (Tables 4.1.5, 4.1.6). Three levels are represented in this hierarchy. In the first level the nine scales which refer to specific domains of physical self concept, the second level which refers to a specific domain of Physical self concept, and at the apex of the hierarchy the Global Esteem scale which refers to general qualities of the self-concept (Figure 4.1.1). The examination of the hierarchy was further tested with two structural equation models (Figures 4.1.2, 4.1.3).

The findings that have resulted from items and scales means, standard deviations and analyses indicated that the PSDQ instrument overall was not subject to 'ceiling' or 'bottoming' effects, was sensitive to a wide range of individual differences and could provide reliable information from the present sample. Further analyses showed a clear pattern of inter-variable relationships. A satisfactory representation of the hierarchy has been produced.

Section 2 Data Analysis of the Physical Activities Questionnaire

(Four by One Day Recall Physical Activity Questionnaire)

A translated and slightly modified version of the Four by One-Day Recall Physical Activity (self-report) Questionnaire (Cale, 1993) modified for the Greek sample as described in Chapter Three, was used to assess the physical activity patterns and levels of the sample. In the present study the instrument gathered information about two days of the adolescents' activity, a weekday and a weekend.

In the analysis of the physical activities, a division was made into Sedentary, Light, Moderate and Hard activities. Table 4.2.1 shows the four groups of activities in which the sample was involved, during a weekday and a weekend. These classifications were set according to Cale (1993). Moderate and Hard intensities include the same physical activities, so they are combined in one column of Table 4.2.1.

Table 4.2.1. Division of Activities, used in the Investigation According to Sedentary, Light, Moderate and Hard Groups

Sedentary Activities	Light Activities	Moderate/Hard Activities
Watching T.V.	Caring for Pets	Hard Households
Watching Video	Light Households	Brisk Walking
Listening to Music	Going for Shopping	Walking
Playing Music	Going out with	Cycling
Drawing	Friends	Tennis
Playing Computer		Football
Doing Homework		Ball-games
Reading for Pleasure		Basketball
Playing Cards		Volleyball
Talking to Friends		Gymnastics
Taking Private Lessons		Jogging
		Athletics
		Swimming
		Going to Gym
		Dance

Sedentary activities require no or almost no physical movement.

Light activities were regarded as non strenuous activities.

Moderate activities were regarded as relatively strenuous activities that most adolescents should be able to engage in and sustain for considerable amounts of time.

Hard activities were strenuous activities undertaken at a level or pace that "make you 'huff and puff'. To 'huff and puff' means to breathe hard, harder than normal and it is an indication which is associated with activities that make the heart beat faster than usual.

On the questionnaire Hard activities were distinguished from Moderate activities by asking the students to indicate their aerobic status ('huff and puff') by ticking the appropriate box (see Chapter Three).

The activities were presented in a check list form, following the Cale (1993) instruction manual, and thus the danger of relying on recall was minimised.

In each section of the questionnaire an open response opportunity 'other' was offered. The purpose of this question was to allow students to record participation in any activity not included in the checklist.

Physical Activity Patterns

To observe patterns of physical activities of Greek adolescents and differences or similarities between boys and girls who reported involvement at the four categories of activities, frequencies and percentages of the activities were calculated separately from the weekday and the weekend responses.

Sedentary Activities

As can be seen from Table 4.2.2 and Figure 4.2.1 for the weekday Sedentary activity group Talking to Friends (97%) was the most commonly reported activity, followed by Watching T.V.(79%), Listening to Music (67%), and Doing Homework (62%). Most of the activities have non-significant gender differences. The only significant one is noted for the fifth most common activity, Using a Computer at 15.6%. This activity however is only about one quarter as frequent as the fourth most common activity Doing Homework (62%).

Table 4.2.2 Frequency and Percentage of Sedentary Activities over a Weekday for the Sample

Sedentary Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%*	No	%*
Watch T.V.	318	78.5	169	85.3	149	72.0
Watch video	27	6.7	19	9.6	8	3.9
Listening to music	273	67.4	126	63.6	147	71.0
Playing music	33	8.1	18	9.1	15	7.2
Drawing	29	7.2	13	6.6	16	7.7
Using Computer	63	15.6	50	25.2	13	6.3
Doing Homework	251	62.0	112	56.5	139	67.1
Read for pleasure	51	12.6	23	11.7	28	13.5
Playing Cards	20	4.9	8	4.0	12	5.8
Talking to Friends	392	96.8	190	95.9	202	97.6
Doing Academic Lessons	59	14.6	27	13.6	32	15.4

*Refers to percentage of group reporting the activity

Figure 4.2.1

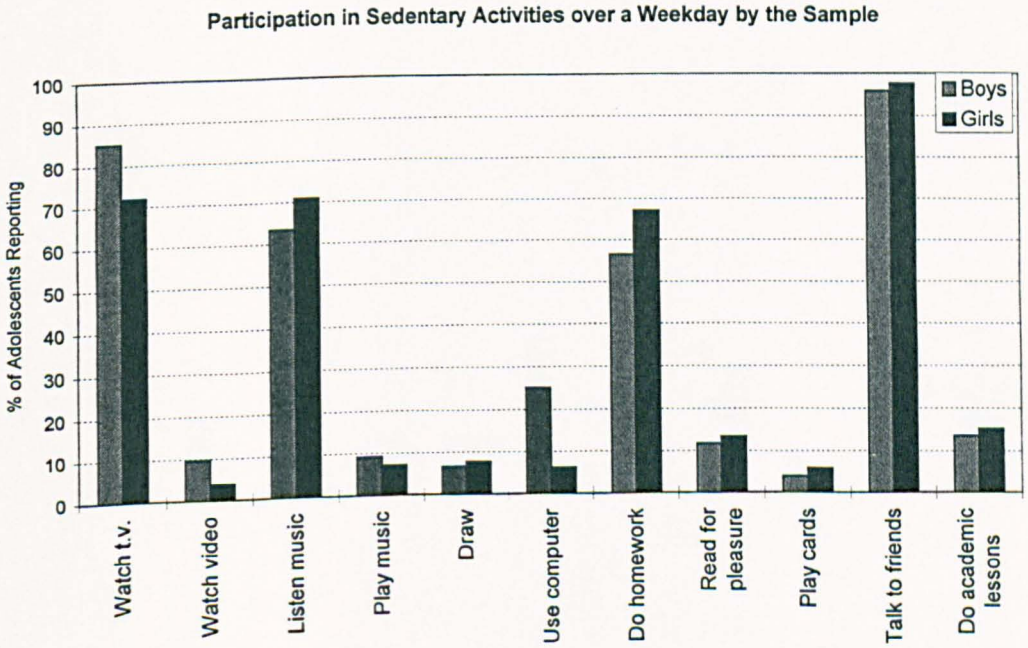


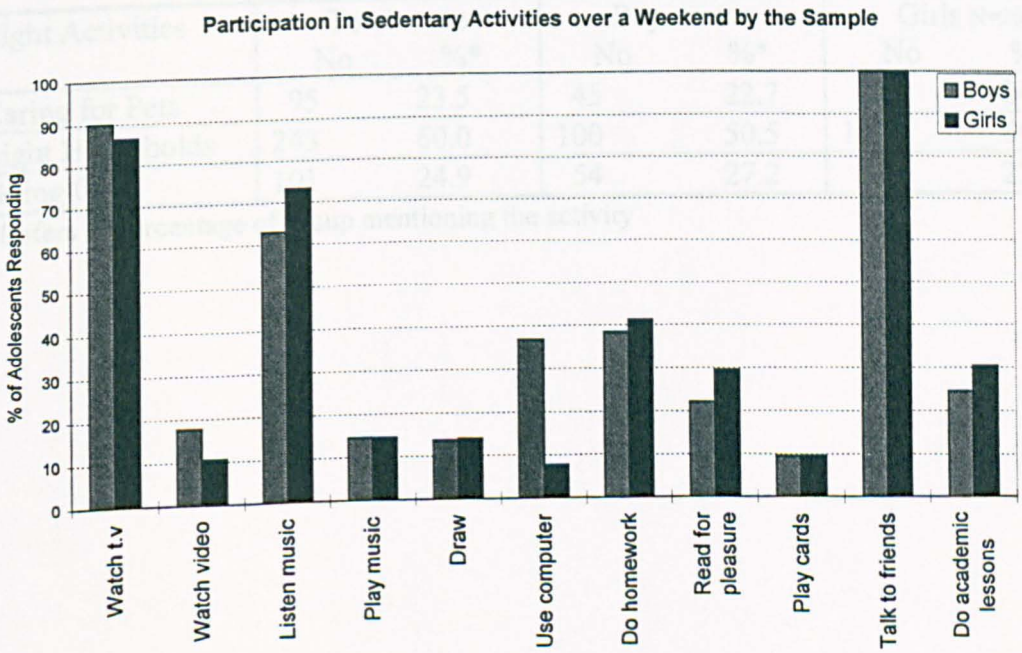
Table 4.2.3 and Figure 4.2.2 shows the frequency and percentage of participation in Sedentary activities for the boys and girls of the sample over a weekend. The choice of types of activities from the sample over the weekend is more or less the same as the weekday distribution. Watching T.V. 89%, Listening to Music 68% and Doing Homework 40% were the most common activities for the total sample as well as for boys and girls separately. The activity Talking to Friends was not included in the Weekend version of the questionnaire, because, it was thought, responses would be 100%, that is that all adolescents would talk to a friend or friends at some time in this period. The frequency of Doing Homework is less at 40% than reported for the weekday (62%). Reading for Pleasure (26%) is now more common than Using a Computer (22%), though the latter still shows the marked gender difference found in weekday activity (Table 4.2.2 and Figure 4.2.1).

Table 4.2.3. Frequency and Percentage of Sedentary Activities over a Weekend for the Sample

Sedentary Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%	No	%
Watch T.V.	359	88.6	180	90.1	179	86.5
Watch video	57	14.1	35	17.7	22	10.6
Listening to music	277	68.4	125	63.1	152	73.4
Playing music	59	14.6	29	14.6	30	14.5
Drawing	56	13.8	27	13.6	29	14.0
Using Computer	89	22.0	73	36.9	16	7.7
Doing Homework	161	39.8	76	38.4	85	41.1
Read for pleasure	105	25.9	44	22.2	61	29.5
Playing Cards	39	9.6	19	9.6	20	9.7
Doing Academic Lessons	112	27.7	49	24.7	63	30.4

*Refers to percentage of group reporting the activity

Figure 4.2.2.



To facilitate comparison with Figure 4.2.1 and Figure 4.2.2 a bar was added for the "Talking to Friends" activity at 100% for each gender; the item was not mentioned at the weekend form of the questionnaire as it was assumed that all adolescents will talk to their friends.

Light Activities

Table 4.2.4 and Figure 4.2.3 show the frequency and the percentage of participation in Light activities of the sample over a weekday. As it can be seen in the weekday involvement, Light Households was the most common Light activity; almost 50% of the boys and 69% of the girls reported it. The gender difference noticed in this activity is probably due to social-cultural nature of the activity. There were no significant gender differences on the other two activity groups.

Table 4.2.4. Frequency and Percentage of Light Activities over a Weekday for the Sample.

Light Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%*	No	%*
Caring for Pets	95	23.5	45	22.7	50	24.1
Light Households	243	60.0	100	50.5	143	69.1
Going Out	101	24.9	54	27.2	47	22.7

*Refers to percentage of group mentioning the activity

Figure 4.2.3

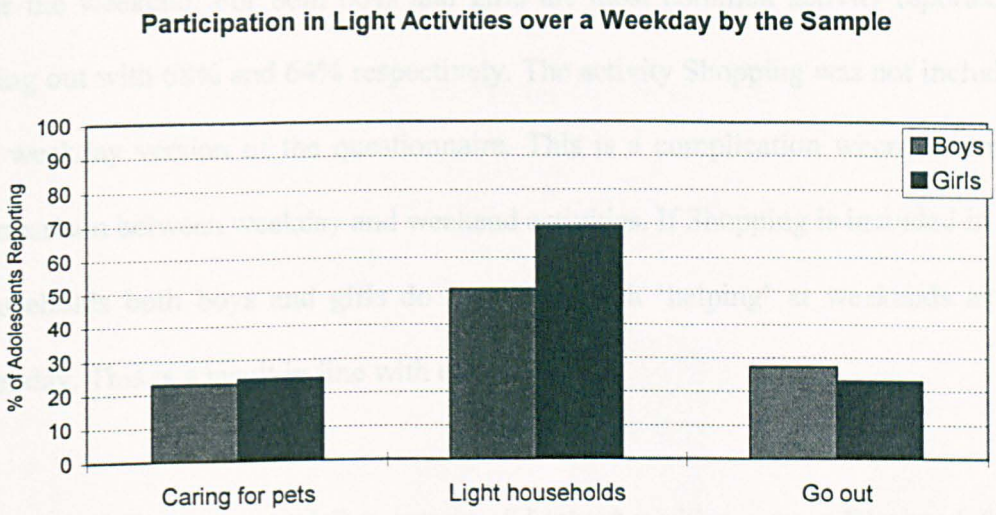

Participation in Light Activities over a Weekday by the Sample
% of Adolescents Reporting
100
90
80
70
60
50
40
30
20
10
0
Boys
Girls
Caring for pets
Light households
Go out

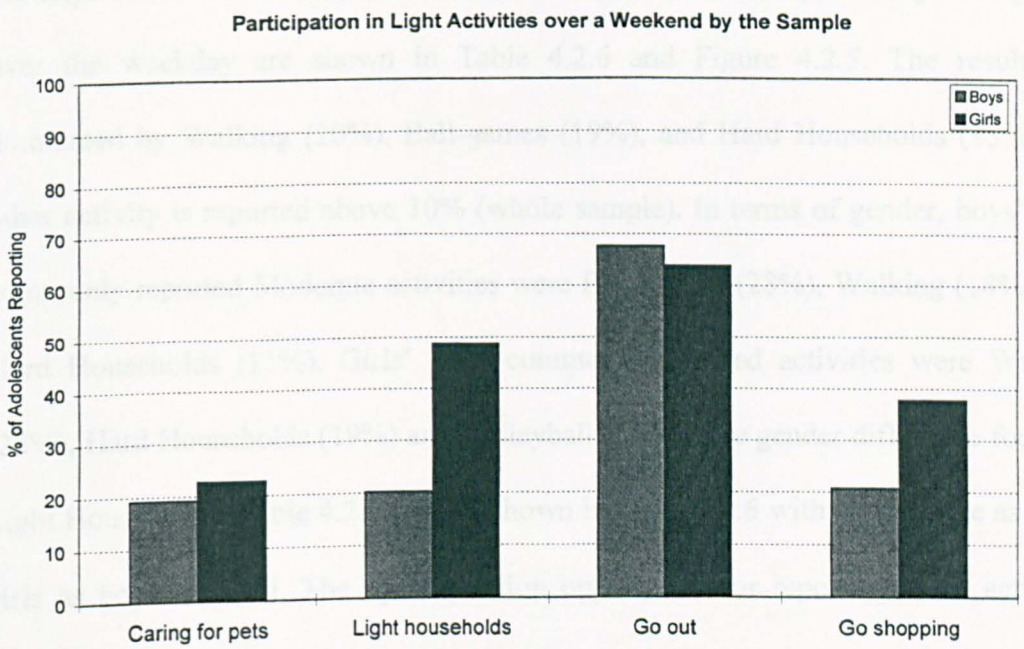
Table 4.2.5 and Figure 4.2.4 shows the frequency and percentage of Light activities over the weekend. For both boys and girls the most common activity reported was Going out with 68% and 64% respectively. The activity Shopping was not included in the weekday version of the questionnaire. This is a complication when it comes to comparison between weekday and weekend activities. If Shopping is included in Light Households both boys and girls do about as much 'helping' at weekends as on a weekday. This is a result in line with expectation.

Table 4.2.5 Frequency and Percentage of Light Activities over a Weekend for the Sample

Light Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%*	No	%*
Caring for Pets	85	21.0	38	19.2	47	22.7
Light Households	141	34.8	40	20.2	101	48.8
Going Out	266	65.7	134	67.7	132	63.8
Shopping	119	29.4	41	20.7	78	37.7

*Refers to percentage of group mentioning the activity

Figure 4.2.4


Participation in Light Activities over a Weekend by the Sample
% of Adolescents Reporting
100
90
80
70
60
50
40
30
20
10
0
Boys
Girls
Caring for pets
Light households
Go out
Go shopping

Moderate Activities

Participation in Moderate physical activities by the total sample and gender groups over the weekday are shown in Table 4.2.6 and Figure 4.2.5. The results are dominated by Walking (20%), Ball-games (19%), and Hard Households (15%). No other activity is reported above 10% (whole sample). In terms of gender, boys' most commonly reported Moderate activities were Ball-games (28%), Walking (18%), and Hard Households (11%). Girls' most commonly reported activities were Walking (23%), Hard Households (19%) and Volleyball (13%). The gender difference found in Light Households (Table 4.2.5) is also shown in Table 4.2.6 with about twice as many girls as boys engaged. The open question opportunity for reporting other activities attracted no responses.

Table 4.2.6. Frequency and Percentage of Moderate Activities** over a Weekday for the Sample

Moderate Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%*	No	%*
Hard Households	61	15.1	21	10.6	40	19.3
Brisk Walking	21	5.2	12	6.0	9	4.3
Walking	83	20.5	35	17.6	48	23.2
Cycling	13	3.2	10	5.0	3	1.4.
Tennis	1	0.2	1	0.5	0	0
Football	21	5.2	19	9.6	2	1.0
Ball-games	77	19.0	56	28.3	21	10.1
Basketball	22	5.4	15	7.6	7	3.4
Volleyball	34	8.4	6	3.0	28	13.5
Gymnastics	23	5.7	11	5.5	12	5.8
Jogging	33	8.1	18	9.1	15	7.2
Athletics	1	0.2	1	0.5	0	0
Swimming	6	1.5	4	2.0	2	1.0
Gym	7	1.7	4	2.0	3	1.4
Dance	0	0	0	0	0	0

*Refers to percentage of group mentioning the activity

**Table data are frequencies of responses of engaging in the listed activities without "huff and puff" indication.

Figure 4.2.5

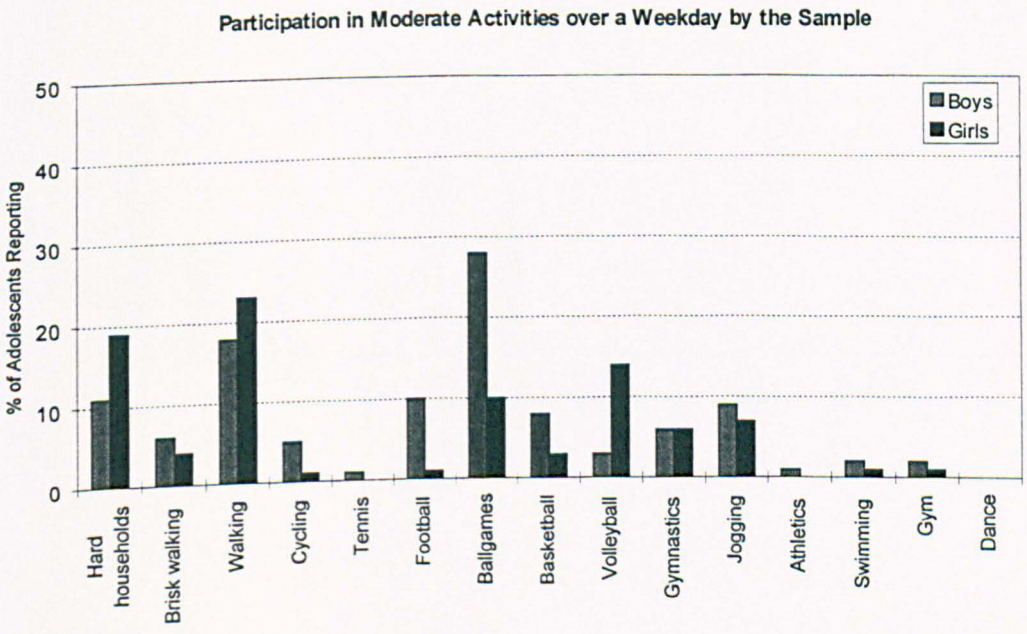


Table 4.2.7 and Figure 4.2.6 show the frequency and percentage of participation in Moderate activities over the weekend for the total sample and gender groups. On the top of the preference for boys were Basketball (19%) and Brisk Walking (14%); girls seemed to prefer Brisk Walking (14%). There seems to be a stereotypically profile for the two genders over the physical activities. Hard Households being on the top of the girls' activities (30%), whereas Basketball is the predominant activity for boys (19%). Comparing the Tables 4.2.6 and 4.2.7 we notice that over the two days, boys engagement in Hard Households is constant at 10.6% whilst girls involvement shows a large increase from 19.3% weekday involvement to 30% weekend involvement. Volleyball appears to be a weekday physical activity for the girls, mainly played at school at a reported level of 13.5% (Table 4.2.6) whilst during the weekend only 1% of girls reported involvement in the activity.

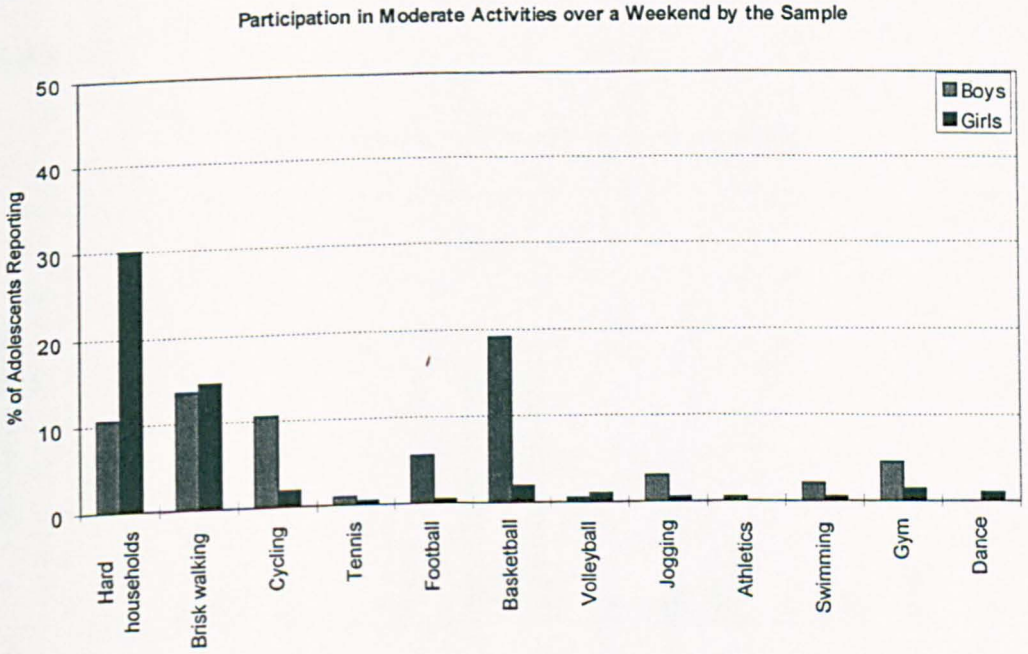
Table 4.2.7. Frequency and Percentage of Moderate Activities** over a Weekend for the Sample.

Moderate Activities	Total N=207		Boys N=198		Girls N= 207	
	No	%*	No	%*	No	%*
Hard Households	83	20.5	21	10.6	62	30.0
Brisk Walking	57	14.1	27	13.6	30	14.5
Cycling	25	6.2	21	10.6	4	1.9
Tennis	3	0.7	2	1.0	1	0.5
Football	12	3.0	11	5.5	1	0.5
Basketball	42	10.4	38	19.2	4	1.9
Volleyball	3	0.7	1	0.5	2	1.0
Jogging	7	1.7	6	3.0	1	0.5
Athletics	1	0.2	1	0.5	0	0
Swimming	5	1.2	4	2.0	1	0.5
Gym	12	3.0	9	4.5	3	1.4
Dance	2	0.5	0	0	2	1.0

*Refers to percentage of group mentioning the activity

** Table data are frequencies of responses of engaging in the listed activities without "huff and puff" indication.

Figure 4.2.6



Hard Activities

Table 4.2.8 and Figure 4.2.7 show the frequency and percentage of Hard activities during the weekday. Sports of Basketball (33%), Ball-games (29%) and Football (10%) were the most commonly reported activities for the boys; the girls most preferred physical activities were Jogging (10%), Walking (8%) and Basketball (7%). We notice that the boys were mainly attracted by group sports while girls seemed to prefer more readily accessible forms of individual activity (Jogging, Walking). It is also evident that there is a lack of variety and a low level of participation in girls' choices of Hard physical activities.

The open question opportunity for reporting other activities did not have any response.

Table 4.2.8 Frequency and Percentage of Hard Activities** over a Weekday for the Sample

Hard Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%	No	%
Hard Households	9	2.2	4	2.0	5	2.4
Brisk Walking	7	1.7	1	0.5	6	2.9
Walking	26	6.4	10	5.0	16	7.7
Cycling	25	6.1	11	5.5	2	1.0
Tennis	2	0.5	2	1.0	0	0
Football	19	4.7	19	9.6	0	0
Ball-games	70	17.3	58	29.2	12	5.8
Basketball	80	19.7	65	32.8	15	7.2
Volleyball	12	2.9	5	2.5	7	3.4
Gymnastics	15	3.7	6	3.0	9	4.3
Jogging	31	7.6	10	5.0	21	10.1
Athletics	7	1.7	6	3.0	1	0.5
Swimming	9	2.2	7	3.5	2	1.0
Gym	21	5.2	13	6.5	8	3.8
Dance	6	1.5	1	0.5	5	2.4

*Refers to percentage of group mentioning the activity

**Table data are frequencies of responses of engaging in the listed activities with positive "huff and puff" indication.

Figure 4.2.7

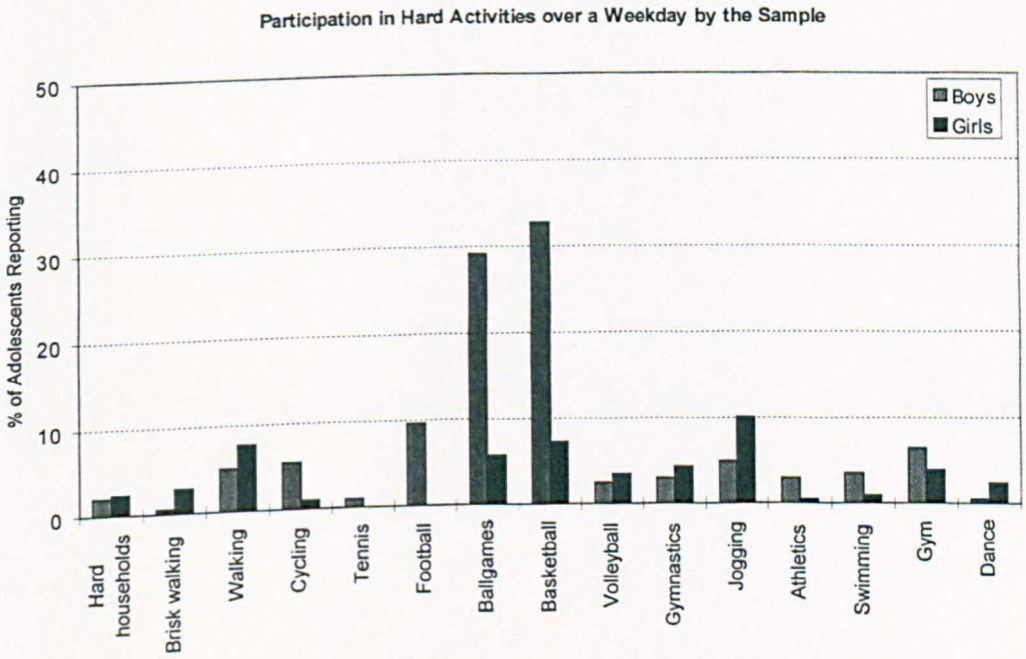


Table 4.2.9 and Figure 4.2.8 show the frequency and percentage of participation in Hard activities over a weekend for the sample. Team games of Basketball (24%) and Football (12%) again seemed to attract the majority of the boys' attention, Cycling (8%) was also frequently reported by boys. For the girls of the sample Hard Households (9%), Brisk Walking (9%) and Gym Workouts (7%) were their main physical activities. Comparing Tables 4.2.8 and 4.2.9 we notice that over the weekend boys involvement increased in physical activities as Brisk Walking, Cycling, Football, Volleyball, Gym Workouts, whereas for the girls the emphasis during the weekend was on stereotypical physical activities (Hard Households, Brisk Walking, and Gym Workouts).

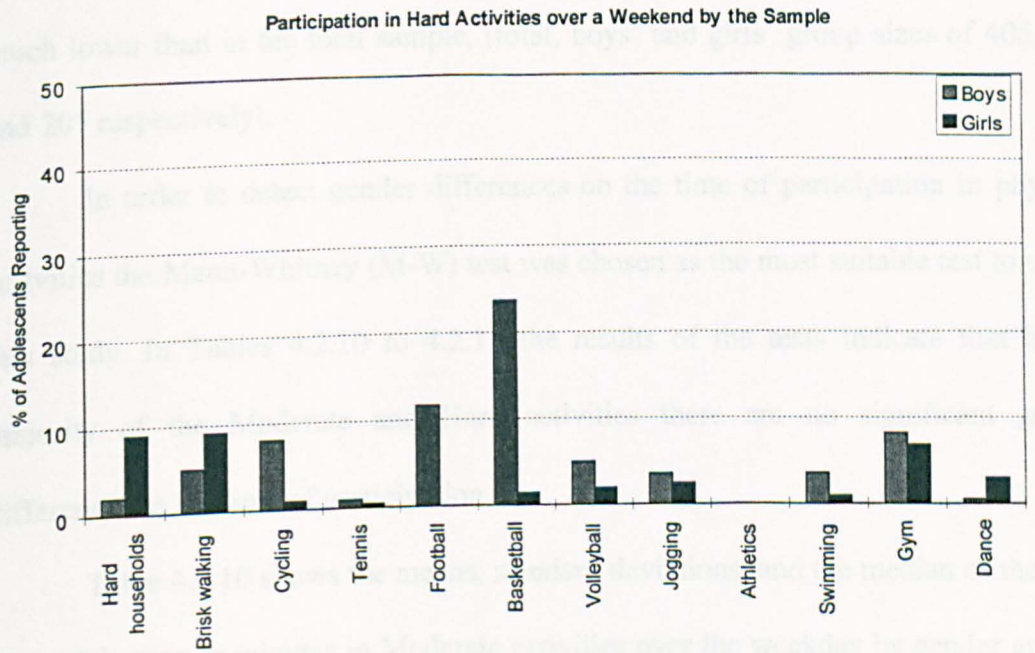
Table 4.2.9 Frequency and Percentage of Hard Activities** over a Weekend for the Sample.

Hard Activities	Total N=405		Boys N=198		Girls N=207	
	No	%*	No	%	No	%
Hard Households	23	5.7	4	2.0	19	9.1
Brisk Walking	29	7.1	10	5.0	19	9.1
Cycling	18	4.4	16	8.1	2	0.9
Tennis	3	0.7	2	1.0	1	0.5
Football	23	5.7	23	11.6	0	0
Basketball	50	1.2	47	23.7	3	1.4
Volleyball	14	3.4	10	5.0	4	1.9
Jogging	12	3.0	7	3.5	5	2.4
Athletics	0	0	0	0	0	0
Swimming	9	2.2	7	3.5	2	0.9
Gym	30	0.7	16	8.1	14	6.7
Dance	7	1.7	1	0.5	6	2.9

**Refers to percentage of group mentioning the activity

**Table data are frequencies of responses of engaging in the listed activities with positive "huff and puff" indication.

Figure 4.2.8



Analysis of the Time of Participation in Physical Activities

In addition to the descriptive summaries of participation frequencies for the four groups of activities shown in Tables 4.2.6 to 4.2.9 and Figures 4.2.5 to 4.2.8, some statistical analyses of the data based on the time of participation in the physical activities were also made.

Means, standard deviations, and the median for activity duration of the total sample and of boys and girls were separately calculated and are presented in the following tables (Table 4.2.10 to 4.2.13). In these tables the focus is on the time (in minutes) for which the adolescents participated in physical activities. Only participants are included in the tables. Thus a girl or boy who indicates that she or he did not engage in a physical activity is not included in the line of the tables for that activity. This is why the numbers of respondents shown in Tables 4.2.10 to 4.2.13 are much lower than in the total sample, (total, boys' and girls' group sizes of 405, 198 and 207 respectively).

In order to detect gender differences on the time of participation in physical activities the Mann-Whitney (M-W) test was chosen as the most suitable test to use in this study. In Tables 4.2.10 to 4.2.13 the results of the tests indicate that in the majority of the Moderate and Hard activities there are no significant gender differences in the time of participation.

Table 4.2.10 shows the means, standard deviations, and the median of the time of participation in minutes in Moderate activities over the weekday by gender groups. The M-W tests value reveals that there are no significant gender differences in the time of participation in Moderate activities over the weekday. For example although fewer boys than girls participated in Volleyball the mean values (boys=34.16 mins,

girls=34.21 minutes) show that the boys who played Volleyball, played it for as long as the girls. Ball-games is another example of the same kind; the mean scores (boys=43.71 minutes, girls=43.33 minutes) show that although fewer girls than boys were involved in these activities they played for as long as boys. Football is the only activity in which boys and girls differ significantly in both the frequency of involvement, and time of participation ($p=0.02$). As would be expected no gender differences could be found for activities with a small number of participants (Tennis, Dance, Athletics).

Table 4.2.10 Means, Standard Deviations and Median of Participation Time in minutes in Moderate Activities over a Weekday for the Sample by Gender using the M-W test

Moderate Activities over a Weekday	Group	N	Mean in min.	S.D.	Median	M-W value	sign
Hard Households	Boys	21	30.47	23.76	30.00		
	Girls	40	32.75	25.31	30.00		
	Total	61	31.97	24.62	30.00	-.16	0.87
Brisk Walking	Boys	12	21.25	18.47	12.50		
	Girls	9	36.66	45.20	20.00		
	Total	21	27.86	32.65	15.00	-1.04	0.29
Walking	Boys	35	12.34	8.68	10.00		
	Girls	48	12.70	7.65	10.00		
	Total	83	12.55	8.05	10.00	-.75	0.45
Cycling	Boys	10	52.50	46.44	37.50		
	Girls	3	51.66	31.75	70.00		
	Total	13	52.31	42.26	45.00	-.25	0.80
Ball-games	Boys	56	43.71	45.98	27.50		
	Girls	21	43.33	34.83	30.00		
	Total	77	43.61	43.00	30.00	-.77	0.43
Basketball	Boys	15	31.66	14.72	30.00		
	Girls	7	29.28	4.50	30.00		
	Total	22	30.90	12.30	30.00	-.28	0.77
Volleyball	Boys	6	34.16	13.93	37.50		
	Girls	28	34.21	18.27	30.00		
	Total	34	34.20	17.40	30.00	-.62	0.53
Football	Boys	19	43.94	32.13	30.00		
	Girls	2	10.00	0.00	10.00		
	Total	21	40.71	32.14	30.00	-2.22	0.02
Tennis	Boys	1	60.00	-	60.00		
	Girls	-	-	-	-		
	Total	1	60.00	-	60.00	-	-
Swimming	Boys	4	108.75	33.26	105.00		
	Girls	2	120.00	0.00	120.00		
	Total	6	112.50	26.41	120.00	-.49	0.62
Gym Workout	Boys	4	127.50	37.75	120.00		
	Girls	3	80.00	17.32	90.00		
	Total	7	107.14	38.17	90.00	-1.85	0.06
Dance	Boys	-	-	-	-		
	Girls	-	-	-	-		
	Total	-	-	-	-	-	-
Gymnastics	Boys	11	14.10	7.00	10.00		
	Girls	12	14.16	7.64	10.00		
	Total	23	14.13	7.17	10.00	-.20	0.84
Jogging	Boys	18	12.33	9.81	9.00		
	Girls	15	9.80	7.60	10.00		
	Total	33	11.18	8.83	10.00	-.26	0.80
Athletics	Boys	1	30.00	-	30.00		
	Girls	-	-	-	-		
	Total	1	30.00	-	30.00	-	-

Table 4.2.11 shows the means, standard deviations, median of time of participation in Moderate activities over the weekend by gender. The M-W test value ($p>0.05$) shows that in most of the activities there were no significant differences over the boys' and girls' time of involvement. For activities of Dance and Athletics where only a small number of participants were involved, no gender differences could be detected.

Table 4.2.11 Means, Standard Deviations and Median of Participation Time in minutes in Moderate Activities over a Weekend for the Sample by Gender using the M-W test

Moderate Activities over a Weekend	Group	N	Mean in mins	S.D.	Median	M-W value	sign
Hard Households	Boys	21	50.00	47.14	30.00		
	Girls	62	43.63	34.84	30.00		
	Total	83	45.24	38.12	30.00	-3.36	0.71
Brisk Walking	Boys	27	54.07	57.78	30.00		
	Girls	30	52.67	56.55	30.00		
	Total	57	53.33	56.62	30.00	-.32	0.74
Cycling	Boys	21	112.86	59.53	90.00		
	Girls	4	90.00	73.93	80.00		
	Total	25	109.20	60.91	90.00	-.63	0.52
Basketball	Boys	38	119.34	97.14	90.00		
	Girls	4	60.00	42.43	45.00		
	Total	42	113.70	94.65	90.00	-1.14	0.25
Volleyball	Boys	1	40.00	-	40.00		
	Girls	2	135.00	106.06	135.00		
	Total	3	103.33	92.92	60.00	-1.22	0.22
Football	Boys	11	94.63	53.93	70.00		
	Girls	1	5.00	-	5.00		
	Total	12	87.16	57.57	65.00	-1.60	0.10
Tennis	Boys	2	130.00	113.13	130.00		
	Girls	1	60.00	-	60.00		
	Total	3	106.66	89.63	60.00	.00	1.00
Swimming	Boys	4	75.00	51.96	75.00		
	Girls	1	30.00	-	30.00		
	Total	5	66.00	49.30	30.00	-.81	0.41
Gym Workout	Boys	9	140.00	65.38	150.00		
	Girls	3	100.00	34.64	120.00		
	Total	12	130.00	60.45	120.00	-1.13	0.25
Dance	Boys	-	-	-	-		
	Girls	2	130.00	14.14	130.00		
	Total	2	130.00	14.14	130.00	-1.55	-
Jogging	Boys	6	36.67	15.05	30.00		
	Girls	1	20.00	-	20.00		
	Total	7	34.28	15.11	30.00	-1.30	0.19
Athletics	Boys	1	105.00	-	105.00		
	Girls	-	-	-	-		
	Total	1	105.00	-	105.00	-	-

Table 4.2.12 shows the mean, standard deviations, and median of participation time in Hard activities over a weekday by gender. From the M-W test value it is evident that there are no-significant gender differences for almost all of the Hard physical activities, meaning that these activities are performed at similar time durations for both genders. An exception to this is Basketball. More boys than girls played Basketball and for longer periods of time ($p=0.00$). No differences could be detected for the time of involvement in Tennis and Football because only a small number of adolescents reported participation.

Table 4.2.12 Means, Standard Deviations and Median of Participation Time in minutes in Hard Activities over a Weekday for the Sample by Gender using the M-W test

Hard Activities over a Weekday	Group	N	Mean in mins	S.D.	Median	M-W value	sign
Hard Households	Boys	4	38.75	24.62	40.00		
	Girls	5	62.00	34.93	60.00		
	Total	9	51.67	31.42	60.00	-1.02	0.31
Brisk Walking	Boys	1	20.00	-	20.00		
	Girls	6	40.50	32.76	40.00		
	Total	7	37.57	30.90	30.00	-.50	0.61
Walking	Boys	10	15.40	9.42	12.50		
	Girls	16	21.69	17.17	20.00		
	Total	26	19.26	14.79	17.50	-.83	0.40
Cycling	Boys	11	67.27	37.44	60.00		
	Girls	2	15.00	7.07	15.00		
	Total	13	85.60	56.66	90.00	-1.89	0.06
Ball-games	Boys	58	64.40	60.83	45.00		
	Girls	12	62.08	44.95	57.50		
	Total	70	64.00	58.13	45.00	-.09	0.92
Basketball	Boys	65	69.69	46.24	45.00		
	Girls	15	33.00	25.55	30.00		
	Total	80	62.81	45.34	42.50	-4.31	0.00
Volleyball	Boys	5	58.00	44.52	35.00		
	Girls	7	74.28	57.47	90.00		
	Total	12	67.50	50.92	62.50	-.24	0.80
Football	Boys	19	66.58	56.40	40.00		
	Girls	-	-	-	-		
	Total	19	66.58	56.40	40.00	-	-
Tennis	Boys	2	75.00	21.21	75.00		
	Girls	-	-	-	-		
	Total	2	75.00	21.21	75.00	-	-
Swimming	Boys	7	100.00	18.03	105.00		
	Girls	2	82.50	31.82	82.50		
	Total	9	96.11	20.73	105.00	-.90	0.36
Gym Workout	Boys	13	91.54	33.62	90.00		
	Girls	8	80.00	31.17	65.00		
	Total	21	87.14	32.42	90.00	-.98	0.32
Dance	Boys	1	70.00	-	70.00		
	Girls	5	102.00	78.23	60.00		
	Total	6	96.66	71.18	65.00	-.31	0.75
Gymnastics	Boys	6	28.33	19.14	22.50		
	Girls	9	30.55	14.67	30.00		
	Total	15	29.66	15.97	30.00	-.59	0.55
Jogging	Boys	10	28.00	37.50	10.00		
	Girls	21	13.43	14.77	10.00		
	Total	31	18.13	24.80	10.00	-.80	0.42
Athletics	Boys	6	111.66	23.80	120.00		
	Girls	1	120.00	-	120.00		
	Total	7	112.85	21.96	120.00	.00	1.00

Finally Table 4.2.13 shows the means, standard deviations, median for the time of participation in Hard activities over the weekend. As before, for both genders non-significant gender differences in the M-W value ($p>0.05$) were revealed. Boys and girls participation in Hard activities were for similar time durations during the weekend. As in the other analyses gender differences could not be found in activities such as Football, and Athletics because of the small number of participants.

Table 4.2.13 Means, Standard Deviations and Median of Participation Time in minutes in Hard Activities over a Weekend for the Sample by Gender using the M-W test

Hard Activities over a Weekend	Group	N	Mean in mins	S.D.	Median	M-W value	sign
Hard Households	Boys	4	52.50	28.72	45.00		
	Girls	19	85.00	43.68	80.00		
	Total	23	79.35	42.81	60.00	-1.32	0.18
Brisk Walking	Boys	10	47.50	32.68	52.50		
	Girls	19	50.21	48.21	30.00		
	Total	29	49.27	42.89	30.00	-.18	0.85
Cycling	Boys	16	93.75	59.12	90.00		
	Girls	2	85.00	91.92	85.00		
	Total	18	92.77	59.91	90.00	-.21	0.83
Basketball	Boys	47	274.15	104.47	270.00		
	Girls	3	220.00	86.60	270.00		
	Total	50	270.90	103.54	270.00	-.96	0.33
Volleyball	Boys	10	81.50	39.16	80.00		
	Girls	4	90.00	54.78	90.00		
	Total	14	83.93	42.07	80.00	-.36	0.71
Football	Boys	23	117.61	82.73	90.00		
	Girls	-	-	-	-		
	Total	23	117.61	82.73	90.00	-	-
Tennis	Boys	2	75.00	21.21	75.00		
	Girls	1	50.00	-	50.00		
	Total	3	66.66	20.81	60.00	-1.22	0.22
Swimming	Boys	7	110.71	73.84	90.00		
	Girls	2	105.00	63.64	105.00		
	Total	9	109.44	67.84	90.00	.00	1.00
Gym Workout	Boys	16	103.13	52.78	90.00		
	Girls	14	92.14	46.27	75.00		
	Total	30	98.00	49.31	90.00	-.68	0.49
Dance	Boys	1	45.00	-	45.00		
	Girls	6	118.33	67.65	120.00		
	Total	7	107.85	67.69	120.00	-1.55.	0.12
Jogging	Boys	7	40.71	36.56	30.00		
	Girls	5	73.00	48.17	80.00		
	Total	12	54.16	43.00	35.00	-1.22	0.22
Athletics	Boys	-	-	-	-		
	Girls	-	-	-	-		
	Total	-	-	-	-	-	-

Summarising the above Tables (4.2.10 to 4.2.13) we conclude that the means and standard deviations show no gender differences in the reported durations by participants in physical activities. This means that participating adolescents of both genders, when involved in Moderate and Hard physical activities, engage for similar periods of time.

Time Spent Being Active

As mentioned and in Chapter Two the criteria of 'appropriate' physical activity, identified by social-health and other medical workers, are closely linked with the time of involvement in physical activities. Although in the present study determination of the time spent in Moderate and Hard activities was not one of the primary aims, it was thought that it would be useful to study the information about the duration of involvement in activities reported by the current sample. The sample was classified into three groups according to the time spent in Moderate and Hard activities: 1-30 minutes, 31-60 minutes and over 61 minutes. Tables 4.2.14, 4.2.15, 4.2.16, and 4.2.17 show the times the adolescents spent in Moderate and Hard activities over the weekday and weekend. As before only participants are involved in the tables. It is evident there were large individual differences in the amount of active time. Most of the adolescents, however, had engaged in at least some Moderate activity over the two days (weekday and weekend) though for only a short period of time in some cases. Boys were found to spend generally more time in physical activity than girls.

Table 4.2.14. Grouped Time Participation in Moderate Activities over a Weekday for the Active Participants

Moderate Activities over a Weekday	1-30 mins			31-60 mins			over 61 mins		
	T	B	G	T	B	G	T	B	G
Hard households	47	16	31	9	3	6	5	2	3
Brisk Walking	16	9	7	4	3	1	1	-	1
Walking	81	34	47	2	1	1	-	-	-
Cycling	6	5	1	2	2	-	5	3	2
Tennis	-	-	-	1	1	-	-	-	-
Swimming	-	-	-	-	-	-	6	4	2
Gym Workout	-	-	-	1	-	1	6	4	2
Dance	-	-	-	-	-	-	-	-	-
Gymnastics	23	11	12	-	-	-	-	-	-
Ball-games	44	33	11	14	7	7	19	16	3
Basketball	14	8	6	8	7	1	-	-	-
Volleyball	20	3	17	12	3	9	2	-	2
Football	15	13	2	2	2	-	4	4	-
Athletics	1	1	-	-	-	-	-	-	-
Jogging	32	18	14	1	-	1	-	-	-

Note: T=Total, B=Boys, G=Girls

Table 4.2.14 shows again the low levels of participation in Moderate activities over a week day. Even among participants the majority of adolescents participated for less than 30 minutes. For the over 61 minutes time, only a very small number of young people of the original sample of 405 were involved. Physical activities in which the students were involved for over 61 minutes are Ball-games, Gym workout and Swimming. Over the three time groups only Ball-games had a 'significant' number of participants in all time categories.

Table 4.2.15. Grouped Time Participation in Moderate Activities over a Weekend for the Active Participants

Moderate Activities over a Weekend	1-30 mins			31-60 mins			over 61 mins		
	T	B	G	T	B	G	T	B	G
Hard households	50	12	38	17	5	12	16	4	12
Brisk Walking	31	14	17	15	8	7	11	5	6
Cycling	2	1	1	4	3	1	19	17	2
Tennis	-	-	-	2	1	1	1	1	-
Swimming	3	2	1	-	-	-	-	-	-
Gym Workout	1	1	-	2	1	1	7	7	-
Dance	-	-	-	-	-	-	2	-	2
Basketball	10	8	2	9	8	1	23	22	1
Volleyball	-	-	-	2	1	1	1	-	1
Football	2	1	1	4	4	-	6	6	-
Athletics	-	-	-	-	-	-	-	-	-
Jogging	5	4	1	2	2	-	-	-	-

Note: T=Total, B=Boys, G=Girls

Table 4.2.15 shows the participation time for Moderate activities over the weekend. Again the majority of the moderately active adolescents were involved for a maximum of 30 minutes, though a few adolescents participated for over 61 minutes in activities of Basketball, Cycling and Hard Households. More girls than boys got involved with Hard Households activities in all time participation intervals. The table shows that more boys were active for the over 61 minutes period compared to girls.

Comparing the Tables 4.2.14 and 4.2.15 we notice that the patterns length of time and the numbers of students being active are different from weekday to weekend. In Table 4.2.14, more adolescents participated in Moderate activities in the time period 1 to 30 minutes. The number of adolescents being active for over 61 minutes was very small. On the other hand the weekend physical activity Table 4.2.15 gives a different picture with a much larger number of adolescents participating in a Moderate activity for a period of time of over 61 minutes.

Table 4.2.16. Grouped Time Participation in Hard Activities over a Weekday for the Active Participants

Hard Activities over a Weekday	1-30 mins			31-60 mins			over 61 mins		
	T	B	G	T	B	G	T	B	G
Hard households	3	2	1	5	2	3	1	-	1
Brisk Walking	4	1	3	2	-	2	1	-	1
Walking	24	10	14	1	-	1	1	-	1
Cycling	5	3	2	3	3	-	5	5	-
Tennis	-	-	-	1	1	-	1	1	-
Swimming	-	-	-	1	-	1	8	7	1
Gym Workout	-	-	-	8	4	4	13	9	4
Dance	-	-	-	3	-	3	3	1	2
Gymnastics	9	4	5	6	2	4	-	-	-
Ball-games	26	21	5	21	20	1	19	13	6
Basketball	19	9	10	37	33	4	21	20	1
Volleyball	5	2	3	1	1	-	6	2	4
Football	9	9	-	2	2	-	8	8	-
Athletics	-	-	-	-	-	-	7	6	1
Jogging	27	7	20	2	2	-	2	1	1

Note: T=Total, B=Boys, G=Girls

Table 4.2.16 shows the grouped participation time in Hard activities over the weekday. Among the hard active adolescents the majority were involved for about 30 minutes. Few adolescents got involved with a Hard activity for the 31-60 minutes and over 61 minutes time groups though in both there were more boys than girls. Ball-games and Basketball were the only two physical activities that for all the time groups had always a significant number of participants.

Table 4.2.17 Grouped Time Participation in Hard Activities over a Weekend for the Active Participants

Hard Activities over a Weekend	1-30 mins			31-60 mins			over 60 mins		
	T	B	G	T	B	G	T	B	G
Hard households	5	2	3	7	1	6	11	1	10
Brisk Walking	15	4	11	10	5	5	4	1	3
Cycling	5	4	1	3	3	-	10	9	1
Tennis	-	-	-	2	1	1	1	1	-
Swimming	-	-	-	3	2	1	6	5	1
Gym Workout	2	1	1	10	4	6	18	11	7
Dance	-	-	-	3	1	2	4	-	4
Basketball	-	-	-	2	2	-	48	45	3
Volleyball	2	1	1	5	4	1	7	5	2
Football	1	1	-	7	7	-	15	15	-
Athletics	-	-	-	-	-	-	-	-	-
Jogging	6	5	1	2	1	1	4	1	3

Note: T=Total, B=Boys, G=Girls

Table 4.2.17 shows the participation time for Hard activities over the weekend. In this table most of the hard active adolescents were involved for over 61 minutes though smaller numbers of participants were involved for the other two time groups. Hard Households, Brisk Walking, Gym Workout, Volleyball and Jogging were the activities that had some participants for all three time ranges.

Table 4.2.16 like 4.2.17 are similar in showing a minority of the sample being involved in Hard activities. The tables are dissimilar in the distribution of participants between the 'short' and 'long' time periods. The Table 4.2.16, the most common time period of the participation is less than 30 minutes, whereas for Table 4.2.17 it is predominately more than 61 minutes. Almost certainly the great amount of free time available to adolescents at the weekend is the basic reason for these differences.

The Pattern of Reports of Activities at Different Levels

Table 4.2.18 presents the weekday and weekend responses of the sample about their reported participation in Sedentary, Light, Moderate and Hard activities. The frequencies are high because each adolescent could have been involved in more than one physical activity per day, in other words there was a 'double-counting' in the activities reported by the sample. Nevertheless the summing up of frequencies of different kinds of activities and the percentage of responses gives a measure of the pattern of involvement in physical activity of adolescents. As we can see a higher number of active events is reported on weekdays than at the weekend. In addition there is some change in the proportions of frequencies at different levels. Fifteen percent (15%) of the total reported activities were Moderate activities on weekdays compared with only 10% at the weekend. The Hard activity level shows a similar picture 12% of the reportings at this level were for the weekday and 9% were for the weekend. Even without further analysis this pattern appears to be consistent with previous results showing that the adolescents are more active during the weekday than during the weekend.

Table 4.2.18 Frequencies of Activities Reported by Boys and Girls Grouped by Level for the Weekday and Weekend

Activity Level	Total				Boys				Girls			
	Weekday		Weekend		Weekday		Weekend		Weekday		Weekend	
	N	%	N	%	N	%	N	%	N	%	N	%
Sedentary	1516	56.2	1314	54.9	755	54.5	657	55.1	761	58.5	657	54.7
Light	439	16.2	611	25.5	199	14.3	253	21.2	240	18.5	358	29.8
Moderate	403	15.1	252	10.5	213	15.5	141	11.8	190	14.6	111	9.3
Hard	339	12.5	218	9.1	218	15.7	143	11.9	109	8.4	75	6.2
Total	*2697*	*100*	*2395*	*100*	*1385*	*100*	*1194*	*100*	*1300*	*100*	*1201*	*100*

Because the purpose of this part of the analysis was to estimate the total activity level of the adolescents, in the following two Tables and two Figures, the weekday and weekend responses of the sample are shown combined.

Tables 4.2.19 and 4.2.20 present the total, two-day, reported activities of the sample by gender. It is clear that, as shown by earlier Tables (4.2.2 to 4.2.9), the majority of activities are in the Sedentary and Light categories. Table 4.2.19 shows that only 11% of the activities to be Hard active and 12% to be Moderate active. It is also revealed that the majority of the 11% Hard activities in the total sample were reported by boys 14% compared with just 7% of the girls. When the Moderate active and Hard active categories were combined (Table 4.2.20) only 23% or approximately one quarter of the activities could be classified as either Moderate active or Hard active, the remaining 77% or approximately three fourths were classified as of Sedentary or Light nature. The Table also shows that activities classed as Moderate or Hard were reported by just 28% of the boys and 19% of the girls.

Table 4.2.19 Frequencies of Activities Reported by Boys and Girls Grouped by Level for combined the Weekday and Weekend

Activity Level	Total		Boys		Girls	
	N	%	N	%	N	%
Sedentary	2830	55.3	1412	54.8	1418	56.7
Light	1050	21.3	452	17.5	598	24.0
Moderate	655	12.5	354	13.8	301	12.0
Hard	557	10.9	361	13.9	184	7.3
Total	*5092*	*100*	*2579*	*100*	*2501*	*100*

Figure 4.2.9

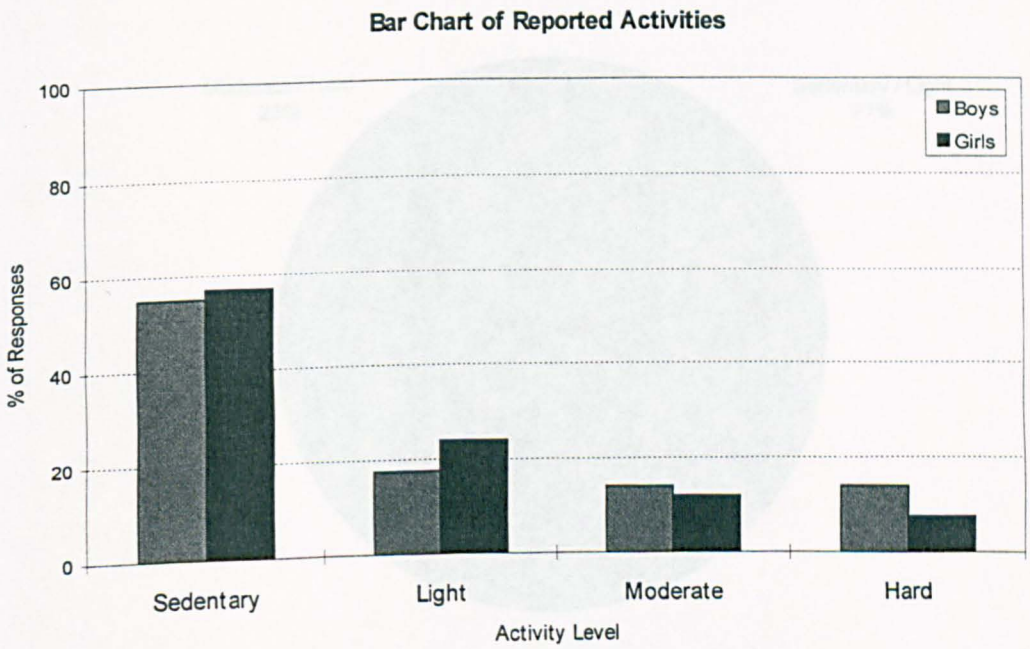
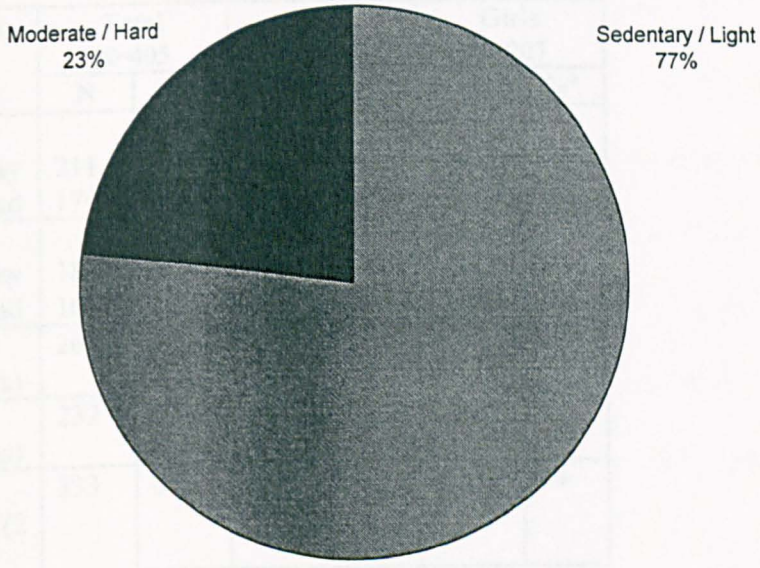


Table 4.2.20 Summary of Reported Activities by the Sample

Activity Level	Total	Boys	Girls
Sedentary /Light	76.6%	72.3%	80.1%
Moderate /Hard	23.4%	27.7%	19.3%

Figure 4.2.10 Pie Graph Showing the Summary of Activity Levels of the Sample



The two tables 4.2.19 and 4.2.20 and Figures 4.2.9 and 4.2.10 support what has been evident from the more detailed Tables presented earlier in this chapter. The majority of the activities were in the Sedentary or Light categories and suggest low participation rates for the Moderate and Hard activities.

Frequencies and Durations of Participation in Moderate and Hard Activities

The reported duration frequencies of involvement in Moderate and Hard physical activities, was calculated using data from the participants only. Table 4.2.21 shows the frequency of participation in Moderate and Hard activities of the active individuals based on their reported activity.

Table 4.2.21 Participation Frequencies in Moderate and Hard Activities of the Active Individuals according to Gender and Day of Participation

Levels of Activity	Total N=405		Boys N=198		Girls N=207	
	N	%*	N	%*	N	%*
Moderate						
Weekday	211	52	105	53	106	51
Weekend	174	43	87	44	87	42
Hard						
Weekday	183	45	116	58	67	32
Weekend	163	40	107	54	56	27
Total Moderate (2 Days)	263	65	133	67	130	62
Total Hard (2 Days)	232	57	146	73	86	41
Moderate/Hard Active (2 Days)	333	82	179	90	154	74

*Percentage of participation group as percentage of total sample

Table 4.2.21 was constructed in a manner that eliminated 'double counting' of participants in activity events. In the Table each boy or girl is recorded once for Moderate activity no matter whether he or she reports participation in one, two, three, or more Moderate activities on the chosen day. Similarly for Hard activities. An equivalent procedure was followed when calculating the '2 Days' and 'Total' figures shown in the Table. As we can see 105 boys engaged in at least one Moderate activity on a weekday and 87 did so at the weekend. The 'Total Moderate' row shows that 133

boys were Moderately active on one or both of these days. The difference between 133 and 192 (= 105+87) shows the effect of eliminating 'double counting' and evidently provides a realistic indication of the extent of Moderate activity in male adolescents.

Results from Table 4.2.21 are encouraging as it was revealed that most adolescents had engaged in at least some Moderate or Hard activity over the two days of the study (weekday, weekend). Indeed 82% of the sample reported being active at least once during the two days. More adolescents were Moderately active (65%) than Hard active (57%), and as shown by earlier Table (4.2.18) the majority of the pupils in both activity levels were more active during the weekday than during the weekend. Based on the duration of activity 90% the boys in the sample were found to be active and mainly be involved in Hard activities (73%) rather than in Moderate activities (67%). Seventy four percent (74%) of the girls were reported to have done some kind of physical activity and mainly be involved in Moderate activities (62%). It is obvious that more boys were engaged in Hard activities, while more girls were engaged in Moderate activities.

In addition to the frequency of activities (shown in Table 4.2.21), the average daily duration of activities for each participant in Moderate and Hard activities for the weekday and the weekend were also calculated. Table 4.2.22 shows the mean time and the standard deviations, both in minutes, spent in Moderate and Hard activities on weekdays and at weekends of the active sample by gender. The Table was constructed by totalling for each individual the separate times for each reported activity no matter how many or few were indicated. Note that the 'N' values in Table 4.2.22 are the

same as those in Table 4.2.21 confirming the elimination of 'double-counting' had been successful.

In the study a proportion (12%) of respondents gave 'ridiculous' answers, such as doing Jogging for 1 minute or playing Basketball for 10 hours. We decided to include these data as valid because any other choice seemed equally false and open to accusation of bias via selective reporting. Although these data anomalies were noted, and are reported here, it is felt that they do not represent any threat to the results. This is because over the sample as a whole, even an extra 1200 minutes of reporting (20 hours) or so of unjustified activity represents an increase in the average of about 3 minutes, a value well within the normal range of reporting error. Although both very small and very large 'estimates' of time duration were included in the analysis, it is likely that the times shown and summarised in Table 4.2.22 are maxima.

Table 4.2.22 Standard Deviations and Mean Time Spent in Physical Activities from the Active Sample -Boys and Girls in Moderate and Hard Activities in minutes

Level Of Activity	Total (405)			Boys (198)			Girls (207)		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Moderate in mins									
Weekday	211	59.08	68.49	105	68.54	82.41	106	49.71	49.78
Weekend	174	106.09	130.70	87	145.24	156.59	87	66.95	82.13
Hard in mins									
Weekday	183	102.59	82.17	116	121.71	87.30	67	69.47	59.86
Weekend	163	171.03	139.60	107	200.88	145.57	56	114.00	107.29
Total Moderate (2 Days) in Mins	263	117.65	161.08	133	149.23	198.05	130	85.34	102.39
Total Hard (2 Days) in Mins	232	201.09	181.35	146	243.93	191.67	86	128.36	134.92
Moderate/Hard Active (2 Days) in Mins	333	233.22	229.65	179	309.95	252.55	154	144.03	159.19

From Table 4.2.22 we notice that frequencies of participation in Moderate activity on a weekday and at the weekend are different. More individuals were active during the

weekday (211) than the weekend (174). During the weekend, however, they were active for longer periods; thus although the mean time over the weekday was found to be 59 minutes (SD=68) for the weekend the mean time duration increased to 106 minutes (1 hour and 46 minutes) (SD=130). A similar pattern appeared for the Hard activity levels, with a greater number of adolescents being active during the weekday (183) than the weekend (163) but again, time participation was significantly longer over the weekend, mean time 171 minutes (2 hours 51 minutes) (SD=139) compared to their participation for over the weekday mean time 102 (1 hour 42 minutes) (SD=82). When we combine weekday and weekend the mean time spent in Moderate activity over the 2 days was found 118 minutes (1 hour 58 minutes) (SD=161) and the mean time spent in Hard activity over the 2 days was 201 (3 hours 21 minutes) (SD=181). The mean total time spent in physical activity (Moderate or Hard) over the two days of the study was found to be 233 (3 hours 53 minutes) (SD=229). The boys were found to spend more time in physical activities than girls over the 2 days. The mean time spent in combined Moderate/Hard activities by the boys was 309 minutes (5 hours 9 minutes) (SD=253) compared with the combined total of 144 minutes (2 hours 24 minutes) (SD=159) for girls.

Most of the pupils in the sample were found to have been engaged in some Moderate or Hard activity over the two days Table 4.2.21. As is evident from the large standard deviations obtained, there were large individual differences in the amount of time adolescents spent in physical activity Moderate or Hard, (daily range of 01 minutes to 500 minutes or over) with boys spending twice the time being active compared with girls (Table 4.2.22).

The results from the time spent in Moderate and Hard activities by active adolescents showed a mean time participation of 233 (3 hours 53 minutes) over the

two days of study. This represents a daily average of approximately 2 hours (1 hour 57minutes), in Moderate or Hard activity.

Summary of Findings of the Four by One Recall Activity Questionnaire

The responses of the sample of 405 adolescents to the Four by One-Day Recall Physical Activity Questionnaire were analysed in several ways in order to bring out different characteristics of the responses. In the analyses care was taken to differentiate between levels of activity (Sedentary, Light, Moderate and Hard), between the occasion of the activity (weekday, weekend), and between the responses of boys and girls. Some analyses were on the basis of frequency of reported participation whilst others used the duration in the participation.

The examination of responses by frequency showed adolescents of both sexes commonly engaged in some common Sedentary and Light activities on weekdays and at weekends (Tables 4.2.2 to 4.2.5). In contrast only a minority of adolescents reported engaging in Moderate and Hard activities (Tables 4.2.6 to 4.2.9). Anticipated gender differences in involvement in activities such as Hard Households, Football were observed. Several activities that were included in the questionnaire checklist attracted very small frequencies. These activities included Tennis, Jogging, Athletics, Swimming, and Dance. As noted, no additional Moderate or Hard activities were written into the space available in the open 'Other' category.

In the second group of analyses, the focus was on the reported duration of the activity. Using data from participants only, the means of activity duration were

calculated for Moderate and Hard activities on weekday and weekend (Table 4.2.10 to 4.2.13). Large standard deviations showed that there were large differences in the durations reported by different participants. The Mann-Whitney test was used to test for gender differences in duration times. As expected no differences could be detected for those activities attracting only a small number of participants. Non-significant results for other activities suggested that when girls play a 'boys sport' such as basketball, they play for as long as the boys.

In order to reveal more information about the range of durations reported by individuals, activity times were presented grouped into three ranges 1-30 minutes, 31-60 minutes and over 61 minutes. Results are shown in Tables 4.2.14 to 4.2.17 inclusive. Several interesting patterns emerged. It was observed that the fall off in frequency of participation for longer times is different for Moderate and Hard activities and as between a weekday and a weekend day. Some speculation for the reason for these differences was given.

In order to facilitate comparison with results quoted in some published work, the responses were also shown grouped by level (Sedentary, Light, Moderate and Hard). The results showed that when both reporting periods were combined, only one-quarter of the reported activities by the sample could be classed as being Moderate or Hard in nature (Table, 4.2.20).

When the participation in physical activities of the adolescents was calculated based on the duration of activity of adolescents (Tables, 4.2.21 and 4.2.22), large individual differences were found in the duration of activities (daily range of 01 minutes to 500 minutes and over). It was found that most adolescents (82%) reported

that they were active and had engaged in at least some Moderate or Hard activity over the two days (weekday and weekend). Also it was found as before that with base the duration of physical activity the sample was more active during the weekdays than the weekends, with boys doing more Hard activities and for longer periods of time and girls doing more Moderate activities. Calculating the mean time and standard deviations of the average daily time of duration of physical activity, the adolescents were found to be active for longer periods of time during the weekend in both Moderate and Hard activities. The total average time spent was fount to be mean=233 (3 hours 53 minutes) for the two days and daily average time of almost two hours, with boys spending almost twice as long as girls being active (mean times 309 and 159 minutes respectively).

Different ways of analysing the data lead to two apparently contradictory findings, summarised in Tables 4.2.20 and 4.2.21. This contradiction appears because the two tables focus on different aspects of the data. Table 4.2.20 focuses on the reported activity and shows that the majority, over 75%, were of a low activity level, i.e. of a Sedentary or a Light nature. In contrast, Table 4.2.21 looks at the adolescents and finds that a high proportion of the sample (82%) was at least Moderately active at sometime in the study period.

All the analyses show the same features; a low level of participation in Moderate and Hard activities, generally low durations of the activity and, again generally, a weekend preference for the more sedentary occupations except for longer participation periods by some boys and girls. Few gender differences were found,

those located are in agreement with expectations based on traditional social roles and will be discussed in the Chapter Six.

The consistency of the findings that have resulted from the different analyses and the values themselves confirm that the Four by One-Day Recall Physical Activity Questionnaire has yielded reliable information about the activities of the sample of adolescents. It is argued that the inclusion of 'large' and 'small' answers does not invalidate the findings. The proportion of 'suspect' answers was not large and is part of the normal range of reporting error.

The validity of the questionnaire also appeared to be good. This was confirmed by the open response opportunity 'other' which did not collect a significant number of responses, and thus it was decided not to be added to the analyses. No additions or changes to the categories included in the instrument, appear to be necessary. A further evaluation of the Four By One Day Recall physical activity questionnaire will be confirmed by the Interview study which will be presented in Chapter Five.

Section 3. Relations Between Physical Self-Perceptions and Levels and Patterns of Physical Activity

Previous investigations have generally shown physical self-perceptions to be associated with the degree of involvement in physical activity. Based on this evidence it was hypothesised that Greek adolescents' perceptions in the physical domain, would be associated with their participation in physical activities. This section presents the results of analyses of these hypothesised relationships between the eleven physical self-perception variables of the PSDQ and the adolescents' patterns and levels of physical activity participation found using the Four by One-Day Recall questionnaire. As already shown in Chapter Two and in Section 2 of this Chapter the activities were divided as Sedentary, Light, Moderate and Hard, and the sample was similarly classified as Very Inactive, Inactive, Moderate and Hard Active. The direction of the relationship physical self-perceptions - activity involvement was also examined.

For the purpose of this part of the study, the Very Inactive and Inactive adolescents created the Inactive group (N=72), whereas the Moderate and Hard active adolescents created the Active group (N=333). This classification of the Active and Inactive adolescents was based on the adolescents' reported time of participation in physical activities (see Table 4.2.22). In order to identify any possible relationships between adolescent's level of involvement in physical activities (Moderate/Hard) and their physical self-perceptions the classification of the Moderate active (N=263) and Hard active (N=232) was used for the active sample (see Table 4.2.22).

Physical Self-Concepts and Active / Inactive Groups

In order to assess the differences of Physical Self-Perceptions of the Active and Inactive groups the Mann-Whitney test statistic was computed. The results are presented in Table 4.3.1. Higher mean scores were obtained for the Active group for the scales of Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance, and Global Physical. On the other hand the Active and Inactive groups appeared to have similar physical self-perceptions on the Body Fat, Health, Appearance, and Global Esteem scales. A 'group of seven' (Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance, Global Physical) self-perception scales could differentiate the Active from the Inactive adolescents, whereas a 'group of four' (Body Fat, Health, Appearance, Global Esteem) self-perception scales could not.

Table 4.3.1 Means and Standard Deviations of Physical Self-Perception Scales by Active-Inactive Groups using the Mann Witney test for the Whole Sample

Physical Perception Scales		Active N=333	Inactive N=72	M-W value	sig
Physical Activity	Mean	25.44	19.70	-7.75	.00
	SD	8.14	8.68		
Body Fat	Mean	12.39	12.34	-.51	.61
	SD	7.90	7.95		
Coordination	Mean	28.57	26.64	-3.98	.00
	S.D	5.10	5.38		
Health	Mean	21.97	21.25	-1.00	.31
	SD	4.62	4.47		
Sport Competence	Mean	28.02	24.51	-6.24	.00
	SD	6.71	7.78		
Appearance	Mean	21.73	21.10	-.62	.52
	SD	2.80	3.47		
Strength	Mean	23.75	21.94	-4.11	.00
	SD	5.23	5.66		
Flexibility	Mean	26.11	24.16	-3.39	.00
	SD	4.30	4.94		
Endurance	Mean	24.80	21.94	-4.66	.00
	SD	7.79	8.23		
Global Esteem	Mean	23.69	23.25	-.94	.34
	SD	3.84	3.86		
Global Physical	Mean	28.32	26.94	-2.52	.01
	SD	6.65	6.33		

Perceptions and Levels of Physical Activity

Table 4.3.2 presents the correlations between the Physical Self-Perceptions and the level of activity of Moderate and Hard active of the physically active sample and the separate gender groups. Observed correlations range from insignificant values close to zero to values of almost 0.4 significant at the 0.001 level.

A 'group of six' physical self-perceptions (Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance) have a highly significant correlation for both activity groups. In addition the Global Physical scale, has one moderately significant correlation ($p<0.05$) with the Hard active level of activity. The three scales Body Fat, Appearance, Global Esteem have no significant correlations with any group of activity. The scale Health has one correlation at the lowest level of significance ($p=0.05$) at the Moderate Activity level only.

Looking at the boys' correlations, the scales of Appearance and Strength have highly significant correlations for the Moderate active group, whilst the Physical Activity, Sport Competence, and Flexibility scales have a moderately significant correlation for the Hard active level. The lowest level of significance is with the scale of Coordination for the Hard active group. The other physical self-perceptions for boys, Body Fat, Health, Endurance, Global Esteem and Global Physical have no significant correlation with any group of activity.

The girls' correlations are different from those of the boys'. The scales of Physical Activity, Sport Competence, Strength and Endurance show highly significant correlations for both levels of activity. At the Moderate activity level, the scales of Coordination and Flexibility have moderately significant correlations whilst Body Fat,

Health, Appearance, Global Esteem and Global Physical have no significant correlations with either activity group.

From the above we conclude that Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance scales are for both genders significantly correlated for both levels of activity. On the other hand, the Body Fat, Health, Global Esteem and Global Physical perceptions have no significant correlation for either gender with either level of activity. The scale of Appearance gained a highly significant correlation only with the Moderate activity level for the boys' sample. Looking back at the table 4.1.2 we see that boys have higher Appearance self-concepts than girls. This supports the present finding for this scale.

Table 4.3.2 Correlations of Physical Self-Perceptions and the Moderate Active / Hard Active Level of Activity by Gender

Perceptions	Levels of Activity					
	Whole Sample		Boys		Girls	
	Moderate Active N=263	Hard Active N=232	Moderate Active N=133	Hard Active N=146	Moderate Active N=130	Hard Active N=86
Physical Activity	.2115***	.3760***	.1397	.1931**	.1979**	.4076***
Body Fat	.0584	.0033	.0705	.0339	.0212	-.1022
Coordination	.1588**	.2141**	.1058	.1361*	.1343*	.0851
Health	.1128*	.0224	.1459	.0914	.1029	-.0225
Sp. Competence	.1754**	.3286***	.0662	.1649**	.1851**	.2639***
Appearance	.1240	.0529	.2775***	.0142	-.0369	-.0214
Strength	.2157***	.2276***	.1944**	.0942	.1591**	.1505**
Flexibility	.1353*	.2007***	.0945	.1543**	.1339*	.1393*
Endurance	.1524**	.2011***	.0730	.0447	.1283*	.2335***
Global Esteem	.0433	.0501	.0056	.0002	.0793	.0782
Global Physical	.1024	.1189*	.0855	.0218	.0359	.0274

* significant at .05
** significant at .01
*** significant at .001

Perceptions and Common Physical Activities

Bibble & Armstrong (1992) recommended that measures of typical physical activity obtained from self-report measures, are needed to be correlated with psychological factors such as physical self-perceptions (p.330). Following this advice, we decided to correlate the five most commonly Moderate and Hard physical activities reported by the sample with the Physical Self-Perception scales.

Table 4.3.3 presents the correlations between the eleven Physical Self-Perception scales and five most common Moderate physical activities (Hard Households, Brisk Walking, Basketball, Volleyball, Ball-games) combined for the weekday and weekend, for the total sample. The interesting column is that for Ball-games (right hand last column in the table). Here there are significant or highly significant correlations between several Physical Self-Perception scales (Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance) and the activity. Basketball correlated with some physical perceptions (Coordination, Sport Competence, Strength, Endurance) that belong to the 'physical ability' group (Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance, see Fig. 4.1.3). In contrast Volleyball is not correlated with any of the physical self-perceptions taken from the PSDQ instrument. The reason for this may be the nature of the activities, Basketball is easier to organise and play compared to Volleyball which needs certain abilities (playing, position skills etc.), a specific number of players, and more space than Basketball. It is also noticeable that Hard Households and Brisk Walking physical activities have no significant correlation with the Physical Self-Perception scales.

Table 4.3.3 Coefficient Correlations Analysis for the Five most Common Moderate Activities of the Whole Sample using the PSDQ Scales Scores

Perceptions	Common Moderate Physical Activities				
	Hard Households	Brisk Walking	Basketball	Volleyball	Ball-games
Physical Activity	-.0767	.0198	.1090	.0477	.2000***
Body Fat	.0326	-.0868	.0317	.0541	-.0201
Coordination	-.0920	.0811	.1282**	-.0192	.1225**
Health	.0337	-.0671	.0361	.0525	.0494
Sp. Competence	-.0796	.0149	.1320**	.0269	.1735**
Appearance	-.0719	-.0021	.1065	-.0716	.0445
Strength	.0264	.0419	.1158**	.0197	.1302**
Flexibility	-.0310	-.0100	.0600	.0421	.1237**
Endurance	-.0328	-.0327	.1119*	-.0138	.1790***
Global Esteem	-.0479	-.0471	.0661	.0442	.0139
Global Physical	-.1331	.1082	.1040	-.1100	.1328

* significant at .05
** significant at .01
*** significant at .001

Tables 4.3.4 presents the correlations of the Physical Self-Perception Scales and the five most common Hard physical activities, again combined for the weekday and weekend, for the total sample. Basketball and Football have high significant correlations with the Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance scales. On the other hand Hard Households, Brisk Walking, and Ball-games being performed as Hard activities, have the same pattern as when they were reported as Moderate activities of no correlation with any of the physical self-perception scales.

It is noticeable that all the physical self-perceptions which significantly correlate at the Moderate and Hard physical activities are coming from the 'Physical Ability' self-perception group scales (see Fig. 4.1.3).

Table 4.3.4 Coefficient Correlations Analysis for the Five most Common Hard Activities for the Whole Sample using the PSDQ Scales Scores.

Perceptions	Common Hard Physical Activities				
	Hard Households	Brisk Walking	Basketball	Football	Ball-games
Physical Activity	-.0036	.0076	.2769***	.1394**	.0681
Body Fat	-.0096	-.0895	.0005	-.0734	.0238
Coordination	-.0481	-.0638	.2067***	.1843***	.1057
Health	.0318	-.0465	-.0045	.0845	.0567
Sp. Competence	-.0365	-.0293	.3157***	.1621***	.0592
Appearance	-.1219	.0128	.0477	.0679	-.0585
Strength	.0196	.0154	.2088***	.0556	-.0074
Flexibility	.0132	.0104	.1296**	.0973	.0729
Endurance	.0075	.0226	.1208**	.1835***	.0701
Global Esteem	.0727	.0311	.0004	.0125	.0195
Global Physical	-.0405	-.0545	.1622**	.0989	-.0850

* significant at .05
** significant at .01
*** significant at .001

From Tables 4.3.3 and 4.3.4 we notice that the level of relation between Physical Self-Perceptions and participation in Physical Activities for the present sample perhaps depends on the nature of the activity. It does not appear to apply to non-voluntary activities, such as helping with Hard Household tasks at home, Walking to the school or the shops. However when the activities are more the result of a free choice as Ball-games being performed Moderately at the school break or Basketball and Football being performed as Hard activities the relation between the

two variables (Physical Self Perception/ Participation in Physical Activities) seems to become significant.

However all the correlations are always quite small so that their predictive power (R Square) is also small; for example the Physical Activity self-perception scale could predict only 4% of participation in Ball-games played at a moderate pace (Table 4.3.3) and about 10% of Basketball played 'hard' for the sample (Table 4.3.4).

Multiple Regression Analyses

The Correlation Analyses (Table 4.3.2 and 4.3.3) looked at the relationship of physical self-perceptions and physical activity levels taking each self-perception and each activity level individually. The significance of the correlations suggested that Multiple Linear Regressions on the level of physical activity (Moderate/Hard) were appropriate. Multiple Linear Regression incorporates multiple independent variables, in this case the eleven physical self-perceptions, in a model of the form:

Activity Level = α_1 * Perception A + α_2 * Perception B +.....+α_{11} * Perception K.

Where α_1, α_2, ..., α_{11} are unknown parameters.

The important variables in the equation are those that have a high or moderate correlation with the dependent variable and whose effect is not already accounted for by other variables.

The levels of physical activity (Moderate, Hard) was subjected to stepwise multiple regression using each of the eleven physical self-perception scales as predictors. These independent variables, appearing as predictors of levels of physical activity (Moderate and Hard) are presented for the total data as well as for the boys and girls in the Tables 4.3.5 to 4.3.10.

An examination of the results in Table 4.3.5 reveals that only two of the physical self-perception variables entered the Regression Equation for the Moderate Active level for the total sample. Strength, Physical Activity emerged as the only significant predictors of involvement in Moderate Activities. It is interesting that so few of the eleven perceptions are actually involved. The R Square results were low 6% at best.

Tables 4.3.6 and 4.3.7 present the boys and girls physical self-perception scales which can predict the Moderate level of physical activity. Worthy to note is that the Appearance scale was the only one related to boys Moderate level of activity. For the girls the Physical Activity scale was the sole predictor of Moderate physical activity level of involvement. It is also noticeable the low prediction powers of the equations as measured by the R Square.

Table 4.3.5. Multiple Linear Regressions for the Moderate Active Level for the Whole Sample.

Moderate Active / Predictor variable	Beta	Mult. R	R Sq.	F chge	Sign.
1. Strength	.16	.21	.04	15.22	.000
2. Physical Activity	.14	.25	.06	10.56	.000

Table 4.3.6. Boys Multiple Linear Regressions for the Moderate Active Level

Moderate Active / Predictor variable	Beta	Mult. R	R Sq.	F chge	Sign.
1. Appearance	.27	.27	.07	12.68	.000

Table 4.3.7. Girls Multiple Linear Regressions for the Moderate Active Level

Moderate Active/ Predictor variable	Beta	Mult. R	R Sq.	F chge	Sign.
1. Physical Activity	.19	.19	.03	6.44	.012

Similar analyses were performed for the physical self-perception variables and the Hard Active level for the total sample and for boys and girls separately. In Table 4.3.8 R Square values were generally a little higher. Physical Activity and Sport Competence were the two significant predictors of participation in Hard activities for the whole sample. For both boys and girls the physical activity scale was now the sole predictor of involvement in Hard physical activities. It is also worth mentioning the different values between boys (.03) and girls (.16) for the values of R Square (Tables 4.3.9 and 4.3.10).

Table 4.3.8. Multiple Linear Regressions for the Hard Active Level for the Whole Sample

Hard Active/ Predictor variable	Beta	Mult. R	R Sq.	F chge	Sign.
1. Physical Activity	.28	.37	.14	51.36	.000
2. Sp. Competence	.14	.39	.15	28.29	.000

Table 4.3.9. Boys Multiple Linear Regressions for the Hard Active Level

Hard Active/ Predictor variable	Beta	Mult. R	R Sq.	F chge	Sign.
1. Physical Activity	.19	.19	.03	5.88	.016

Table 4.3.10. Girls Multiple Linear Regressions for the Hard Active Level

Hard Active/ Predictor variable	Beta	Mult. R	R Sq.	F chge	Sign.
1. Physical Activity	.40	.40	.16	31.47	.000

It is interesting to note that the Physical Activity perception appeared to be the most important variable from the different combinations of physical self-perceptions able to predict the Moderate and Hard Level of involvement in physical activities for both genders. It is surprising also to note that the Appearance scale could predict Moderate level of involvement, although it belongs to the Physical Fitness group of scales (Body Fat, Health, Appearance, see Figure 4.1.3).

Physical Self-Perceptions and Involvement in Physical Activities: Testing for Direction of Causal Flow

Some researchers have supported a causal relationship between self concept and physical achievement. So far in our study, we examined the correlation between physical self- perceptions and physical activity participation, however, correlation indicates only the degree of association, between two variables and does not confirm the direction of cause-effect relationship (Cronbach & Furby, 1970).

Here, we tried to examine whether there is a direction in the relationship of physical self-perceptions and participation in physical activities. Univariate regression analyses were used for this part of the investigation. The activity participation variable underwent a stepwise multiple regression to determine which linear combination of physical self perceptions emerged as the best predictor for activity involvement. As can be seen in Table 4.3.11 the Physical Activity perception was the only perception which could predict sports involvement for the whole sample. The R square value for the Physical Activity perception is quite low.

Table 4.3.11 Multiple Linear Regressions for the Prediction of Physical Activity Participation from Physical Self Perceptions

	Participation in Physical Activity			
	Beta	R Sq	F chge	Sig
Physical Activity Self Perception	.44	.20	76.51	.00

Testing the hypothesis that participation in physical activity can predict perceptions we extended the univariate regression analyses. This time, each of the physical self perceptions underwent a stepwise multiple regression to determine activity participation. As can be seen from Table 4.3.12 participation in physical

activity could predict the Physical Activity self perception scale. Again the R square value is quite low.

Table 4.3.12. Multiple Linear Regressions for the Prediction of Physical Self Perceptions from Activity Participation

	Physical Activity Self Perception
Participation in Physical Activity	
Beta	.44
R square	.19
F change	92.10
Sig	.00

From the above Tables we can not say which is the direction of the relationship between physical self concept and physical activity participation, a result which was anticipated in the opening paragraph of this section.

The possibility of a causal relationship between the two variables was further examined. In this attempt structural modelling was used to test alternative models. Two models were tested to examine their fit to the data (Figure 4.3.1).

First, we tested whether physical self perceptions can influence actual participation in physical activities; a hierarchical model based on Sonstroem's model (Figure 2.3.1) was developed as a full structural equation model with directional paths specified as flowing from the physical self perceptions through physical activity participation (i.e. from right to left). Second, we also tested the hypothesis that causal direction flows from participation in physical activity to physical self perceptions (i.e. from left to right). Goodness-of-fit statistics related to both models are presented in Table 4.3.13.

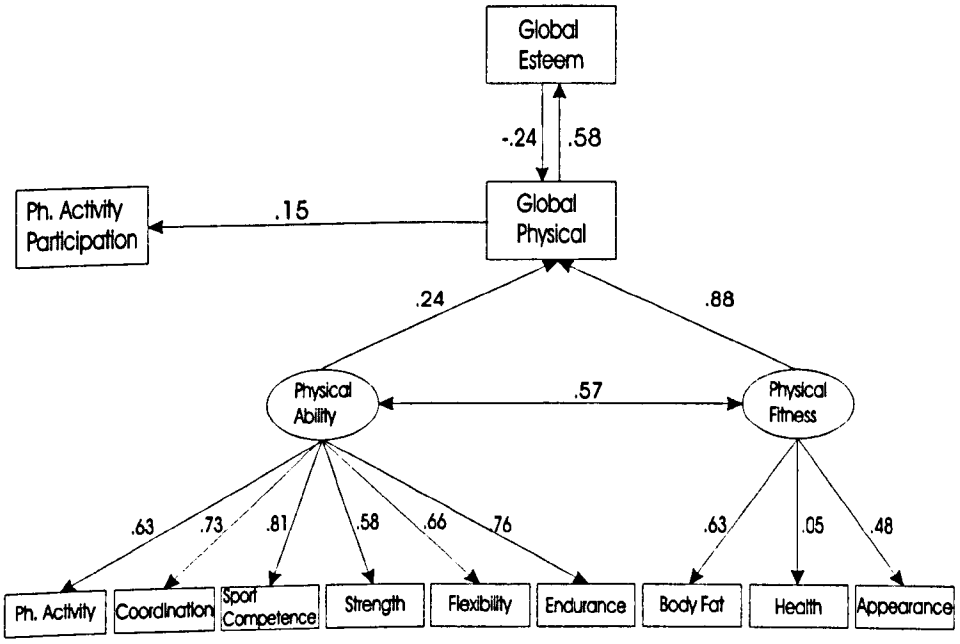
Table 4.3.13 Goodness-of-fit indices for alternative models

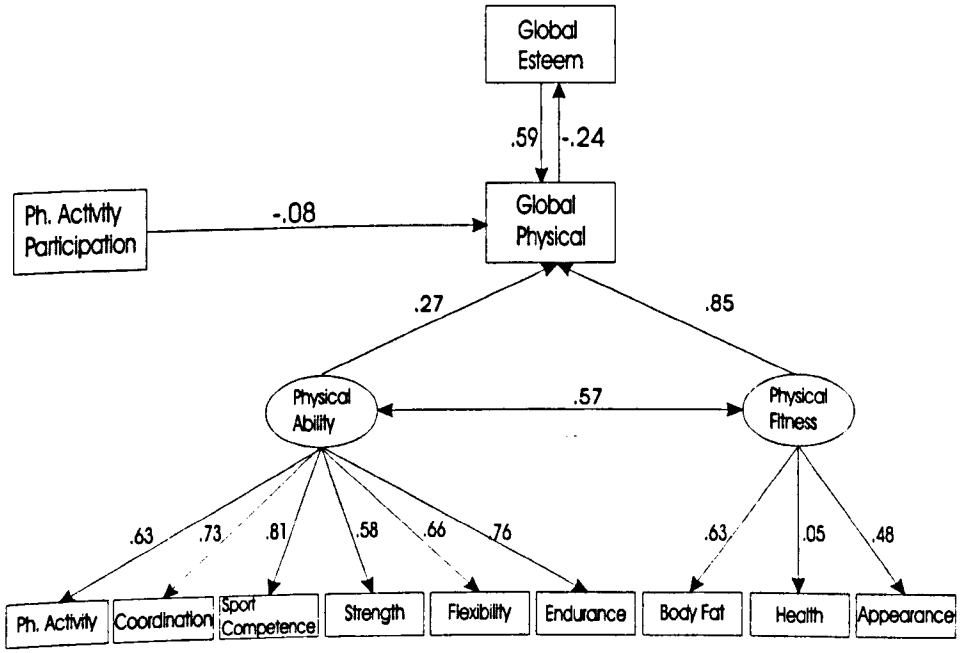
Model	χ^2	df	GFI	CFI	ECVI
Phys. SP → Phys. activity participation	342.48	51	.86	.83	.98
Phys. activity participation → Phys. SP	347.50	51	.87	.82	.99

Note Phys. SP = Physical Self Perceptions; GFI = Goodness-of-fit index; CFI = Comparative fit index; ECVI = expected cross-validation index.

On the basis of Table 4.3.13 results, it is confirmed that there is no difference between the two alternative models. This result is expected as it is not possible to test statistically for such reciprocity since the two models represent a reparameterization of the same data. To test hypotheses bearing on causal predominance between physical self perceptions and exercise involvement, the data would need to be appropriate to a longitudinal design (see e.g. Byrne, 1986; Marsh, 1990a). Nonetheless the study does address the existence of reciprocal relationship as Sonstroem's (1978) model proposed. To facilitate a clear picture of these analyses, the two alternative models, complete with standardised estimates are presented schematically in Figure 4.3.1.

Figure 4.3.1 Adolescent maximum likelihood estimates (standardised solution estimates) for alternative models of hypothesised causal flow relative to the physical activity participation based on Sonstroem model (1978).
Top model: Physical Self Perceptions → Participation in Physical Activities.
Bottom model: Participation in Physical Activities → Physical Self Perceptions.





Summary of the Findings of the Correlation Statistics of Relationships

Past research has supported the mediating role of Physical Self-Concepts in the participation in physical activities (see Chapter Two). In order to find out whether this relationship exists in our sample, the responses of the sample to the PSDQ physical self-concept instrument and the Four by One-Day Recall Questionnaire were analysed in several ways. The examination of the relationships was carried out in four analyses, Mann-Whitney tests between activity groups, Coefficient Correlation analysis at the level of physical activity involvement (Moderate - Hard), Correlation analysis at the five most commonly reported activities, Multiple Regression analysis by activity level and gender. Furthermore, two methods were employed in order to examine the possibility of a causal relationship between physical self concept and participation in activities: first we extended the univariate regression analyses, and second we developed two full structural equation models.

To assess the differences between the Physical Self-Concepts on the Active and Inactive groups the non-parametric Mann Whitney-test statistic was computed (Table 4.3.1). The Physical Ability group of self-perception scales (Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance), could clearly differentiate the Active from the Inactive adolescents, whereas the Physical Fitness group of scales could not.

Correlation analysis (Table 4.3.2) showed that again the Physical Ability group of self-perception scales (Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance), for both genders have a high significant correlation for both Moderate and Hard activity groups. In contrast the Body Fat, Health, Global Esteem and Global Physical scales do not have any significant correlation for both

boys and girls with any group of activity. A surprising correlation came from the scale of Appearance, which had a highly significant correlation for the Moderate active level for boys only.

Coefficient Correlation analyses (Tables 4.3.3 and 4.3.4) were used to reveal the relationships between the Physical Self-Concepts and the five most common Moderate and Hard activities for the weekday and weekend combined for the whole sample. Highly significant correlations were found between perceptions and Ball-games performed as Moderate activities, but not when Ball-games are performed as Hard activities. No relations were found between the eleven scales of Physical Self-Perceptions and Hard Households, Brisk Walking and Volleyball for both the Moderate and Hard activity level. Only Basketball and Football performed as Hard activities have high correlations with the Physical Self-Perception scales. We noticed that when activities were performed voluntarily (e.g. playing Ball games at the school break) significant correlations occurred either on the Moderate or the Hard active level. However, when physical activities were performed as a necessity/non-voluntarily (e.g. help with Hard Household tasks at home, Walking to school) no relations appeared between Physical Self-Perceptions and both levels of activity.

Multiple Regression Analysis was used for the Moderate active and Hard active levels by gender to show which Physical Self-Concept scales could predict involvement in Moderate and Hard activities (Table 4.3.5 to 4.3.10). The Physical Activity perception appeared to be the only common variable able to predict involvement in physical activities for both genders. Though significant, the level of prediction measured by R square was low in most analyses.

In order to examine the causal flow of the association an extension of the Linear Regression analyses (Tables 4.3.11 and 4.3.12) and the development and test of two structural equation models (Figure 4.3.1) was conducted. However results did not provide any evidence for the direction of the relationship between Physical self-perceptions and participation in activities.

All the analyses give the same results, that different combinations of physical self-perceptions are related to Moderate/Hard activity levels of physical activity participation. The correlation analyses provided evidence that the Physical Ability group of self-perception scales is significantly related to the type and level of activity in which individuals choose to be involved.

CHAPTER FIVE

RESULTS OF THE INTERVIEW STUDY

Semi-Structured Interviews with Adolescents

Involvement in physical activity is normally considered to be a fundamental part of everyday life, presumably driven by a primary human motive to be physically active rather than inactive (Robertson & Halverson, 1984). Given the right sort of encouragement it should be possible to channel these natural energies towards sports and physical activities. However results from the previous phase of the study, examining the levels and patterns of physical activities has found that for the specific 14-15 year old Greek adolescents, 'Sport for All' had become sport for some. The previous phase of the study has shown:

a) a low physical activity level among the sampled adolescents;

b) boys being more active than girls;

c) adolescents being more physically active on weekdays than at weekends;

d) gender differences in physical activity patterns;

e) a lack of variety in the physical activity patterns.

The purpose of the interview phase was to confirm the validity of the previous findings by giving a sample of adolescents an opportunity to talk about the role of sports and other activities in their leisure life. Also by using interviews we tried to identify and record the current reality of adolescents' physical activity involvement. It was hoped that by soliciting the adolescents' stories in their own words, critical variables in physical activity participation would be identified, uninfluenced by conceptual and measurement limitations.

The Interview Approach for Gathering Research Data.

According to Bright (1991, p. 58), the interview provides an appropriate setting for gathering data. Jobber (1991, p. 174) shares this view, postulating: 'the main strength of the face-to-face questionnaire is its ability to cover complex issues'. As a research technique, the interview may serve three purposes. First it may be used as the principal means of gathering information having direct bearing on the research objectives. As Tuckman describes it, *'By providing access to what is 'inside a person's head' [it] makes it possible to measure what a person knows (knowledge or information), what a person likes or dislikes (values and preferences), and what a person thinks (attitudes and beliefs)*' (Tuckman, 1973). Second it may be used to test hypotheses or to suggest new ones: or as an explanatory device to help identify variables and relationships. And third, the interview may be used in conjunction with other methods in research undertaking. In this connection Kerlinger (1973) suggests that it might be used to follow up unexpected results, for example, or to validate other methods, or to go deeper into the motivations of respondents and their reasons for responding as they do. This third purpose of using interviews was the main reason of conducting the present interview study, that is to validate findings obtained from the Four By One-Day Recall questionnaire.

Interviewing has a wide variety of forms and a multiplicity of uses. The most common type of interviewing is individual, face to face verbal interchange, but it can also take the form of face to face group interviewing and telephone surveys. Interviewing can be structured, semi-structured or unstructured.

One type of interview is the completely formalised or structured interview. A structured interview can take the form of a personally administered questionnaire,

with the interviewer following a standard wording and reading a list of predetermined questions in an attempt to make the realisation of the interview as consistent as possible across the sample. Each interviewee is offered the same series of questions in a standard form. That is the same wording is used for the questions and the questions are always asked in the same order for each interview. The responses of the interviewee are recorded, usually in terms of pre-coded categories. The main advantage over the use of a self-report questionnaire is that the interviewer can provide clarification if the interviewee experiences difficulties or appears to misinterpret questions. The interview unlike the questionnaire does not rely on language skills for its use. It also enables the interviewer to collect contextual information not accessible using a self-report questionnaire.

The unstructured interview might be described as more closely resembling a conversation, with the interviewer working from a relatively loose set of guidelines. Here the questions are open and the format flexible. The prime concern of the interviewer 'might be to explore the world for the perspective of the interviewee and to construct an understanding of how the interviewee makes sense of their experiences' (Brown & Dowling, 1998, p. 73). In this case the use of standard questions and a fixed format would be constraining. The intensity of the interaction between interviewer and interviewee will necessitate that the interview is recorded in some way, for example using an audiocassette recorder. The analysis will focus on making sense of what the interviewee says and how he or she says it.

The semi-structured interview captures the differences between structured and unstructured interviewing. The former aims at capturing precise data of a codable nature in order to explain behaviour within pre-established categories, whereas the later is used in an attempt to understand the behaviour of the interviewees without

imposing any categorisation that may limit the field of inquire. In a semi-structured interview the interviewer tries to establish a human to human relation with the respondent and he/she is motivated by the desire to understand rather than to explain. The semi-structured interviews can only explore few themes or topics. Techniques can be varied to meet various situations, the researcher is involved in an informal conversation with the respondent, thus he or she must maintain a tone of 'friendly' chat while trying to remain close to the guidelines of the topics of inquiry he or she has in mind. Therefore a balance of focus and freedom is necessary in order to obtain valid findings. The researcher begins by 'breaking the ice' with general questions and gradually moves on to more specific ones, while also, if thought necessary asking questions intended to check the veracity of statements made by the respondent. The interviewer allows the respondent to express personal feelings and therefore presents a more realistic picture that can be.

The type of interview most suited to the needs of this study was the semi-structured, for it allows the interviewer to explore and clarify a topic by the use of prompts and probes (Nisbet & Entwistle, 1970, p. 39). The focus of the questions was kept the same for each interviewee, but the sequence of the questions was varied in order to follow the natural course of conversation.

Method

Participants

The participants of this study were twelve Greek adolescents who were chosen to be interviewed. The sample was selected to represent a group based on gender and activity participation differences. The interviews were held during evenings in September at a playground of Nea Smyrni of Athens close to one of the schools where the questionnaires had been distributed. The playground where the interviews took place is an open space belonging to the local authorities, in the middle of housing area of Nea Smyrni. Adolescents can go free of charge through out the day and use the facilities or enjoy the relaxed atmosphere of an open-air snack bar which, was the main meeting point of adolescents from the neighbourhood. The sporting facilities of the playground include a closed 50 m swimming pool, closed and open basketball and volleyball facilities, and an open football terrain. It was obvious from observation that not every adolescent in the playground was actively involved in physical activities, some were sitting and talking in small groups in the snack bar, while others were playing in teams. The active and inactive interviewees were chosen from the groups that the adolescents had formed and their activity status was confirmed during the interviews. It seemed that the informal atmosphere of the playground helped the interviewees to be open and relaxed in their answers.

Although all interviewees were volunteers a balance was sought as explained in terms of active and inactive adolescents. Thus six adolescents of the sample (three boys and three girls) were relatively active and six (three boys and three girls) were relatively inactive. Each participant was asked to respond to the questions of the interview guide.

Interview Guide

The interview guide consisted of five general themes chosen to follow up the results of the questionnaire study. The themes of the interview comprised questions related to:

a) importance of participation in physical activities;

b) gender differences in the involvement in physical activities;

c) characteristics of the 'sports type';

d) barriers to participation in physical activities;

e) general comments and suggestions about sports participation.

Table 5.1 shows the five themes of the interview guide and gives typical examples of the specific questions used according to appropriateness. These five themes remained the same for all interviewees, but the question order and the wording of the questions was matched to the interviewee and his or her previous responses.

Table 5.1 The Interview Guide

Themes
1. **Importance of participation in physical activities** How important is participation in physical activities to you? In what activities do you participate? How often do you participate?
2. **Gender differences in the involvement of physical activities** Do you think that there is any difference in the physical activities which boys and girls participate? Can you tell me some physical activities which are typical for a boy or a girl of your age? Why do you think these differences between boys and girls exist?
3. **Characteristics of a 'Sports Type'** Is there a 'Sports type'? What are the characteristics he /she might have?
4. **Influences to participation** Would you like to participate in more physical activities? Does anything stop you from participating in more physical activities?
5. **General comments and suggestions about sports participation** Could you make some general comments and give some suggestions for your participation in sports?

Pilot interviews

Once the general aims of this phase of the research, and a possibly appropriate order of topics and questions was decided, some pilot interviews followed. The interview guide was pilot-tested among teenage acquaintances of the researcher. Pilot, or trial interviews have three major functions, they give: (a) a check that the structure, or organisation, of the interview meets the requirements of the study (b) a particular test of the logistics of the interview (c) an opportunity to practise the social interactive skills necessary for the kind of interview chosen (Powney &Watts, 1987).

In checking the structure of the interview, some changes were made before it was used in the present investigation. The pilot study helped to identify inappropriate

wording, ambiguities and misjudgements in questioning, and if the order of questions and topics was suitable. For example before the pilot study the interview started by asking the adolescents whether they enjoyed doing physical activities. However the pilot study showed that a more general 'warming up' question was needed. So the question 'Is sport important to you?' was included for most interviews and is believed that it helped to start the conversation in a normal way.

The pilot study also showed that the interviewee's reaction was better to the question: 'Do you think that the way you look influences your participation in physical activities?' than asking 'Does appearance influence participation in physical activities?' as was originally stated.

Finally the pilot study provided an opportunity to practise the interviewing and tape recording procedures. The first interviews took longer than expected and the main reason was that the researcher had underestimated the time needed making initial introductions and explanations.

Procedures

At the start, the researcher introduced herself and gave some general information about the research. Then she explained that most of the questions refer to physical activity participation; an example was usually offered. In setting the scene, the interviewee was further requested to feel at ease and to be honest in his/her responses. Adolescents were also assured at the beginning of the interview that the content of the discussion would be treated confidentially.

All interviews were tape-recorded and lasted from 10 to 15 minutes. This method was deemed to be the best because it freed the interviewer from having to take notes. All the attention can go to the discussion. This was explained at the beginning

of every interview and none of the interviewees objected to the use of the tape recorder.

The young people approached, were forthcoming, happy to take part in research, happy to talk, think and be critical about their involvement in physical activities. None of the interviewees was previously known to the researcher which as Powney & Watts (1987b, p. 357) noticed, frees the situation from unwanted influences.

Data Analysis Procedures

Because the interview questions were open and the order of presentation variable (as is characteristic of semi-structured interviews) the interview data were general, unstructured and in a variable sequence, and had to be classified and summarised. These functions were carried out in three stages:

a. Initially, all the questions of the interview schedules were written as headings on the tops of A4 sheets. Then, each interview was listened to carefully and a short form of each response was put down on each of the A4 sheets. The effect was that responses from different people were grouped together under common themes. This analytical technique is recommended by Patton (1990, p. 376).

b. At the second phase of the data analysis, each interview was listened to again. This time the researcher was looking for patterns, interpretations, assumptions and connections. The analysis had moved away from the mere recording and sorting out of the first stage into a more abstract manipulation of the data. Fineman & Mangham (1983, p. 297) remind us that it is the job of qualitative investigators to abstract and classify elements of the phenomenon under investigation in order to develop theoretical themes. Using the raw-data themes developed, an inductive

analysis was conducted to identify common patterns of greater generality. These patterns represented common general ideas, with no links between them. After all the general patterns had been identified, the researcher reviewed the emergent subjects to ensure that they made intuitive sense and could be easily understood.

c. In the third phase the data from the interviews was organised around the five main themes that formed the basis of the interview research.

So far the interview study methodology and its preparation and procedures have been described. Now it is proposed to turn to the findings.

Results and Discussion

Analysis of the five themes of the twelve interviewees (six active boys and girls and six inactive boys and girls) are described below and discussed with reference to the previous research findings. Table 5.2 shows the five themes and the specific dimensions extracted from the interviews.

Table 5.2 Themes and Specific Dimensions

Themes	Specific dimensions extracted from interviews
Importance of Physical Activities	Participation or not participation in physical activities Preference for certain activities physical or sedentary Preference for team or individual activities Frequency of participation Involvement on weekdays or weekends
Gender differences	List of physical activities for girls List of physical activities for boys Stated reasons for the gender differences
Sports Type	Physical characteristics, Somatotype Healthy lifestyle Clothing Participation in physical activities and relationship to Body Fat / Health / Appearance
Influences to participation	Lack of time due to studies , household tasks Lack of facilities Other leisure interests
General comments and suggestions	Physical activity is important and much needed Suggestions for more facilities Suggestions for more school PE

Table 5.3 Raw Data as was Extracted from the Specific Dimensions of the Interview Themes (continues on next four pages)

Theme 1	ACTIVE						INACTIVE					
	GIRLS			BOYS			GIRLS			BOYS		
	MA	MG	KA	YI	ST	DI	MA	SO	EL	YI	CH	DM
1. Is sport important to you?												
Yes	✓	✓	✓	✓	✓	✓						
So and so							✓				✓	
No								✓	✓	✓		✓
2. Do you like to take part in physical activities?												
Yes	✓			✓	✓	✓						
No							✓			✓	✓	✓
3. What do you enjoy to do?												
Listen to music							✓		✓	✓	✓	
Read							✓	✓	✓	✓	✓	✓
Go out with friends										✓		✓
Watch tv								✓	✓			
Play with the computer							✓					
4. How often to you participate in physical activities?												
Every day	✓	✓	✓	✓	✓	✓						
5. When exactly do you participate in sports ?												
During the week			✓			✓			✓		✓	
During the weekend	✓	✓		✓	✓	✓			✓		✓	
Whenever I can			✓			✓	✓	✓	✓	✓	✓	✓
6. What are the physical activities you participate in?												
Football				✓	✓							
Basketball		✓	✓		✓	✓						
Volleyball		✓	✓	✓								
Swimming	✓					✓						
Aerobics	✓	✓	✓									
Cycling	✓			✓								
Tennis			✓									
Walking			✓									
7. Do you prefer individual to team activities?												
Team activities		✓	✓	✓	✓	✓		✓	✓	✓		✓
Individual activities	✓						✓				✓	
8. Why do you prefer the team activities												
Be with my friends			✓		✓	✓	✓	✓		✓		✓
I like the team atmosphere		✓		✓	✓							
I like the challenge, to win		✓		✓								

	ACTIVE						INACTIVE					
	GIRLS			BOYS			GIRLS			BOYS		
	MA	MG	KA	YI	ST	DI	MA	SO	EL	YI	CH	DM
9. Why do you prefer the individual activities												
I like to be on my own											✓	
I do not like competition	✓											

Theme 2

	MA	MG	KA	YI	ST	DA	MA	SO	EL	YI	CH	DM
1. Do you think that there are differences in boys and girls sports choices?												
Yes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Can you tell some physical activities which are typical for a <u>boy</u> at your age?												
Basketball	✓	✓	✓	✓	✓	✓			✓	✓	✓	
Football	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓
Volleyball				✓				✓				
Handball				✓								
Going to Gym, Body Building			✓					✓				✓
Swimming								✓				
Cycling									✓			
Karate			✓									
3. Can you tell some physical activities which are typical for a <u>girl</u> at your age?												
Volleyball		✓	✓				✓			✓		
Basketball		✓	✓									
Tennis			✓									
Swimming	✓		✓	✓		✓						
Cycling				✓		✓						
Households					✓	✓		✓	✓		✓	
Aerobics	✓	✓	✓		✓							✓
Jogging			✓							✓		
Walking					✓	✓				✓		✓

	ACTIVE						INACTIVE					
	GIRLS			BOYS			GIRLS			BOYS		
	MA	MG	KA	YI	ST	DA	MA	SO	EL	YI	CH	DM
4. Why do you think these differences exist?												
Biological differences		✓		✓				✓				
Personality characteristics	✓							✓				
Tradition, sport appropriateness		✓	✓	✓			✓	✓	✓		✓	✓
The family				✓	✓	✓	✓			✓		

Theme 3

	MA	MG	KA	YI	ST	DA	MA	SO	EL	YI	CH	DM
1. Describe a 'sports type'												
Physical characteristics, somatotype	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Healthy lifestyle		✓		✓								
Appropriate clothing					✓	✓						
2. Does *Body Fat* influences participation in physical activities?												
Yes			✓	✓	✓			✓	✓		✓	
Depends on the participated physical activity e.g. weight lifting, gymnastics	✓	✓				✓	✓			✓		✓
3. If yes, why?												
Somebody who is slim is fit and can do more sports			✓	✓	✓			✓	✓	✓	✓	✓
4.Do you think there is any relationship between *Health* and sports participation ?												
Yes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5. If yes why?												
When somebody is healthy can participate in physical activities					✓				✓			✓
'Healthy mind in a healthy body'	✓		✓	✓		✓				✓		

	ACTIVE						INACTIVE					
	GIRLS			BOYS			GIRLS			BOYS		
	MA	MG	KA	YI	ST	DA	MA	SO	EL	YI	CH	DM
6. Do you think that the way you look influences your participation in physical activities?												
No	✓		✓	✓					✓	✓		✓

Theme 4

	MA	MG	KA	YI	ST	DA	MA	SO	EL	YI	CH	DM
1. Would you like to participate in more physical activities												
Yes	✓	✓	✓	✓	✓	✓						✓
No							✓	✓	✓	✓	✓	
2.What stops you from participating in more physical activities?												
Lack of facilities		✓		✓								✓
Lack of time due to studies households	✓		✓	✓		✓						✓
Other interests							✓	✓	✓	✓	✓	

Theme 5

	MA	MG	KA	YI	ST	DA	MA	SO	EL	YI	CH	DM
1. Could you make some general comments and give some suggestions for sports participation												
They are good and needed				✓	✓	✓			✓	✓	✓	✓
Health and Fitness			✓	✓			✓	✓			✓	
Energy release	✓											
Need for more facilities		✓			✓							
Need for more P.E. hours at school						✓						
Participation in sports is good but there are other activities as interesting as sports									✓	✓		

The interviews were then analysed. The results of the data analysis are discussed under the five themes.

Theme 1. Importance of physical activity

All the active young people in the study confirmed the importance of participation in physical activity to them (Table 5.3). Characteristically, Katerina an active girl said: *'I love doing sports..!'* and Dimos an active boy said: *'Sports play a very important role in my life....'*

The types of physical activities that was reported by the active adolescents were mainly ball games. Stavros said *'I mainly play football and basketball'*. Preference for ball game activities by the active sample is consistent with previous results of the study. Other activities that were reported were swimming, aerobics, cycling, tennis and walking. Katerina said *' I walk wherever I go; I do not like to use the bus. I play basketball and tennis and I do aerobics'*. What is characteristic is the lack of variety in the reported activities, this has been observed in the previous results. It was suggested that this lack of variety may be due to the limited number of physical activities the adolescents are being taught in school. According to the physical education curriculum ball games athletics and gymnastics are the main physical activities to which the young people are introduced. It might be that the adolescents have limited school experiences of other physical activities.

The preference for team games and doing things together was characteristic of both active boys and girls. When the active group was asked why they preferred team activities to individual activities the most frequent stated reasons were to be with friends and to enjoy the team atmosphere. Yiorgos (active) said: *I prefer the team games because I can play with my friends and the game is more interesting'*. Only one

active girl and one inactive boy stated that they prefer individual activities to team activities. The active girl, Maria, said: *'I prefer to participate in individual activities because I do not like the competition in a team game'*. An inactive boy, Christos, said: *'I like the peace and the relaxed atmosphere of doing things alone'*.

When the active group was asked about their frequency of participation in physical activities they reported that they 'did something on a daily basis'. This did not come as a surprise since the interview study took place in September when the schools do not operate and the youngsters have ample time for sports involvement. However when the active adolescents were specifically asked to recall when they participated in physical activities the majority of them stated that they mainly participate over the weekend. This finding is different from previous results of the study. Previously, it was found that adolescents were mainly involved in physical activities over the weekday. One explanation might be that involvement in school PE classes increased their weekday participation in physical activities during the school period. Another explanation could be that in the interview the perceived notion of the weekend as a time for leisure and sports is mentioned over the more calculated view obtained through the questionnaire.

Relatively inactive adolescents expressed negative comments towards both how they viewed physical activity and their participation to sports, e.g. Sophia one of the inactive girls said: *'Sports are not particularly important to me, I' d rather go out with my friends'*.

When they were further asked what are the leisure activities that they are involved in, inactive adolescents mainly stated sedentary activities such as: listening to music, reading, going out with friends, watching TV, and playing with the computer. In terms

of frequency of participation in sedentary activities the majority of them reported that they participate whenever they have time, both weekdays and weekends. The findings for this theme are consistent with the previous questionnaire study, the only exception to this is the weekend preference in sport participation by the interviewed adolescents.

Theme 2. Gender differences in physical activity participation

It is distinctive that all the interviewed adolescents both active and inactive, boys and girls, reported that there is a gender differentiation in participation in physical activities. Some were very emphatic saying '*Yes, there is a big difference* !' (Magda, active); whereas others characterised the difference as being small '*Well, I think that in general the difference is small*'(Yiorgos, inactive).

Then the respondents were asked to suggest in what activities a boy and a girl of their age might be involved. It was surprising to see that all adolescents reported activities which are considered to be gender acceptable for males and females (Table 5.3). According to answers of both boys and girls, boys are involved in football, basketball, going to the gym, having karate lessons. Girls, on the other hand were said to participate mostly in swimming, volleyball, aerobics and household tasks.

Two of the active girls (Table 5.3) mentioned playing basketball, which can be classified as male team activity, but no boys indicated participating in aerobics, an activity for females, and only one recalled participation in volleyball. This trend reflects the pattern of sex stereotyping found by the questionnaire, and is also reported in a study by Colley et al. (1987). Males were reported as being more conservative about the appropriateness of their participation in certain activities than females, and it was assumed by Colley et al. that they were under greater pressure to conform to perceived gender appropriate behaviour than females.

Although there was an agreement in the responses for active and inactive interviewees over the gender differentiation of physical activities, it was striking to see that the inactive group reported that Household tasks is the typical physical activity for girls of this age. It is obvious that both sex-stereotyped attitudes and personal preferences have formed the answers of these boys and girls.

Reasons for gender role differentiation

When probed for reasons why girls and boys play the sports they do, the sample offered a range of reasons, which mostly reflected four themes:

(1) Biological differences

The contribution of biological and physical factors to participation in physical activities were mentioned by three interviewees. Yiorgos an active boy said:

'I suppose that there is a difference between boys and girls activities, because boys are physically stronger'.

(2) Personality characteristics

Two adolescent girls suggested that broad personality variables are responsible to the different patterns of physical activity of the two genders. Maria, an active girl said: *'Volleyball and the other activities seem to appeal more to girls, we are quieter as characters. Boys are more energetic and tend to turn to Football and things'.*

Sophia an inactive respondent stated: *'Generally girls like to be involved in activities close to their nature like reading or listening to music'.*

(3) Tradition

Perhaps one of the most consistent variables shown to influence girls' and boys' participation patterns in physical activities has been 'tradition'. In our sample eight out of the twelve interviewees (Table 5.3), found that tradition was the reason of the

gender differences in involvement in physical activities. Magda an active girl stated: *'I do not really know. I think there are activities which have always been thought of as boys or girls - so it is more tradition than anything'.* Christos an inactive boy said: *'I think girls study more and are better students also they help more at the house whereas boys spend most of their time practising different sports activities'.*

(4) The family

The value of the family in influencing sport and activity involvement was mentioned by five adolescents. Dimos an active boy said: *'I think girls are more restricted by their parents so they do not have the freedom to do what they would like to'.* Maria an inactive girl stated: *'I do not really know, but I think the family plays an important role. If I take as an example my family, I was never encouraged to participate in sports'.*

Perhaps the origins of low physical patterns of teenage girls lie in parental attitudes. Parents elicit gross-motor behaviour at a young age more from their sons than their daughters. Because exercise and sport have been sex-stereotyped as masculine in our culture, boys have more parental reinforcement for exercise than girls. Parents should be encouraged to provide positive role models for their children's activity behaviour, and parental modeling may be especially important for girls.

Theme 3. The 'Sports Type'

Most of the young people in the study associated the 'sports type' with a desirable body shape (tall, slim, strong). Yiorgos, an inactive boy said:

'The sports person has a nice and harmonic body something like the ancient Greek statues we see at the museum'.

Some adolescents also associated the 'sport type' with being fit and having a healthy lifestyle. Magda, an active girl said of a sports person: *'She is fit, she does not smoke or use drugs'.*

Finally two male active adolescents associated the 'sports type' with the appropriate clothing, Stavros, said: *'He is always wearing trainers, athletic shocks and athletic shorts'.* Whilst Dimos said: *'He is dressed up with sports clothes'.*

Body Fat

One of the interview questions was about 'body fat' as a factor of influence in participation in physical activities *'Do you think that being fat affects involvement in physical activities?'.* Exactly half of the interviewed adolescents (Table 5.1.3) reported that the body fat can influence participation in physical activities. The adolescents' comments revealed that fat people were readily stereotyped as unhealthy and unfit, and slim people tended to be stereotyped as healthy and fit. Eleni an inactive girl stated: *'Somebody who is fat can not take part in sports for long, she gets easily tired and sweats a lot. On the other hand somebody who is slim can do more activities'.*

However the other six respondents thought that it was the type of the physical activity that influences involvement in sports and not the body fat. Characteristically Maria an active girl said: *'It does not really matter how fat you are to play sports. All*

depends on the sport you choose to play!. For example to play basketball somebody needs to be tall and heavy whereas to take part in gymnastics somebody needs to be thin and small'.

Dimitris an inactive boy also stated: *'There are some sports that the participant needs to be fat and short in order to perform well such as weight lifting and other sport the participant needs to be slim such as gymnastics'.*

Health

It has been found in previous studies that young people tend to define health either as fitness, or the ability to conduct everyday activities smoothly, or as a static state of being (Murray& Jarrett, 1985).

In our study (see Table 5.3 - Theme 3) virtually all of the young people responded that being healthy has a close association with sports participation. Everyone of the sample interpreted 'health' as physical health. The comments revealed a strong emphasis on the physical and visible nature of health. For example, health and fitness were close connected in the mind of the interviewees. Stavros an active interviewee said: *'If you are not healthy you can not play sports'.* The answers of health in many cases included a very well known phrase to the adolescents 'A healthy mind in a healthy body'. Katerina stated: *'Not only the physical health but the psychological health is connected with sports participation,...after all 'a healthy mind in a healthy body' as the Greeks used to say'.*

The discussions also indicated that little attention is paid to unseen or invisible factors such as the functioning of the body systems. Nobody made any reference to a healthy person having, for example, a more efficient cardiovascular or respiratory system. It would seem that such factors are not well understood or are overlooked.

Physical Appearance

According to the interviewees, physical appearance does not influence sports involvement. When the interviewees were asked whether there was a connection between physical appearance and participation at sports, all answered negatively. Yiorgos an active boy said emphatically: *'Of course not, how you look like has nothing to do with playing sports !!'*

Theme 4. Influences of participation

Then interviewees were asked whether they would like to participate in more physical activities. It is perhaps not surprising that the active group indicated a desire to increase their physical activity. Stavros an active boy said: *'Yes, this year I will play football for a local team'.*

However all the inactive respondents apart from one boy said that they would not like to participate in physical activities. Their statements sound like justifications for their previous statements. Maria, emphatically said: *'No, no really being involved in sports is not my style'.* Christos said: *'I would rather read than play sports'.* These negative statements could match findings of the Canada study (Shephard et al., 1980). In that study, it was reported by the researchers that increased involvement in physical activities over the years 1978 to 1980 was entirely due to already active people becoming more active. The number of people who were minimally active actually declined over this period.

When girls and boys were asked what stops them from participating in more sports they offered a range of reasons:

(1) Lack of time due to study or household duties.

Dimitris an inactive interviewee said: '*I wish I could, but I am in an age when I have to study more'*. Katerina, active: *'I also help my mother at home, so there is not really enough time to do more sports'*.

Lack of time is the most consistently reported obstacle. This may be a rationalization rather than a reflection of reality: the observation that there is never enough time for everything is fairly common. The problem may well be, then, a question of priorities - a question of what a person wants to make time for, those who exercise are likely have no more time than those who do not exercise. Nevertheless, this factor should be treated seriously and attempts made to help individuals overcome the problem, whether real or perceived.

(2) Inadequate facilities

Magda an active girl said: *'I could do more but there are not enough facilities available'*. Yiorgos also stated: '*I would like to do more sports but here (in this neighbourhood) there are not any facilities for the sports that I like, such as skating board'*.

These statements are consistent with previous results and comments on the lack of variety of the adolescents' participated activities. Here the inadequate facilities in the neighbourhood were regarded by the active adolescents as a serious barrier to more sports involvement. Furthermore it is suggested that the insufficient local sports facilities is responsible for the limited variety of participated activities.

(3) Lack of interest

Eleni inactive stated: *'I have other interests, I prefer to go out with friends or listen to music'*. Yiorgos inactive said: *'I like to stay at home and read or watch T.V.'*

Lack of interest and motivation, is a common barrier to participation physical activity. These reasons indicate the importance of environmental factors and of the sports programmes themselves in fostering participation. Lack of interest might reflect a negative early exposure to sport and greater physical activity of the inactive group might perhaps be stimulated by providing a new enjoyable exposure to different activities.

Theme 5. General Comments and Suggestions

At the end of the interview the adolescents were asked if they wished to make some general comments or give some suggestions about participation in physical activities. All of the respondents agreed that participation in physical activities is something 'good and necessary' in order to be healthy and keep fit.

Sofia, inactive said: *'Well, it is very good to be involved in sports it keeps you fit and healthy, but I do not participate'*.

It is general accepted and understood that people participate in physical activity for two main reasons - health benefits and enjoyment. Here all the respondents, even the inactive ones, commented on the health benefits of exercise. However evidence indicates that the desire to be healthy is not sufficient motivation to become involved in a physical activity. Dimitris inactive stated: *'Being active is a 'must' for keeping in good health, I Know I should be more active but..'*.

If involvement is to be long-term, then, the programme must be 'fun', satisfying, or enjoyable. The idea is widely accepted, (Wimbush, 1994; Harris & Cale, 1997), but there are no guidelines on what it is that leads to these conditions. Young people may generally agree on some of the characteristics of fun, that is, feeling good, or having a smiling face. Different people prefer different activities different ways of structuring activities, different social groupings for activity, or they may simply dislike activity altogether ! Yiorgos, inactive said: *'Sports and participation in sports is good but there are so many other things I can do'.* Yiorgos with his comment confirms that the adolescents have a narrow view of sports and activity.

As we already said a lack of interest might reflect a negative attitude to sports and physical activities. Perhaps it needs careful consideration of how to spend energy and resources to help those who want to be active rather than try to convince those who do not.

As might be expected, suggestions for increased participation were only given by the active individuals:

(1) Need for more facilities

Magda said: *'Sports are excellent to be involved in, they keep you fit and healthy but there are not enough sports facilities in our neighbourhood'.*

Attractive and accessible sports facilities need to be made available at reasonable cost and at times when children can use them. Accessibility and convenience are both necessary if physical activity is to become a popular leisure time activity. It is known that people participate most frequently in activities that are unstructured and easily accessible. (Canada Fitness Survey, 1983).

Convenience, however, does not ensure involvement. Although lack of convenience is definitely a limiting factor and is frequently reported as the reason for

withdrawing from an activity, convenience in itself is not a sufficient motivating influence for most people to become involved in a programme. Usually, there are activities that can easily be practised at home or near the work place, but that people still do not choose to practice. Clearly, then, further research is needed on other factors that may influence involvement.

(2) School PE

Dimos said: *'We need more P.E. hours. Two sessions of 45 minutes each per week, is not enough...there is not enough time to practice different things and learn, by the time the teacher tells us what to do the session is over !!'*

Dimos with his answer hits a major problem that the Greek PE curriculum faces, not enough hours for practising and not a great deal of variety of the physical activities that are taught. Physical education by its very nature is the ideal medium for promoting physical activity, and physical education teachers should realise the importance of their role in promoting participation in physical activities. Adolescents must be guided through a physical education curriculum that includes gymnastics, games skills, dance, swimming, athletics and outdoor education, with plenty of opportunities to explore the full range of available activities. With a balanced, enjoyable programme, children can develop a repertoire of motor skills, achieve success at their own levels, and feel confident enough in their own abilities to want to pursue more active lifestyles.

Summary and Conclusions

This part of the study extends the previous questionnaire phase of research on adolescents' physical activity participation. The Four by One-Day Recall Physical Activity Questionnaire was used in the previous phase of the research to test the level and patterns of physical activity participation. In this phase semi-structured interviews were used to a small size sample of twelve adolescents (six active and six inactive) to confirm the validity of the previous findings and to explore the current activities and opportunities for adolescents physical activity involvement. As Runkel & McGrath (1972) suggested, every research method has potential strengths and inherent weaknesses. Here, by using the questionnaire and the interview together we could reduce uncertainty and accomplish what we liked to do in our work.

Using interviews we asked our sample to identify and describe their physical involvement according to an interview guide which comprised questions related to (a) importance of physical activity participation; (b) gender differences; (c) characteristics of the 'sports type'; (d) influences to participation; (e) general comments and suggestions. The interview guide was pilot-tested on several individuals and minor changes were made before it was used in the present investigation.

In the first theme of the interview guide the importance of physical activity was confirmed by the active adolescents. All six adolescents reported that sports were important to them, they loved to participate and they did so, as often as they could. The boys' preference for ball games activities and girls' for individual activities is consistent with previous results of the study. Also in both stages of the study the lack of variety in the physical activity patterns was evident.

It is important to notice that for this sample the involvement was said to be higher at weekends than on weekdays. This finding seems to come in contrast with findings of the previous phase, where the sample was found to be more active during the weekdays than the weekends (Table 4.2.18). An explanation of this contradiction could be that the distribution of the questionnaire in the first phase was done on school period and consequently the adolescents participated mainly in activities in PE classes and did not have time for out of school sports participation. The interview study was conducted on a holiday period and the sample had free time to participate in sports both on weekdays and weekends.

In the second theme, we noticed strong gender stereotypes over the reported physical activities appropriate for boys and girls at their age. It appears that their perceptions of gender physical activity participation is in accordance with traditional male female roles, ball games for boys and individual activities for girls. This finding gives an insight to the questionnaire results. When the sample was asked for the reasons of these gender differences, they stated biological and personality reasons as well as traditional and family influences. It appears that, already in adolescence family life patterns have been formed and it is likely that these patterns will be carried out into adulthood. It is known that participation in sports activities is mainly guided by these gender role stereotypes and this has been confirmed.

In the third theme the characteristics of the sports type were given by the sample. According to the adolescents the sports person is mainly tall and strong, having a healthy lifestyle and with appropriate sports clothing. When the interviewees were further asked about the influences of body fat in sports participation, many considered that being slim is necessary in order to be active. Other adolescents stated that it was the type of sport that influences sports involvement and not the body fat

factor. Health was also regarded by the sample as vital to involvement in physical activities, while 'looking good' was thought to be unnecessary for sports participation.

In theme four the sample indicated their perceived barriers to more participation in physical activities. Lack of time due to studies and household tasks, inadequate facilities and participation to other leisure pursuits were the reasons that the sample stated as obstacles to involvement in physical activities.

Finally, the sample was asked whether they had any comments and suggestions to make. Data obtained from this theme was helpful. The active sample suggested on the need of more facilities to be available and more school PE hours.

The data from the six inactive adolescents extended the previous research and provided additional insight into our understanding of inactive adolescents conceptions of physical activity participation. Even if this inactive group had different interest and fields of participation they agreed that physical activity involvement is good and needed; and that gender differences exist in the sports activities due to physiological and traditional sex role stereotypes.

Table 5.4 summarises the active and inactive adolescents' responses and presents a comparison of them.

Table 5.4 Summary Table of Interviewees Responses

Themes	The Active responses	The Inactive responses	Comparison
1. Importance of physical activity	• Importance of physical activity • Participation in physical activities • Weekend participation	• Unimportance of physical activity • Participation in sedentary activities • Every day participation	Not in agreement
2. Gender differences	• Gender differences in sports	• Gender differences in sports	In agreement
3. Sports type	• Physical characteristics	• Physical characteristics	In agreement
4. Influences to participation	• Lack of facilities • Lack of time	• Other interests (only)	Not in agreement
5. Comments and suggestions	• Sports are good to health and fitness • Need for more facilities • More school PE hours	• Physical activities are good and needed	In agreement

The interviews used a small sample size which limits the generality of the results. However the gathered data from the interview analysis confirmed that the Four by One Day Recall Questionnaire had yielded valid information. This was established by acquiring similar answers from the adolescents in both phases and in different seasons. Validity has been one of the fundamental aspects of the physical activity self reports measures and it has been difficult to establish. Here, the validity of the Four By One Day questionnaire was confirmed by the absence of different perspectives between questionnaire questions and adolescents' free responses to the same themes. The two different research strategies have come to the same findings being complementary with the Greek sample. Table 5.5 compares the findings from the questionnaires and the interview studies.

Table 5.5 Findings from the Questionnaire and Interview Phases of the Study

Findings	Questionnaire Results	Interview Results
Low physical activity levels among the sampled adolescents	✓	
Boys being more active than girls	✓	
Adolescents being physically active on weekdays and at weekends	✓	✓
Gender differences in physical activity patterns	✓	✓
Lack of variety in physical activity patterns	✓	✓
Characteristics of sports type		✓
Influences on participation		✓

Based on these findings it seems reasonable to declare that the Four By-One Day Recall physical activity questionnaire is both valid and reliable in measuring adolescents physical activity patterns and levels. Furthermore the results of the two different phases of the analyses (questionnaire and interview) provided useful information of the current physical activity patterns and levels of a sample of Greek adolescents.

CHAPTER SIX

DISCUSSION

Competence and achievement motivation theories (Harter, 1978; Nicholls, 1984; White,1959) state that we are drawn towards settings and behaviours through which we can demonstrate a high degree of ability or adequacy. In other words individuals who perceive themselves as competent in sports are more likely to continue their participation, while those low in perceived physical competence will be more likely to discontinue participation in sport. As described in Chapter Two, much research has been done on this relationship. One of the purposes of this study was to investigate whether similar relationships are found among physical self-perceptions and physical activity participation in Greek adolescents. The PSDQ instrument was chosen to measure the physical self-perceptions of the sample. This instrument had been used in similar research and has been shown to have good reliability and validity for this type of study in Australia. The physical activities of the sample were measured by a modified form of the Four by One-Day Recall instrument. The evaluation of the questionnaire was confirmed by the interview study.

In this chapter the results and comparisons with other studies will be presented. First the properties of the instruments used in the study will be discussed. The findings of the application of the instruments to the sample follows.

Instruments used in the Study

The PSDQ instrument

The PSDQ instrument which was chosen to measure the physical self-concepts of the sample and to relate them with their physical activity participation was found to be a suitable instrument for the current research. The reliability, validity and structural organisation of the PSDQ was tested using a sample of Greek adolescents, before its measures of physical self-perceptions were correlated with physical activity. The evidence for believing the PSDQ was a suitable instrument for the study is now presented in three short sections.

Scale Characteristics

Descriptive statistics for the eleven scales were calculated for boys and girls. Means, standard deviations and maximum and minimum values were also calculated (Table 4.1.2). All scales drew a wide range of scores. For many of the scales (Physical Activity, Health, Appearance, Strength, Endurance, Global Esteem) the mean score was close to the scale mean. The Body Fat scale has the lowest mean, which shows that the majority of the responses from the sample were False (score 1) or Mostly False (score 2) for both boys and girls.

Table 6.1.1 shows the PSDQ scale means and standard deviations for the total sample and for boys and girls, for the current study and for the sample 2 in a study conducted by Marsh et al. (1994). The item format allowed a 1 to 6 response and thus the ideal mean response would be 3.5 . An examination of the scale means shows that they are distributed around this score. Standard deviations ranged from 0.48 to 1.48 for the current study and 0.98 to 1.57 for the Marsh et al. (1994) study, showing

adequate dispersal and no evidence of a 'ceiling' or 'bottoming' effect. A comparison of the descriptive statistics between the current study and Marsh et al. (1994) data shows that the scale means and standard deviations were remarkably similar across samples. The mean scores from the Marsh et al. (1994) sample are, however slightly higher. A possible explanation for this difference may be the wider age range (12-18 years old) of the Australian study. Comparisons between samples of the two studies show between group stability. Evidence of the degree of stability of the PSDQ in the two studies gives further confidence in the psychometric properties of the instrument.

It is also relevant to compare the PSDQ and the PSPP (Fox, 1987) instruments scale characteristics. Fox (1987) study provided support for a multidimensional, hierarchical physical self-concept construct and there is an apparent similarity in the PSDQ and PSPP instruments' scales. At least superficially 6 of 11 scales considered in the PSDQ instrument (Endurance, Strength, Physical Appearance,/Body Fat, Sport Competence, Global Physical) match those of Fox (1987) PSPP instrument (Physical Condition, Physical Strength, Body Attractiveness, Sport Competence, Physical Self-Worth).

Table 6.1.2 shows the PSPP instrument [administered by Marsh et al. (1994)] scale means and standard deviations. In the PSPP instrument the item format allowed 1 to 4 score, with an ideal of 2.5 . An examination of scale means reveals a tendency to be higher than 2.5, standard deviations ranged from 0.56 to 0.61 and suggest an adequate spread. A comparison of means and standard deviations from the PSDQ and PSPP results shows similarities of the two instruments.

After observing the scale means and standard deviations for the total samples and for boys and girls separately in these studies, in all cases scales appear to be sensitive to a wide range of individual differences, give approximately normal

distributions of scores, and were not susceptible to either 'ceiling' or 'bottoming' effects.

Table 6.1.1 The PSDQ Descriptive Statistics by Gender for the Current Study and for the Sample 2 of Marsh et al., (1994) Study

	PSDQ Current Study						PSDQ Sample 2 (Marsh et al., 1994)					
	Total (N=405)		Males (N=198)		Females (N=207)		Total (N=395)		Males (N=217)		Females (N=178)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Strg	3.87	.92	4.19	.75	3.48	.96	4.15	1.22	4.36	1.19	3.89	1.20
Bfat	2.06	1.32	2.11	1.35	2.01	1.29	4.45	1.57	4.81	1.50	4.01	1.55
Pact	3.70	1.48	4.29	1.35	3.13	1.38	4.29	1.32	4.35	1.32	4.22	1.31
Endr	3.86	1.36	4.41	1.23	3.32	1.26	3.83	1.36	4.12	1.33	3.48	1.30
Sprt	4.34	1.25	4.89	.97	3.82	1.26	4.20	1.23	4.46	1.16	3.88	1.25
Cord	4.58	.89	4.86	.74	4.31	.93	4.38	1.08	4.48	1.05	4.27	1.11
Heal	2.69	.56	2.68	.57	2.71	.56	4.79	.98	4.80	1.01	4.78	.95
Appr	3.56	.53	3.63	.47	3.49	.58	3.76	1.21	4.05	1.09	3.40	1.25
Flex	4.16	.79	4.32	.69	4.02	.86	4.34	1.13	4.37	1.10	4.31	1.17
Gpsc	4.60	1.08	4.87	.85	4.31	1.20	4.21	1.39	4.49	1.31	3.86	1.40
Gse	2.93	.48	2.97	.46	2.89	.49	4.63	1.05	4.79	1.01	4.44	1.07

Note. M=means; SD=standard deviations; Strg = Strength; Bfat = Body Fat; Pact = Physical Activity; Endr = Endurance/fitness; Sprt = Sport Competence; Cord = Coordination; Heal = Health; Appr = Appearance; Flex = Flexibility; Gpsc = Global Physical Self-Concept; Gse = Global Self-Esteem. Responses to the PSDQ instrument vary along a 1-6 response scale.

Table 6.1.2 PSPP Scale Means and Standard Deviations by Gender

	PSPP (Fox, 1987, administered by Marsh et al., 1994)					
	Total (N=315)		Boys (N=208)		Girls (N=107)	
	M	SD	M	SD	M	SD
Strg	2.60	.56	2.62	.54	2.56	.59
Body	2.45	.59	2.59	.53	2.18	.61
Cond	2.73	.59	2.80	.57	2.60	.60
Sprt	2.69	.59	2.79	.56	2.50	.60
Gpsw	2.65	.61	2.75	.58	2.47	.62

Note. M=means; SD=standard deviations; Strg=Strength, Body = Attractive Body, Cond = Physical Condition, Sprt= Sport Competence, Gpsw= Physical Self Worth. Responses to the PSPP instrument vary along a 1-4 response scale.

Reliability

First the internal consistency of the scales was examined. The Cronbach alpha value was calculated for each scale (Table 4.1.3). This measure of reliability of the scales indicated that all the items in a single score tap the same construct. The alphas ranged between 0.74 and 0.92 for the total sample, from 0.54 to 0.92 for boys and from 0.78 to 0.91 for girls. These are high values for scales of about six items only. Even the Body Fat scale with a low mean score had a high alpha value of 0.91. The values of alpha show that generally girls have answered the questionnaire a little more reliably and consistently compared to boys.

In the study of Marsh et al. (1994) analyses of scale scores and coefficient alpha estimates of reliability were computed separately for the two samples (1 and 2). The following Table 6.1.3 shows the two coefficient alpha estimates of reliability and three month test-retest stability coefficients obtained, by Marsh et al. (1994) compared with the alpha estimates obtained in our study. We notice that in all these studies the coefficient alpha are equally high and indicate the consistent reliability of the PSDQ scales across both Australian and Greek samples.

Table 6.1.3 Alpha Reliability Coefficients for PSDQ Instrument Responses

Physical Self Perception Scale	Coefficient Alpha		
	Current study	Marsh et al. (1994) 1 sample	2 sample
Physical Activity	.88	.88	.90
Body Fat	.91	.89	.96
Coordination	.80	.88	.91
Health	.75	.82	.87
Sport Competence	.92	.91	.94
Appearance	.87	.90	.91
Strength	.88	.88	.92
Flexibility	.83	.86	.90
Endurance	.92	.90	.92
Global Esteem	.74	.86	.91
Global Physical	.87	.92	.96

Results indicated that the PSDQ scales when used with the Greek sample, have good internal consistency and reveal that all individual items contributed adequately to the functioning of their scales. The psychometric integrity of the instrument has been supported and there appear to be no major problems caused by its translation into Greek. However these estimates of alpha should be interpreted cautiously as additional implementation of the PSDQ with a larger sample drawn from a wider population is needed to further establish full psychometric characteristics and norms for use with Greek adolescents.

Validity

The PSDQ instrument was designed with eleven scales each for the measurement of a separate facet of self-perception within the physical domain. However there was the concern that the scales were closely related and there was a danger that they could be assessing the same construct. A key issue was therefore the need for evidence of scale discrimination for the Greek sample. The validity of the

instrument was established through: factor analyses, scale interrelationships and the consistency of the findings of gender differences.

Factorial validity

Examining the PSDQ instrument principal components analysis was used to establish the independence and integrity of the scales. The data indicated strong support for the eleven structure proposed by Marsh et al. (1994), with the resultant eleven factors explaining 61.5% of the variance (Table 4.1.4). The factor structure appears to be similarly powerful across the Australian and Greek populations.

Scales interrelations

Zero-order and partial correlation coefficients were calculated in order to determine the degree of support for the hierarchical structure among constructs (see Fig. 4.1.1). Results (Tables 4.1.5 and 4.1.6) indicated that the Global Esteem is more strongly correlated with the Global Physical than any specific scale; the specific scales are more strongly correlated with Global Physical than with Global Esteem; and relationships between the specific scales and Global Esteem were greatly reduced when the effect of Global Physical is removed by partial correlation. These findings are in line with Fox's (1990) recommendations for the necessary conditions for the support of the hierarchy in the physical domain and provide evidence for the validity of the instrument and of its results.

Gender differences

Significant gender differences with females scoring lower than males in all scales was revealed in this study. Similar observations were noted by other researchers (Marsh et al., 1994; Fox, 1987). Gender differences in the physical self-perceptions is

such a persistent result that Fox (1990) suggested the 'necessity to systematically conduct separate analyses by gender when dealing with self-perception research' (p.9).

The results from our study provided good support for the ability of the PSDQ scales to differentiate between components of physical self-concept. The cross-cultural comparison of the PSDQ confirmed its validity for use with Greek adolescents

The Four by One-Day Recall Questionnaire

A modified form of the Four by One-Day Recall Questionnaire (Cale, 1993) was used to measure the patterns and levels of physical activity of the sample. The original questionnaire was designed in a systematic way (two separate forms, division into segments of day, checklist of activities) and the adapted form, which kept this structure, was found to be feasible and practical to administer and, with its revised list of activities, relevant to the lifestyle of Greek adolescents both male and female.

It should be mentioned at this stage that Cale (1993) in her own study used the Four by One-Day Recall Questionnaire as an interview schedule. In the present study it was necessary that it was used as a self completion questionnaire. Consequently there may have been some problems, such as insufficient detail in judgements of times and difficulties in reporting duration of physical activity by the adolescents. However these problems are related with the general nature of self-report measures, as we mentioned earlier, and are not specific to the modified Cale instrument.

It was found in the present study that the scoring system of the Four by One-Day Recall Questionnaire was flexible though perhaps not always accurate, because it relied on adolescents reporting both the participation in and the duration of time in which they were engaged in an activity. The 'time' questions were probably the most difficult for the pupils to answer, because they had to think and give specific time information. On the other hand, one can argue that perhaps this difficulty was an advantage because it made pupils rather more careful and specific in their answers.

The 'huff and puff' rating used in this study had also some limitations. Some pupils had difficulty in responding to the question "Did the activity made you "huff and puff". Generally, it is not easy for an adolescent to report accurately this type of activity information (Cale, 1993). In many cases the pupils may not have been able to recall whether or not they had "huffed and puffed" during the reported activity. Another factor that may have influenced the results of this kind of question, is the different fitness levels of the adolescents. Individuals were all of differing fitness levels and would therefore react very differently to activity of the same intensity. Unfit individuals for instance, would "huff and puff" more readily than fitter individuals during physical activity. However, the fact that an adolescent "huffed and puffed" was itself positive and important information as it indicated that the adolescents have been exercising at a hard level for them (Cale, 1993).

Cale combined the weekday and weekend physical activities in her calculation processes. In this study, this division was kept throughout the analyses and separate tables were presented and discussed for the weekday and weekend physical activities of the sample. This division proved to be worthwhile and has given a significant extension to Cale's study. One result was that the Greek sample was found to be more

active during weekdays than at the weekends. The significance of this finding will be mentioned later.

Reliability and Validity

The determination of reliability and validity is a problem in the self-reports. Cale (1993) states that there are problems associated with the evaluation of validity and reliability of self-report questionnaires which deal with activities over a short time frame, including the Four by One Day Recall questionnaire, adapted for the present study. She also says that the most appropriate way of assessing reliability and validity is not really known. Lamb & Brodie (1990) also recognise problems of establishing reliability and validity. They recommend test-retest procedures for reliability studies but they also recognise that one problem with this method is that it may be affected by the stability of the subjects' physical activity habits. In addition, Klesges & Klesges, (1987) state that reliability studies tend to rely mainly on test-retest method but this too, can be problematic where physical activity is concerned. It is difficult to determine the extent to which a subject's memory or the stability of their physical activity habits influences the results.

While reliability has been found difficult to establish in self-report measures, a test-retest procedure is traditionally the optimal method. The reliability of the Four by One Day Recall physical activity instrument was tested by Cale (1993), and was found to be acceptable. Though the reliability coefficient ($r = 0.62$) was not high, given the problems that encountered with test-retest reliability studies dealing with physical activity over a short time frame, the instrument was characterised as adequately reliable and capable of yielding acceptable activity values (Cale, 1993).

In our study in order to evaluate the findings obtained form the Four by One Day Recall questionnaire and to assess whether it provided reliable and valid measures for our sample a further study was needed to be done. Semi-structured interviews were conducted. The interview schedule for the study was based on the findings of the Four by One-Day Recall questionnaire and was designed specifically for Greek adolescents.

The interview study conducted to a different sample from the sample the Four by One-Day Recall physical questionnaire had been distributed, and aimed to confirm the validity and reliability of the findings by assessing how closely the interviews' responses agreed with the answers from the Four by One-Day Recall questionnaire.

The interviews were conducted during the summer vacations and not over the school period as the Four By One Day Recall questionnaire was distributed. The reason for doing this, was to cover as much as possible 'all around the year' physical activity variation. The findings obtained from the interviews revealed high levels of agreement with the findings of the Four By One Day Recall physical activity questionnaire. In this respect the interview clearly showed that the Questionnaire developed for British adolescents gathered valid information from the Greek sample as well.

The results of different kinds of analyses used in this study were consistent, and show that adolescents did understand the questionnaire and responded in a way that represented their perception of what they did. The consistency of the findings in our study, confirm that the Four by One-Day Recall Physical Activity Questionnaire has yielded reliable and valid information about the activities of the sample of

adolescents. Confidence in the instrument is sufficient for some suggestions for further research, using the same instrument to be given in Chapter Seven .

The Findings of the Study

Physical Self-Concept (PSDQ)

A Possible Hierarchical Structure of the Physical Self-Concept

A hierarchical structure similar to that previously described by Shavelson et al. (1976) model (Fig. 2.1.1) is hypothesised here. A representation of the relationship between Global Self-Esteem, Global Physical Self-Concept, and the specific domains of the latter divided into Physical Ability and Physical Fitness is presented in Figure 6.1.1. Global Esteem represents the apex of the hierarchy. The next level features the Global Physical self which exists as a general product of more specific domains. As Marsh (1986) noted 'with the increased emphasis on the multidimensionality of self-concept, the specific facets have become more important and the role of general self-concept has become less clear' (p. 1224). The present study revealed that there are two groups of specific domains (see Fig. 6.1.1): the Physical Ability group (Physical Activity, Endurance, Sport Competence, Flexibility, Coordination, Strength) and the Physical Fitness group (Body Fat, Health, Appearance). This finding may be one of the significant findings of the study. It seems to call into question the view that the scales belong to a common, single construct for the specific sample. This also might mean that specific self-concepts, of Physical Ability (Physical Activity, Endurance, Sport Competence, Flexibility, Coordination, Strength) are more related with participation in physical activities, while the Physical Fitness group (Body Fat, Health,

Appearance) might not be significantly related to participation in physical activities. Together the two groups of scales however, give a rounded picture of the physical self-concept of adolescents. Figure 6.1.1 presents the nine physical self-concept scales divided into two groups: the Physical Ability and the Physical Fitness in our study.

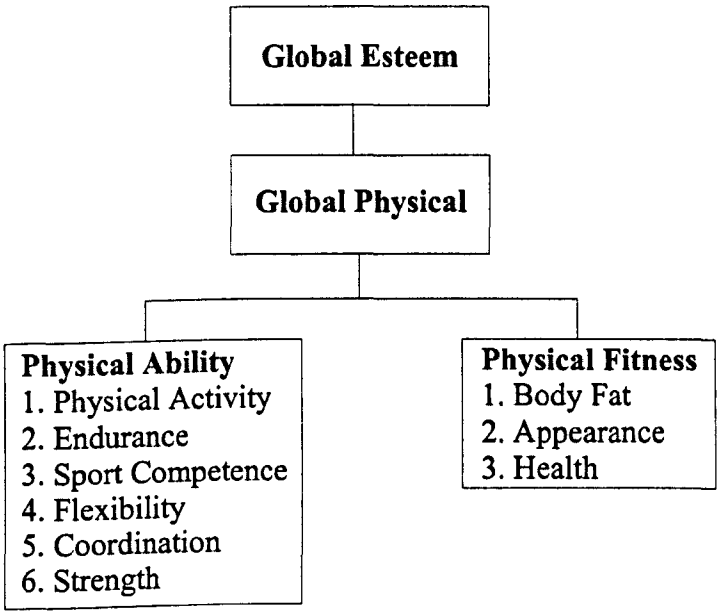


Figure 6.1.1. A Hypothesised Hierarchical Organisation of the Physical Self-Concept Scales from the PSDQ Instrument in our Study based on the Shavelson et al. (1976) Model

The results from the present Greek sample are consistent with Fox (1987) hierarchical model where the General Self-Concept is at the apex, Physical Self-Concept is at the next level, and the specific components of physical self-concept are at the third level (see Figure 2.1.2, p.31). Besides, the findings supported the Shavelson model of fully differentiated physical concepts (see Figure 2.1.1, p.20) and indicated that the self-concept hierarchy is probably more complicated than originally anticipated.

Furthermore, the semi-differentiated structure of the physical self-concept that was revealed, fits well with earlier results from Coopersmith (1967) who worked with young children and with Marsh (1989) research over the differentiation of self-

concept with age. Specifically, Marsh (1989) concluded that 'self-concept becomes increasingly differentiated, only for the early adolescent ages' (p.425). That is, children are more likely to have uniformly high or uniformly low self-concepts across all areas, whereas as they enter adolescence they are more likely to have relatively low self-concepts in some areas and relatively high self-concepts in other areas.

The demonstrated reliability and validity of the PSDQ plus the findings of an unexpected but nevertheless readily explainable concept structure confirm its suitability for the measurement of physical self-concepts. According to Marsh (1990), during preadolescence and early adolescence self-concept declines, this phenomenon has been noticed sometimes as an unrealistically high self-concept score (the so-called 'ceiling' effect). However as adolescents grow they become increasingly realistic in perceiving themselves and their abilities, thus their responses to self-report psychological instruments become more consistent, more reliable and almost certainly more valid in the sense that the scores approximate to 'true' values.

The present investigation using the PSDQ instrument supported the suggestions of Marsh et al. (1994) that the instrument 'is appropriate for adolescents males and females' and 'may be applicable to a wide range of sports/exercise research and practice' (p.p. 283, 301). The analyses of the PSDQ have provided support for the multidimensionality of physical self-perceptions and have confirm the scales of physical self-concept with the physical domain for the Greek sample.

Confirmation of the scales of physical self-concept within the physical domain and the investigation of the relationships between the scales of physical self-concepts has been achieved.

Gender Differences

Marsh (1989) claimed that gender differences in specific components of self-concept may be lost when a total score is formed. He also argued that *'there are small sex effects favouring boys for total self-concept measures and for measures of esteem derived from the self-esteem scales. There also appear to be larger, counterbalancing sex differences in more specific facets of self that are generally consistent with sex stereotypes'* (p. 420). Furthermore he claimed that physical self-concept is one of the subdomains of self where boys seem to have higher scores than girls (p. 421).

The results from this study are fully in line with Marsh's findings. Specifically, in the first phase of the analysis responses were tested to individual items (Table 4.1.1). The frequency and percentage of responses to items for each scale were examined by gender. In four of the eleven scales (Physical Activity, Sport Competence, Strength, Endurance) every item showed a significant gender difference ($p<0.05$) while the scales in Body Fat, Health and Appearance there were no significant gender differences ($p>0.05$). In the remaining scales (Coordination, Flexibility, Global Esteem, Global Physical) there was no clear or consistent evidence of gender differences.

In other analyses, Mann-Whitney tests were used to examine the differences between the scale means of the eleven scales for boys and girls (Table 4.1.2). As was expected, the boys had higher scores in the perceptions of Physical Activity, Coordination, Sport Competence, Appearance, Strength, Flexibility, Endurance, and Global Physical. The greatest difference between measures was observed in the means for the scales of Physical Activity (boys=25.77, girls=18.78) and Endurance (boys=26.46, girls=19.96). Boys and girls however had equal Global Esteem, Health

and Body Fat scale mean scores. It is characteristic and in agreement with previous research that boys had significantly higher perceptions on the majority of the physical self-concept scales. It may be surprising to some but is consistent with the literature (Marsh et al. 1994; Fox & Corbin 1989) that boys also had the higher score on the Appearance scale. As shown in a longitudinal study Body Image Satisfaction (with Appearance being part of it) is lowest for girls at age 13 and for boys at age 15; after these ages it goes up steadily for both sexes. At every age from 11 to 18, however it is lower for girls than it is for boys (Rauste-von Wright, 1989).

It is relevant to compare the present findings with those from Marsh et al., (1994) since the two studies used a similar age group (adolescents) and had comparable sample sizes. In both the present study and that of Marsh et al., (1994) gender differences for the 11 scales were often small, with mean scores being slightly higher for boys.

Fox (1987) in his research using the similar PSPP also found a consistent pattern of gender differences in scale means. Females scored significantly lower ($p<0.05$) on all scale means. He concluded that on average females have lower Physical Self Worth, perceived Sport Competence, Strength, and Physical Conditioning than males, and perceive themselves as having less attractive bodies. The greatest gender difference was observed in the means for the Sports Competence scale. The Physical Appearance scale in the PSPP instrument is restricted to attractiveness of body. This scale dominated the open-ended responses of Fox's study and explained the greatest amount of variance in the Physical Self-Worth construct. For females the body construct was more closely related to the Condition scale, Endurance Exercise, Callisthenics and Dance. For males body was closely related to Condition and Strength subscales Weight Training and Endurance Activity.

According to Fox (1987) this construct requires further study and more careful delineation.

Wylie (1979) in her review found that there was no evidence for gender differences in global self-concept. A similar finding was detected in this study, with no clear or consistent evidence of gender differences at the Global Self Esteem scale.

However, Marsh (1990) suggested 'small gender differences favouring boys for global measures but larger counterbalancing gender differences in more specific facets of self that were consistent with sex stereotypes' (p.101). Harter (1985b) working with younger children has noted that boys exhibited higher physical self-concepts than girls and that girls had lower perceived athletic ability.

In our study it is evident that a wide range of physical self-perceptions for boys and girls exists. The four scales Physical Activity, Sport Competence, Strength, and Endurance showed significant gender differences while in the remaining seven scales there were no significant differences between the mean scores of boys and girls.

We notice that gender differences are apparent in the majority of the research studies of physical self-perceptions. What do these gender differences mean? They could mean that boys overestimate their physical self or that females underestimate theirs. Corbin et al. (1983) found no evidence that males were over assured in their perceptions but suggested that female modesty when stating confidence beliefs might have contributed to the gender differences found in their study. They also suggested that the lower confidence beliefs of females in their study might have been due to realistic beliefs that they would not be able to perform physical tasks as competently as their male peers. In the present study we noticed that girl's hold lower physical self-perceptions compared to boys and their levels of participation in physical activities is

much lower than that of the boys. Probably lower physical self-perceptions do not allow girls to participate in sports and thus develop the skills needed. On the other hand, possibly boys' higher physical self-perceptions give them the confidence to participate in more physical activities. The gender differences noticed here may also be due, at least in part, to existing gender roles resulting from socio-cultural expectations. It is likely to be more important for a boy than for a girl to be good at sport. To be strong, fast and aggressive are important factors in the cultural role of males, in turn these stereotypes possibly affect their physical self-perceptions. The interesting pattern of gender differences found in our study in the physical self-concepts of Greek adolescents, is a full justification of our decision to examine the concepts of boys and girls separately.

The first objective of the study, to investigate the physical self concept of the sample has been achieved.

Physical Activities (The Four by One-Day Recall Questionnaire)

The second aim of the study was to discover the patterns and levels of physical activities for the two genders. The Four by One-Day Recall self-report questionnaire was used to assess the physical activity patterns and levels of activity of the sample. The responses of 405 adolescents (girls=207, boys=198) to the questionnaire were analysed in several ways, levels of activity (Sedentary, Light, Moderate and Hard), occasion of the activity (Weekday, Weekend) and the duration of activities between the responses of boys and girls were differentiated and calculated separately.

Patterns of Physical Activity

First frequencies and percentages of the four categories of activity were calculated separately for weekday and weekend and for boys and girls. Both sexes engaged in some common Sedentary activities (such as Talking to Friends, Watching T.V., Listening to Music) on weekdays and at the weekend (Tables 4.2.2 to 4.2.3). Doing Homework is less popular during the weekend probably because the adolescents are free from the pressure of school studies on the next day. For the group of Light activities the Household chores (60%) for the weekday and Going Out (66%) for the weekend, were the most common activities for the whole sample and for boys and girls separately (Tables 4.2.4 and 4.2.5).

The examination of the responses by frequency and percentage showed that compared to participation in Sedentary or Light activities, only a relatively small number of adolescent boys and girls reported engaging in Moderate activities during weekdays and at the weekend (Tables 4.2.6 and 4.2.7). Walking (18%, 23%), ball games - Basketball, Football, Volleyball - (28%, 13%) and Hard Households (11%, 19%) were mostly reported from boys and girls respectively on weekdays. Basketball (19%) was the predominant sport for boys and Hard Households (30%) was the top activity for girls in the weekend. There seems to be a stereotypical profile for the two genders in the main, i.e. most commonly reported physical activity, Hard Households for girls, Basketball for boys.

Frequencies and percentages of Hard activity participation over the weekday and weekend periods were calculated (Tables 4.2.8 and 4.2.9). Basketball, Ball-games, Football were the most commonly reported activities for boys for both weekday and weekend. Jogging, Walking and Hard Households were most common

in girls during the week and the weekend too. Again we see the emphasis of the girls activities was on stereotypical 'female' activities.

From the responses of the sample we note that boys' and girls' weekday participation in physical activities is 15% for Moderate and 12% for Hard activities. The weekend had a different picture, a much smaller 10% of the sample reported participation in Moderate activities and 9% in Hard activities. (Table 4.2.18). However we notice that the ratio (15/10, 12/9) between the two groups (Moderate/ Hard active) over the two occasions (weekday, weekend) is about the same. That shows that almost the same numbers who were either Moderate or Hard active during the weekday were also Moderate or Hard active at the weekend. Furthermore, the large degree of overlap between the Moderate and Hard groups reported in Tables 4.2.21 and 4.2.22 shows also that to a large extent the same people were involved on the two occasions. These findings provide extra validity to the results.

The results from the patterns of activity in our study revealed that there was a lack of variety in the reported physical activities by the adolescents. This lack of variety may be due to the limited number of physical activities the adolescents are being taught in school. In the physical education curriculum (see Table 1.3, Chapter One), ball games, athletics and gymnastics are the chief physical activities to which the young people are introduced. The adolescents have limited school experiences of other physical activities. Many other reasons may, however, contribute to this phenomenon of limited activities, such as lack of opportunities, access to facilities, limited financial sources. The lack of variety in physical activities from the active sample can be also an explanation of the level of inactivity that characterised the sample and is an area where more research is required. It was also found that ball games (Basketball, Football, Volleyball) were the common physical activities for boys

and Hard Households and individual activities (Walking, Jogging) for girls. The nature of the activities in combination with the perceived sex roles for the specific sample may provide an explanation for the findings. The stereotypical profile of sex roles is also apparent here. Hard Households and individual activities are generally linked with the feminine roles while ball games are physical activities involving body-contact and are traditionally perceived as masculine.

The results also revealed that boys and girls participated in more physical activities during the weekday than during the weekend. A result that is at first sight surprising, may have a simple explanation. We notice that activities during the weekday include the activities that have been part of the physical education curriculum at school. The weekday activity reported by some of the pupils may have been solely the activities they did during compulsory physical education lessons at school with perhaps a short walk (possibly claimed to be 'brisk') to and from school. If this is the case, then in a few years time when these adolescents finish school and are no longer required to participate in compulsory physical education, or walk to school their involvement in physical activities may decrease still further. As reported earlier (Chapter Two) some age studies commonly find decreasing activity with age. The explanation above for the observed difference in weekday and weekend activity levels does not contradict other findings.

This part of the study has reported findings relating to the second research objective, to find out the patterns of physical activity for the two genders. It has revealed a lack of variety in the reported physical activities by the adolescent sample, with ball games (Basketball, Football) as more common physical activities for boys and Hard Households and individual activities such as Walking, Jogging for girls.

Duration of Activities

Analyses of the data based of the time participation with focus on the reported duration of the activity were made. Using data only from participants in physical activities, the means and the standard deviations of the reported periods of activity were calculated for Moderate and Hard activities over weekday and weekend (Tables 4.2.10 and 4.2.13). The large standard deviations showed large differences in the duration reported by different participants. The Mann-Whitney test indicated that in the majority of the Moderate and Hard activities there were no gender differences in duration times, which means that when girls participate in physical activities they play for as long as the boys.

For more information about the range of duration, reported activity duration were grouped into three ranges, 1-30 minutes, 31-60 minutes over 61 minutes (Tables 4.2.14 to 4.2.17). A large fall off in frequencies of participation for longer times and significant gender differences can be seen in the durations of both Moderate and Hard activities. First boys spent more time in Hard physical activities than girls. Second even for participants engaged in some Moderate activity, this was most often for only a short period of time (1-30 minutes). At the weekend we see a different picture, boys and girls having more time and being free from school responsibilities play for longer periods of time (over 60 minutes) in physical activities. At weekends Ball-games and Basketball have a significant number of participants during all time groups.

There is still much debate about how much physical activity is necessary to achieve health benefits. Traditionally, the types of activities recommended by the American College of Sports Medicine (ACSM, 1978) to achieve health benefits have

been periods of 20-30 minutes on three or more days a week. But more recent evidence suggest that more frequent, lower intensity exercise may also be cardioprotective. A review of medical evidence caused ACSM (1990) to add to the traditional guidelines and to include moderate intensity activities on most days as well as the idea that small periods of physical activity can similarly be beneficial. Today there is growing consensus that the regularity of physical activity is more important than its duration (Sallis & Patrick, 1994). One of the major rationales for promoting physical activity in children is to establish patterns of regular activity that can be maintained throughout life (Wimbush, 1994). Adolescents must be encouraged to incorporate physical activity into their lifestyles by walking upstairs, walking with friends, doing household chores, cycling. Currently emphasis is on the promotion of self-directed Moderate level physical activities and away from the youthful sporty images of 'exercise for fitness' towards an 'active living' in a 'landscape of brisk walkers and helmeted cyclists' (Wimbush, 1994, p. 344).

In our study, Walking, ball games (Basketball, Football), Hard Households, and Jogging were the most common activities for both boys and girls. These physical activities can be pleasant and useful for the adolescents and can be maintained throughout life. Thus the active Greek adolescents, without taking into account the duration of participation in each physical activity, are not far from the suggestions of recent research that the duration of the activities is less important than the fact that energy is expended and a habit of activity is established (Sallis & Patrick, 1994).

Activity Levels

The responses were grouped by Activity Level (Moderate/Hard active and Light/Sedentary, Table 4.2.19). The results showed that when the categories 'Moderate' and 'Hard' were combined, 24% of the reported activities were of Moderate or Hard nature (28% and 20% of the activities were respectively reported by boys and girls) (Table 4.2.20). In other words, just one quarter of the reported activities could be classified as being 'active'. Boys reported more active pursuits than girls.

These findings are in line with the findings from the majority of other studies which are characterised by the low levels of activity among young people. A significant difference is often found between the activity levels of the boys and girls. Some of the relevant studies to this research are those from both the British [Dickenson (1987), The Northern Ireland Fitness Survey (1989), HEA (1989), Armstong et al. (1990a, 1991)], and non British environments, [(Huenemann et al. (1967), Seliger et al. (1974), Shephard et al. (1980), The Australian Health and Fitness Survey (1985), The National Children and Youth Fitness Study (McGinnis, 1987)]. The universal conclusion drawn from theses studies is that activity levels among young people are low.

Many possible reasons for this inactivity have been postulated. Lack of time due to other activities, lack of interest, of motivation or encouragement, inadequate facilities too, may sometimes be obstacles for participation. Here, too more research is required to be done in this area especially in a Greek context. Mention has been made previously in this Chapter of possible lack of opportunities for physical recreation available to the present sample.

Gender differences appear to be present in the current study as in the other studies of patterns and levels of physical activity. Gender appears to be a determinant factor in physical activity participation. In our study significant gender differences were evident in the popularity of different Moderate and Hard activities. For example 28% of boys participated in Ball-games as a Moderate activity (Table 4.2.6), whilst only 10% of girls did so. Again 10% of boys participated in Hard Households as a Moderate activity while 30% of girls did so. Gender differences were obvious in other activities in Moderate and Hard groups. Boys prefer team sports while girls prefer individual sports or social activities. However it seems to be generally accepted that team games are not activities that continue into adulthood (Biddle & Mutrie, 1991). If the goal of physical education is to prepare children for a lifetime of physical activity, then it would appear that the nature of physical education that is included as part of the Greek secondary education needs to be urgently considered. Non-team activities such as aerobics, swimming and dance, need to be given greater consideration if more children are to be encouraged to be active when they leave school (Thirlaway & Benton, 1993).

Adolescent girls were found to spend more time in household work than boys. In the Greek culture there is a pressure on girls to help with household chores. But if girls spend more time in household work than boys, there is less time available for girls to allocate to other activities. Differences by sex appear to be in accordance with traditional male-female roles. It appears that even at early ages, family life patterns are being formed that will likely be carried into adulthood. Mauldin & Meeks, (1990) suggested that sports activities were guided by sex-role stereotypes, and that sex-typed social behaviour is reinforced in turn by adult structuring. For example girls are spending more time in household activity than boys, whilst males are spending more

time in active sports. That means that from a relatively early age many girls have significantly less leisure time than their male peers. By encouraging children of both sexes to participate in active sports and household work, parents can teach responsibility and help their children develop more positive attitudes toward sport involvement and equitable division of household work, that it will be carried over into adulthood.

The activity levels of the sample based on the duration of the reported activity by the adolescents were also calculated. It was found that most adolescents (82%) had engaged in at least some Moderate or Hard activity over the two days of the study (weekday and weekend) possibly for only a short period of time (Tables 4.2.21 and 4.2.22). The average daily time of duration of activities of each participant was found to be almost two hours in Moderate activity and Hard activity combined with boys spending twice as long being Active as girls (daily average was 3 hours 21 minutes for the boys and 1 hour 15 minutes for the girls).

Comparing the results of the study with the results of other studies we find many similarities. Cale used the Four by One-Day Recall Questionnaire (1993) in a study with British children and found that 14% of the sample were Active, 20% Moderately active, 55% Inactive and 10% Very Inactive. She also found that while the sample as a whole was Inactive the girls were found to be particularly Inactive. The results from time spent in activity were revealing. Respondents in Cale's study reported they spent a daily average of approximately 1 hour (62.44 minutes) in Moderate activity and a daily average of 16.85 minutes in Hard / Very Hard activity. Nearly all, (97.5%) had engaged in some Moderate activity during the four day period. Of particular concern though were the large individual differences in the amount of

time pupils spent in Hard / Very Hard activity. A daily range of 0 to 161 minutes was obtained.

In our study the results from the duration of the reported participation in physical activities by the sample (Table 4.2.22) appear to be more promising than the activity levels based on the frequency of responses (Table 4.2.20). However these findings may be partly explained by considering the nature of the activities which were classified as Moderate or Hard. As was mentioned earlier Moderate activities included non strenuous activities, the type that most children should be able to engage in and sustain for considerable amount of time (Chapter Four, section 2). These less strenuous activities may be the types of activities young adolescents would choose if engaging in any activity at all and this certainly seemed to happen in this study.

Examining the total duration of the Hard activity level we find an unexpectedly high mean time value over the two days (mean = 201 or 3 hours and 21 minutes). There are three possible explanations for this: one reason might be that when adolescents were involved in Hard activities they participated seriously and for longer periods, compared to their involvement in Moderate activities. The second reason has to do with the limitations of the 'huff and puff' question. Adolescents in this study were asked to report whether the activity in which they had participated made them 'huff and puff'. It was this information that was used to distinguish Moderate from Hard activity level. However as Cale (1993) suggested 'if the adolescents indicated that they had 'huff and puff' this did not necessarily mean that the adolescents 'huffed and puffed' for the whole duration of the activity. In other words, 20 minutes of activity in which the pupils 'huffed and puffed' at some time did not equate to 20 minutes of sustained Hard activity' (p.255). Another problem also noted by Cale (1993) with the 'huff and puff' question was related to the different

fitness levels of the adolescents. Less fit adolescents would have reported to have 'huffed and puffed' more readily during more activities. The fitness level of the adolescents in the study were not known, and possibly this factor influenced the results as it did in earlier studies.

The difference in activity levels between boys and girls has already been discussed. It was found that boys spend more than twice the amount of time in Hard activities than girls (Table 4.2.22).

The daily average of approximately 1 hour and 57 minutes of activity a day initially appears very encouraging. In reality, however, and when the type of activity is taken into account, it becomes apparent that such time of activity may have little impact on adolescent's health. Also of particular concern were the large individual differences in the amount of time adolescents spent in Moderate and Hard activities. Thus, although it is difficult to quantify, the majority of adolescents in our study appear to meet the first guideline stated by Sallis & Patrick (1994) of daily physical activity (see Table 2.2.2, 'Exercise Guidelines for Adolescents' Chapter Two). However it is the second guideline of three or more sessions of moderate and vigorous activity per week that represents a more structured definition of physical activity. Results from the study suggested that substantial numbers of adolescents, and the majority of girls are not meeting the second criterion. This lack of participation in physical activity implies that effective interventions are needed especially for girls during adolescence since participation in physical activities declines, and the decline continues into adulthood. Because of this trend even those adolescents currently meeting the physical activity guidelines are at risk for becoming sedentary adults (Sallis & Patrick, 1994).

In general, the findings from the present study revealed that the adolescents were found to be mainly involved in activities of a Sedentary and Light nature with out considerable large participation durations at Moderate and Hard activities. However, although the sample from this study could be characterised as inactive it appears to be no less active than samples from other studies (Table 6.1.4)

Table 6.1.4. Summary of Studies Assessing the Activity Levels of Adolescents in the UK and Internationally

Study	Sample	Summary of Results
Dickenson, 1987	11-16 years English adolescents	80 to 85% of children did less than 5 mins of vigorous activity during the week studied.
Shephard et al. 1988	10-12 years Canadian adolescents	Light to Moderate activities accounted a daily average of 2.15 hours.
HEA, 1989	9-15 years English adolescents	A weekly average of 4.7 hours of participation in physical activities was revealed. Activity decreased after the age of 12 or 13.
Armstrong et al. (1990b)	11-16 years English adolescents	36% of boys and 48% of girls failed to do a 10 mins period of activity level with heart rate above 139 bpm
Cale, 1993	11-14 years English adolescents	A daily average of 62 mins of involvement in Moderate activity and 17 minutes in Hard activity was found, 55% of the sample was classified as inactive and 10% as very inactive. The majority of the active pupils were boys and the majority of the inactive and very inactive pupils were girls.
Current study, 1997	14-15 years Greek adolescents	A daily average of 1 hour and 57 mins of participation in physical activity was revealed, 77% of the reported activities were characterised as of Sedentary or Light nature. Boys were more active than girls and both sexes were more active during the weekdays than during the weekends.

It is difficult to compare the results of this study with those of other studies because of the different procedures, definitions and categorisations of physical activities used. Earlier Cale (1993) had noted a similar difficulty 'while it is feasible to compare the general findings of a study, to the conclusions of other studies, it is impossible to compare the precise quantitative results. This is due to the different methodologies and definitions of physical activity which have been adopted by the various studies and which invariably influenced the results and conclusions' (p.235). Before we come to any conclusions for the activity levels of the Greek sample and try to make detailed comparisons with activity levels from other samples, we recommend that more research is needed.

The fact that many adolescents were found to have engaged in some activity rather than none is positive. Perhaps some way should be sought to encourage adolescents who are already doing some physical activity in moderate intensity to engage in it more vigorously and for longer periods. Cale (1993) in her study drew similar conclusions. A change of this kind in behaviour is a desirable goal in the promotion of physical activity among adolescents but it needs extensive research to find how to make it feasible.

Extending the original study, an interview study was conducted. A different sample from the self-report sample, was asked to identify and describe their physical involvement according to an interview guide which comprised questions related to a) importance of physical activity participation; b) gender differences; c) characteristics of the 'sports type'; d) influences to participation; e) general comments and suggestions. The major aim of the interview study was to validate the findings of the Four By-One Day Recall physical activity questionnaire. As already mentioned validity is a fundamental aspect of the physical activity self report measures and it is

difficult to be established. Here, with the interview extension of the research the validity of the questionnaire results was confirmed. It seems reasonable to conclude that the measure is capable of accurately measuring physical activity in the Greek adolescents. The reliability of the instrument was confirmed, the same results were found in the two measures given in different groups of adolescents, much later than when the original study was conducted.

This section has answered the second objective of our study, to find out the patterns and levels of physical activity of the two genders. It was found that only one quarter of the reported activities could be classified as active with the rest being inactive. Boys were more Active than girls and both sexes were more Active during the weekdays. The apparent contradiction of results arises because the analyses focused on different events. The examination of the reported activities revealed that about three quarters of the engaged activities (77%) were of a Sedentary or Light nature, whilst the examination of the individuals revealed that most of the adolescents (82%) were at least Moderately active at some time in the study period.

Relationships between Physical Self-Perceptions and Physical Activity Patterns and Levels

To examine the relationship of physical self-concepts and physical activity participation was one of the objectives of this thesis. In this section the results of section 3 of Chapter Four, showing the relationships of physical self-perceptions to both the levels and the patterns of physical activity participation are discussed and compared with the results from other investigators.

Distinction between Active and Inactive Adolescents

First the eleven physical self-perception scales from the PSDQ instrument were taken as the independent variable and the Active / Inactive adolescent grouping as the dependent variable (Table 4.3.1). The relations between the scales variables and activity - group relationships were studied with the Mann-Whitney test statistic (Table 4.3.1). The results showed that the Active and Inactive groups of the sample hold different levels of physical self-perception. In the Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance and Global Physical scales, the mean scores were significantly higher in the Active than in the Inactive group of adolescents. Coordination, Global Physical and Sport Competence have the highest mean scores 28.57, 28.32, and 28.02 respectively for the Active adolescents. It was found that mean scores on a 'group of seven' scales could differentiate the Active from the Inactive adolescents. These scales seem to have stronger reference to activity-linked behaviour and to involvement in activities than the other scales. On the

other hand both the Active and the Inactive groups seem to hold similar perceptions towards their Body Fat, Health, Appearance, and Global Esteem perceptions.

It is relevant to compare the present findings of this study with those from Fox & Corbin (1989). Fox designed and used the PSPP instrument, the scales of which are closely similar to these of the PSDQ. He employed discriminant analyses to determine the relationships of PSPP four scales (Attractive Body, Sports Competence, Fitness Exercise-Conditions and Strength), with a classification of subjects as either Active or Inactive. The subscales scores were the discriminating variables of Active versus Inactive groups. He found that the canonical correlation coefficients of .43 for males and .47 for females were both significant. In the Fox sample, the Condition scale dominated the relationship with the Active group.

Marsh et al., (1994) in his studies concluded that positive physical self-concept is likely to be particularly important in establishing and maintaining levels of physical activity sufficient to promote health related fitness. More recent research by Marsh (1996) revealed that the majority of the physical self-concept scales from the PSDQ instrument were also highly correlated with external criteria including measure of Body Composition, Physical Activity, Endurance, Strength and Flexibility.

In our study, it was found that the Physical Ability group of scales (Figure 6.1.1) could discriminate Active from Inactive respondents. These perceptions relate to various physical fitness skills and abilities. The Body Fat scale could not distinguish Active and Inactive males and females and thus it could not predict Active from Inactive adolescents. This, is an important aspect and must not be ignored. In the study sample, the adolescents who perceive that they have unattractive bodies, appear to do as much (or as little) exercise as the others who perceive themselves attractive. It

will be recalled that the Body Fat scale scores were possibly subject to a bottoming effect and this may be responsible for not finding a between groups difference.

Distinction between Moderate and Hard Active Adolescents

In a further analysis, the Active sample was divided into two groups, Moderate and High active, according to their aerobic level. The relation between physical self-perceptions and the variable active levels was re-investigated.

First correlations between the two variables (physical self-perception scales - levels of activity) were examined (Table 4.3.2). Results showed that the Physical Ability group of scales (Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance) had high significant correlations with both levels of activity (Moderate and Hard). The scales of Health, and Global Physical had low and insignificant correlations with Moderate and Hard level of activity for both boys and girls. The scales Body Fat and Global Esteem had no significant correlation with any group of activity either for the whole sample or for boys and girls separately. For the boys, Physical Activity, Sport Competence and Flexibility scales had a moderate significant correlation with the high activity level. For girls the relations with Physical Activity, Sport Competence, and Endurance had high significant correlations for the Hard active level. For both genders the Moderate level of activity gained only low and moderate significant correlations with the six scales. The exception was with the Appearance scale in the Moderate active level, which had a high significance correlation with only the boys. In general Physical Activity, Coordination, Sport Competence, Strength, Flexibility and Endurance (the Physical Ability self-perception group) had significant correlation with both levels of activity.

There are differences in the correlations between the Moderate and Hard levels of activity and the PSDQ scales. As we noticed most of the correlations appeared within the Hard level. A possible explanation can be linked to with earlier observations, that these adolescents have reported participation in a great number of Moderate activity and possibly certain of these did not merit this classification (e.g. strolling to school recorded as Brisk Walking, a few Basketball shoots recorded as Moderate activity).

Fox (1987) investigated the power of the physical self-perception variables in the classification of individuals reporting high and low levels of activity. His findings revealed that low activity individuals do not rate Sports, Strength and Physical Condition as important as the higher active individuals regardless of gender. 'The results of discriminant analyses, he stated, are consistent with competence motivation theory which suggest that those individuals who are active believe themselves to be competent' (p. 139). Perceptions of Physical Condition and ability to persist in exercise (corresponding at the PSDQ instrument to the Physical Activity and Endurance scales) were for Fox the most significant predictors. The perceptions of Sport Competence, Strength and Physical Condition distinguish between High and Low Active males and females. For the Fox sample, the perception of Attractive Body scales (corresponding at the PSDQ instrument to the Appearance or Body Fat scales) failed to contribute to the prediction of physical activity level and this appears to fit the competence behaviour model to a much lesser degree (p.139).

Page et al., (1993) examined the relationship of the PSPP scales to exercise involvement using British college students. Results showed that for both males and females, the PSPP subscales were capable of discriminating between high and low physical activity participation. A significant canonical function emerged for each of

the analyses. These could classify 70-83% of the sample of high and low exercise involvement. Examination of the structure coefficients revealed that the dominant contributor in each case was the Condition subscale (corresponding at the PSDQ instrument to the Physical Activity and Endurance scales).

Biddle & Armstong (1992) examined the extent to which activity levels were related to selected psychological factors. Results from the PSPP-C showed that for boys it was not possible to discriminate active from less active on the basis of their scores but for girls, the discriminant function was significant. A cross-classification analysis showed that 85.2% of girls were correctly classified. Standardised canonical discriminant function coefficients showed that the best discriminators between active and less active girls using the PSPP-C instrument were scales of Body Attractiveness, Physical Worth, and Global Self-Esteem

In this study, the Physical Ability group of self-perceptions, could differentiate Moderate from Hard active levels of activity. It is notable that Appearance scale with items referring to 'good looks' could predict involvement only for boys at the Moderate level. This shows that positive perceptions in Appearance for boys is connected with some facets of sports participation. This is consistent with traditional sex stereotyping which expects the male to be 'good looking and athletic'. The finding that the Global Esteem scale was not significantly correlated with any level of participation in physical activities, suggests that Global Esteem perceptions have no direct effect on level of participation for both genders. This can be taken as an indication of the hierarchical nature of the Physical Self-Concept through the PSDQ scales (see structure discussion earlier in this chapter) with Global Esteem, a general scale, being more closely correlated to the Global Physical Scale than to specific scales (Marsh, 1996, p.112).

These results have shown that, for the Greek sample the physical self-perceptions are associated with level of involvement of physical activity in a pattern that is in agreement with other studies using the same or a similar instrument. The pattern of relationships is not different from that found in other countries.

Relationships between Perceptions and the most Common Activities

Biddle & Armstrong (1992) noted the importance of examining relations between self-reported types of physical activity and perceptions. Following their recommendation, relations between perceptions and the five most common types of activity in both Moderate and Hard level of participation were studied.

The five most common self-reported Moderate activities (Hard Households, Brisk Walking, Basketball, Volleyball and Ball-games) combined for the weekday and the weekend were also related to the eleven physical self-perceptions and the coefficient correlations were calculated (Table 4.3.3). From the Moderate activities, time spent in Ball-games correlated significantly or highly significantly with the Physical Ability group of self-perception scales (Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance). On the other hand, Basketball gained only moderate correlations with the Coordination, Sport Competence, Strength and Endurance scales. There were no significant correlations for the rest of the Moderate common activities (Hard Households, Brisk Walking, and Volleyball) and any of the physical self perceptions. Ball-games activities and the six physical self-perception scales represent a sport orientation to activities by adolescents.

Relating the five most common self-reported Hard activities (Hard Households, Brisk Walking, Basketball, Football, and Ball-games) in Table 4.3.4 with

the physical self-perception scales we observe that only Basketball and Football had moderate significant correlations with the Physical Ability group of scales Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance). Hard Households, Brisk Walking, and Ball-games had no correlation with any of the eleven scales.

Fox (1989) used canonical correlation analysis to relate PSPP subscales with involvement in five groups of physical activities (Ball-sports, Aerobic endurance, Weight training, Callisthenic exercises and Other Activities). The four PSPP subscale scores were one set of variables and involvement in the five categories of physical activity was the dependent variable. The analyses produced two significant canonical functions for females, which together explained 94% of the variance. Examination showed the first function to be dominated by a strong sport and weights component. The second appears to have been generated from exercise and conditioning elements, with sport loading negatively. A possible interpretation of this finding could be that there are two types of active female. The first is representative of 'athletic' females, taking part in many sports whereas the second is a more private and personal 'exercising' female. Also in the Fox study two significant canonical functions emerged for males, explaining 95% of the common variance. For males the first function was dominated by Weight Training activities and the second by Ball sport activities and perceptions of Sport Competence representing a 'sport' orientation to activity.

In the present study we notice that there is a pattern of relationships between physical self-perceptions and the nature of the participated activities. This means that correlations did not appear to apply to activities, such as Hard Households (instructed

by family) or Walking (to school or shops) but to activities which were engaged in by adolescents by their own choice (Ball-games being performed Moderately at the school break, Basketball, Football). A possible interpretation might suggest that generally there are two types of physical activities the adolescents are involved in: 'voluntary' activities, in which the adolescent choose to participate such as Ball-games performed at the school break or Basketball and Football, and 'non voluntary' activities in which the adolescents 'have' to do, such as help with Hard Household tasks at home, Walk to the school or shops. The analyses (Tables 4.3.3 and 4.3.4) showed that when the activities are more likely to be the result of a free choice, the relation between physical self-perceptions and participation in physical activities appears to be significant. This agrees with the Biddle & Armstrong (1992) statement that physical self-perceptions may be more influential on adolescents activity when they have control over their physical activity patterns (p.330).

Furthermore high correlations appeared between perceptions from the Physical Ability group of self-perceptions (Physical Activity, Coordination, Sport Competence, Strength, Endurance, Flexibility) and team-games (Basketball, Ball-games, Football). These relations support once again the competence motivation theory. This means that individuals with high physical perceptions from the Physical Ability group of scales (Physical Activity, Coordination, Sport Competence, Strength, Endurance, Flexibility) appear to participate at a higher level in team games.

The results from our investigation show that the nature of the physical activity patterns ('voluntary/non-voluntary') can influence the associations with physical self-perceptions. Apart from that, a mixed success on the relationship of perceptions and specific physical activities was revealed. This slightly confused pattern comes in line with other researchers work, and confirms that there are associations between self-

perceptions and types of physical activities and that these are different in males and females.

Multiple Linear Regression Analyses

Multiple Linear Regression was used to incorporate the eleven physical self-concepts as multiple independent variables to find out which can help to predict level of physical activity (Moderate, Hard) involvement for the whole sample and for boys and girls separately (Tables 4.3.5 to 4.3.10). For the Moderate level (Table 4.3.5 to 4.3.7) two perception scales (Strength, Physical Activity) entered the Regression Equation for the total sample. Surprisingly, Appearance was the only predictor scale for the boys' activity while the perception of Physical Activity could predict a significant portion of girls' involvement. For the Hard activity level (Tables 4.3.8 to 4.3.10) for the total sample the perceptions of Physical Activity and Sport Competence were the main predictor scales of activity. For both boys and girls the perception of Physical Activity was the only scale to be retained as a predictor. In general the R Square results were from all regression analyses low. The small values of explained variance are unlikely to be very useful to educators and curriculum developers. In other words, even if PSDQ scores were easily available to educators and others, it would not be possible to determine with reasonable certainty each individual's perceptions of sport and his or her likely level of participation.

Fox used multiple regression to find significant predictors of physical activities. In his analyses he used five physical activity categories Ball-sports, Aerobic Endurance, Weight Training, Callisthenics, and Other Activities. Each of these five activity categories was subjected to multiple regression using the four PSPP scales

(Sport, Condition, Body and Strength) scores as predictors for boys and girls separately. His results revealed that only one of the perception variables entered the regression equation for each of the activity categories for both boys and girls. Interestingly, it was, as in the present study, the Appearance scale of the self-perception measures which related to every activity category. Perceived Sport Competence emerged as the only significant predictor of Ball-sport involvement and explained 19% of its variance. Perceived Strength was the only significant predictor for weight training. Fox found no significant predictors of the other categories, probably because each was a mixture of activities.

Relations between certain traits of physical self concepts and physical activities were tested by Zacharopoulos & Hodge (1991). In their cross-sectional study they examined differences between adolescent athletes (n=63) and non-athletes (n=50) in levels of multidimensional self-concept, using the Self Description Questionnaire III summary items (Marsh & O'Neill, 1984). It was found that: a) athletes differed significantly from non-athletes in physical ability self-concept but not in global self-concept; b) that females did not differ from males in physical ability self-concepts. They claimed their findings support the multi-dimentionality of self-concept. They refuted the assumption that sport participation enhances self-concept in general, suggesting instead that sport may be affected by a particular aspect of the self-concept that is more closely related in sport involvement (i.e. physical ability self-concept rather than other areas of global self-concept).

In our study, the analyses have shown that the self-perceptions are related to amount of physical activity participation. Perceptions are able to distinguish between Active and Inactive individuals and it is also shown that different profiles are associated with Low Active and High Active individuals. The correlation analyses

provided evidence that self-perceptions are significantly related to the types of activity in which individuals choose to be involved. The demonstrated positive relationship between physical self-perceptions and physical activity is again in line with competence motivation theory. Individuals with high competence perceptions in some subdomains of the physical self are more likely to be Active than Inactive. The higher an individual score is in competence the more involved in physical activities he or she tends to be.

However, testing for the direction of the relationship between physical self perceptions and participation in physical activities in our sample, we could not found a causal relationship between the two variables. According to literature (Byrne, 1986; Marsh, 1990a) to test hypotheses bearing on causal predominance between perceptions and behaviour the data would need to be appropriate to a longitudinal design.

It is evident from the above analyses that the relationships between physical self-perceptions and physical activity are statistically significant. The low levels of explained variance show that other psychological and environmental factors must also be involved in the relationship.

This section has answered to the third and final objective of the study, to investigate the association between physical self-concepts and types and levels of involvement in physical activities including possible gender differences.

Summary

A psychological multidimensional questionnaire of the physical domain, the PSDQ was used to study the first objective of the study as stated in Chapter Three. The validity and reliability of the PSDQ were evaluated with the help of a sample of 405 Greek adolescents. The item responses to the eleven scales have been examined and the results have indicated that the scales are measuring independent but correlated constructs. Descriptive statistics for the eleven scales were calculated and the internal consistency of the scales was examined. Factor analysis examined the structure of the data and verified the PSDQ internal validity. The multidimensionality of self-concept within the physical domain, from the Greek data, has been evident. Support for the hierarchical organisation of the physical self-concept was also given. Furthermore, it was found that specific scales belong to a common construct for the specific sample. A pattern of Physical Ability - Physical Fitness structure (Figure 6.1.1) was suggested by factor analysis and structural equation models. It has been shown that at the age of 14-to-15 years old adolescents are able to discriminate the different domains of their physical self.

Gender differences in the frequency and percentage of responses among the eleven PSDQ traits were found to be typically small although they were larger for boys, i.e. in general boys have higher physical self-concepts than girls.

To attain our second objective about physical activities, the Four by One-Day Recall Questionnaire was used to find out the patterns and levels of physical activity for male and female Greek adolescents.

The examination of the responses by frequency and percentage showed that boys and girls were engaged predominately in Sedentary and Light activities on

weekdays and weekends. Only a minority of the sample reported engaging in Moderate and Hard activities. Ball-games (Basketball, Football, Volleyball) were the most commonly reported activities for boys and Hard Households were the most commonly activities for girls during the weekday and the weekend too. Again the stereotypical profile for the two genders over the physical activities (Ball-games for boys, Hard Households for girls) and the lack of variety of activities reported were evident in the study.

Time participation in physical activities was another variable that was studied. Means and standard deviations of the reported periods of activity were calculated for Moderate and Hard activities over the weekday, weekend and for the weekday and weekend grouped together. Large differences in the duration reported by the participants were found (large values of standard deviations). A fall off in frequencies of participation was found for longer times (over 61 minutes) and significant gender differences were seen in the duration of both Moderate and Hard activities with boys spending more time in Hard activities than girls, and more during the weekend. In general, for both genders Moderate activity participation was most often for only a short period of time (1-30 minutes).

The Activity Level of the adolescents was also measured. Activity Level was defined as a four level measure based on the most active level of participation reported. The results showed that only one quarter of the sample could be classed as being involved in Moderate and Hard activities. All the analyses showed the same features, low level of participation in Moderate and Hard activities, generally low participation duration in the activity, and, again, a weekend preference for the more Sedentary activities, except for longer participation periods by a minority of both boys and girls. Gender differences found were based on traditional social roles with boys

being more active than girls. When the level of activity based on the duration of activity was calculated, a more positive note was found. Most adolescents were found to have engaged in some Moderate and Hard activity over the period of study with an average of about 2 hours of activity a day. However this may be insufficient to have any significant impact on the total health of the adolescents especially when the type of activity and the large individual differences are taken into account.

Extending the self-report study, an interview study was conducted to confirm that the Four by One Day Recall questionnaire had yielded valid information. The findings from the interview study provided good support for the ability of the Four by One Day Recall questionnaire to acquire reliable and valid information from the Greek sample.

Our final objective for the study was to examine the association of physical self-concepts and patterns and levels of involvement in physical activities was also reached.

First differences in physical self-concepts between Active and Inactive groups were examined. The analyses showed that the Active and Inactive groups of the sample had different physical self-perceptions. Mean scores of the Physical Ability group of scales, could differentiate the Active and Inactive adolescents, with Coordination, Global Physical and Sport Competence having the higher mean scores for the Active adolescents.

The distinction between Moderate and Hard active individuals according to their aerobic level was also examined. Again the Physical Ability group of self-perceptions, could differentiate Moderate from Hard active levels of activity. Relation between physical self-perceptions and physical activities combined together for the

weekday and the weekend were also found in this study. A pattern of significant correlations between physical self-perceptions and types of activities which generally adolescents participate in by choice was revealed. Coefficient correlations showed that Ball-games activities were related with the Physical Ability physical self-perceptions, representing a sport orientation to activities by adolescents.

Multiple Linear Regression analyses were used and helped to predict level of physical activity (Moderate-Hard) involvement for the whole sample and boys and girls separately. The Physical Activity self-perception variable, was found to be the main predictor of physical activity involvement for both boys and girls. In general the correlations illustrated the relationship between the psychological constructs and activity participation. The Physical Ability group of physical self-perception scales (Physical Activity, Coordination, Sport Competence, Strength, Endurance, Flexibility) was found to be associated with the patterns and levels of physical activity participation and was able to distinguish between Active and Inactive, Moderate and Hard active adolescents in a manner in consistent with competence motivation theory (Harter, 1978).

Finally, a further examination was undertaken in order to examine the direction of the relationship between physical self concept and participation in physical activities. The results of the analyses were not conclusive, as they demonstrated no causal relationship between the two variables.

Results from the analyses are in agreement with the statement by Marsh (1996) that: 'a positive physical self-concept may be an important mediator in achieving other desired outcomes such as appropriate levels of physical activity, health-related physical fitness, and appropriate levels of physical performance' (p. 130). Here, as in other parts of the study, results from the Greek sample are similar with results obtained from samples from other parts of the world (UK, Australia, USA).

CHAPTER SEVEN

SUMMARY

1. General Summary of Findings

The purposes of the study were: to investigate the physical self concept; to determine the physical activity patterns and levels of Greek adolescents; and to examine the associations between physical self perceptions and participation in physical activity for the specific sample. The research was based on the use of two instruments. First, the PSDQ instrument (Marsh et al. 1994) which measures eleven domains of the physical self-concept (Strength, Physical Activity, Endurance/Fitness, Sport Competence, Flexibility, Coordination, Body Fat, Health, Appearance, Global Physical and Global Esteem) was employed. Second, a modified version of the Four by One-Day Recall Questionnaire (Cale,1993) was used to find out the patterns and levels of physical involvement of adolescents.

Responses to the two instruments were obtained from a sample of 405 Greek adolescents (198 boys and 207 girls) studying in six comprehensive schools in Athens. Both instruments were found to be reliable, valid, in the sense that they measured what they were expected to measure, and appropriate for use with Greek males and females aged 14-15.

A summary of the major findings follows:

Statistical analyses of the physical self-perceptions:

- showed that boys generally had modestly higher self-concepts than girls,

- supported the multidimensionality and hierarchy of self-concept within the physical domain,
- supported the Shavelson et al. (1976) model of differentiated physical concepts and indicated that the self-concept hierarchy is probably more complicated than originally anticipated. For the specific sample, the pattern of inter-scale correlations suggested a Physical Ability - Physical Fitness structure of concepts at the lower hierarchical level (Figure 6.1.1).

Statistical analyses of activity patterns and levels of the young adolescents showed:

- low physical activity levels ,
- boys being more active than girls,
- adolescents were more physically active on weekdays than at weekends,
- a stereotypical pattern of the choice of participation in physical activities the majority of the sample was engaged in Sedentary and Light activities,
- gender differences in activity patterns - commonly reported activities for the girls were Household chores, Jogging, Walking while boys enjoyed to play more ball games (Basketball, Football, Ball-games),
- a lack of variety in the physical activity patterns,
- when the level of activity was based on the duration of the activity
    a) most adolescents appeared to have engaged in some Moderate and Hard activity over the 2 days,
    b) a daily average of approximately about 2 hours of physical activity was found.

Statistical analyses of the relationship between physical self-perceptions and activity participation showed:

- the Physical Ability group of self-perception scales (Physical Activity, Coordination, Sport Competence, Strength, Flexibility, Endurance):
    a) was able to distinguish between Active and Inactive adolescents,
    b) was able to distinguish between Moderate and Hard active adolescents,
    c) was associated with physical activity engaged in by adolescents by choice,
- in multiple regression analysis the Physical Activity self perception variable was found to be the main predictor of physical activity involvement for both boys and girls,
- no direction was found for the relationship between physical self-concepts and physical activity involvement.

The findings of the study confirmed for Greek adolescents what is already generally well known, that boys have more positive psychological orientation to sports and this is evidenced by their much higher participation rates in all activity categories. Girls, on the other hand, are less active than boys and perceive themselves to be less able in sports and physical activities.

Although the significant correlations found in the present study do not allow us to come to a causal conclusion that perceptions of competence influence physical activity participation, they do allow us to suggest that this is a possibility which needs further investigation. Further studies may benefit by examining perceived competence using a longitudinal design over a period of five to ten years to find out whether perceptions can actually influence voluntary sport involvement.

2. Evaluation and Limitations of the Study

The Sample

This study was conducted with male and female adolescents of a suburb of Athens. The sample size (405) was adequate for most of the analyses, and was comparable in size with samples used within previous physical self-perception research (e.g. Marsh et al., 1994). The sample was however, not drawn from a geographically large area of Greece, and this may have given some lack of representation of variables such as choice of physical activity. Furthermore, because the sample was chosen from six schools in a suburb of Athens it is not necessarily representative of Greek or even Athenian adolescents. Thus any generalizability of the results to adolescents across the whole country is unknown.

An inspection of the age of the sample revealed that it had a narrow range (14-15 years old), and consequently did not cover adolescence fully, and generalisation of findings to all Greek adolescents should be regarded with caution.

Physical Self Description Questionnaire (PSDQ)

The consistency of the findings that have resulted from the different analytic approaches and the values themselves confirm that the PSDQ instrument was both valid and reliable in this study and there is no evidence here that changes are needed. A replication would look for further evidence of the Physical Ability - Physical Fitness factor structure, found in the PSDQ instrument. The identification of such a structure argues that the PSDQ is sufficiently sensitive in its present form to be useful in studies of this kind.

The Four by One-Day Recall Physical Activity Questionnaire

Generally the instrument performed satisfactorily and could be used in further studies without modification. Detailed analysis of the findings does, however, indicate that minor changes to the administration of the instrument may be worthwhile.

It might be fruitful if the methodology of the use of the questionnaire was slightly changed. The questionnaire was used in this study following Cale's (1993) recommendations, respondents answered the questionnaire on two occasions, on a Monday, and also on another day of the week. Whilst this tactic gives the required two estimates of physical activity without demanding excessive use of memory, it is not necessary for the same respondents to answer the instrument on the two occasions. A future study could use one representative sample of adolescents to answer the weekday form of the questionnaire and another equally representative sample to respond to the weekend form. There are two advantages in using different samples to respond on the two occasions. One is for economy of respondents 'time'. The time saved could be usefully employed to investigate other variables such as availability of resources for games and access to physical activities. The second reason is that adolescents are likely to lose interest when they are asked to respond again to an almost similar questionnaire. This may produce a negative 'done this before' reaction and consequently lack of reliability in responses. However, in the current study the examination of the pattern of the responses over the two occasions did not find any evidence of a negative feeling on the second administration.

It has been said that there are no gold standard measures of physical activity against which to validate an instrument (Cale, 1993). It was stated that problems of assessing validity arise because there is no accepted method of assessing physical activity and corresponding uncertainty about the assessment of validity of physical activity measurement. Using a heart rate monitor as a method to validate the Four by One-Day Recall questionnaire would not be appropriate in this study. The sustained periods of high heart rate that are said to be indicative of fitness and exercise routines in adults, may be inappropriate for young adolescents who are likely to participate in more sporadic, less intense, but higher frequency bouts of activity (Biddle & Armstrong, 1992). Again using observation as a method of validating the Four by One-Day Recall questionnaire may causes alterations or influence adolescents' habitual physical activity patterns and levels. It is, at the very least, unlikely that an adolescent who knew that he or she was being 'observed' would engage in the same pattern of activities as they would in a normal situation. Because interviews can provide depth of explanation within a particular context, while questionnaires paint a broad picture, it is often a good idea to use both. Thus, in order to evaluate the findings of the Four by One-Day Recall questionnaire and assess whether it provided reliable and valid measurements, an interview confirmation of the questionnaire was thought to be appropriate. A small sample of adolescents, different from the ones who answered the questionnaire, was selected and interviewed in a playground close to one of the schools where the questionnaires were distributed. A comparison of what was said in the interview and the questionnaire responses followed.

The findings obtained from the interviews were closely similar to the findings of the Four By One Day Recall Physical Activity Questionnaire. The interview study provided a strong evidence that the findings from the Questionnaire were reliable and

valid. In this respect the interview showed that the instrument is capable of accurately measuring physical activity in Greek adolescents.

In an attempt to achieve balance between economy and reliable measurement it was decided to collect two days of activity information for each adolescent rather than the four days (two days over the winter and two days over the summer) used by Cale (1993). In our study for revealing any possible seasonal variations on the physical activity habits of the respondents the study could be repeated another time over the year. However, it would seem that during the winter months the opportunities for adolescents to engage in outdoor physical activities are restricted by the weather and dark evenings. Cale, (1993) observed no significant differences between winter and summer activity measures. She noted that the winter and summer measures were really taken, in her study, to ensure that a representative on all year round physical activity profile was obtained. In our study, it was thought that since May is an average time in Greece -the weather is mild, the days are long- the youngsters will have ample opportunities for participation in physical activities. Furthermore, in May the schools are still in session and this makes possible the conduct of school based research. It is therefore believed that a study conducted another time of the year is not likely to yield very different results. However May is a month of preparation for exams, and opportunities of involvement in sports may be restricted due to studies and homework. The interview study was decided to be conducted in early September when schools do not operate and adolescents have more time to be involved in physical activities. As mentioned and before the findings from the two methods were similar.

More importance should be given to the nature of the activities as 'voluntary' and 'non-voluntary', for example 'walk to school' is not the same as 'choose to walk

for recreation/exercise' especially when correlating them with psychological components such as physical self-perceptions. This is because it is believed that, physical self-perceptions can influence participation in activities when they are the result of a personal choice and not when they are 'forced' by necessity or other circumstances.

The following were seen as limitations of the study:

- the sample was not representative of Greek adolescents and had a narrow age range 14-15 years old;
- the Four By One Day Recall physical activity questionnaire was originally an interview instrument; in this study the instrument was adapted for use in a self-response group-use context;
- two days of activity information (a weekday and a weekend day) were collected for each adolescent, in an attempt to achieve balance between economy and reliable measurement. Cale (1993) collected two days of activity information, a weekday and a weekend day twice in the year, in order to account for possible seasonal variations;
- the traditional test-retest procedure of reliability was not conducted as it was thought that it may be affected by the stability of the adolescents physical activity habits. However, the interview study conducted to other subjects showed that the instrument can provide reliable and valid findings.

3. Implications

There are three levels of implications that can be made from the findings of this investigation:

1. In seeking to apply the results of the present study it is worthwhile to recall what Marsh (1996) suggested, 'the purpose of the physical self-concept measures is to reflect the physical self-perceptions and self evaluations of the students, and to develop and maintain a positive physical self-concept which will be an important mediator in achieving other desired outcomes such as appropriate levels of physical activity, and appropriate health related performance' (p.129). However, the physical self-perceptions are complex and probably different in content between individuals, making it unrealistic to attempt to establish clear, unambiguous and universal patterns of relationships between physical self-concepts and activities.

2. The study showed that adolescents engage in much of their physical activities on schooldays and at school. This demonstrates the major role that school plays in adolescent's activity patterns and levels. The school is the only place where all children, irrespective of background, sex, race, and athletic prowess have the opportunity to benefit from taught physical activity experiences (Bar-Or, 1987). Thus the responsibility of school is critical. Haywood (1991) stressed that physical activity should become part of the school day in much the same way as the lunch break. If the school sees itself in this central role it has a unique opportunity to become a potent force for promoting physical activity within the community, responding to the changing needs of modern society.

At school adolescents can be guided through a physical education curriculum that includes gymnastics, game skills, dance, swimming, athletics and outdoor

education, with plenty of opportunities to explore the full range of available activities. With a balanced, enjoyable programme, adolescents can develop a variety of motor skills, achieve success in their own levels and feel confident in their own abilities and thus establish more active lifestyles.

Research mentioned in Chapter Two and the findings from the current study point to the wishes of girls to engage in a different pattern of activities of that of boys. Thus it will be more relevant to their needs if boys and girls, through the physical education curriculum, are presented with differentiated activities. Furthermore taking into consideration the results from the German study (Naul & Neuhaus, 1996), (Chapter Two) non-traditional sports and physical activities such as judo, karate, skateboard were mainly the preferred activities of these adolescents. Within the Greek school environment, such physical activities can be encouraged by making necessary equipment available at break times. Also other non-conventional physical activities and the availability of local clubs and facilities can be brought to adolescent's attention, in an attempt to promote positive attitudes to physical activity. It would be wrong to distinguish physical activity from other aspects of a healthy lifestyle, so special provision needs to be made for a cross-curricular approach to activity education. Science, home economics, physical education staff should all be involved in a multidisciplinary, integrated approach.

Today, however the Greek school does not seem to realise the importance of such an approach to health issues. As we noticed in Chapter One, while describing the physical education curriculum, a narrow range of the taught physical activities was revealed. We actually mentioned that activities such as swimming - an individual activity which is preferred by girls, and outdoor activities are not even included in the Greek curriculum. The findings from this study confirmed this case and showed a lack

of variety of the reported participated physical activities. This condition has to change and the role and responsibilities of school need to be redefined and developed.

3. The low levels of activity by females was a striking finding. The active girls were mainly involved in Hard household activities and individual activities such as Walking, Jogging. In his study, Fox (1987) noticing a similar phenomenon of girls' inactivity stated that 'the majority of girls seem to emerge from their childhood experience with a very narrow base to their physical self-concept' (p.161), as a consequence by adolescence the girls perceive themselves as having low competence in sports and physical activities. Harris (1987) argued that girls need to be given the equal opportunities and the positive reinforcements throughout their life spans as boys. Equal opportunities, however, does not necessarily mean the same activity opportunities, as we mentioned and above girls do not seem to prefer the same kind of activities as boys do (e.g. team games). This is an instance where the PE curriculum and PE teachers need to take a 'wider view' of what is in the life-long interests of the young people.

Apart from the school, the local community can help to broaden the content of the physical self-concept in females. The number and the quality of physical facilities available for physical activity (e.g. bicycle tracks, walking paths, public swimming pools, sports centres); and the number and type of community activities offered to promote physical exercise (e.g. classes and groups, fitness screenings, community contests and events), are determined by local policies aimed at encouraging physical activity. It is possible that such provision can influence a larger proportion of adolescents especially girls to participate in sports and exercise activities. However as we already said, promoting physical activity at a local level is not an easy task, it needs well planned strategies, long term goals and frequent evaluation.

3. Recommendations for further research

From the findings of our study we can recommend the use of the PSDQ and the Four by One-Day Recall questionnaire for further research. Furthermore the implications of the findings result in the following recommendations:

1. The first is a simple replication of the study. In the current study the sample was large enough for statistical analyses but not representative of Greek adolescents, since it was conducted with youngsters from one area only. Thus an immediate replication of this study with adolescents from other areas (both rural and urban), with other age groups (from early to late adolescents) and with less importance placed to seasonal variations, is suggested.

2. The second recommendation refers to the academic training of physical educators for secondary education. In Chapter One we noticed that traditional team games dominate the physical education curriculum and we emphasised the imbalance that such a limited physical education experience may create to adolescents. Thus more focus in degree programmes should be placed on teaching the adolescents 'a wide variety of individual, partner, and team activities, with the emphasis placed upon developing a sound foundation of motor skills, which can contribute to successful and enjoyable physical activity experiences both in the present and the future' (Armstrong, Bellew et al, 1990d, p. 225). Practical applications and tips should also be included in teacher inservice classes.

In addition, the current content of teacher training focuses on physiological and pedagogical factors only. Course work on the stages of human psycho-emotional development and motivation should be added to teacher training programmes. Today's physical educators should not be only concerned with the physical well-being

of young people but also consider the unique opportunity they have to affect quality of life via the enhancement of the physical self-concept.

Concluding we note that Greek adolescents have been shown to conform to norms and patterns of physical activity found also in other parts of the world (UK, Australia, USA). An interesting and unexpected result revealed the important part that school physical education plays in the formation of the norms and patterns of physical activity. Thus future research should start to look systematically at ways of improving the current Greek physical education programmes.

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APPENDIX A

THE PHYSICAL SELF-DESCRIPTION QUESTIONNAIRE

THE PHYSICAL DESCRIPTION QUESTIONNAIRE

Name:.....

Age:.....

Male:..... Female:.....

School/Institution:..... Grade/Year:.....

This a chance to look at yourself. IT IS NOT A TEST. There are no right answers and everyone will have different answers. Be sure that your answers show how you feel about yourself. PLEASE DO NOT TALK ABOUT YOUR ANSWERS WITH ANYONE ELSE. We will keep your answers private.

The purpose of this study is to see how people describe themselves physically. In the following pages you will be asked to think about yourself physically; for example, how good looking you are, how strong you are, hoe good you are at sports, whether you exercise regularly, when you are physically coordinated, whether you get sick very often and so forth. Answer each sentence quickly as you feel now. Please do not leave any sentence blank.

When you are ready to begin, please read each sentence and decide your answer. (you may read quietly to yourself if they are read aloud to you). There are six possible answers for each question - "true", "false", and four answers in between. There are six numbers next to each sentence, one for each of the answers. The answers are written at the top of the numbers. Choose your answer to a sentence and put a circle (O) around the number under the answer you choose. Do not say your answer aloud or talk about with anyone else.

Before you start there are three example below. I have already answered two of the three sentences to show you how to do it. In the third one you must choose your own answer and circle it (O).

	false	mostly false	more false than true	more true than false	mostly true	true
1. I like to read comic books	1	2	3	4	5	(6)

(I put a circle around the number 6 under the answer "True". This means that I really like to read comic books. If I did not like to read comic books very much, I would have answered 1 (False) or 2 (Mostly False)

2. In general, I am neat and tidy	1	2	(3)	4	5	6

(I answered "More false than true" because I am definitely not very neat, but I am not really messy either)

3. I like to watch T. V.	1	2	3	4	5	6

(For this sentence you have to choose the answer that is best for you. First you must decide if the sentence is "True" or "False" for you, or somewhere in between. If you really like to watch T.V. a lot you would answer "True" by putting a circle around the last number 6. If you hate watching T.V. you would answer "False" by circling the first number 1. If you do not like T. V. very much, but you watch it sometimes, you might decide to circle 2 "Mostly false" or 3 "More false than true").

If you want to change an answer you have marked you should cross out the circle and put a new circle around another number on the same line. For all sentences be sure that your circle is on the same line as the sentence you are answering. You should have only one answer circled for each sentence. Do not leave out any sentences even if you are not sure which number to circle. If you have any questions hold up your hand. Otherwise please begin.

	FALSE	MOSTLY FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	MOSTLY TRUE	TRUE
1. When I get sick I feel so bad that I cannot even get out of bed.	1	2	3	4	5	6
2. I feel confident when doing coordinated movements.	1	2	3	4	5	6
3. Several times a week I exercise or play hard enough to breathe hard (to huff and puff).	1	2	3	4	5	6
4. I am too fat.	1	2	3	4	5	6
5.Other people think I am good at sports.	1	2	3	4	5	6
6. I am satisfied with the kind of person I am physically.	1	2	3	4	5	6
7. I am attractive for my age.	1	2	3	4	5	6
8. I am physically strong person.	1	2	3	4	5	6
9. I am quite good at bending, twisting, and turning my body.	1	2	3	4	5	6
10. I can run a long way without stopping.	1	2	3	4	5	6
11. Overall, most things I do turn out well.	1	2	3	4	5	6

	FALSE	MOSTLY FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	MOSTLY TRUE	TRUE
12. I usually catch whatever illness (flu, virus, cold, etc.) is going around.	1	2	3	4	5	6
13. Controlling movements of my body comes easily to me.	1	2	3	4	5	6
14. I often do exercise or activities that makes me breathe hard.	1	2	3	4	5	6
15. My waist is too large.	1	2	3	4	5	6
16. I am good at sports.	1	2	3	4	5	6
17. Physically, I am happy with myself.	1	2	3	4	5	6
18. I have a nice looking face.	1	2	3	4	5	6
19. I have a lot of power in my body.	1	2	3	4	5	6
20. My body is flexible.	1	2	3	4	5	6
21. I would do well in a test of physical endurance or stamina.	1	2	3	4	5	6
22. I don't have much to be proud of.	1	2	3	4	5	6
23. I am sick so often that I cannot do all the things I want to do.	1	2	3	4	5	6
24. I am good at coordinated movements.	1	2	3	4	5	6

	FALSE	MOSTLY FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	MOSTLY TRUE	TRUE
25. I get exercise or activity three or four times a week that makes me huff and puff and lasts at least 30 minutes.	1	2	3	4	5	6
26. I have too much fat on my body.	1	2	3	4	5	6
27. Most sports are easy for me.	1	2	3	4	5	6
28. I feel good about the way I look and what I can do physically.	1	2	3	4	5	6
29. I'm better looking than most of my friends.	1	2	3	4	5	6
30. I am stronger than most of my friends.	1	2	3	4	5	6
31. My body is stiff and inflexible.	1	2	3	4	5	6
32. I could jog 5 kilometres without stopping.	1	2	3	4	5	6
33. I feel that my life is not very useful.	1	2	3	4	5	6
34. I hardly ever get sick or ill.	1	2	3	4	5	6
35. I can perform movements smoothly in most physical activities.	1	2	3	4	5	6
36. I do physically active things (like jogging, dancing, bicycling, aerobics, gym, or swimming) at least three times a week.	1	2	3	4	5	6
37. I am overweight.	1	2	3	4	5	6

	FALSE	MOSTLY FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	MOSTLY TRUE	TRUE
38. I have good sports skills.	1	2	3	4	5	6
39. Physically I feel good about myself.	1	2	3	4	5	6
40. I am ugly.	1	2	3	4	5	6
41. I am weak and have no muscles.	1	2	3	4	5	6
42. My body parts bend and move in most directions well.	1	2	3	4	5	6
43. I think I could run a long way without getting tired.	1	2	3	4	5	6
44. Overall, I'm no good.	1	2	3	4	5	6
45. I get sick a lot.	1	2	3	4	5	6
46. I find my body handles coordinated movements with ease.	1	2	3	4	5	6
47. I do lots of sports, dance, gym, or other physical activities.	1	2	3	4	5	6
48. My stomach is too big.	1	2	3	4	5	6
49. I am better at sports than most of my friends.	1	2	3	4	5	6
50. I feel good about who I am and what I can do physically.	1	2	3	4	5	6
51. I am good looking.	1	2	3	4	5	6
52. I would do well in a test of strength.	1	2	3	4	5	6

	FALSE	MOSTLY FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	MOSTLY TRUE	TRUE
53. I think I am flexible enough for most sports.	1	2	3	4	5	6
54. I can be physically active for a long period of time without getting tired.	1	2	3	4	5	6
55. Most things I do, I do well.	1	2	3	4	5	6
56. When I get sick it takes me a long time to get better.	1	2	3	4	5	6
57. I am graceful and coordinated when I do sports and activities.	1	2	3	4	5	6
58. I do sports, exercise, dance or other physical activities almost every day.	1	2	3	4	5	6
59. Other people think that I am fat	1	2	3	4	5	6
60. I play sports well.	1	2	3	4	5	6
61. I feel good about who I am physically.	1	2	3	4	5	6
62. Nobody thinks that I'm good looking.	1	2	3	4	5	6
63. I am good in lifting heavy objects.	1	2	3	4	5	6
64. I think I would perform well on a test measuring flexibility.	1	2	3	4	5	6
65. I am good at endurance activities like distance running, swimming, or cross-country skiing.	1	2	3	4	5	6

	MOSTLY FALSE	FALSE	MORE FALSE THAN TRUE	MORE TRUE THAN FALSE	TRUE	MOSTLY TRUE
66. Overall, I have a lot to be proud of.	1	2	3	4	5	6
67. I have to go to the doctor because of illness more than most people my age.	1	2	3	4	5	6
68. Overall, I'm a failure.	1	2	3	4	5	6
69. I usually stay healthy even when my friends get sick.	1	2	3	4	5	6
70. Nothing I do ever seems to turn out right.	1	2	3	4	5	6

APPENDIX B

THE FOUR BY ONE-DAY RECALL PHYSICAL ACTIVITY QUESTIONNAIRE

a) WEEKEND FORM

b) WEEK DAY FORM

2. QUESTIONNAIRE WEEKEND FORM

WHAT YOU DID ON SATURDAY/SUNDAY

The purpose of this questionnaire is to find out how young people spend their time. The questionnaire will ask you about what did you did either on SATURDAY or on SUNDAY. You should not mention things you have done on any other day. Please try to be honest and accurate in your answers. Do not worry if you have not done any of the activities in the lists, just go on to the next part of the questionnaire. All the answers you give will be confidential.

The questionnaire is divided into three parts. Part one -in the morning. Part Two - in the afternoon. Part Three - in the evening.

Some of the following questions will simply ask you whether you participated in activity/ies i.e.

watched television ❑

If you participated in some of these activities you tick ✓ where is appropriate.

Other questions will ask you for how long did you do the activity/ies i.e.

		TOTAL TIME hours	minutes
Cared for pets	❑	❑	❑❑
went out with friends	❑	❑	❑❑

Additionally there are questions which will ask you whether you 'huff-puff' ie

	TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
swimming	❑ ❑	❑❑	❑	❑

Attention should be given to the exact time you were involved in the activity/ies. For example, being at the swimming baths for 2 hours does not equate to swimming for 2 hours. You should report only the time you were actually doing the activity for, excluding changing time, travel time, breaks etc.

To 'HUFF and PUFF' means to breathe hard, harder than normal. It is associated with activities that make your heart beat faster than usual and tend to make you hot and/or sweaty- running playing basketball or even walking briskly may cause 'huffing and puffing'.

Finally at the bottom of each page there is a question asking you whether there is any other activity you did yesterday. If yes please report this activity/ies.

PART ONE -IN THE MORNING

1) What time did you get up on Saturday/Sunday?

☐☐☐☐ a.m.

2) Did you do any of these activities?

watched television	☐
watched videos	☐
listened to music	☐
played card or board games	☐
drew or painted	☐
played a musical instrument	☐
used a computer/played computer games	☐
homework	☐
read for pleasure	☐

3) Did you do any of these activities?
If so, for how long?

		TOTAL TIME hours	minutes
cared for pets	☐	☐	☐☐
light house hold chores, wash-up, tidy-up etc.	☐	☐	☐☐
went out with your friends	☐	☐	☐☐
went for shopping	☐	☐	☐☐
had private academic lessons	☐	☐	☐☐

IN THE MORNING

4) Did you do any of these activities ?
If so, for how long? Did you "huff and puff?"

	TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
clean /hoover or move furniture	❑	❑❑	❑	❑
cycle	❑	❑❑	❑	❑
brisk walking	❑	❑❑	❑	❑
swimming	❑	❑❑	❑	❑
tennis	❑	❑❑	❑	❑
went to the gym	❑	❑❑	❑	❑
volleyball	❑	❑❑	❑	❑
basketball	❑	❑❑	❑	❑
athletics	❑	❑❑	❑	❑
football	❑	❑❑	❑	❑
jogging	❑	❑❑	❑	❑
went for dancing	❑	❑❑	❑	❑

5) Any other activity?
If so, what?

---------- ❑ ❑ ❑❑ ❑ ❑

PART TWO-IN THE AFTERNOON

6)

watched television	❑
watched videos	❑
listened to music	❑
played card or board games	❑
drew or painted	❑
played a musical instrument	❑
used a computer/played computer games	❑
homework	❑
read for pleasure	❑

7)

	TOTAL TIME hours	minutes
cared for pets	❑ ❑	❑❑
light house hold chores, wash-up, tidy-up etc.	❑ ❑	❑❑
went out with friends	❑ ❑	❑❑

IN THE EVENING

8)

	TOTAL TIME "HUFF AND PUFF" hours	minutes	Yes	No
clean /hoover or move furniture	☐ ☐	☐☐	☐	☐
cycle	☐ ☐	☐☐	☐	☐
brisk walking	☐ ☐	☐☐	☐	☐
swimming	☐ ☐	☐☐	☐	☐
tennis	☐ ☐	☐☐	☐	☐
went to the gym	☐ ☐	☐☐	☐	☐
volleyball	☐ ☐	☐☐	☐	☐
basketball	☐ ☐	☐☐	☐	☐
athletics	☐ ☐	☐☐	☐	☐
football	☐ ☐	☐☐	☐	☐
jogging	☐ ☐	☐☐	☐	☐
went for dancing	☐ ☐	☐☐	☐	☐

9) Any other activity?
If so, what?
---------- ☐ ☐ ☐☐ ☐☐

PART THREE-IN THE EVENING

10)

watched television	❑
watched videos	❑
listened to music	❑
played card or board games	❑
drew or painted	❑
played a musical instrument	❑
used a computer/played computer games	❑
homework	❑
read for pleasure	❑

11)

	TOTAL TIME hours	minutes
cared for pets	❑❑	❑❑
light house hold chores, wash-up, tidy-up etc.	❑❑	❑❑
went for a walk / stroll	❑❑	❑❑
did a part-time job	❑❑	❑❑
went to a youth club or disco	❑❑	❑❑

IN THE EVENING

12)

	TOTAL TIME "HUFF AND PUFF" hours minutes			Yes	No
clean /hoover or move furniture	❑	❑	❑❑	❑	❑
cycle	❑	❑	❑❑	❑	❑
brisk walking	❑	❑	❑❑	❑	❑
swimming	❑	❑	❑❑	❑	❑
tennis	❑	❑	❑❑	❑	❑
went to the gym	❑	❑	❑❑	❑	❑
volleyball	❑	❑	❑❑	❑	❑
basketball	❑	❑	❑❑	❑	❑
athletics	❑	❑	❑❑	❑	❑
football	❑	❑	❑❑	❑	❑
jogging	❑	❑	❑❑	❑	❑
went for dancing	❑	❑	❑❑	❑	❑

13) Any other activity?
If so, what?

---------- ❑ ❑ ❑❑ ❑❑

14) What time did you go to bed on Saturday/Sunday?

❑❑❑❑ p.m.

15) Was Saturday/Sunday a typical day for you?

YES ❑
NO ❑

If no why not?

----

3. QUESTIONNAIRE WEEK DAY FORM

Name:.....

Age:.....

Male:..... Female:.....

School:..... Grade/Year:.....

WHAT YOU DID YESTERDAY

The purpose of this questionnaire is to find out how young people spend their time. The questionnaire will ask you about what did you did YESTERDAY. You should not mention things you have done on any other day. Please try to be honest and accurate in your answers. Do not worry if you have not done any of the activities in the lists, just go on to the next part of the questionnaire. All the answers you give will be confidential.

The questionnaire is divided into three parts. Part one - yesterday morning before school, at school, at break time. Part Two - after school. Part Three - in the evening.

Some of the following questions will simply ask you whether you participated in activity/ies i.e. watched television ❑

If you participated in some of these activities you tick ✓ where is appropriate.

Other questions will ask you for how long did you do the activity/ies i.e.

		TOTAL TIME hours	minutes
Cared for pets	❑	❑	❑❑
went out with friends	❑	❑	❑❑

Additionally there are questions which will ask you whether you 'huff-puff' ie

		TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
swimming	❑	❑	❑❑	❑	❑

Attention should be given to the exact time you were involved in the activity/ies. For example, being at the swimming baths for 2 hours does not equate to swimming for 2 hours. You should report only the time you were actually doing the activity for, excluding changing time, travel time, breaks etc.

To 'HUFF and PUFF' means to breathe hard, harder than normal. It is associated with activities that make your heart beat faster than usual and tend to make you hot and/or sweaty- running playing basketball or even walking briskly may cause 'huffing and puffing'.

Finally at the bottom of each page there is a question asking you whether there is any other activity you did yesterday. If yes please report this activity/ies.

PART ONE-IN THE MORNING

1) What time did you get up yesterday?

❑ ❑ ❑ ❑ a. m.

2) How did you get to school yesterday?
(Just report the main method of how you got there).

WALK	❑
BUS	❑
CAR	❑
CYCLE	❑
OTHER	❑
(If other, what was it?)	

3) How long did the journey take?

❑ ❑ minutes

IN THE MORNING
YESTERDAY MORNING BEFORE SCHOOL

4) Did you do any of these activities?
watched television
listened to music
talked with friends

5) Did you do any light household chores, wash-up, tidy-up etc. ?
If so, for how long?

	TOTAL TIME hours	minutes
light household chores	❑	❑❑

6) Did you do any of these activities? If so, for how long?
Did you "huff and puff"

	TOTAL TIME "HUFF AND PUFF" hours	minutes	Yes	No
played football in the playground	❑	❑❑	❑	❑
played basketball, volleyball in the playground	❑	❑❑	❑	❑

7). Any other activity?
If so, What?

	TOTAL TIME "HUFF AND PUFF" hours	minutes	Yes	No
_____	❑	❑❑	❑	❑

AT SCHOOL

8) Was yesterday a P.E. day?

YES ❑
NO ❑

9) If yes, did you do any of these activities?
(If no, go to Q 11 on next page)

		TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
basketball	❑	❑	❑❑	❑	❑
volleyball	❑	❑	❑❑	❑	❑
gymnastics	❑	❑	❑❑	❑	❑
jogging	❑	❑	❑❑	❑	❑
football	❑	❑	❑❑	❑	❑
athletics	❑	❑	❑❑	❑	❑
swimming	❑	❑	❑❑	❑	❑

10) Any other activity?
If so, what?

_____ ❑ ❑ ❑❑ ❑ ❑

AT BREAK TIME

11)

talked with friends	❑
got prepared for the next lesson	❑
had something to eat	❑

12)

	TOTAL TIME hours	minutes	"HUFF AND PUFF" Yes	No
played football in the playground	❑	❑❑	❑	❑
played other ball games in the playground	❑	❑❑	❑	❑
played tag/chasing games in the playground	❑	❑❑	❑	❑

13) Any other activity?
If so, What?
---------- ❑ ❑❑ ❑❑

PART TWO-AFTER SCHOOL

14)

talked with friends ❑

listened to music ❑

15)

	TOTAL TIME hours	minutes		"HUFF AND PUFF" Yes	No
played football in the playground	❑	❑	❑❑	❑❑	
played other ball games in the playground	❑	❑	❑❑	❑❑	
jogged or walked fast	❑	❑	❑❑	❑❑	

16) How did you get home from school yesterday?
(Just report the main method of how you got home).

WALK ❑

BUS ❑

CAR ❑

CYCLE ❑

OTHER ❑
(If other, what was it?)

17) How long did the journey take?

❑❑ minutes

18) Any other activity?
If so, What?

_____ ❑ ❑ ❑❑ ❑❑

PART THREE: IN THE EVENING

19)

Did you do any of these activities?

watched television	❑
watched videos	❑
listened to music	❑
drew or painted	❑
played a musical instrument	❑
used a computer/played computer games	❑
homework	❑
read for pleasure	❑
played card or board games	❑

20) Did you do any of these activities?
If so, for how long?

		TOTAL TIME hours	minutes
cared for pets	❑	❑	❑❑
light house hold chores, wash-up, tidy-up etc.	❑	❑	❑❑
went out with friends	❑	❑	❑❑
had private academic lessons	❑	❑	❑❑

IN THE EVENING

21)

	TOTAL TIME "HUFF AND PUFF" hours minutes			Yes	No
clean /hoover or move furniture	❑	❑	❑❑	❑	❑
brisk walking	❑	❑	❑❑	❑	❑
cycle	❑	❑	❑❑	❑	❑
swimming	❑	❑	❑❑	❑	❑
tennis	❑	❑	❑❑	❑	❑
went to the gym	❑	❑	❑❑	❑	❑
volleyball	❑	❑	❑❑	❑	❑
basketball	❑	❑	❑❑	❑	❑
athletics	❑	❑	❑❑	❑	❑
jogging	❑	❑	❑❑	❑	❑
football	❑	❑	❑❑	❑	❑
dance	❑	❑	❑❑	❑	❑

22) Any other activity?
If so, what?
_____ ❑ ❑ ❑❑ ❑ ❑

23) What time did you go to bed on Saturday/Sunday?

❑❑❑❑ p.m.

24) Was Saturday/Sunday a typical day for you?

YES ❑
NO ❑

If no why not?

_____

APPENDIX C

The Greek versions

1. ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΠΕΡΙΓΡΑΦΗΣ ΤΟΥ ΕΞΩΤΕΡΙΚΟΥ – ΣΩΜΑΤΙΚΟΥ ΕΑΥΤΟΥ ΜΑΣ

2. ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΠΕΡΙΓΡΑΦΗΣ ΔΡΑΣΤΗΡΙΟΤΗΤΩΝ

   α) ΣΑΒΒΑΤΟΚΥΡΙΑΚΟΥ

   β) ΚΑΘΗΜΕΡΙΝΗΣ ΗΜΕΡΑΣ

1. ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΠΕΡΙΓΡΑΦΗΣ ΤΟΥ ΕΞΩΤΕΡΙΚΟΥ – ΣΩΜΑΤΙΚΟΥ ΕΑΥΤΟΥ ΜΑΣ

ΤΙ ΠΙΣΤΕΥΩ ΓΙΑ ΕΜΕΝΑ

Αυτο ειναι ενα ερωτηματολογιο που θα σου δωσει την ευκαιρια να εκτιμησεις τον εξωτερικο–σωματικο εαυτον σου ΔΕΝ ΕΙΝΑΙ ΤΕΣΤ. Δεν υπαρχουν σωστες και λαθος, απαντησεις και ο καθενας μπορει να εχει διαφορετικη αποψη. Να εισαι ομως σιγουρος/σιγουρη οτι οι απαντησεις που θα δωσεις δειχνουν το πως αισθανεσαι για τον εαυτον σου. ΠΑΡΑΚΑΛΩ ΜΗΝ ΣΥΖΗΤΗΣΕΙΣ ΤΙΣ ΑΠΑΝΤΗΣΕΙΣ ΣΟΥ ΜΕ ΚΑΝΕΝΑΝ, και εμεις με τη σειρα μας, θα κρατησουμε τις απαντησεις σου κρυφες.

Ο σκοπος αυτης της ερευνας ειναι να δουμε πως οι ανθρωποι περιγραφουν τον εξωτερικο–σωματικο εαυτον τους. Στις παρακατω σελιδες υπαρχουν προτασεις που θα σε βοηθησουν να σκεφτεις σχετικα με τον σωματικο εαυτον σου. Για παραδειγμα ποσο δυνατη/δυνατος εισαι; ποσο καλος/καλη εισαι στα σπορ; ποσο συχνα γυμναζεσαι; ποσο συχνα αρρωσταινεις; κ.λ.π. Απαντησε σε καθε προταση, για το πως αισθανεσαι. Σε παρακαλω, μην αφησεις καμια προταση κενη.

Οταν εισαι ετοιμος να ξεκινησεις, διαβασε καθε προταση και αποφασισε για την απαντηση σου. Υπαρχουν εξι πιθανες απαντησεις για καθε προταση– σωστο, λαθος, και τεσσερις ενδιαμεσες απαντησεις. Υπαρχουν εξι νουμερα διπλα απο καθε προταση, καθε νουμερο αντιστοιχει σε μια απαντηση. Οι απαντησεις ειναι γραμμενες στην κορυφη της σελιδας. Σε καθε προταση διαλεξε τη σωστη απαντηση κατα τη γνωμη σου. Σημειωσε εναν κυκλο (○) γυρω απο το νουμερο κατω απο την απαντηση που επελεξες. Μη διαβασεις τις απαντησεις σου δυνατα και μην τις συζητησεις με κανεναν.

Πριν ξεκινησεις υπαρχουν τρια παραδειγματα για να σε βοηθησουν. Εχω ηδη απαντησει στις δυο απο τις τρεις προτασεις–παραδειγματα, για να σου δειξω πως θα εργαστεις.
Στην τριτη προταση πρεπει να επιλεξεις την απαντηση μονη /μονος σου
και να σημειωσεις εναν κυκλο (○) γυρω της.

	ΛΑΘΟΣ	ΣΧΕΔΟΝ ΛΑΘΟΣ	ΠΙΟ ΠΟΛΥ ΛΑΘΟΣ ΠΑΡΑ ΣΩΣΤΟ	ΠΙΟ ΠΟΛΥ ΣΩΣΤΟ ΠΑΡΑ ΛΑΘΟΣ	ΣΧΕΔΟΝ ΣΩΣΤΟ	ΣΩΣΤΟ
1. Μου αρεσει να διαβαζω κινουμενα σχεδια–κομικς.	1	2	3	4	5	⑥
2. Γενικα, ειμαι καθαρος/καθαρη και τακτικος/τακτικη.	1	2	③	4	5	6
3. Μου αρεσει να βλεπω τηλεοραση.	1	2	3	4	5	6

Αν θελεις να αλλαξεις καποια απαντηση που εχεις σημειωσει, μπορεις να διαγραψεις τον κυκλο που εχεις κανει με μια γραμμη και να βαλεις εναν νεο κυκλο γυρω απο την απαντηση της ιδιας προτασης, που σε εκφραζει. Πρεπει να δωσεις ΜΟΝΟ ΜΙΑ ΑΠΑΝΤΗΣΗ σε καθε προταση. Μην αφησεις καμια προταση αναπαντητη, ακομα και οταν δεν εισαι σιγουρος/σιγουρη για το πιο νουμερο να επιλεξεις.

	ΛΑΘΟΣ	ΣΧΕΔΟΝ ΛΑΘΟΣ	ΠΙΟ ΠΟΛΥ ΛΑΘΟΣ ΠΑΡΑ ΣΩΣΤΟ	ΠΙΟ ΠΟΛΥ ΣΩΣΤΟ ΠΑΡΑ ΛΑΘΟΣ	ΣΧΕΔΟΝ ΣΩΣΤΟ	ΣΩΣΤΟ
1. Όταν αρρωσταινω, νιωθω τοσο ασχημα που δεν μπορω ουτε να σηκωθω απο το κρεββατι.	1	2	3	4	5	6
2. Με πολυ ανεση κανω κινησεις που απαιτουν συντονισμο.	1	2	3	4	5	6
3. Αρκετες φορες την εβδομαδα ασκουμαι τοσο εντονα ωστε να λαχανιαζω.	1	2	3	4	5	6
4. Ειμαι παχυς/ παχια.	1	2	3	4	5	6
5. Οι αλλοι πιστευουν οτι ειμαι καλος/καληστα σπορ.	1	2	3	4	5	6
6. Ειμαι ικανοποιημενη/ικανοποιημενος με τον εαυτον μου απο αποψεως φυσικης κατασκευης.	1	2	3	4	5	6
7. Ειμαι ομορφος/ομορφη για την ηλικια μου.	1	2	3	4	5	6
8. Ειμαι δυνατη/δυνατος απο αποψεως σωματικης δυναμης.	1	2	3	4	5	6
9. Ειμαι αρκετα καλος/καλη στο να σκυβω, στριβω και να λυγιζω το σωμα μου.	1	2	3	4	5	6
10. Μπορω να τρεξω αρκετα μεγαλη αποσταση χωρις να σταματησω.	1	2	3	4	5	6

	ΛΑΘΟΣ	ΣΧΕΔΟΝ ΛΑΘΟΣ	ΠΙΟ ΠΟΛΥ ΛΑΘΟΣ ΠΑΡΑ ΣΩΣΤΟ	ΠΙΟ ΠΟΛΥ ΣΩΣΤΟ ΠΑΡΑ ΛΑΘΟΣ	ΣΧΕΔΟΝ ΣΩΣΤΟ	ΣΩΣΤΟ
11. Γενικα, τα περισσοτερα πραγματα που κανω , τα κανω με επιτυχια.	1	2	3	4	5	6
12. Συνηθως κολλαω οποιαδηποτε αρρωστια, (ιο, συναχι, κρυωμα...) που κυκλοφορει.	1	2	3	4	5	6
13. Ελεγχω με ευκολια τις σωματικες μου κινησεις.	1	2	3	4	5	6
14. Συχνα, συμμετεχω σε ασκησεις η δραστηριοτητες, οι οποιες με κανουν να λαχανιαζω .	1	2	3	4	5	6
15. Η μεση μου ειναι μεγαλη.	1	2	3	4	5	6
16. Ειμαι καλη/καλος στα σπορ.	1	2	3	4	5	6
17. Ειμαι ικανοποιημενος/ικανοποιημενη με τον εξωτερικο–σωματικο εαυτον μου.	1	2	3	4	5	6
18. Το προσωπο μου ειναι ωραιο.	1	2	3	4	5	6
19. Ειμαι δυνατος/δυνατη.	1	2	3	4	5	6
20. Ειμαι ευκινητος/ευκινητη.	1	2	3	4	5	6
21. Θα τα πηγαινα καλα σε ενα τεστ φυσικης αντοχης.	1	2	3	4	5	6
22. Δεν μπορω να υπερηφανευτω για τιποτα.	1	2	3	4	5	6
23. Αρρωσταινω τοσο συχνα ωστε δεν μπορω να κανω ο,τι θελω.	1	2	3	4	5	6
24. Ειμαι καλη/καλος σε κινησεις που απαιτουν συντονισμο.	1	2	3	4	5	6
25. Συμμετεχω, 3–4 φορες τη βδομαδα σε ασκησεις η δραστηριοτητες που με κανουν να λαχανιαζω, και διαρκουν τουλαχιστον 30 λεπτα.	1	2	3	4	5	6
26. Ειμαι αρκετα παχυς/παχυα.	1	2	3	4	5	6
27. Μου ειναι ευκολο να συμμετεχω στα περισσοτερα απο τα σπορ.	1	2	3	4	5	6
28. Ειμαι ικανοποιημενη/ικανοποιημενος, με την εξωτερικη μου εμφανιση, και με τις σωματικες ικανοτητες μου.	1	2	3	4	5	6
29. Ειμαι πιο εμφανισιμος/εμφανισιμη απο τους περισσοτερους φιλους/φιλες μου.	1	2	3	4	5	6

	ΛΑΘΟΣ	ΣΧΕΔΟΝ ΛΑΘΟΣ	ΠΙΟ ΠΟΛΥ ΛΑΘΟΣ ΠΑΡΑ ΣΩΣΤΟ	ΠΙΟ ΠΟΛΥ ΣΩΣΤΟ ΠΑΡΑ ΛΑΘΟΣ	ΣΧΕΔΟΝ ΣΩΣΤΟ	ΣΩΣΤΟ
30. Ειμαι πιο δυνατος/δυνατη απο τους περισσοτερους φιλους/φιλες μου.	1	2	3	4	5	6
31. Το σωμα μου ειναι δυσκαμπτο και δυσκινητο.	1	2	3	4	5	6
32. Μπορω να κανω jogging για 5 χλμ., χωρις να σταματησω.	1	2	3	4	5	6
33. Πιστευω, οτι η ζωη μου ειναι αχρηστη.	1	2	3	4	5	6
34. Σχεδον ποτε δεν αρρωσταινω.	1	2	3	4	5	6
35. Στις περρισσοτερες απο τις αθλητικες δραστηριοτητες που συμμετεχω οι κινησεις μου ειναι στρωτες και ομαλες.	1	2	3	4	5	6
36. Συμμετεχω σε αθλητικες δραστηριοτητες, οπως jogging ποδηλασια, aerobics, γυμναστηριο–βαρη, κολυμπι, χορο τουλαχιστον 3 φορες τη βδομαδα.	1	2	3	4	5	6
37. Ειμαι πανω απο το κανονικο βαρος μου.	1	2	3	4	5	6
38. Οι αθλητικες μου ικανοτητες ειναι καλες.	1	2	3	4	5	6
39. Πιστευω, οτι το σωμα μου ειναι καλοφτιαγμενο.	1	2	3	4	5	6
40. Ειμαι ασχημος/ασχημη.	1	2	3	4	5	6
41. Ειμαι αδυναμη/αδυναμος και δεν εχω καθολου μυs.	1	2	3	4	5	6
42. Τα μελη του σωματος μου λυγιζουν και κινουνται σωστα προs ολες τις κατευθυνσεις.	1	2	3	4	5	6
43. Πιστευω οτι μπορω να τρεξω, για μεγαλη αποσταση χωρις να κουραστω.	1	2	3	4	5	6
44. Γενικα, δεν ειμαι καλος χαρακτηρας.	1	2	3	4	5	6
45. Αρρωσταινω συχνα.	1	2	3	4	5	6
46. Πιστευω, οτι ευκολα μπορω να συγχρονιζω τις κινησεις μου.	1	2	3	4	5	6
47. Συμμετεχω σε πολλα σπορ, χορο, γυμναστηριο, η αλλες αθλητικες δραστηριοτητες.	1	2	3	4	5	6

	ΛΑΘΟΣ	ΣΧΕΔΟΝ ΛΑΘΟΣ	ΠΙΟ ΠΟΛΥ ΛΑΘΟΣ ΠΑΡΑ ΣΩΣΤΟ	ΠΙΟ ΠΟΛΥ ΣΩΣΤΟ ΠΑΡΑ ΛΑΘΟΣ	ΣΧΕΔΟΝ ΣΩΣΤΟ	ΣΩΣΤΟ
48. Εχω μεγαλη κοιλια.	1	2	3	4	5	6
49. Ειμαι καλυτερος/καλυτερη στα σπορ σε σχεση με τους περισσοτερους απο τους φιλους/φιλες μου.	1	2	3	4	5	6
50. Νιωθω αυτοπεποιθηση για το τι ειμαι και τι μπορω να κανω, αθλητικως.	1	2	3	4	5	6
51. Ειμαι ομορφη/ομορφος.	1	2	3	4	5	6
52. Πιστευω θα τα πηγαινα καλα σε ενα τεστ δυναμης.	1	2	3	4	5	6
53. Πιστευω οτι ειμαι αρκετα ευκινητος/ευκινητη ωστε να μπορω να συμμετεχω σε διαφορα σπορ.	1	2	3	4	5	6
54. Μπορω να ειμαι δραστηρια/δραστηριος για μεγαλο χρονικο διαστημα χωρις να κουραζομαι.	1	2	3	4	5	6
55. Ο,τι κανω, το κανω καλα.	1	2	3	4	5	6
56. Οταν αρρωστησω, περναει αρκετος καιρος. ωσπου να γινω καλα.	1	2	3	4	5	6
57. Ειμαι συγχρονισμενος/συγχρονισμενη και ευπαρουσιαστος/ευπαρουσιαστη οταν κανω σπορ η αλλες αθλητικες δραστηριοτητες.	1	2	3	4	5	6
58. Συμμετεχω σε σπορ, ασκησεις, χορο η αλλες αθλητικες δραστηριοτητες σχεδον καθε μερα.	1	2	3	4	5	6
59. Οι αλλοι πιστευουν οτι ειμαι παχυς/παχια.	1	2	3	4	5	6
60. Ειμαι ικανη/ικανος στα σπορ.	1	2	3	4	5	6
61. Νιωθω καλα για το σωμα μου.	1	2	3	4	5	6
62. Κανεις δεν πιστευει οτι ειμαι ωραια/ωραιος.	1	2	3	4	5	6
63. Ειμαι καλος/καλη στο να σηκωνω βαρια αντικειμενα.	1	2	3	4	5	6
64. Πιστευω οτι θα τα πηγαινα καλα σε ενα τεστ ευλυγισιας.	1	2	3	4	5	6

	ΛΑΘΟΣ	ΣΧΕΔΟΝ ΛΑΘΟΣ	ΠΙΟ ΠΟΛΥ ΛΑΘΟΣ ΠΑΡΑ ΣΩΣΤΟ	ΠΙΟ ΠΟΛΥ ΣΩΣΤΟ ΠΑΡΑ ΛΑΘΟΣ	ΣΧΕΔΟΝ ΣΩΣΤΟ	ΣΩΣΤΟ
65. Ειμαι καλη/καλος σε δραστηριοτητες αντοχης οπως τρεξιμο μεγαλων αποστασεων, ανωμαλος δρομος, κολυμπι.	1	2	3	4	5	6
66. Γενικα, μπορω να ειμαι υπερηφανος για πολλα πραγματα στη ζωη μου.	1	2	3	4	5	6
67. Οταν αρρωσταινω επισκευτομαι το γιατρο πιο συχνα απο οτι τα αλλα παιδια της ηλικιας μου.	1	2	3	4	5	6
68. Γενικα, ειμαι μια αποτυχια.	1	2	3	4	5	6
69. Παραμενω υγιης ακομα και οταν οι φιλοι μου αρρωσταινουν.	1	2	3	4	5	6
70. Τιποτα απο ο,τι κανω δεν ειναι σωστο.	1	2	3	4	5	6

2. ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΠΕΡΙΓΡΑΦΗΣ ΔΡΑΣΤΗΡΙΟΤΗΤΩΝ ΣΑΒΒΑΤΟΚΥΡΙΑΚΟΥ

ΤΙ ΕΚΑΝΕΣ ΤΟ ΣΑΒΒΑΤΟ/ΚΥΡΙΑΚΗ

Ο στοχος αυτου του ερωτηματολογιου ειναι, να εξετασει πως παιδια της ηλικιας σου περνανε την ημερα τους. Οι ερωτησεις που ακολουθουν θα σε ρωτησουν τι εκανες το ΣΑΒΒΑΤΟ/ΚΥΡΙΑΚΗ. Δεν πρεπει να αναφερθεις σε δραστηριοτητες που εκανες αλλη ημερα. Προσπαθησε να εισαι οσο το δυνατον πιο συγκεκριμενη/ος και ειλικρινης. Αν δεν μπορεις να απαντησεις καποια απο τις ερωτησεις δεν πειραζει προχωρησε στην επομενη ερωτηση. Οι απαντησεις σου θα μεινουν απορρητες.

Το ερωτηματολογιο εχει χωρισει τις δραστηριοτητες σε τρια μερη.
Μερος πρωτο:Το πρωι. Μερος δευτερο: Το απογευμα. Μερος τριτο: Το βραδυ.
Ορισμενες ερωτησεις σε ρωτανε απλως αν συμμετειχες σε καποιες δραστηριοτητες π.χ. αν παρακολουθησες τηλεοραση . Αν συμμετειχες σε καποια απο αυτες τις δραστηριοτητες σημειωνεις ενα ✓ στο τετραγωνακι ❑.
Αλλες ερωτησεις σου ζητανε να σημειωσεις για ποσο χρονο συμμετειχες σε καποια δραστηριοτητα π.χ.

		ΧΡΟΝΟΣ ωρα	λεπτα
ασχοληθηκες με καποιο κατοικιδιο ζωο που εχεις σπιτι σου	❑	❑	❑❑
βγηκες βολτα με την παρεα σου	❑	❑	❑❑

Τελος , ορισμενες ερωτησεις σου ζητανε, εκτος των αλλων, να σημειωσεις αν λαχανιασες η οχι κανοντας καποιες δραστηριοτητες, πχ.

		ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
πηγες για κολυμπι στην πισινα	❑	❑	❑❑	❑	❑

Στα δυο τελευταια ειδη ερωτησεων προσοχη πρεπει να δωσεις στην καθε αυτη συμμετοχη σου στην δραστηριοτητα . Ετσι, οταν π.χ. λεω οτι κολυμπησα για 25 λεπτα στην πισινα , αυτο σημαινει οτι ουσιαστικα κολυμπουσα για 25 λεπτα, αφαιρωντας το χρονο που ξοδεψα για να παω και να ερθω απ την πισινα, το χρονο να αλλαξω ρουχα στα αποδυτηρια, κλπ.
Ο ορος "λαχανιαζω" σημαινει οτι η αναπνοη δεν γινεται κανονικα. Το λαχανιασμα εχει σχεση με εντονες δραστηριοτητες που κανουν την καρδια να χτυπα γρηγορα, με επακολουθο να ανεβαινει η θερμοκρασια του σωματος και να παραγεται ιδρωτας.

ΜΕΡΟΣ ΠΡΩΤΟ : ΤΟ ΠΡΩΙ

1. Αυτο το Σαββατο/Κυριακη το πρωι τι ωρα σηκωθηκες απο το κρεβατι ;

❑❑❑❑ π. μ.

2. Εκανες καποια απο τις παρακατω δραστηριοτητες ;

παρακολουθησες τηλεοραση ❑

ειδες video ❑

ακουσες μουσικη ❑

επαιξες επιτραπεζια παιχνιδια, χαρτια ❑

ζωγραφισες η σχεδιασες ❑

επαιξες καποιο μουσικο οργανο ❑

ασχοληθηκες με το computer ❑

μελετησες τα μαθηματα της επομενης ημερας ❑

διαβασες εξωσχολικα βιβλια ❑

3. Εκανες καποια απο τις παρακατω δραστηριοτητες ;
Αν ναι, σημειωσε το χρονο

		ΧΡΟΝΟΣ ωρα	λεπτα
ασχοληθηκες με καποιο κατοικιδιο που εχεις	❑	❑	❑❑
εκανες καποια ελαφρια δουλεια στο σπιτι	❑	❑	❑❑
βγηκες βολτα με την παρεα σου	❑	❑	❑❑
πηγες για ψωνια	❑	❑	❑❑
πηγες φροντιστηριο	❑	❑	❑❑

ΤΟ ΠΡΩΙ

4. Το Σαββατο/Κυριακη το πρωι εκανες καποια απο τις παρακατω δραστηριοτητες ; Αν ναι, για ποσο χρονο ; Λαχανιασες, ενω τις εκανες ;

	ΧΡΟΝΟΣ ωρα	ΧΡΟΝΟΣ λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	ΛΑΧΑΝΙΑΣΕΣ Οχι
βοηθησες στην καθαριοτητα του σπιτιου π.χ. σκουπισμα, μεταφορα βαριων επιπλων, κλπ	❑	❑❑	❑	❑
εκανες ποδηλατο	❑	❑❑	❑	❑
περπατησες εντονα και ζωηρα	❑	❑❑	❑	❑
πηγες στην πισινα για κολυμπι	❑	❑❑	❑	❑
επαιξες tennis	❑	❑❑	❑	❑
πηγες γυμναστηριο	❑	❑❑	❑	❑
επαιξες volleyball	❑	❑❑	❑	❑
επαιξες basketball	❑	❑❑	❑	❑
εκανες στιβο (δρομοι,αλματα, ριψεις)	❑	❑❑	❑	❑
επαιξες ποδοσφαιρο	❑	❑❑	❑	❑
ετρεξες, εκανες jogging	❑	❑❑	❑	❑
εκανες χορο/ μπαλλετο	❑	❑❑	❑	❑

5. Αυτο το Σαββατο/Κυριακη το πρωι μηπως εκανες κατι αλλο ; Αν ναι, τι ;

_____	❑	❑❑	❑	❑

ΜΕΡΟΣ ΔΕΥΤΕΡΟ: ΤΟ ΑΠΟΓΕΥΜΑ

6.

παρακολουθησες τηλεοραση ❑

ειδες video ❑

ακουσες μουσικη ❑

επαιξες επιτραπεζια παιχνιδια, χαρτια ❑

ζωγραφισες η σχεδιασες ❑

επαιξες μουσικη ❑

ασχοληθηκες με το computer ❑

μελετησες τα μαθηματα της επομενης ημερας ❑

διαβασες εξωσχολικα βιβλια και περιοδικα ❑

7.

		ΧΡΟΝΟΣ ωρα	λεπτα
ασχοληθηκες με καποιο κατοικιδιο που εχεις στο σπιτι	❑	❑	❑❑
εκανες καποια ελαφρια δουλεια του σπιτιου	❑	❑	❑❑
βγηκες βολτα με τους φιλους / φιλες σου	❑	❑	❑❑

ΤΟ ΑΠΟΓΕΥΜΑ

8.

	ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
βοηθησες στην καθαριοτητα του σπιτιου π.χ. σκουπισμα, μεταφορα βαριων επιπλων, κλπ.	❑	❑❑	❑	❑
εκανες ποδηλατο	❑	❑❑	❑	❑
περπατησες εντονα και ζωηρα	❑	❑❑	❑	❑
πηγες στην πισινα για κολυμπι	❑	❑❑	❑	❑
επαιξες tennis	❑	❑❑	❑	❑
πηγες γυμνασηριο	❑	❑❑	❑	❑
επαιξες volleyball	❑	❑❑	❑	❑
επαιξες ποδοσφαιρο	❑	❑❑	❑	❑
επαιξες basketball	❑	❑❑	❑	❑
εκανες στιβο (δρομοι, αλματα, ριψεις)	❑	❑❑	❑	❑
ετρεξες, εκανες jogging	❑	❑❑	❑	❑
εκανες χορο/ μπαλλετο	❑	❑❑	❑	❑

9. Εκανες κατι αλλο ;
Αν ναι, τι ;

_____ ❑ ❑ ❑❑ ❑ ❑

ΜΕΡΟΣ ΤΡΙΤΟ ΤΟ ΒΡΑΔΥ

10.

ειδες τηλεοραση	❑
ειδες video	❑
ακουσες μουσικη	❑
επαιξες επιτραπεζια παιχνιδια, χαρτια	❑
ζωγραφισες η σχεδιασες	❑
επαιξες μουσικη	❑
ασχοληθηκες με το computer	❑
μελετησες τα μαθηματα της επομενης ημερας	❑
διαβασες εξωσχολικα βιβλια και περιοδικα	❑

11.

	ΧΡΟΝΟΣ ωρα	λεπτα
ασχοληθηκες με καποιο κατοικιδιο που εχεις	❑❑	❑❑
εκανες καποια ελαφρια δουλεια στο σπιτι, πχ. καθαρισες το δωματιο σου, επλυνες τα πιατα, κλπ	❑❑	❑❑
βγηκες μια βολτα με τους φιλους / φιλες σου	❑❑	❑❑

ΤΟ ΒΡΑΔΥ

12.

	ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
βοηθησες στην καθαριοτητα του σπιτιου				
πχ σκουπισμα , μετεφορα βαριων επιπλων, κλπ.	❑	❑❑	❑	❑
εκανες ποδηλατο	❑	❑❑	❑	❑
περπατησες εντονα και ζωηρα	❑	❑❑	❑	❑
πηγες στην πισινα για κολυμπι	❑	❑❑	❑	❑
επαιξες tennis	❑	❑❑	❑	❑
πηγες γυμναστηριο	❑	❑❑	❑	❑
επαιξες ποδοσφαιρο	❑	❑❑	❑	❑
επαιξες volleyball	❑	❑❑	❑	❑
επαιξες basketball	❑	❑❑	❑	❑
εκανες στιβο (δρομοι, αλματα, ριψεις)	❑	❑❑	❑	❑
ετρεξες,εκανες jogging	❑	❑❑	❑	❑
εκανες χορο/ μπαλλετο	❑	❑❑	❑	❑

13. Μηπως εκανες κατι αλλο αυτο το Σαββατο/Κυριακη;
Αν ναι, τι ;

_____ ❑ ❑ ❑❑ ❑ ❑

14. Αυτο το Σαββατο/Κυριακη το βραδυ, τι ωρα πηγες για υπνο ;

❑❑❑❑ μ. μ.

15. Ηταν αυτο το Σαββατο/Κυριακη μια συνηθισμενη μερα για εσενα ;

ΝΑΙ ❑

ΟΧΙ ❑

Αν οχι , γιατι οχι ; _____

3. ΕΡΩΤΗΜΑΤΟΛΟΓΙΟ ΠΕΡΙΓΡΑΦΗΣ ΚΑΘΗΜΕΡΙΝΩΝ ΔΡΑΣΤΗΡΙΟΤΗΤΩΝ

ΟΝΟΜΑ.....

ΗΛΙΚΙΑ.....

ΚΟΡΙΤΣΙ..... ΑΓΟΡΙ .....

ΣΧΟΛΕΙΟ..... ΤΑΞΗ .....

ΤΙ ΕΚΑΝΕΣ ΕΧΘΕΣ

Ο στοχος αυτου του ερωτηματολογιου ειναι, να εξετασει πως παιδια της ηλικιας σου περνανε την ημερα τους. Οι ερωτησεις που ακολουθουν θα σε ρωτησουν τι εκανες ΧΘΕΣ. Δεν πρεπει να αναφερθεις σε δραστηριοτητες που εκανες αλλες μερες. Προσπαθησε να εισαι οσο το δυνατον πιο συγκεκριμενη/ος και ειλικρινης. Αν δεν μπορεις να απαντησεις καποια απο τις ερωτησεις δεν πειραζει προχωρησε στην επομενη ερωτηση. Οι απαντησεις σου θα μεινουν απορρητες.

Το ερωτηματολογιο εχει χωρισει τις δραστηριοτητες σε τρια μερη.
Μερος πρωτο:το πρωι πριν πας σχολειο, κατα τη διαρκεια του σχολειου, κατα το διαλειμμα.
Μερος δευτερο: αμεσως μετα το σχολειο. Μερος τριτο: το απογευμα –βραδυ.
Ορισμενες ερωτησεις σε ρωτανε απλως αν συμμετειχες σε καποιες δραστηριοτητες π.χ. αν παρακολουθησες τηλεοραση. Αν συμμετειχες σε καποια απο αυτες τις δραστηριοτητες σημειωνεις ενα ✓στο τετραγωνακι ❑.
Αλλες ερωτησεις σε ρωτανε να σημειωσεις ποσο χρονο συμμετειχες σε καποια αναφερομενη δραστηριοτητα π.χ.

		ΧΡΟΝΟΣ ωρα	λεπτα
ασχοληθηκες με καποιο κατοικιδιο ζωο που εχεις σπιτι σου	❑	❑	❑❑
βγηκες βολτα με την παρεα σου	❑	❑	❑❑

Τελος , ορισμενες ερωτησεις σου ζητανε, εκτος των αλλων, να σημειωσεις αν λαχανιασες η οχι κανοντας καποιες δραστηριοτητες, πχ.

	ΧΡΟΝΟΣ		ΛΑΧΑΝΙΑΣΕΣ	
	ωρα	λεπτα	Ναι	Οχι
πηγες για κολυμπι στην πισινα	❑	❑❑	❑	❑

Στα δυο τελευταια ειδη ερωτησεων προσοχη πρεπει να δωσεις στην καθε αυτη συμμετοχη σου στην δραστηριοτητα . Ετσι, οταν λεω οτι κολυμπησα για 25 λεπτα στην πισινα , αυτο σημαινει οτι ουσιαστικα κολυμπουσα για 25 λεπτα, αφαιρωντας το χρονο που ξοδεψα για να παω και να ερθω απο τηνστην πισινα, το χρονο να αλλαξω ρουχα στα αποδυτηρια, κλπ.

Ο ορος "λαχανιαζω" σημαινει οτι η αναπνοη δεν γινεται κανονικα. Το λαχανιασμα εχει σχεση με εντονες δραστηριοτητες που κανουν την καρδια να χτυπα γρηγορα, με επακολουθο να ανεβαινει η θερμοκρασια του σωματος και να παραγεται ιδρωτας.

ΜΕΡΟΣ ΠΡΩΤΟ : ΤΟ ΠΡΩΙ

1. Τι ωρα σηκωθηκες απο το κρεβατι χθες το πρωι ;

❑ ❑ ❑ ❑ π. μ.

2. Με τι μεσον ηρθες στο σχολειο χθες ;

με τα ποδια ❑
με λεωφορειο ❑
με αυτοκινητο ❑
με ποδηλατο ❑
με αλλο μεσο ❑
(αναφερε με τι) _____ ❑

3. Ποση ωρα εκανες για να ερθεις απο το σπιτι σου στο σχολειο ;

❑ ❑ λεπτα

ΤΟ ΠΡΩΙ ΠΡΙΝ ΤΟ ΣΧΟΛΕΙΟ

4. Εκανες κατι απο τα παρακατω ;

παρακολουθησες τηλεοραση ❑

ακουσες μουσικη ❑

μιλησες με τους φιλους/φιλες σου ❑

πηγες φροντιστηριο ❑

5. Εκανες καποια ελαφρια δουλεια στο σπιτι π.χ. τακτοποιησες το δωματιο σου, επλυνες τα πιατα, κλπ ; Αν ναι, ποσο χρονο σου πηρε;

	ΧΡΟΝΟΣ ωρα	λεπτα
ελαφριες δουλειες του σπιτιου	❑	❑❑

6. Εκανες καποια απο τις παρακατω ασχολειες ;
Αν ναι, για ποσο χρονο ; Λαχανιασες ενω τις εκανες ;

	ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕ Ναι	Οχι
επαιξες ποδοσφαιρο στην αυλη του σχολειου	❑	❑❑	❑	❑
επαιξες basketball, volleyball η αλλα σπορ με μπαλλα στην αυλη του σχολειου	❑	❑❑	❑	❑

7. Μηπως εκανες καποια αλλη δραστηριοτητα χθες το πρωι πριν το σχολειο;
Αν ναι, ποια ;

	ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
_____	❑	❑❑	❑	❑

ΣΤΟ ΣΧΟΛΕΙΟ

8. Χθες, ειχες Φυσικη Αγωγη– γυμναστικη στο προγραμμα του σχολειου ;

ΝΑΙ ❑

ΟΧΙ ❑

9. Αν ναι, εκανες καποια απο τις παρακατω δραστηριοτητες ;

(Αν οχι, πηγαινε στην ερωτηση 11 στην επομενη σελιδα)

	ΧΡΟΝΟΣ			ΛΑΧΑΝΙΑΣΕΣ	
	ωρα	λεπτα		Ναι	Οχι
basket-ball	❑	❑	❑❑	❑	❑
volley-ball	❑	❑	❑❑	❑	❑
γυμναστικη	❑	❑	❑❑	❑	❑
τρεξιμο, jogging	❑	❑	❑❑	❑	❑
ποδοσφαιρο	❑	❑	❑❑	❑	❑
στιβο (δρομοι, αλματα, ριψεις)	❑	❑	❑❑	❑	❑
κολυμπι	❑	❑	❑❑	❑	❑

10. Συμμετειχες σε καποια αλλη δραστηριοτητα κατα τη διαρκεια της Φυσικης Αγωγης ;

Αν ναι, ποια ;

_____	❑	❑	❑❑	❑	❑

ΣΤΟ ΔΙΑΛΕΙΜΜΑ

11.

συζητησες με τους φιλους / φιλες σου ❑

προετοιμασες το μαθημα της επομενης ωρας ❑

εφαγες κατι απο την καντινα του σχολειου ❑

12.

	ΧΡΟΝΟΣ ωρα	λεπτα		ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
επαιξες ποδοσφαιρο στην αυλη του σχολειου	❑	❑	❑❑	❑	❑
επαιξες basketball, volleyball η αλλα σπορ με μπαλλα στην αυλη του σχολειου	❑	❑	❑❑	❑	❑
ετρεξες η περπατησες εντονα στην αυλη του σχολειου	❑	❑	❑❑	❑	❑

13. Χθες κατα την ωρα του διαλειμματος, μηπως εκανες κατι αλλο ;

Αν ναι, τι ;

_____	❑	❑	❑❑	❑	❑

ΜΕΡΟΣ ΔΕΥΤΕΡΟ : ΑΜΕΣΩΣ ΜΕΤΑ ΤΟ ΣΧΟΛΕΙΟ

14.

μιλησες με τους φιλους/ες σου ❑

ακουσες μουσικη ❑

15.

	ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
επαιξες ποδοσφαιρο στην αυλη του σχολειου	❑ ❑	❑❑	❑	❑
επαιξες basketball, volleyball η αλλα σπορ με μπαλλα στην αυλη	❑ ❑	❑❑	❑	❑
ετρεξες η περπατησες ζωηρα στην αυλη	❑ ❑	❑❑	❑	❑

16. Μετα το σχολειο με τι μεσον επεστρεψες σπιτι σου ;
(Απλως αναφερε τον τροπο με τον οποιο γυρισες στο σπιτι σου)

με τα ποδια ❑
με λεωφορειο ❑
με αυτοκινητο ❑
με ποδηλατο ❑
με αλλο μεσον ❑
(τι,) ——————————

17. Ποση ωρα εκανες για να φθασεις στο σπιτι σου απο το σχολειο ;

❑ ❑ λεπτα

18. Χθες αμεσως μετα το σχολειο, εκανες κατι αλλο ;
Αν ναι, τι ;

——————————————— ❑ ❑ ❑❑ ❑ ❑

ΜΕΡΟΣ ΤΡΙΤΟ : ΤΟ ΑΠΟΓΕΥΜΑ–ΒΡΑΔΥ

19.

παρακολουθησες τηλεοραση ❑

ειδες video ❑

ακουσες μουσικη ❑

ζωγραφισες η σχεδιασες ❑

επαιξες μουσικη ❑

επαιξες με το computer ❑

διαβασες τα μαθηματα της επομενης ημερας ❑

διαβασες εξωσχολικα βιβλια ❑

επαιξες επιτραπεζια παιχνιδια η χαρτια ❑

20.

	ΧΡΟΝΟΣ ωρα	λεπτα
ασχοληθηκες με καποιο κατοικιδιο ζωο που εχεις σπιτι σου	❑ ❑	❑❑
εκανες ελαφριες δουλειες του σπιτιου πχ τακτοποιησες το δωματιο σου, επλυνες τα πιατα, κλπ	❑ ❑	❑❑
βγηκες βολτα με τους φιλους/ φιλες σου	❑ ❑	❑❑
πηγες φροντιστηριο	❑ ❑	❑❑

ΤΟ ΑΠΟΓΕΥΜΑ–ΒΡΑΔΥ

21.

	ΧΡΟΝΟΣ ωρα	λεπτα	ΛΑΧΑΝΙΑΣΕΣ Ναι	Οχι
βοηθησες στην καθαριοτητα του σπιτιου				
π.χ. σκουπισες, μετακινησες επιπλα κλπ.	❑	❑❑	❑	❑
περπατησες εντονα και ζωηρα	❑	❑❑	❑	❑
εκανες ποδηλατο	❑	❑❑	❑	❑
πηγες για κολυμπι στην πισινα	❑	❑❑	❑	❑
πηγες για tennis	❑	❑❑	❑	❑
πηγες γυμναστηριο	❑	❑❑	❑	❑
επαιξες volleyball	❑	❑❑	❑	❑
επαιξες basketball	❑	❑❑	❑	❑
εκανες στιβο (δρομοι, ριψεις, αλματα)	❑	❑❑	❑	❑
ετρεξες, εκανες jogging	❑	❑❑	❑	❑
επαιξες ποδοσφαιρο	❑	❑❑	❑	❑
πηγες για χορο/μπαλλετο	❑	❑❑	❑	❑

22. Χθες το απογευμα–βραδυ, εκανες καποια αλλη δραστηριοτητα ;
Αν ναι, ποια ;

_____ ❑ ❑❑ ❑ ❑

23. Τι ωρα πηγες για υπνο χθες το βραδυ ;

❑❑❑❑ μ.μ.

24. Χθες, ηταν για εσενα μια συνηθισμενη μερα ;

ΝΑΙ ❑
ΟΧΙ ❑

Αν οχι, γιατι οχι ; _____

APPENDIX D

THE CHECKLIST OF THE TYPES OF ACTIVITIES ACCORDING TO CALE (1993)

SEDENTARY ACTIVITIES AVERAGE 1.5 METS

ACTIVITY
1. drawing/painting
2. homework
3. listening to music
4. playing a musical instrument
5. reading for pleasure
6. talking with friends
7. using a computer/playing computer games
8. watching television
9. watching videos
10.playing cards

LIGHT ACTIVITIES AVERAGE 2.5 METS

ACTIVITY
1. caring for pets
2 light household chores-washing-up, tidying-up etc.
3. shopping
4. walking/strolling
5 going out with friends

MODERATE ACTIVITIES AVERAGE 4.0 METS

ACTIVITY
1. basketball
2. cleaning/hoovering/moving furniture
3. cycling
4. football in the playground
5. gymnastics
6. playing any other ball game in the playground
7. swimming
8. tennis
9. volleyball
10. walking briskly

HARD ACTIVITIES AVERAGE 6.0 METS

ACTIVITY
1. basketball
2. disco dancing
3. jogging
4. rugby

VERY HARD ACTIVITIES AVERAGE 10.0 METS

ACTIVITY
1. athletics
2. football

NOTE

Differentiation should be made between Walking / Strolling and Walking Briskly. Walking/Strolling is a light activity and Walking Briskly is a moderate activity.