Socialisation of the primary school child into a physically active lifestyle

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SOCIALISATION OF THE PRIMARY SCHOOL CHILD INTO A PHYSICALLY ACTIVE LIFESTLYE

A LIFETIME HEALTH PERSPECTIVE

BY

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ABSTRACT

O Sullivan, S. Socialisation of the primary school child into a physically active lifestyle: A lifetime health perspective

Mounting epidemiological evidence shows physical inactivity and lack of exercise to be related to the occurrence of several diseases and degenerative conditions in adulthood. The maintenance of a physically active lifestyle, as well as the development of positive attitudes towards physical activity are viewed by many as major components of preventive medicine that should begin in childhood. In a synthesis of study findings of the decade 1985-1995, the observed relationships between physical activity and conditions of public health importance are reviewed. Patterns and trends in children's physical activity behaviour, observed in youth studies of the same period, are outlined. Physical activity of children is described as the product of a complex interweaving of biographical, social and cultural threads, and studies examining such influences on behaviour are discussed.

The population study was designed to increase understanding of physical activity behaviour, and its social context in the lives of young people. Data were collected from a cohort of preadolescent children in 5th and 6th classes of primary school. 1,602 children were interviewed, 810 girls and 792 boys, in a nation-wide random sample of 62 Irish national primary schools. Socio-cultural factors were suggested to contribute to the high activity participation rate observed for this population. Gender differences in recreational activity were significant (p <.0001), and a significant decline was observed in girls' activity from 5th to 6th class (p<.0001). Evidence of social class effect on behaviour was not convincing. In regression analysis, gender (B, -.209, 95% CI -.277 to -.141, p < .0001), sports club membership (B,.201, 95% CI .131 to .272, p < .0001), and social integration status (B, .039, 95% CI .024 to .055, p < .0001) were identified as significant independent predictors of recreational activity. Parental support and physical self-perception were weak predictors. Primary PE, measured by the physical education index, was significantly and positively associated with activity, and independently of all variables included in the analysis (B,0.016, 95% CI 0.012 to 0.021, p <.0001). The physical education index provided a significant increment in the prediction of children's activity over and above the effects explained by demographic and sociometric variables. No association was observed between self-assessed health and well-being and activity. Children's PE curriculum experience and school travel patterns were also examined. Findings attest to the importance of the primary school in the education of children for lifetime health. [References: 1,117]

Keywords: children, health, physical activity, social environment

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SOCIALISATION OF THE PRIMARY SCHOOL CHILD INTO A PHYSICALLY ACTIVE LIFESTYLE

A POPULATION STUDY

4.0 Introduction

Youth activity studies cited in the literature review have been conducted in diverse populations and in a variety of settings. Few studies however have focused exclusively on the preadolescent age group, and no study has examined the physical activity behaviour of an Irish youth cohort (Northern Ireland excluded). It is timely therefore that health behaviour research should be directed to the Irish child population. From an epidemiological perspective, it is also important that physical activity patterns of relevant age, gender, and social class groups be documented.

There is a growing body of evidence on the factors which influence physical activity behaviour. In the social-environmental domain, the influences of such factors as socio-economic status, parental support and social network, have been documented in several population studies. The role of the primary school however is the least informed, and no study has to-date addressed the influence of the school in a non-intervention setting. In exploring the activity behaviour of preadolescents therefore, the social context of behaviour is the predominant interest. A specific research focus is on the educational environment of the primary school: the physical, social, attitudinal and curriculum contexts, and associated activity pattens in physical education, playground activity, and school travel.

Psychological factors have been observed to contribute to variation in activity behaviour. The child's perception of the physical self, for example, is an important independent predictor of adolescent participation. It may also be an interactive component in the activity socialisation process, although this has not been studied. Children's motives for activity have been documented in several population studies. The association of motives with actual behaviour and the implications for physical education have, however, received little attention in the literature. While health knowledge is not predictive of behaviour, nonetheless it is important in health research to assess such cognition at key stages of children's education. To increase understanding of activity behaviour therefore, the population study investigates these three influences from the psychosocial domain.

It has been suggested that in the relationship between children's physical activity and health, a dual direction of influence may be present. For example, the recent British youth cohort study found a significant association between the emotional well-being of adolescents and their participation in sporting activity (Steptoe & Butler, 1996). Using a similar but modified self-assessment of health and well-being, the research investigates health status and the relevance of this direction of influence to the behaviour of preadolescents.

Within the parameters of the model schematically illustrated in Figure 3.1, the population study examines the nature and extent of children's physical activity, the association of personal and social factors with behaviour, and the particular role of the primary school in active lifestyle development.

4.1 Aim and objectives

The study seeks to investigate the socialisation of the primary school child into a physically active lifestyle, examining activity behaviour and its associated influences in a sample of 11-12 year old Irish children.

The population study is designed to examine:

- The frequency and range of physical activities in which Irish children participate, and estimated weekly activity.
- Children's physical education experience in school, and the relationship of this experience to recreational activity outside of school.
- Parental support, socioeconomic status, and social integration status: their associations with activity
- Selected psychological variables: motivation, physical self-perception, health knowledge: their relationships with behaviour.
- Gender differences in physical activity and in the sources of influence on behaviour.
- Health and well-being status: the relationship with physical activity

A prime objective of the analysis is to determine if school physical education experience provides a significant increment in the prediction of children's activity over and above the effects explained by demographic, sociometric and social network variables.

4.2 Material and methods

Data were collected by researcher administered questionnaire in 62 Irish national primary schools.

4.2.1 Study population and sample

The study population was defined as children in 5th and 6th classes of primary education, equivalent age cohort 11-12 years (± 1 yr.). One class was selected as the sampling unit from each school. Thus in larger urban schools, either a 5th or a 6th class group was interviewed, while in smaller schools [4-teachers or less] 5th and 6th class pupils were interviewed as a combined unit.

1.602 pupils were interviewed, 810 girls and 792 boys. Interviews were conducted in sixty-two national primary schools [Appendix A]. The sample comprised 17 girls schools, 14 boys schools, and 31 co-educational schools. 95% of schools in the sample were designated denominationally as Roman Catholic and 5% as Church of Ireland.

The sampling area was defined by a line extending from Dublin / Wicklow on the east coast to Clare / Kerry on the west, and south east to Cork / Waterford. The topographical diversity of the selected area precluded the possibility of geographic or regional bias. Bias of a socio-cultural nature was minimised by the representation of 12 counties in the sample. Socio-cultural influences on sport in Ireland are reflected in areas and counties which have a strong tradition in a predominant sport, for example, Tipperary's orientation to hurling, Kerry's historical links with Gaelic football. This cultural more is expected to influence the selection of sport in a school PE programme, and to be reflected in the child's pattern of sport participation. Such traditions were acknowledged in the sampling process, and represented in the counties sampled.

Each county, except Dublin, was represented by at least one rural region or rural centre school, and one or more urban / suburban schools. The urban / rural school representation was 36:26. Fourteen schools [22%] were in designated areas of disadvantage [Appendix B]. Of the country's 3,300 national schools, 310 [9%] are

currently registered under the Designated Areas of Disadvantage Scheme (Department of Education, 1996). 67.7 % of these schools are located in three main urban areas: Dublin, Cork, and Limerick. The most recent report on educational disadvantage however, estimates that 60.7% of all disadvantaged pupils in the country live in rural areas with populations of less than 10,000 people (Kellaghan et al., 1995). The rural school representation, and the selection of disadvantaged schools outside the main urban areas, was designed to give the best possible representation of dispersed disadvantage.

4.2.2 Questionnaire design

The questionnaire consisted mainly of pre-categorised multiple-choice questions, and a physical activity report. Itemised rating scales were introduced for attitude questions. These scales used verbal descriptions and balanced category sets. Selection of appropriate language and question style were important factors in the design of a child-friendly questionnaire. For visual appeal, the questionnaire was colour printed, illustrated with appropriate graphics, and presented in booklet format. A total of 40 questions, incorporating 120 response variables, was considered the maximum number to which children could respond, with accuracy, in a 'normal lesson' period.

Design of the physical activity measure was modelled on the Seven-day Physical Activity Recall (PAR) devised by Sallis and colleagues (Sallis et al., 1993b), who report a test-retest reliability for this measure of $r = 0.77$. Children's difficulties in recalling activities on specific days have however also been reported, and in the recently modified version (SPARK)[1] a two-category recall format [week-days and week-end] is used. This format was adopted by the researcher and an activity list compiled with specific reference to the Irish child population. The data processing mechanism of the one-week PAR prescribes three categories of activity [mild, moderate, and vigorous intensity] to which 3 nominal energy expenditure [MET][2] values are assigned. In this study an individual MET value is assigned to each of the activities reported [Appendix C], and a sum total derived from the aggregated products [frequency x intensity]. This procedure is designed to better reflect differences in the intensity of children's habitual activity. Expressing MET values

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1 Personal communication .J Sallis, 4 April 1996

2 One MET is approximately 3.5 ml oxygen . kg body weight $^{-1}$. min $^{-1}$

per unit body weight would improve accuracy of the measure. Physiological measures of height and weight however were considered to be intrusive in the presentation of a questionnaire interview, and social desirability in response was also likely to be increased by objective measurement. Also, while measures of activity relative to adiposity might have been desirable in the study, the simple measurement of height and weight to calculate body mass index (Wt/Ht^2) is not recognised as an appropriate measure for children.[3]

Pre-tests

Interview method was pre-tested in three schools: an inner-city boys school (6th), a girls school in a designated area of disadvantage (5th), and a mixed school in a predominantly middle-class suburban area (5th). The physical activity report format in the 7-day PAR asks respondents to sum the number of times activities are performed for '15 minutes or more at one time'. In the first pre-test, it became evident that the 15-minute interval was not a realistic time unit for participation in a sport, such as soccer, which is played by some children with a frequency of two or three times per day. The interval of time for the activity report was therefore amended to 'half an hour or more at one time'. In the three pre-tests, the socio-cultural variable 'mother's level of education' elicited a low 51% response rate. The options 'I do not know' and 'I prefer not to answer this question' were selected by most children. This variable was not included in the final draft. Syntax ambiguities evidenced in pre-tests were also amended.

Pupil interviews

Requests to conduct the research and arrangements of school visits were made by telephone communication with each school principal. Appointments pre-arranged two to three days in advance proved to be the most satisfactory scheduling procedure for schools. Appointments pre-scheduled by more than a week were sometimes lost in school administration detail, but only 2 such omissions necessitated an additional visit to the school. Subsequent to each school interview, the principal and class teacher were personally thanked in a written communiqué. School interviews commenced on 15 May

[3] BMI or Quetelet index cannot be used for children unless different standard values for p are used at different ages in the equation Wt/Ht^p. This calculation assumes that the index should be unrelated to height (Royal College of Physicians, 1983), p.6.

1996 and concluded on 5 October 1996. Within the school year, this is the time period in which children are expected to be the most active. Across this time period, differences in the extent of opportunity for outdoor play are marginal. Allocation of curriculum time to PE however, may, in some schools be more extensive in the summer term.

The questionnaire was administered by the researcher in each of the 62 schools. Answer format and physical activity reporting parameters were clearly explained to the children. The researcher qualified the physical activity reporting unit as that which is played for 'about half an hour or more', as respondents have been shown to over-estimate this variable in self-reports. Although there is some evidence that children's reporting of physical activity is not subject to social desirability bias (Biddle, Mitchell & Armstrong, 1992), social desirability must be anticipated in health behaviour studies. Reporting of the *right* response is strongly suggested to arise in the school classroom context of research (Parke, 1996). The researcher therefore stressed the importance of the personal response, emphasised that there were no *right* answers, and that doing very little or no activity was acceptable behaviour. Children with cognition difficulties were helped individually by the researcher and their class teacher.

A class interview typically required 45 to 60 minutes to complete. Administration time was extended in the main by the prevalence of literacy or cognition problems, and, in only two interviews, by the teacher's adopted class management style. Additional time was allowed in each school for informal dialogue with the school principal. The discussion briefly addressed the nature of the research project, the social context of the school and its pupils, and the school's PE programme.

4.2.3 Data processing and analysis

Questionnaire responses were coded solely by the researcher, thus consistency in interpretation of reports was ensured. This was particularly important in the assigning of social class codes to ill-defined responses. The researcher's knowledge of the school and its location also facilitated the detection of reporting error, e.g. identification of a games coach as a 'PE specialist teacher'.

Socio-economic status

The assignation of a social class code is based on the children's reports of parents occupations. In cases where both parents are employed, the higher of the two social class categories is assigned. Socio-economic status is based on the six-point Social Class Scale (O Hare, Whelan & Commins, 1991). Unemployed persons are assigned to a separate category. Cases with missing values, or information not known are assigned to an 'unknown' category.

While standardised coding of occupation is facilitated by reference to the Classification of Occupations (CSO, 1991), there are inherent difficulties in the classification of children's answers. A farmer, for example, might be classified in any one of six social classes. Such heterogeneity of occupation is not identifiable from an unqualified acreage report. A ratio derived from 1991 census data [2:3 > 50 acres. 1:3 < 50 acres], indicates that two in three farmers are assigned to classes 1-3. This ratio and school location were used as guidelines in coding a generic 'farmer' response. A generalised estimate broadly based on school location was used for other cases, such as 'a builder'. The imprecision of this procedure is acknowledged, as subjects may still be rather heterogeneous within schools or neighbourhoods.

Non-response (category 7) was observed in administration to reflect unwillingness of some children to reveal parent's occupation. In data analysis such cases were re-coded as category 6.

Mother's level of education, which is recommended as an alternative[4] or an additional indicator of socio-economic status (Mueller & Parcel, 1981) was rejected as a response variable in questionnaire pre-tests.

Physical activity index [PAI]

The physical activity index [PAI] provides a measure of the frequency and intensity of activities in which children participate in a typical week within the school year, and

[4] The alternative is recommended if the researcher's theory suggests that the educational level of the primary caretaker is what produces variation in a given aspect of development. (Mueller & Parcel, 1981), p.23.

with collapsing values of an ordinal or interval variable is that the choice of cut-off points is bound to be arbitrary, and will have a direct impact on the results obtained (Bryman & Cramer 1997). Hence, all scores above the criterion activity level (>10) were systematically assigned to three groups (tertile basis). To preclude double-entry of an activity score, scores for 'running/jogging' were excluded from the index. Index values lie within the range 0 to 282 [Appendix E1-E5].

The total score for each child is not a measure of total time spent in physical activity, but is a relative measure of how much physical activity has been carried out or energy expended in a week.

Physical education experience [PEI]

Physical education experience is measured by a combined index that takes into account PE curriculum experience, frequency of PE lessons, extra-curricular physical activity, and reported evaluation of school PE. Curriculum experience is measured by a three-category report format for each of the curricular physical education areas. 'Lots of practice', 'some practice' and 'no practice' in each area are assigned values 4, 2, 0 respectively. Frequency of physical education lessons is recorded by a value in the range 0 - 4, attitude towards PE lessons in the range 1-7, and teacher motivation 1-3. Scores are summed and the aggregate is used as an indicator of the child's primary PE experience.

The total score does not measure the quality of experience. High quality teaching in one or two subject areas might be represented by a low PEI score. The objective in primary PE however ".... is to provide children with a wide range of movement experiences" (O Sullivan)[6] and the measure used in the questionnaire was designed for the reporting of such experience. Index values in the sample ranged from 1 to 60 [Appendix E6]. Cases were sorted into three (tertile) groups: 'low PE' (1-25), 'medium PE (26-32), and 'high PE' (33-60).

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[6] O Sullivan, S. *Physical Education 8-12: A direction for the non-specialist teacher.* Limerick: Mary Immaculate College Curriculum Development Unit. [2nd edition -in press].

Physical self-perception profile [PSPP]

A physical self-perception profile is designed to provide a measure of physical self-worth. Items for the scale are selected from the physical subscale of Harter's (1982) Perceived Competence Scale for Children and The Physical Self Perception Profile [PSPP-C] (Fox & Corbin, 1989; Fox, 1990), subsequently modified by Biddle & Armstrong (1992). The six subscales of the PSPP-C were not, in their entirety, appropriate to this study. Seven questions selected are designed to tap the child's perception of sports competence, motor skill acquisition and body attractiveness. Construct validity of the items for children aged 12-13 has been demonstrated in the original (Harter, 1982; Fox & Corbin, 1989) and subsequent tests (Weiss, 1987; Weiss & Duncan, 1992; Biddle & Armstrong, 1992).

Items are presented in a structured-alternative format to reduce social desirability on the part of the children. Children are asked to choose between two statements and then answer whether the statement is 'sort of' or 'really' true for them. Responses are scored on a 4-point scale in which a score of 4 represents a very positive degree of physical self worth. Scores on the individual items are summed to produce an overall score, ranging from a minimum of 6 to a maximum of 28 points [missing response assigned a zero score][Appendix E8]. Groups were labelled 'low' (6-13), 'medium' (14-21) and 'high' (22-28). The scale was tested for internal consistency using Cronbach's Alpha (1951). A coefficient of 0.696 was obtained, and deemed adequate for the research purpose.

Activity motivation ratio

Children are asked to indicate the relative importance of each of nine possible motives for physical activity. A ratio was devised to observe the correlation between each motive and the actual physical activity undertaken. This ratio was calculated by dividing the percentage of children in the *highly active* category among those who answered 'very important' by the percentage in the *highly active* category who answered 'not important at all' for each of the motives presented.

Social integration index

Children's social integration is measured by a combined index that takes into account contacts with friends, ability to communicate with friends about their problems, ability to make new friends, and knowing what to do with unexpected free time. The index is an extension of the 3-item social integration scale devised by Eder (1990). Five items are balanced rating scales, and one is a dichotomous question (yes/no), giving a total score range from a minimum of 5 to a maximum of 18 [Appendix E7]. Cases are then assigned to one of three groups, 'not integrated' (5-9), 'mixed' (average integration) (10-14) and 'highly integrated' (15-18).

Health and well-being status

Reported health and well-being are measured by an index that takes into account the subjective feeling of health and fitness, symptoms of malaise, and emotional well-being as measured by feelings of loneliness, attitude towards school and attitude towards life in general. This seven item scale combines, and also extends, the health index and the happiness index construed by Eder (1990), and used in the analysis of WHO cross-national survey data (Aaro et al., 1986).

The eight-item somatic symptom subscale is that of the malaise inventory (Grant et al.,1990), a 25-item list of psychological and somatic symptoms based on the Cornell medical index (Rutter et al.,1970). Steptoe and Butler (1996), in a cohort study of adolescents aged 16 years, report an internal consistency measure of α 0.83 on Cronbach's test for this subscale. A maximum score of 4 was assigned to the reporting of 4 or more items on the somatic symptom subscale. The range of possible scores on the index is from 6 to 22, the lower score indicating the more positive health status. Cases are sorted into one of three groups: 'healthy' (6-11) 'mixed' (12-17) and 'not healthy' (18-22).

Health knowledge

A brief assessment of health knowledge is based on curricular source material for 5th and 6th classes (O Sullivan, 1992). A gender-biased statement is included. Children are presented with six statements, to which they select the response 'true' or 'false'. Responses to individual statements and a total health knowledge score are recorded.

Data analysis

The Statistical Package for the Social Sciences (SPSS for Windows, Version 7) and associated statistical procedures (Bryman & Cramer, 1997; SPSS Inc. 1977; Fischer, 1977) were used in analysis of survey data.

5

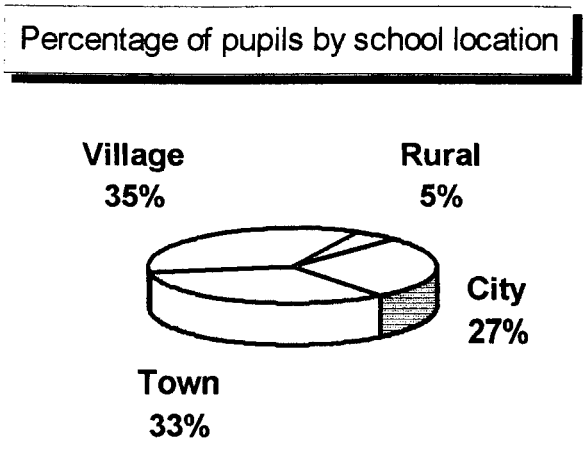
POPULATION STUDY
RESULTS AND DISCUSSION

5.1 Demographic profile of pupils

A total of 1,602 children were interviewed, 810 girls and 792 boys. 50.2% of children were in 6th class and 49.8% in 5th class.

The dispersion of schools by geographic area is illustrated in Figure 5.1.

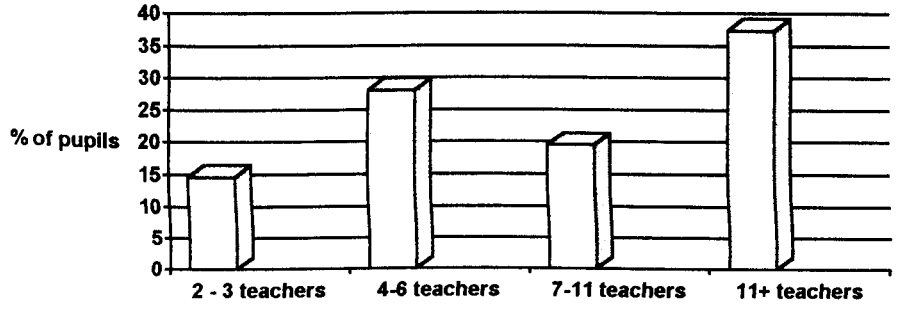
Figure 5.1 *Location of school attended by pupils*



Schools in or adjacent to a village are termed 'village', while 'rural' applies to schools at a distance from a rural centre. Percentage in 'city' accounts for schools in both urban and conurban areas.

Schools in the sample varied from small 2-teacher schools to schools with more than 11 teachers [Figure 5.2].

Figure 5.2 *Size of school attended by pupils*



The sample of schools was a random selection by survey area. The sample was not stratified by size of school, hence distribution by teacher number is not necessarily proportionate to national distribution.

Gender of teachers

56.1% of children were taught by female teachers and 43.9% by male teachers.

Social class

There were no differences between boys and girls in distribution of cases by social class [Table 5.1].

Social class group	Boys %	Girls %	All %
1	4.8	4.9	4.9
2	13.8	13.8	13.8
3	25.1	29.5	27.3
4	21.9	21.0	21.5
5	10.5	9.1	9.8
6	8.1	7.7	7.9
Unemployed	15.7	13.8	14.8

Table 5.1
Percentage of children by social class

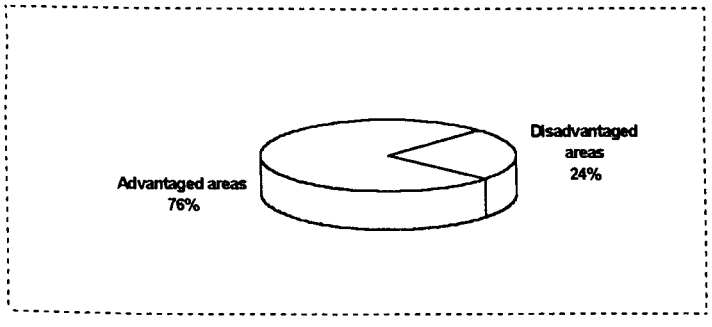
Cases in social class groups 1 - 6 were ordered according to the six-point Social Class Scale (O Hare, Whelan & Commins, 1991). Unknown cases were assigned to group 7, and unemployed to group 8. The 'unknown' category included unreported cases, and these were assumed in the main to be the reports of children unwilling to disclose parent's occupation. Given the difficulties that are anticipated in questions on occupation, the percentage of non-response [less than 4.1% of 'unknown'] was considered to be low. For analysis purposes, cases categorised as group 7 were re-coded into the aggregate group 'lower'.

The proportion of children in the 3 higher social classes [46 %] and the proportion in the lower classes [54 %], including unemployed, is deemed to be an acceptable ratio for the research purpose. 54 % of mothers were working full-time outside the home.

Pupils of schools in disadvantaged areas

9% of all national primary schools are currently registered under the Designated Areas of Disadvantage Scheme (Department of Education, 1996). In sample design, a higher percentage of such schools was included to improve representation of dispersed disadvantage.

Figure 5.3 *Percentage of children attending schools in designated areas of disadvantage*



The percentage of the sample [24%] illustrated includes children in inner-city schools, urban, and rural schools [Appendix B].

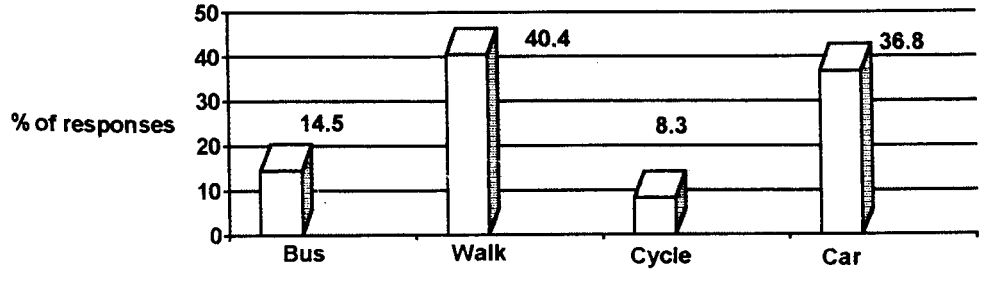
5.2 Lifestyle activity profile

Lifestyle physical activity for children during the school year is not confined to recreational activity after school, but includes travel to and from school, and periods of play within the school day. The study examines the extent to which children are active during these periods, and the factors that influence this activity.

5.2.1 School travel patterns

Children were asked to denote the method of transport to and from school that was 'mostly' used. As two options were selected by some children, data were analysed as a single multiple response variable.

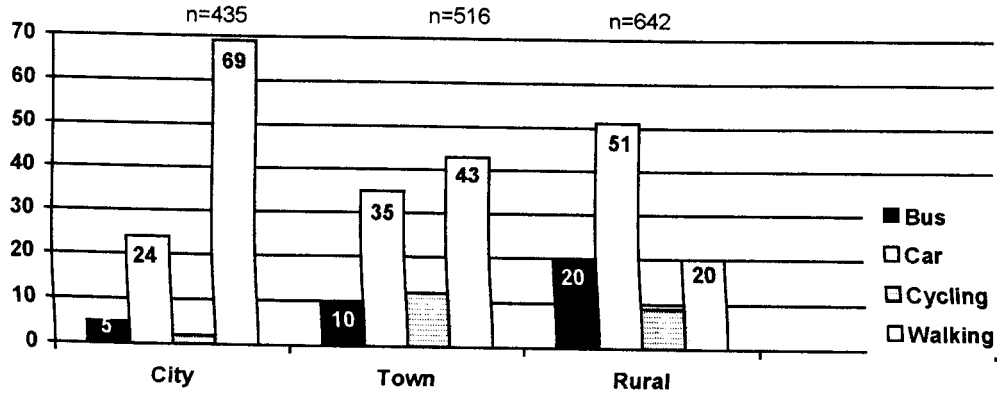
Figure 5.4 *Method of travel to / from school [Responses 1,706 =107% of cases]*



Analysis of the responses shows that 49 % of children's journeys to and from school are active, whilst 51% are inactive. Transport policy, restrictions on children's independent mobility, increased escorting of children in cars, school amalgamation and concomitant increase in bus transport, have all contributed to the loss of activity opportunity for more than half of the child population.

There was a significant difference between boys and girls in travel mode (Chi-square 31.967, $p < .001$). A greater percentage of boys (11%) cycle to school compared to girls (4%), and more girls are escorted by car (38%) than boys (30%). There were no differences in those who walk or travel by bus. Gender differences in children's cycling have been noted in British travel patterns during the period 1985-1992 (DiGuiseppi et

Figure 5.5 *Method of travel [Single response: n=1593] and geographic location of school*

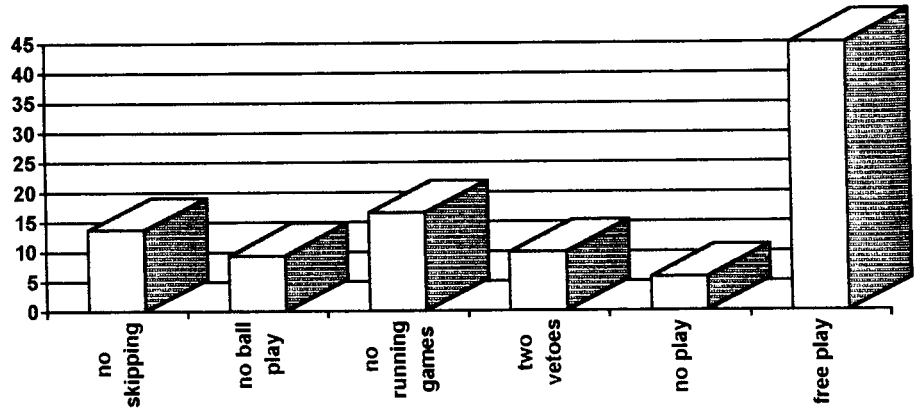


Children who attend village / rural schools are now the highest users of bus and car transport. 71% of this group are thus transported to school, compared to 55% of town pupils and to 29% of city pupils. City schoolchildren are the most active in school travel, in that 69% walk to school and a further 2% cycle. Less than half (45%) of town pupils and less than a third of rural pupils (29%) are active during school travel periods.

5.2.2 Playtime activity

Safety concerns coupled with accident litigation, has limited the playground opportunities some schools may offer. City schools with large numbers of children enrolled may also have physical space problems. This is more in evidence in suburban areas rather than in the inner-city, where pupil numbers have declined. To estimate the extent of this problem, the principals of schools in the survey were asked to denote which of the following activities were disallowed in the playground: skipping with ropes, running activities, and ball play [Figure 5.6].

Figure 5.6 *Play opportunities in school playground (% of children)*



Almost 40 % of children interviewed were disallowed one activity option, and 9.9%of children had two options disallowed. 5.7% of children were confined to 'walking or standing around'. Only 45% had unlimited opportunities for activity.

The most hazardous activities in the playground appear to be skipping-rope play and running games, as these are vetoed for a total of 29.3% and 27.4% of children respectively. Ball play is disallowed for 19.8% of children. Some of the pupils who are allowed ball play are however disallowed play with footballs and basketballs.

While such restrictions may be indicative of a national pattern, data are not substantive, and represent management procedures in only 62 national primary schools. Data for children's playtime choice however represent the decisions of 1,602 pupils and are nationally representative.

From a number of playground activities listed, children were asked to identify the option they 'usually' selected in their mid-day lunch break. As playtime activity choice is not constant, the reporting of two options was permitted [Table 5.3]. Data were first analysed as a multiple response variable[2] and subsequently as a single response variable [Figure 5.7].

Table 5.3 *Playtime preferences of children (%) tabled as multiple response*

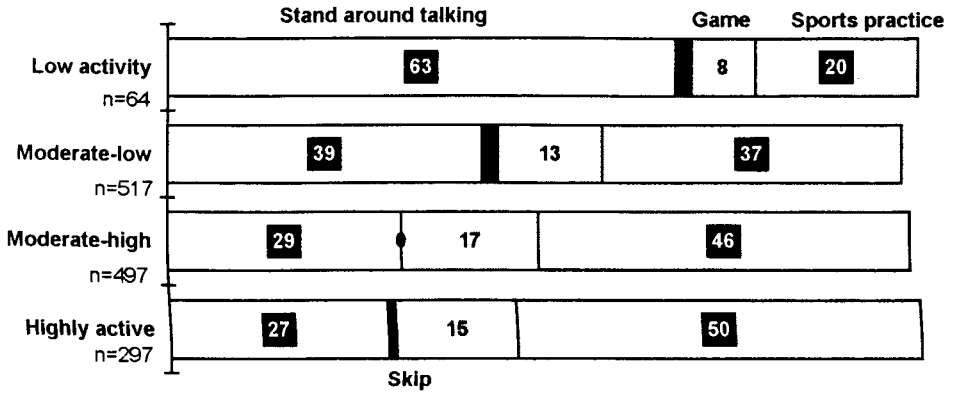
Options	Boys %	Girls %	All %
Stand around talking to friends	10	24	34
Practice a sport	31	16	47
Participate in a playground game	5	12	17
Play with a skipping rope	0	2	2
Go home for lunch - no time for play	5	4	9

66% of the play options of children (in school during lunch break) are active, and 34% inactive. Given that very restrictive procedures apply to 15.6% of children, restriction on playground usage therefore can not be cited as a contributory factor in the decisions of 18% of children who opt to 'stand around'.

Significant differences were observed between the choices of children who were *highly active* and those categorised as *moderate-low* and *low activity* outside of school [Chi-square 59.98, $p<0.001$]. As illustrated in Figure 5.7 children who are *highly active* outside school are more likely to be active during play periods. Among the group of children who were labelled 'highly active' the proportion of those who 'practice a sport' is two and a half times greater than that among the 'low activity' group. 63% of the latter opt to 'stand around' compared to 29% of the 'highly active' group.

[2] Sum of responses (n=1,710) = 107.9% of cases. Rounded percentages tabled

Figure 5.7 *Activity status of child and playtime activity* [3] *[Single response n=1585]*



The high numbers of both *moderate-high* and *highly active* children however who opt to stand around (18% of total), suggests that talking to friends may be more important than play as social exchange for some 11-12 year olds. Given the gender differences observed, this may be particularly true for girls.

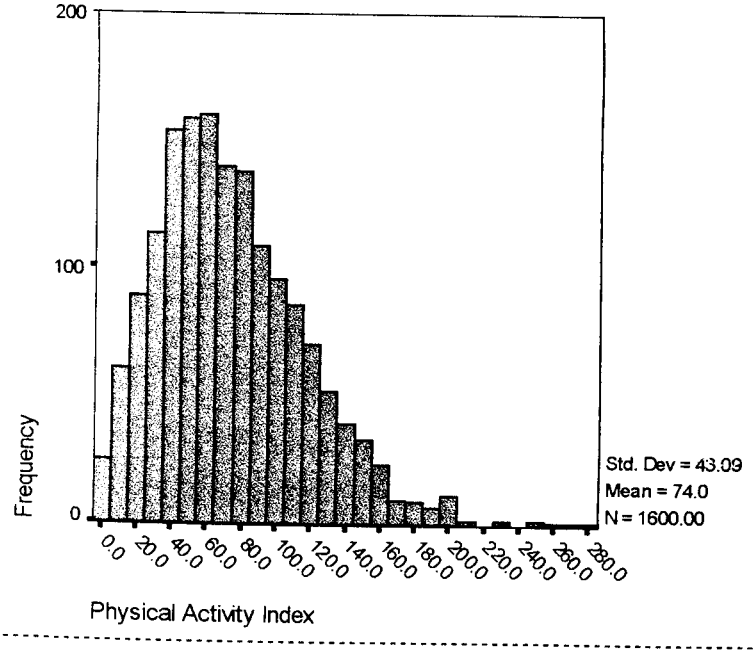
Gender differences in selection of playtime activity were highly significant [Table 5.4]. 46% of girls select the option of 'standing around' compared to 10% of boys. In contrast, 61% of boys practise a sport compared to only 26% of girls. Girls were more strongly represented in the 'playground game' option than boys, 20% vs.9%. Thus boys are significantly more active than girls at playtime. In addition, due to the large number of boys who practise a sport during playtime, a greater percentage of boys than of girls are likely to be involved in activity of higher intensity.

[3] Percentage of children who 'go home for lunch' not included in bar chart

participation in each activity is multiplied by the relevant age-adjusted MET value and the products summed. The index serves as the criterion variable in data analysis.

Scores range from a minimum of 0 to a maximum of 282. Although the distribution of scores is approximately normal (Kolmogorov-Smirnov Z = 0.064, p =.000)[4] scores are bunched at the lower end of the distribution [Figure 5.8]. The mean score is 74.03 and standard deviation 43.09. The median (68.00) is lower than the mean, and outside the confidence intervals of the mean (72.29 to 76.51).

Figure 5.8 *Distribution of physical activity index in 1600 children*

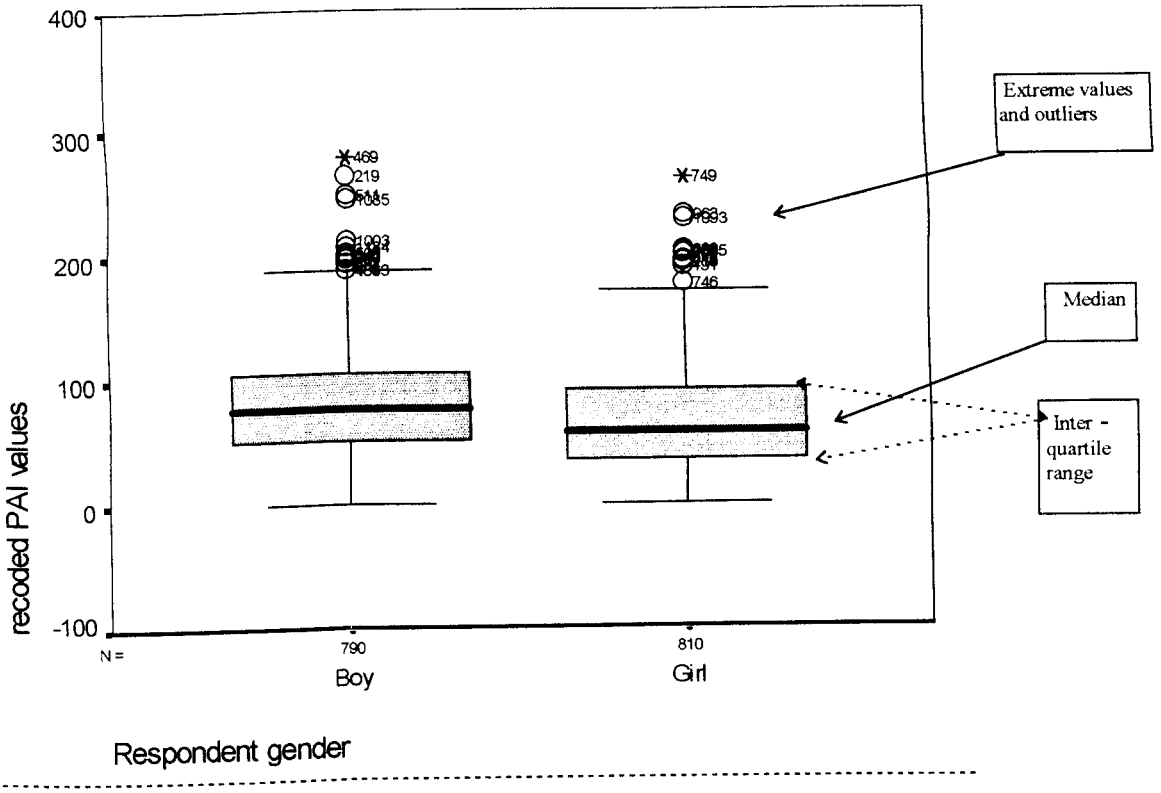


There were 28 outside values (≥ 188) in the distribution of the index, representing 1.75% of cases.

Differences between population groups (boys and girls) were observed to be significant. The mean score for boys was 82.07, compared to 66.18 for girls (F = 56.252, df = 1, p = .000). The median score for boys (76.38) was also higher than that for girls (58.12). The difference was observed in the median test to be signficant (Yates' chi-square = 6.059, p <.05).

[4] Kolmogorov-Smirnov test of normality: Lilliefors Significance Correction.

Figure 5.9 *Box-plots of physical activity index by gender group*



The box-plots illustrate the dispersion of values, the lower range of scores for girls, and the position of the inter-quartile range (50% of values) at the lower end of both distributions. The box-plots also show the higher position of the median for boys. Unlike the mean score, the median is not sensitive to outliers (outside values).

There were 15 outliers in the distribution of boys' scores (≥ 189) and 11 (≥ 178) in that for girls, and one extreme value in each gender group.[5] Twenty girls recorded values of zero, compared to only 2 boys.

[5] Outliers (outside values) are those 1.5 - 3 hspreads outside the hinges, extremes (far outside values) are more than 3 hspreads outside. In this sample, relevant hinge is 75th percentile.

Seasonal Variation

A significant difference was observed in scores for children interviewed in the May-June survey period and those interviewed in September.

Table 5.5 *Mean PAI scores for respondents May-June and September*

	N	Mean	t-test	Sig. (2-tailed)
May-June	1205	77.8	6.590	.000
September	395	62.5		

May and June are the school calendar months in which children are likely to be the most active. Somewhat lower activity levels are expected in the September period as school and club games are at the organisational stage, and children's participation routines are not established. Data for the two interview periods combined more accurately reflect a 'normal' week.

Activity groups

For initial data analysis, cases were sorted into four activity groups. Subjects with an index value of less than (or equal to) 10 were classified as 'low' activity. This level corresponds to approximately one period of vigorous intensity activity or two periods at moderate intensity. Cases above the cut-off point for 'low' activity were then grouped on a tertile basis [Table 5.6].

Activity group	Boys %	Girls %	All %
Highly active [n = 511]	38	26	32
Moderate-high [n = 501]	34	29	31
Low-moderate [n = 519]	26	38	32
Low [n = 69]	2	6	4

$\chi^2 = 52.822$, df = 3, $p = 0.000$

Table 5.6 *Activity by gender and activity groups total (% of children)*

The criterion measure for 'low' activity is more stringent than has been formerly applied in youth studies [6]. Twenty-two children (1.4%) were *inactive*, participating in no physical activity whatsoever outside of school. Gender differences by groups are also observed to be significant, boys being considerably more active than girls in all categories of activity.

Frequency of activity: comparative data

Frequency data presented in many national population studies are compiled from responses to the question "How often do you take part in an activity where you get out of breath or sweat". This question implies participation in moderate to vigorous intensity activity (MVPA) only.[7] The index measurement method used in this study includes a number of activities which are categorised as mild intensity. Activity at this intensity has been shown to provide health benefits (Powell et al.,1986, 1987; Leon et al.,1987; Slattery et al.,1989; Shaper & Wannmethee,1992), and it is the intensity at which much of the child's habitual physical activity is performed (Armstrong et al.,1990; Biddle et al.,1992; Atkins et al.,1995).

For data comparison purposes, a frequency table of participation in those activities classified as intensity > 4.3 METs was compiled (average period of activity one hour: coefficient 0.5).

Table 5.7 *Frequency of moderate-to-vigorous physical activity (% of children)*

Moderate to vigorous physical activity	Boys %	Girls %	All %
4 or more times per week	91.3	77.9	84.6
2 -3 times per week	7.1	15.3	11.2
Once a week or less	1.6	6.8	4.2

[6] Cut-off points applied for 'low activity' group in studies of 11-18 year old youth: "...Total moderate activity score (TI) less than class mean, and total activity score (AS) less than class mean, no vigorous activity" (Murphy et al.1994), p.51 "...One hour or less of light aerobic exercise per week" (Raitakari et al.,1994), p.197.

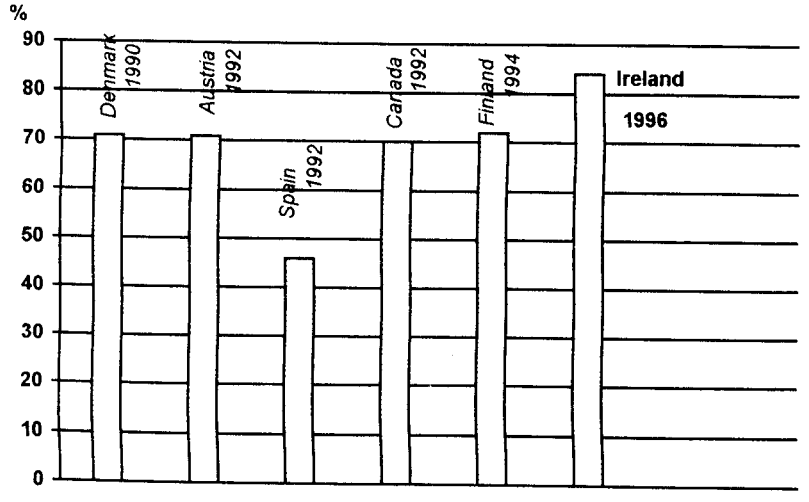
[7] MVPA - moderate to vigorous physical activity, defined as activity greater than 4.3 METs (Royal College of Physicians,1991)

The percentage of Irish children observed to be very active outside of school [Figure 5.10] is somewhat higher than that observed for Denmark (Holstein, Ito & Due, 1990)[8] Finland (Telama et al.,1994), Canada and the European countries included in the WHO cross-cultural study (King & Coles, 1992). It must be emphasised however that data in these studies are responses to 'being out of breath or sweating' and not records of participation in intensity-specified activity.

A study of Northern Irish children, wherein a similar 7-day recall activity measure was used, provides the most reliable comparison (Murphy et al.,1994). In the 11-12 year age-group, 6.5% of boys and 11.5% of girls were classified in the 'low activity' group, viz. *once a week or less.* Thus the proportion (9%) in the 'low activity' category is much higher than that observed for children in the Republic (4%).

Comparison of data across different time periods is also subject to error. In 1992, the proportion of 'inactive' children in Finland was 36% (King & Coles, 1992). In 1994, this had been halved, and 18% of children were thus classified (Telama et al.,1994). Caution therefore must be exerted in comparing the 1996 study of Irish children with population studies conducted at earlier time periods.

Figure 5.10 *Percentages of children who exercise at least four times a week out of school*

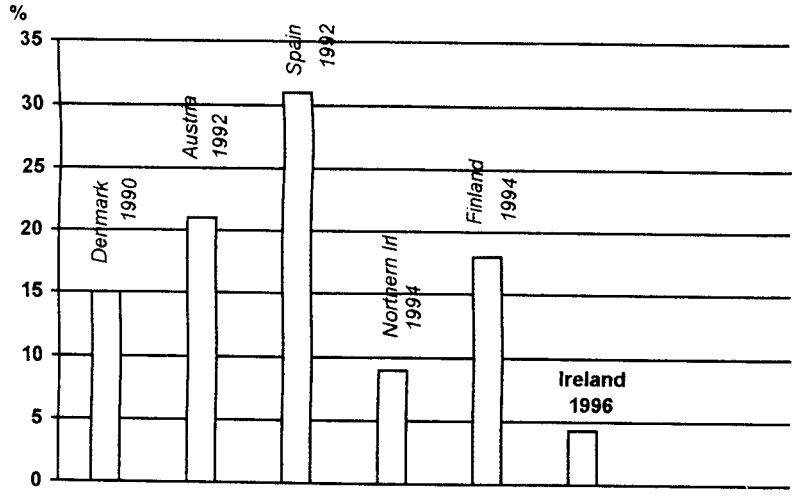


Sources: Holstein, Ito & Due (1990); King & Coles, (1992); Telama et al.,1994

[8] Data for Denmark derived from sum of responses '2-3 hours' and '4 or more hours' of exercise per week

Comparison of data for children who are 'inactive', that is, who exercise once a week or less outside school, is graphically illustrated in Figure 5.11

Figure 5.11 *Percentages of children who exercise once a week or less*



Sources: Holstein, Ito & Due (1990); King & Coles, (1992); Telama et al.,1994; Murphy et al.,1994

The number of inactive children varies widely between populations. The percentage of children categorised as inactive in Spain (31%) is more than three times higher than that observed for Northern Ireland. The percentage of Irish children classified as inactive (4.3%) is much less than that observed in many studies.

Comparisons between population groups are confounded by disparate measurement instruments employed, the inherent difficulties in activity measurement, and the differing measurement periods. Intensity of activity measured as the response to 'out of breath or sweating' may be greater or lower than that defined by the activity's MET value. In addition, the intensity relates to a particular episode of activity, hence values for a 'normal' week are arbitrary measures as such. Nonetheless, data presented in Table 5.7 clearly indicate that activity frequency for Irish children, aged 11-12 years, is extremely high. Data in this study support the epidemiological evidence which suggests that this age cohort is the most active of the youth population.

Activity choice

The percentages of children who participated at least once a week in an activity listed on the questionnaire were rank ordered, and the 16 most popular activities (of 32 listed) are shown [Table 5.8].

Table 5.8 *Percentages of children participating in 16 most popular activities*

≥ 45%*	%	≥ 25%	%	≥ 10%	%
Soccer	75	Gaelic Football	41	Camogie	20
Cycling	70	Blade skating	38	Jazz dance	19
Basketball	51	Hurling	34	Golf	17
Swimming	47	Baseball/Rounders	32	Rugby	15
Running	45	Tennis	29	Horse riding	14
				Irish dance	11

Percentages tabled to nearest whole number

Multicultural influences on sport are reflected in the pattern of preferences. International recreation trends, such as blade-skating, are also evident in activity preference. It is interesting to note that individual activities are equally represented with team games in the ten most popular choices.

The pattern of Irish boys' activity choice has some similarities to that observed for Northern Ireland boys (Riddoch, 1990), soccer and Gaelic football ranking as the first and third choices of both populations [Table 5.9]. However, the pattern for girls is markedly different.

Table 5.9 *Most popular activities of 12-year old children, Ireland and Northern Ireland* [9]

Republic of Ireland	Boys	Northern Ireland	Boys	Republic of Ireland	Girls	Northern Ireland	Girls
	%		%		%		%
Soccer	92	Soccer	71	Cycling	72	Netball	62
Cycling	73	Basketball	29	Soccer	60	Swimming	62
Gaelic football	57	Gaelic football	27	Basketball	55	Hockey	43
Hurling	52	Swimming	27	Blade skating	49	Running	34
Swimming	46	Running	25	Swimming	47	Badminton	31

Source: Riddoch, 1990

[9] Variable 'running' is excluded from table for Irish children [Boys 45% Girls 51%] as children were observed to double count this activity in reports

Cycling and soccer are the most popular for girls in the Republic, but do not rank at all in the first five choices of Northern Ireland girls. Hockey, on the other hand, does not rank at all (in the first 5) for girls in the Republic. The differences in activity choice are likely to reflect curriculum content emphasis as well as other socio-cultural and environment (sport infrastructure) influences. Among the five most popular choices of both genders, percentages participating are higher for Republic of Ireland children.

Gender differences were examined in activities wherein at least 10% of children participated. Differences were observed to be significant in nine popular activity areas (hurling and camogie excluded). Percentages of each gender group who participated at least once weekly in the activity are shown in Table 5.10

Table 5.10 *Recreational activity by gender [% playing once or more weekly]*

		Gender	
		Boys (% of group)	Girls (% of group)
Activity	Soccer [n=1,208]	92	60 ***
	Gaelic football [n= 649]	57	25 ***
	Basketball [n= 798]	45	55 **
	Rounders [n=514]	28	36 **
	Blade skating [n= 610]	28	49 ***
	Tennis [n= 461]	26	32 *
	Jazz dance [n= 285]	14	22 ***
	Rugby [n= 238]	22	8 ***
	Irish dance [n=179]	3	19 ***

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

In team games and dance activities, gender orientation parallels that observed for children's reported experience of these activities in school. A higher percentage of boys

play soccer, gaelic football and rugby, while a higher percentage of girls select basketball, blade skating, rounders, tennis and dance activities.

Recreational activity and geographic area

To investigate the relationship, if any, between place of living and level of activity, the geographic area of the school attended by the child was used as the area indicator. This measure is subject to error: for example, a rural child might attend a town school. The urban/rural school populations are however, in the main, deemed to be representative of the populations so topographically defined.

Table 5.11 *Physical activity by geographic area*

		Geographic area			
		City	Town	Village	Rural
		[% of group]			
Physical activity	*Low*	7	3	4	3
	Low-moderate	35	31	32	27
	Moderate-high	32	30	31	34
	Highly active	26	36	32	36
	Total (n=1,600)	n = 437	n = 518	n =565	n = 80

$\chi^2 = 18.712$ df = 9 $p = .028$

Cramer's v = .062 $p < .05$

Cramer's v was also used to denote the strength of the relationship. While differences between 'town' and 'village' children are negligible, city children are significantly less represented in the *highly active* category than either town or rural school children. A greater proportion of city children (42%) are in the *low activity* categories compared to town (34%), village (36%) and rural region (30%) children.

These results are in contrast with the findings for adult activity. In the most recent national survey (Irish Heart Foundation, 1994), male and female adults in rural areas were reported to be less active than their urban counterparts.

Differences in physical activity between 5th and 6th class children

Epidemiological studies of physical activity all report age-related declines for youth, the greatest decline occurring in the adolescent years. In this study of preadolescents, no significant differences in activity levels were observed for boys in their 5th and 6th class years [$\chi^2 = 4.252$, $p = .687$]. Girls' activity levels however were significantly lower in 6th class.

Table 5.12 *Physical activity of girls by primary class group*

		Primary class	
		5th (% of group)	6th (% of group)
Physical activity category	*Low*	4	10
	Low-moderate	36	42
	Moderate-high	27	30
	Highly active	33	18
	Total (n=809)	N = 463	N = 346
	$\chi^2 = 30.872$	$p = .000$	

The percentage of 'highly active' girls declines from 33% in 5th class to 18% in 6th class. There is also a higher proportion of 6th class girls in the low activity groups. The pubescent growth period and associated biological changes, coupled with diverging recreational interests, are suggested to contribute to a declining interest in physical activity for girls. It is of serious concern that the declining interest in physical activity among girls is now already apparent before girls leave primary school.

5.3 The primary school

Social factors suggested to influence physical activity include parents, peers, school, and socio-economic status. In this study, the role of the school is closely examined, as it is hypothesised that the primary school may be a significant factor in active lifestyle development.

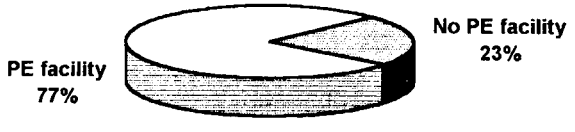
5.3.1. Physical education programme

The main channel of influence through which the primary school can affect children's lifestyle is the physical education programme. The effectiveness of the PE programme and the range of experiences children enjoy, is dependent on a variety of factors. These include the ability of the teacher to deliver curriculum content and to manage the class at activity, the facilities available in the school, school access to ancillary facilities, frequency of PE, co-operation of other teachers in the school, and the assistance of peripatetic teachers and sports coaching personnel.

Facilities

77% of children interviewed have access to an indoor area suitable for physical education.

Figure 5.12 *Percentage of children with access to an indoor PE facility*



Although estimates of the Department of Education (1996)[10] suggest that only 52% of schools have access to an indoor PE facility, INTO survey data indicates that 60% of

[10] Personal communication. Mr.B.Sheehan, Higher Executive Officer, Buildings Branch; Department of Education, 12 February, 1996.

schools have a PE hall, and 21% have an all-purpose room (INTO,1996)[11]. Thus a greater number of schools may have access to an indoor area for PE teaching than estimated. The improved access observed in the INTO survey and in this study, may in part be due to falling pupil numbers, and re-allocation of space used for class teaching to PE and the practical curriculum areas.

Access to playing fields was not examined in this study. INTO (*ibid.*) data indicate that 60% have access to a playing field, and 72% have a suitable surfaced school yard.

Frequency of PE lessons

A number of frequency of PE options were presented, and children were asked to indicate the option that applied within the current school term.

Figure 5.13 *Frequency of physical education lessons*

The frequency of PE reported by the children indicates that 81% of children are taught PE on a regular weekly basis. Of the 51% who are taught PE once weekly, some however may not receive the recommended curriculum provision [one hour per week] as class periods may be of 30-minutes duration. 7% have PE weekly, but regularity is weather dependent. Almost 12% of children do not receive what can be termed 'statutory entitlement' in physical education.

[11] Irish National Teachers Organisation, 1996. *Primary school curriculum: An evolutionary process.* Dublin, INTO.

The results of this study are very similar to that reported in the INTO (1996) survey of 540 schools. In the latter report, almost 82% of children are reported to have PE at least once a week. The comparative proportion in this study is 81%.

Frequency of PE	INTO (1996) %	Study sample %
At least twice a week	27.0	30.6
At least once a week	54.8	50.7
At least once a month	7.6	7.9
Never	6.0	3.6
Every week weather fine	--	7.1

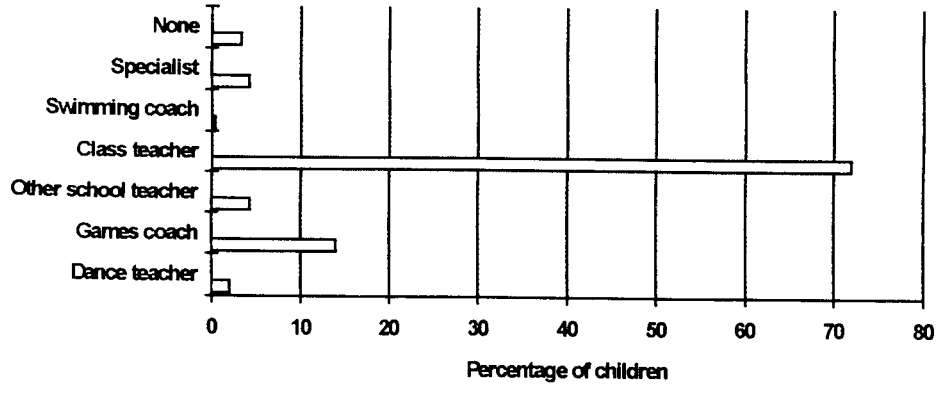
Table 5.13 *Frequency of PE : comparative data*

The number of pupils who have little or no PE is reported to have fallen from 20% in 1985 to 14% in 1995 (INTO, 1996). The 11.5 % identified in this study is still high in terms of the denial of children's statutory curriculum provision.

Teacher of PE in primary school

The class teacher is responsible for the teaching of PE to 72% of children, 14% receiving all regular tuition by games coaches. 23% had games tuition in addition to PE with the class teacher, and 7% had PE with the class teacher in addition to the swimming programme.

Figure 5.14 *Teacher of physical education in primary school*



An increase in the numbers of teachers employed to teach PE, from outside the school, is noted in the INTO curriculum report. The survey reports that 22.4 % of schools use

services of coaches and teachers outside of school personnel [termed 'specialist' teachers in the report], and in 6% of schools, a teacher in the school gives PE lessons to other classes. In this study, 47 % of children have tuition with personnel outside of school (including swimming coaches), while 6% of children are taught by another class teacher. Specialist teachers are defined in this study as professional teachers of physical education. 4% of children are taught by PE specialists.

After-school activity

More than half of the children participate on school games teams, and 20% are in activity clubs in school other than games [Table 5.14].

Table 5.14
Membership of school teams and activity clubs (% of children)

	Boys %	Girls %	All %
Member of school games team (s)	57	49	53
Member of school activity club	20	21	20

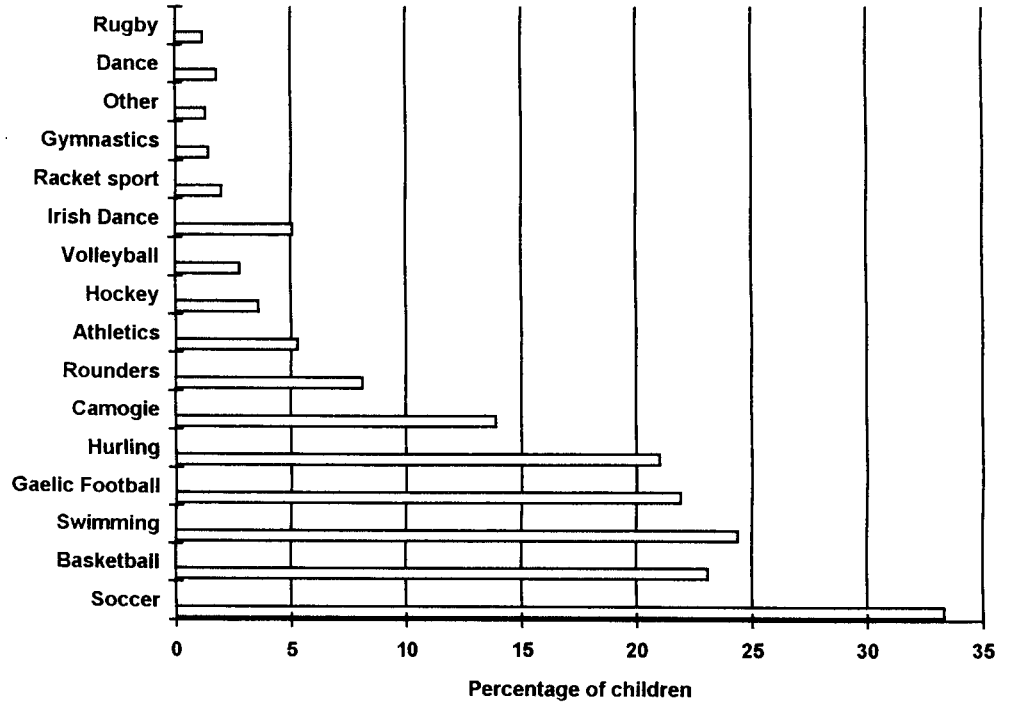
Boys are more likely to play on school games teams than girls [Yates $\chi^2 = 9.828$, $p < 0.01$], but there are no gender differences in membership of school activity clubs.

5.3.2 Physical education curriculum

To estimate the extent of children's curriculum physical education experience, children were asked to identify whether they had *'lots of practice'*, *'some practice'* or *'no practice'* in each of 15 curricular PE subject areas.

The response was explained to the children as to be inclusive of all their experiences from 1st class to-date. Figure 5.15 illustrates the percentages of children who have received *'lots of'* practice in each curricular area.

Figure 5.15 *Percentages of children who reported 'lots of practice' in curriculum areas*



Although the percentages in all areas are low, the results are neither unexpected nor disappointing. The objective of primary school PE is not to focus exclusively on one or two curriculum areas, but as the researcher has suggested, "... to introduce children to a wide range of sports and activities which will facilitate participation and enjoyment in physical activity in adolescence and later on, throughout adult life". (Leigh-Doyle, 1992). The variety of activities children experience by the final years of primary school is best estimated by summing the responses *'lots of'* and *'some'* practice in each curriculum area [Table 5.15].

Table 5.15 *Experience of curricular PE subject areas [percentages of children]*

Activity	None %	Some %	Lots of.. %	Cumulative[12] %
Basketball	28.7	48.2	23.0	**71**
Soccer	35.9	30.8	33.2	**64**
Gaelic football	46.0	32.0	21.9	**54**
Swimming	49.6	25.9	24.3	**50**
Rounders	53.2	38.6	8.1	**47**
Camogie	55.8	23.0	21.0	**44**
Hurling	55.8	23.0	21.0	**44**
Athletics	57.4	37.2	5.2	**42**
Gymnastics	60.3	38.2	1.4	**40**
Irish dance	75.1	19.7	5.1	**25**
Hockey	77.9	18.3	3.6	**22**
Volleyball	77.7	19.5	2.7	**22**
Dance	80.5	17.6	1.7	**19**
Racket sport	81.6	15.7	2.6	**18**
Rugby	91.8	6.9	1.2	**8**
Other	91.3	7.4	1.2	**9**

Inter alia: bench-ball, crab soccer, handball

Contrary to a widespread belief that children do not have much PE in primary school, it is evident from data shown in Table 5.15 that large numbers of children have been introduced to a variety of team games, swimming and individual activities in their primary years.

Hurling/camogie has been taught to 88% of children (combined). 71% of children were introduced to basketball, 64% to soccer, almost 54% to Gaelic football, and swimming tuition was provided for 50% of pupils.

While the results shown in Table 5.15 present a positive picture of the teaching of major games, the teaching of movement is very limited indeed, with 60% of children having no introduction to gymnastics, and 80.5% having no experience of creative or structured dance.

It is also surprising that almost 75% of Irish children have had no introduction to the cultural dance form of their country in their primary years. While 11% enjoy this activity outside of school [Table 5.8], the majority of boys and girls appear to complete the primary years with no Irish dance experience. Teaching the very simple formations and rhythms in a structured or a creative (dance-drama) approach would enhance appreciation of Irish music and cultural heritage, and provides an ideal opportunity for the integration of PE, music and drama. The neglect of this aspect of the primary curriculum is surprising.

The introduction of G.A.A. and I.R.F.U. coaching schemes has certainly enhanced the primary PE programme and contributed to a wider experience of games geographically, and socially. Leprechaun rugby is gradually being introduced to both girls and boys at all socio-economic levels. High levels of camogie practice, for example, were reported by children in Wicklow,[13] comparing favourably with the more 'traditional' Gaelic games county such as Kilkenny [14] [Table 5.16].

---

12 Sum of responses 'lots of practice' and 'some practice' tabled to nearest whole number

13 Children in Kilcoole, Newtownmountkennedy and Greystones national schools

14 Children in Freshford, Kilkenny city, and Johnstown national schools

Table 5.16 *Camogie experience in two counties*

Camogie	N	Mean	t-test	p
Wicklow	86	1.51	1.37	.17
Kilkenny	80	1.18		

However, in comparing hurling experience within these counties, the mean score is significantly higher in Kilkenny [Table 5.17].

Table 5.17 *Hurling experience in two counties*

Hurling	N	Mean	t-test	p
Wicklow	86	.21	- 14.11	.00
Kilkenny	80	1.58		

Thus the level of experience in Gaelic games can vary considerably between counties.

Skill learning areas

Introducing children to a variety of skill acquisition areas is one of the main objectives of the primary PE programme. An analysis of the data by skill acquisition area shows the number of children who, through experience of one or more subject areas, have acquired fundamental motor skills by the final years of primary school [Table 5.18].

For data presentation purposes, the classification of games is by the predominant skill type only. It is acknowledged that all games incorporate a number of skill learning areas, and some may have two predominant skill types e.g. handling and striking skills in rounders, handling and kicking skills in rugby. The classification does nonetheless give an overview of the motor skill experiences of children in their final years of primary education.

Table 5.18 *Percentages of children by major skill acquisition areas*

Physical activity skills [15]	Subject areas of skill acquisition	Experience level - high %	Experience level -basic %	No experience %
Striking skills	Hurling Camogie Unihoc Rounders Racket sport	35	48	17
Kicking skills	Gaelic football Soccer Rugby	33	45	22
Handling skills	Basketball Volleyball Rounders	26	57	17
Movement skills	Gymnastics Dance Irish dance	10	42	48

Curriculum physical education experience offered to pupils must be viewed in the light of PE facilities available to the school. In this study, 77% of children had access to an indoor area for PE, and yet almost 48% of children had no movement education outside of the games and swimming programme.

Analysis of movement experience by teaching area shows that absence of hall provision does not fully account for the numbers of children who have no movement experience. Of the 48% shown in column 3 above, 38% of these have an indoor area for PE teaching [Table 5.19]

[15] Aquatics and athletics skills data presented in Table 5.10

Table 5.19 *The impact of facilities on movement experience*

		Teaching area	
		Hall or GP room (% of group)	Outdoor (% of group)
Movement category	*None*	38	79
	Basic	50	19
	High	12	2
	Total (n=1,600)	N = 1226	N = 374
	χ^2 = 191.489	p = .000	

It is evident from data tabled above that provision of *basic* and *high* levels of movement experience are significantly influenced by the use of an indoor teaching area. In this sample, 12% of those who had an indoor area were in the *high* category compared to only 2% of those with no facility.

While many indoor areas are not suitable for gymnastics, and schools in general do not have access to a range of gymnastic equipment, most all-purpose areas are adequate for the teaching of dance. The high percentage of children who have no experience of movement education, other than games, is a cause of concern.

Some disparity is observed between these results and those presented in the recent INTO curriculum review (INTO, 1996). The latter reports that gymnastics is taught by 40% of teachers, and this concurs with children's experience of same (40%). Dance however is reported as taught by 41.7% of teachers and free movement by 71.7%. Even allowing for wide interpretation of the term 'free movement', there is little convergence between the children's actual experiences of movement education as reported in this study, and the experience as reported by teachers.

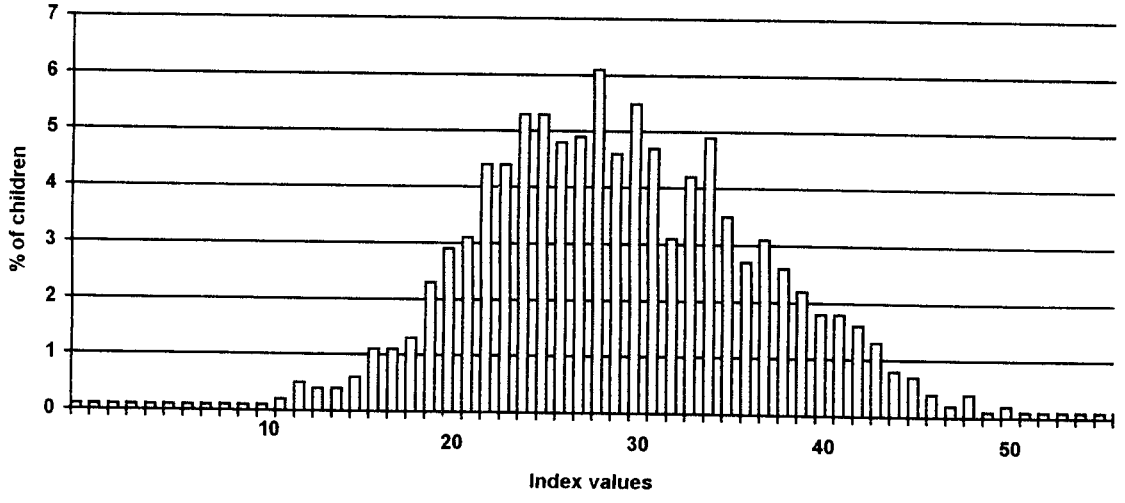
17.1% of the children have no experience of a stick game or activities requiring batting/striking skills. More than one fifth of the sample (22.4%) have no introduction to

kicking skills, and 16.6% have no experience of ball handling skills (outside of the Gaelic games experience).

5.3.3. Physical education index [PEI]

The physical education index is a combined record of scores for PE curriculum experience, frequency of PE lessons, extra-curricular physical activity, and reported evaluation of school PE. Scores ranged from 1-60 [Appendix E6]. Values were approximately normally distributed (Kolmogorov-Smirnov Z = 0.491, p =.000). The distribution of the index and variation in extent of PE experience is shown in Figure 5.16.

Figure 5.16 *Distribution of physical education index [1,600 children]*



There is a clustering of scores in the range 20-39 (mean = 29.14), with approximately 10% of children in the higher range (40-60). 29% of children have scores less than 25 and are thus considerably disadvantaged relative to their peer in terms of PE provision. 11.5% of all children however had scores less than or equal to 20 (amongst these were 9% ≤ 15) which implies that such children have extremely limited levels of PE, and are critically disadvantaged in terms of their overall educational experience.

PE index and gender

There was no significant difference between boys and girls on index scores.

The mean score for boys was 29.26 and for girls 28.95. The median 29.00 was similar for both groups, and the inter-quartile range was 10 for boys and 11 for girls. The distribution of values for girls PE was not normally distributed [Z = 1.272, p =.079]. As illustrated in the stem-and-leaf plot [Figure 5.17] there is an exaggerated clustering of values in the range 20-40. The distribution of values for boys [Figure 5.18] shows a higher proportion with scores ≥ 40, but at the lower extreme, there are greater numbers of boys with scores ≤ 10.

Figure 5.17 *Stem and leaf plot: girls physical education index scores*

```
Frequency          Stem &  Leaf

     6.00 Extremes    (=<6)
     3.00        0 .  &
    14.00        1 .  024&
    59.00        1 .  56677889999
   164.00        2 .  00000111122222223333333344444444
   194.00        2 .  55555555666667777777778888888899999999
   176.00        3 .  00000000111111112222233333344444444
   116.00        3 .  55555666677777888889999
    58.00        4 .  000111222334
    16.00        4 .  568&
     2.00        5 .  &
     2.00 Extremes    (>=52)

Stem width:  10
Each leaf:  2 case(s)
& denotes fractional leaves
```

Figure 5.18 *Stem and leaf plot: boys physical education index scores*

```
Frequency          Stem &  Leaf

     2.00 Extremes    (=<8)
      .00        1 .
     7.00        1 .  233
     5.00        1 .  45
    16.00        1 .  6666777
    24.00        1 .  88889999999
    49.00        2 .  0000000000011111111111111
    61.00        2 .  22222222222222223333333333333
    89.00        2 .  44444444444444444444445555555555555555555555
    86.00        2 .  66666666666666666666666677777777777777777777
    87.00        2 .  88888888888888888888888899999999999999999999
    86.00        3 .  00000000000000000000000011111111111111111111
    57.00        3 .  22222222222223333333333333333
    70.00        3 .  44444444444444444444555555555555555555
    47.00        3 .  66666666666677777777777
    31.00        3 .  888888889999999
    26.00        4 .  000000011111
    23.00        4 .  22222233333
    14.00        4 .  4445555
     4.00        4 .  6&
     2.00        4 .  8
     4.00 Extremes    (>=50)

Stem width:  10
Each leaf:  2 case(s)    & denotes fractional leaves
```

Physical education index groups

At initial stage of data analysis, cases were sorted into three categories of PE experience. ≤ 25 *low*, 26-32 *average*, and 33-60 *high*.

Primary PE experience	Boys % of group	Girls % of group	All % of group
High (n = 520)	32	33	32
Average (n = 539)	36	32	34
Low (n = 541)	32	35	34

Table 5.20 *Percentages of children by PE experience category*

A significant relationship was observed between geographic location of school and children's experience of PE [Table 5.14]. 43% of children in city schools were in the 'high PE' category compared to 32% of children in 'town' schools, and to 26% in rural schools (centre and region combined). City schools had the least number of pupils (30%) in the 'low PE' category. There was little difference however between rural and town schools in the 'low PE' category (34% vs.36%), while in the 'average PE' category, rural schools had a marginally higher representation (38% vs.34%).

Table 5.21 *PE index by geographic location of school*

		School location		
		City %	Town %	Village / Rural %
PE index	*Low*	30	34	36
	Average	27	34	38
	High	43	32	26
	Total	n=437	n=518	n= 645
	$\chi^2 = 42.517$	$p < 0.001$		

Children in city schools had more experience than their rural counterparts in swimming and soccer ($p<0.001$), while rural school children have significantly more hurling, camogie and rounders ($p<0.001$). Of those who had 'lots of swimming' practice, 58% were in city schools compared to 24% in rural schools. Of those who had 'lots of' Gaelic football, 55% were in 'town' schools, 29% in rural schools and 16% in city schools ($p<0.001$).

PE experience and school area status

The relationship between PE in schools designated as 'disadvantaged' and those in advantaged areas was examined [Table 5.22] Although the relationship was observed to be statistically significant ($p<0.05$), the association is unclear. 36% of schools in disadvantaged areas had high PE levels compared to 32% of advantaged schools. The reverse association is observed in the 'low PE' category, 36% vs. 33%.

The results however confirm an observation by the researcher, that in disadvantaged areas, extensive PE provision appeared to be a teacher dependent phenomenon rather than facility and equipment dependent.

Table 5.22 *PE experience by designated school area*

		Designated area	
		Advantaged (% of group)	Disadvantaged (% of group)
PE category	*Low*	33	36
	Average	35	28
	High	32	36
	Total (n=1,600)	N = 1218	N = 382
	$\chi^2 = 6.648$	$p < 0.05$	

PE experience and social class

Examining levels of PE in relation to social class, children in the higher social classes overall appear to enjoy a wider experience of PE [Table 5.23]. More than one third of children in the lower social classes are in the *low PE* group compared to less than one third of those in the higher social classes. Differentials overall however are not marked.

Table 5.23 *PE experience by social class of children*

		Social class: aggregated groups	
		Higher (classes 1-3)	Lower (classes 4-6 and unemployed)
PE index category	*Low*	30	37
	Medium	37	31
	High	33	32
	Total (n=1,598)	N = 736	N = 862
	$\chi^2 = 9.645$	$p < 0.05$	

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The impact of teaching facilities on PE experience

Children who have no access to an indoor PE facility were expected to report much lower scores for school PE experience. While the mean score was lower for this group (Table 5.24), the small 4-point difference indicates that teachers appear to compensate for lack of facilities by extra provision in games which can by played out of doors.

Table 5.24 *Differences in mean PEI scores*

	N	Mean	t-test	Sig. (2-tailed)
Indoor area access	1226	30.10	10.203	.000
Outdoor area only	374	25.80		

The mean scores however do not adequately reflect the disadvantaged position of children who have no indoor PE area. An examination of the PE experience groups shows that provision of an indoor area has considerable impact on the overall PE experience. This is particularly evident at PE index extremes [Table 5.25]

Table 5.25 *The impact of indoor teaching space on children's PE experience*

		Teaching area	
		Indoor area	Outdoor only
		%	%
PE experience	*High*	37	17
	Medium	33	36
	Low	30	47
	Total (n=1,600)	N = 1226	374

$\chi^2 = 60.718$ df = 2 $p = .000$

Although 36% of children who are in schools without a PE facility report medium levels of PE experience, and 17% achieved high PE levels, almost half (47%) of the children with no indoor area are in the 'low PE' category compared to less than one-third (30%) of those with a PE hall.

Gender differences in Physical Education

There was no significant difference between boys and girls in the overall experience of PE as recorded by the physical education index.

Gender differences however were observed to be significant in 11 curriculum PE areas. In six such, girls had more experience within school PE than boys ($p = 0.000$) while boys had more experience in soccer, Gaelic football, swimming ($p < 0.000$), volleyball ($p = .006$) and rugby ($p = .026$).

The teaching of gymnastics and dance is more orientated towards girls. 55% of girls had at least *some* experience of the former compared to 24% of boys. In Irish dance, 28% of girls had *some* practice compared to 11% of boys, and similar proportions apply to other dance teaching, 27% vs.8%. In rounders, basketball and racket sports, girls' experience is significantly higher than boys. Gaelic football and soccer are predominantly male oriented. 35% of boys have *lots of* experience of Gaelic compared to only 10% of girls, while in soccer the proportion is 55% boys:12% girls.

Data for curriculum areas wherein differences were observed to be highly significant are presented in Tables 5.26 to 5.34.[16]

Table 5.26 *Gymnastics experience by gender (Primary PE data)*

		Gender	
		Boys (% of group)	Girls (% of group)
Gymnastics	*None*	76	45
	Some	24	53
	Lots of..	0	2
	Total	N = 790	N = 810
	$\chi^2 = 156.958$	df = 2	$p = .000$

[16] For table presentation, percentages are rounded to nearest whole number

Table 5.27 *Irish dance experience by gender (Primary PE data)*

		Gender	
		Boys (% of group)	Girls (% of group)
Irish dance	*None*	87	64
	Some	11	28
	Lots of..	2	8
	Total	N = 790	N = 810

χ^2 = 115.887 df = 2 p = .000

Table 5.28 *Dance experience by gender (Primary PE data)*

		Gender	
		Boys (% of group)	Girls (% of group)
Dance	*None*	92	70
	Some	8	27
	Lots of..	0	3
	Total	N = 790	N = 810

χ^2 = 130.970 df = 2 p = .000

Table 5.29 *Rounders experience by gender (Primary PE data)*

		Gender	
		Boys (%of group)	Girls (% of group)
Rounders	*None*	67	40
	Some	30	47
	Lots of..	3	13
	Total	N = 790	N = 810

χ^2 = 127.589 df = 2 p = .000

Table 5.30 *Basketball experience by gender (Primary PE data)*

		Gender	
		Boys (%of group)	Girls (% of group)
Basketball	*None*	38	20
	Some	47	49
	Lots of..	15	31
	Total	N = 790	N = 810
	χ^2 = 90.671	df = 2 p = .000	

Table 5.31 *Racket sport experience by gender (Primary PE data)*

		Gender	
		Boys (%of group)	Girls (% of group)
Racket sport	*None*	87	76
	Some	10	21
	Lots of..	2	3
	Total	N = 790	N = 810
	χ^2 = 42.644	df = 2 p = .000	

Table 5.32 *Gaelic football experience by gender (Primary PE data)*

		Gender	
		Boys (%of group)	Girls (% of group)
Gaelic football	*None*	26	65
	Some	39	25
	Lots of..	35	10
	Total	N = 790	N = 810
	χ^2 = 272.466	df = 2 p = .000	

Table 5.33 *Soccer experience by gender (Primary PE data)*

		Gender	
		Boys (%of group)	Girls (% of group)
Soccer	*None*	15	56
	Some	30	32
	Lots of..	55	12
	Total	N = 790	N = 810
	χ^2 = 403.832	df = 2 p = .000	

Table 5.34 *Swimming experience by gender (Primary PE data)*

		Gender	
		Boys (%of group)	Girls (% of group)
Swimming	*None*	44	55
	Some	28	24
	Lots of..	28	21
	Total	N = 790	N = 810
	χ^2 = 22.065	df = 2 p = .000	

5.3.3 Physical education: attitude

Monitoring children's attitudes has been shown to be a useful diagnostic process which can reveal the feelings children have about school and school work (Davies & Brember, 1994). This is an especially relevant activity if done in the early years, for once attitudes have been formed they can be very difficult to change.

For the purpose of this study, and interview time constraint, a simple seven-item balanced rating scale was selected to measure attitude. In a comparison of the more comprehensive 25-item Likert scale, ATCPE [17], to the seven-point Guttman-type scale

[17] Attitude towards Curriculum PE (ATCPE) in: Jones (1988)

adopted (CRATE)[18], the latter has been shown to perform marginally better (Jones,1988). Children were asked to describe how they felt about PE in school by selecting one to the seven attitude options. Items are listed in Table 5.35 in reverse order to questionnaire presentation.

Attitude scale item	%
It is good fun and I like it very much	58
It is most enjoyable	10
I think it is good	17
It is OK sometimes	13
It is always boring	1
It is the worst thing we do in school	0.2
I hate it	0.4

Table 5.35a
Children's rating of PE lessons

Children's rating does not appear to have been affected by desirability to give the 'right' response, as may sometimes arise in the context of classroom research. 85 % of the children have a positive attitude to PE, more than half are very positive, approximately 13% are ambivalent, and only 2% report a negative attitude to PE.

Ambivalence or negative attitude towards PE, from a teaching perspective, may be the result of one or a combination of several factors such as lack of challenge, incorrect lesson pace, repetition of activity, unsuitability of content, poor teaching method. It is not possible to identify the particular causes in this study. However, in analysis of data by teacher category, no significant differences were observed in attitudes of children taught by their class-teacher, and those taught by specialist teachers or by peripatetic teachers.

It is interesting to compare attitudinal data recorded for Irish children with those reported in other national studies. The large cohort study of European and Canadian youth (King & Coles.1992) has tabled attitudes of 11-year old children towards their PE lessons for five of the ten populations surveyed [Table 5.35b].

[18] Children's Rating Scale of Attitudes towards Physical Education (CRATE) in: Jones, B.A.,1988. A scale to measure the attitudes of school pupils towards their lessons in physical education. *Educational Studies.* 1988, 14 (1), 51-63.

Table 5.35b *Attitudes of children towards PE: Comparison of survey data*

Country	Positive %	Neutral %	Negative %
Poland	91	5	4
Ireland	**85**	**13**	**2**
Wales	81	14	5
Finland	78	19	3
Canada	76	17	7
Spain	72	20	8

Source (excl. Ireland): King & Coles (1992)

Results observed for Irish children compare very favourably with international data. Only in Poland are children more positive towards their PE lessons. The Northern Ireland study (Riddoch, 1990) results are not comparable, as the attitude measurement was based on a dichotomous question (*yes, I like a lot / no, I do not like*).

In this study, no significant differences were observed between boys and girls in their attitude to PE. Gender differences were not analysed by King & Coles (*ibid.*), but there appeared to be little variation in the attitudes reported by boys and girls in the 11-year age group.

In one British study (Davies & Brember,1994) boys were observed to have a more positive attitude ($p<.001$) to games in PE, but the authors do not report measures of attitude to PE as a curricular area. In the Danish national study (Holstein, Ito & Due, 1990), boys in 7th and 9th grades were more positive towards PE than girls ($p <0.001$), however, similar to the results obtained in this study, no significant differences were observed for 5th grade children.

Enjoyment is critical to the success of primary PE programmes. Not alone is it essential to maximise participation in lesson activity, but has long-term implications in the formation of desirable attitudes to physical activity. On this measure of primary PE teaching success, the results are very positive indeed.

5.3.4 Teacher encouragement

The final question in the section on primary school activity was designed to assess children's perceptions of the encouragement they received from one of the teachers in school to participate in physical and sporting activities. By implication, this was not necessarily their class teacher. The results are presented in Table 5.37

Encouragement	Boys %	Girls %	All %
Lots of ...	65	64	64
Some ...	27	29	28
A little...	8	7	8

Total N = 1587

Table 5.36
Teacher encouragement in physical activity

There were no significant differences in teacher encouragement between boys and girls. Almost two-thirds of the children report that their teachers are very supportive of activity, with a further 28% giving some encouragement in this area. However there are almost 8% who receive little stimulus in school to adopt an active lifestyle.

Some children are not intrinsically motivated to participate in physical activity, and need external motivation from significant 'others', either in school, family, or community. Motivation from family cannot be assumed. The school therefore must accept its responsibility for active lifestyle development. In the absence of motivation within the school environment, 8% of children, herein identified, might be those most 'at risk' in future health behaviour.

5.3.5 Relationship between primary PE and children's recreational activity

A prime objective of the analysis was to determine the extent of the relationship between children's activity experiences within school, and their recreational activity outside of school. Analysis of the physical education index [PEI] and the physical activity index [PAI] by category groups demonstrates a significant and positive relationship between children's primary PE experience and their recreational activity [Table 5.37]

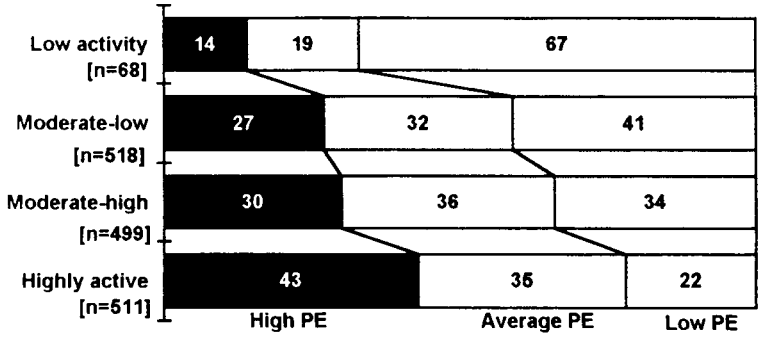
Table 5.37 *The impact of children's physical education experience on activity level*

		PE experience		
		Low (% of group)	Average (% of group)	High (% of group)
Physical activity	*Low activity*	8.5	2.4	1.9
	Low-moderate	39.2	30.4	27.5
	Moderate-high	31.8	33.6	28.5
	Highly active	20.5	33.6	42.1
	Total	N = 541	N = 539	N = 520
	χ^2 = 87.292	df = 6	sig. = 0.000	

Tabled data show that 42% of children with a *high* level of PE experience are 'highly active' compared to 20% who have a *low* level of PE experience. The proportion of those classified at '*low*' PE level within the two lower activity groups is almost a half (48%) compared to a third of those in the '*average*' PE group, and less than a third of those in the '*high*' PE group.

Examining corollary data, viz. the percentages of children in respective activity groups and their PE status, the association is similarly defined [Figure 5.19].

Figure 5.19 *Physical activity and physical education experience of children (%)*



The relationship between primary PE and physical activity remains significant when boys and girls are analysed separately or together [*Boys*: χ^2 = 70.177, df = 6, sig. = 0.000. *Girls*: χ^2 = 27.488, df = 6, sig. = 0.000]. In Table 5.38 Goodman and Kruskal's Gamma is used for the measurement of strength of relationship. This measurement can be interpreted in analogy to Pearson's product-moment correlation coefficient, but takes into account both the ordinal level of variables, and a large number of cases with equal rank.

Table 5.38 *y-values and significance levels for the relationships between physical education and physical activity*

Relationship	Goodman & Kruskal's Gamma	Boys	Girls	All
Physical education and physical activity	*y*	.36	.20	.27
	Sig.level	.00	.00	.00

As observed in the chi-square statistic and gamma coefficients tabled, the correlation between physical education and physical activity is moderately strong for boys, and moderately weak for girls.

5.3.6. Relationship between curriculum area and activity outside of school

The relationship of curriculum PE by individual subject area and the frequency of participation in this activity area outside of school was also examined. For analysis purposes, frequency of participation in each activity outside of school was rank ordered - 1 [*no participation*], 2 [*1-2 periods*], 3 [*3 or more periods*]

The strength of the relationship between both ordinal variables was examined using Kendall's tau [Table 5.39]. This statistic does not assume distributional normality. Although correlations were slightly smaller that produced by Spearman's rho, this statistic is suggested to deal better with tied ranks.[19]

Table 5.39 *Relationship between curriculum PE activity experience and activity practice outside of school expressed as Kendall's correlation coefficient [tau]*

Activity	τ		τ
Camogie	.60 ***	Basketball	.28 ***
Hurling	.50 ***	Rounders	.22 ***
Gaelic football	.44 ***	Irish dance	.23 ***
Soccer	.34 ***	Swimming	.20 ***
Rugby	.21 ***	Racket sport	.10 ***
Volleyball	.20 ***	Hockey	.08 **
Athletics	.18 ***	Dance	.08 **
Gymnastics	.16 ***		

Test for homogeneity (χ^2-test) **p <0.01 *** p < 0.001

The relationship between experience in curricular PE activity and participation in the same activity outside of school was highly significant (p<0.001) for 13 of the 15 activity areas examined. The magnitude of the coefficients for soccer and Gaelic games ranges from 0.34 to 0.60, which suggests a moderately strong relationship for these activities. Correlation is low in the other subject areas.

[19] Bryman, A. and D.Cramer, 1997. *Quantitative data analysis with SPSS for Windows: A guide for social scientists.* London: Routledge, p.184.

5.4 Socio-economic status and physical activity behaviour

Sociometric variables have not been extensively investigated in studies of this age cohort, although clearly, socio-economic status is a major covariant of the type of physical and social environments to which the child is exposed repeatedly.

Results of studies which have examined the relationship between parents' income and status and children's activity behaviour are equivocal. Some studies report significant associations between socio-economic status and children's activity behaviour (e.g. Sunnegardh et al.,1985; Holstein, Ito & Due, 1990; Stucky-Ropp & Lorenzo,1993), while others have found no such relationship (Aaron et al.,1993; Raitakari et al., 1994 Hendry et al., 1993). Validity and reliability however are reduced by the imprecision of children's reports, and measurement of relationships may be under-estimated.

The relationship between children's activity level and parents socio-economic status was examined using the 7-category index already described. There was no significant differences in activity levels between the individual social class groups, whether boys and girls were analysed together or separately. However, when groups were collapsed into two categories, 'higher' and 'lower', the difference was observed to be significant [Table 5.40].

Table 5.40 *Physical activity by social class group (combined categories)*

		Social class group	
		Higher * (% of total)	Lower ** (% of total)
Physical activity	*Low activity*	3	5
	Low-moderate	31	34
	Moderate-high	32	31
	Highly active	34	30
	Total	N = 736	N = 862
	$\chi^2 = 9.541$	$p < 0.05$	

* Groups 1 - 3 ** Groups 4-6 and unemployed

5.5. Influence of community on activity behaviour

Community organisations, both public and private, play a major role in providing structured opportunities for participation in sports and other forms of physical activity.

In the interview, children were asked to indicate membership status in relation to their local community sports club and to any other sports club [Table 5.41].

Table 5.41
Membership of sports clubs
(% of children)

	Boys %	Girls %	All %
Community club	56	38	48
Other sports club	48	32	40

Almost half (48%) of the children are members of their local community sports club, and 40% are members of other sports clubs. There is a significantly greater representation of boys both in local community clubs [Yates $\chi^2 = 66.613$, $p<0.001$][20] and in other sports clubs [Yates χ^2 37.519, $p< 0.001$].

As expected, membership of a local community sports club is positively and significantly associated with activity level. 61% of children categorised as *highly active* are community sports club members ($p<0.001$).

Aggregated data for club membership shows that approximately one third of the sample (34%) are members of either their community club or another sports club, while more than a quarter (27%) are members of two sporting organisations. 39% of children are not members of any sports club.

The relationship between club membership status and activity behaviour is shown in Table 5.42

[20] Yates continuity correction of chi-square statistic for 2 x 2 table

Table 5.42 *Physical activity of children by club membership status*

		Club membership		
		Non-member (% of group)	Member of one (% of group)	Member of both (% of group)
Physical activity	*Inactive*	8	3	1
	Low active	42	31	20
	Active	30	31	34
	Highly active	20	35	45
	Total (n=1594)	N = 619	N = 546	N = 429
	χ^2 = 127.766	$p < 0.0005$		

The association between club membership and activity behaviour is highly significant [Chi-square 127.766, p <0.0005]. 45% of children who are members of two sporting organisations are 'highly active', 35% are 'active' and only 21% of these are in the lower activity groups. Of those who are members of one club, 66% are in the two higher activity groups compared to 34% in the lower groups. Children who are not members of any structured organisation are equally divided between the two higher and two lower activity groups (50% in each).

5.6 Influence of parents on physical activity

The role of parents in children's activity behaviour is multifaceted, and the extent of influence fluctuates as children move from childhood through adolescence. Parental support and socio-economic status may also be interactive. Thus measurement of parental influence as a single independent variable is problematic.

Influence is exerted not alone by encouragement and behaviour reinforcement, but also by such dimensions as role modelling, provision of transport by parents to sport and recreation activities, the volume of sports-related items in the home, actual play and activity performed with children, and support in children's social networking which facilitates play opportunity. In this study, three of the potential mechanisms of parental influence are examined: role modelling, activity encouragement, and participation with children in activity. An aggregate 'parental support' score is derived from the sum of scores on these three variables, and this measure is used in regression model.

5.6.1 Role-modelling

Parents' report of own activity behaviour is considered to be the more reliable indicator of the self-report measures. This method is not always feasible in large-scale studies. Data presented here are based on children's reports, where known, of parent's leisure-time activity.[21] Children selected one of six frequency options, and parents were then categorised into one of three activity groups. The relationship between children's activity level and parents' activity was significant for mother's exercise ($p < 0.001$), and to a lesser extent for father's exercise ($p < 0.05$). The influence of role modelling is more apparent among '*highly active*' children. Among mothers categorised as 'inactive', 24% are parents of *highly active* children, whereas among 'active' mothers, 37% are parents of the *highly active* [Tables 5.43].

[21] For 55 cases (children's reports) father's physical activity was unknown. For 27 cases, mother's physical activity was unknown.

Table 5.43 *Physical activity of children [n=1573] by mother's activity level*

		Mother's activity group		
		Inactive (% of group)	Average (% of group)	Active (% of group)
Physical activity of child	*Inactive*	5	3	4
	Low active	35	34	30
	Active	35	35	28
	Highly active	24	27	37
	Total (n=1573)	N = 410	N = 280	N = 883
	χ^2 = 26.573	$p < 0.001$		

Among fathers categorised as 'inactive' 27% are parents of *highly active* children, whereas among those categorised as 'active', 36% are parents of the *highly active* [Table 5.44]

Table 5.44 *Physical activity of children [n=1545] by father's activity level*

		Father's activity group		
		Inactive (% of group)	Average (% of group)	Active (% of group)
Activity of child	*Low activity*	5	3	3
	Low-moderate	35	34	31
	Moderate-high	33	33	30
	Highly active	27	29	36
	Total (n=1545)	N = 465	N = 267	N = 813
	χ^2 = 14.383	$p < 0.05$		

Analysis by gender showed mother's exercise to be significantly related both to son's activity level (chi-square 18.229, $p<0.05$) and to daughter's activity (chi-square 20.041, $p<0.05$). Father's exercise however was significant only in relation to daughter's activity (chi-square13.549, $p <0.05$). The percentage of highly active children in each of the parent's activity groups is shown in Table 5.45

Table 5.45 *Percentage of highly active children in parent's activity group*

Mother's activity group	Highly active boys %	Highly active girls %
Active	59	73
Average	19	10
Inactive	22	17

Father's activity group	Highly active boys %	Highly active girls %
Active	55	65
Average	19	11
Inactive	26	24

5.6.2 Parental encouragement

Children were asked to select one of three scale items describing the extent of parental encouragement received. While over two-thirds of the children's parents are very supportive of activity, 27% of children receive some encouragement, and almost 5% receive very little support at all.

Encouragement	Boys %	Girls %	All %
Lots of...	72	65	68
Some	24	30	27
A little	4	5	5

Table 5.46
Perceived level of encouragement

Early research has suggested that, because exercise and sport have been sex-stereo-typed as masculine in our culture, boys may have more parental reinforcement for exercise than girls. This suggestion is upheld, to a limited extent, in relation to the level of encouragement children have reported in this study. As shown in Table 5.46, the percentage of boys who receive lots of encouragement is greater than that for girls [chi-square 7.826, $p < 0.05$].

The relationship between parental encouragement and child's activity level is significant. The effect is seen not alone in the 'highly active' category but also within the 'low-moderate' and 'low activity' categories, where the difference in percentages of children receiving little and lots of encouragement is marked [Table 5.47].

Table 5.47 *Physical activity of children by encouragement of parents*

		Parental encouragement		
		Little (% of group)	Some (% of group)	Lots of.. (% of group)
Physical activity	*Low activity*	11	7	3
	Low-moderate	45	40	29
	Moderate-high	27	30	32
	Highly active	17	23	36
	Total (n=1592)	N = 75	N = 431	N = 1086
	$\chi^2 = 59.105$	$p < 0.001$		

The relationship remained significant when boys and girls were analysed separately [Boys: chi-square 32.76, p<0.001 Girls: chi-square 26.32, p<0.001].

5.6.3 Participation in activity with family

Children were asked to report the frequency of activity participation with one or more members of the family.

Activity frequency	Boys %	Girls %	All %
Often	20	22	21
Sometimes	41	45	43
Never	39	33	36

Table 5.48 *Physical activity with family*

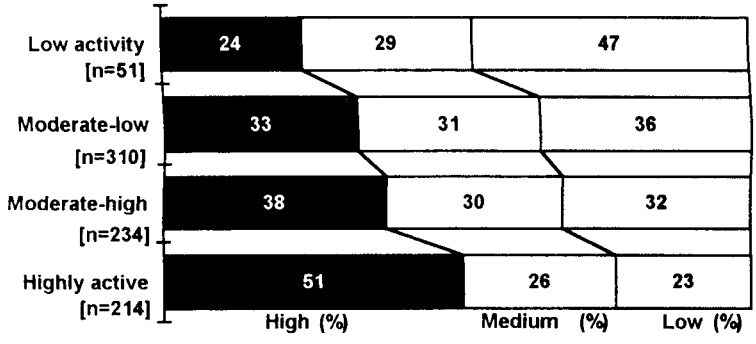
Activity with parents is not a strong feature of 11-12 year old children's exercise pattern. Only 21% of children have joint regular activity periods with their parents.

There was no significant relationship between the frequency of activity performed with family members and the child's level of activity.

5.6.4 Parent support index

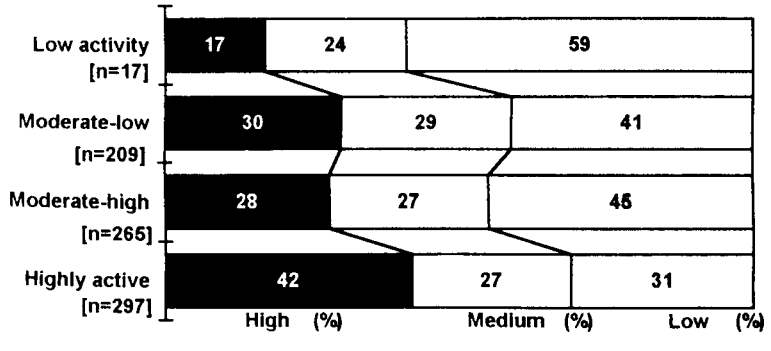
The aggregate of scores on the three variables is the measure used to examine the relationship between parental influence and children's activity behaviour. The association is positive and significant for both boys and girls, whether analysed separately or together.

Figure 5.20 *Girls' physical activity [n=809] and parental support*



For both girls and boys, the pattern is consistent at the extreme levels of activity, but some divergence is observed in the moderate ranges.

Figure 5.21 *Boys physical activity [n=788] and parental support*



Gamma coefficients and chi-square values used for the measurement of the strength of both relationships illustrated are shown in Table 5.49

Table 5.49 *y - values and significance levels for the relationships between parental support and physical activity behaviour*

Relationship	Goodman & Kruskal's Gamma	Boys	Girls	All
Physical activity and parental support	*y*	.16	.22	.17
	Sig.level	.00	.00	.00

As shown in Figures 5.20, 5.21 and Table 5.45, the association between parental support and children's activity is marginally stronger for girls.

5.6.5 Parental support and socio-economic status

The impact of class structure on parental influence scores was examined. The mean parental influence score for children in the lower social classes was lower than the score for children in the higher classes [Table 5.50].

Table 5.50 *Parental influence - differences in means*

Aggregate class group	N	Mean	t-test	Sig.
Higher	736	2.13	5.614	.000
Lower	862	1.90		

In the analysis of parental support by aggregate class group, parental support is observed to be significantly higher for children in the higher social classes.

Table 5.51 *Parental influence by social class groups*

		Social class groups	
		Higher	Lower
Parental influence	*High*	42	31
	Medium	30	27
	Low	28	42
	Total (n=1595)	N = 733	N = 862
	$\chi^2 = 32.638$	$p < 0.001$	

42% of children in the lower social classes are in the 'low' parental support category compared to 28% of children in the higher social classes. Differences in proportions are equally marked at the higher support level. 42% of children in the higher social classes are in the 'high' support category compared to 31% of the lower classes.

The aggregate parental influence index comprises only three of the many potential mechanisms of influence. As such, it is an incomplete measure of parental support, and inferences must be drawn with caution. On this limited measure, it is apparent that the role parents play in the socialisation of children into activity at age 11-12 years is significant. Social class differences in measures of parent support are marked.

5.7 Social Integration

Children were presented with six multiple choices questions relating to their social network. Data indicate that social integration among peers in this age group does not present difficulties for most children. On five of the six integration indicators, more than 70% of children scored in the moderate to high ranges. On the remaining indicator, 'talking to friends about their personal problems', 83% of children were in the low to moderate ranges, with 40% reporting that they found such communication difficult. A quarter of the cohort interviewed reported that they usually exercise on their own. This is more likely to reflect a preference for individual-type play or activity, already observed in children's activity choice [Table 5. 8] rather than be indicative of low social integration per se.

Children's responses to the six-item index were summed to give a measure of social integration. Cases were then grouped into 3 categories 'highly integrated' (15-18) 'mixed'(10-14) and 'not integrated'(5-9). [Table 5.52].

Table 5.52 *Social integration status*

Social integration status		Boys %	Girls %	All %
Highly integrated	[n = 573]	38	34	36
Mixed	[n = 926]	56	60	58
Not integrated	[n = 97]	6	6	6

There were no significant differences between boys and girls of this age group within integration groups.

Significant gender differences however were observed on four of the six scale items. Frequency of being with friends after school was higher among boys than girls ($p<.001$). Boys also reported higher frequency of exercising with friends than did girls ($p<0.001$). Boys were more positive than girls in knowing what to do with an unexpected free afternoon ($p<0.01$). On only one indicator, 'having a close friend', did girls perform marginally better than boys, 89% reporting 'yes' compared to 84% of boys ($p<0.01$).

Responses to individual scale items and the percentages of children who are 'highly active' in each response category were examined. Results are shown in Table 5.53

Table 5.53 *Relationship of activity to social network variables*

Social network variable	Response category		Highly active %
In a week, how often are you with your friends after school	4 -5 times	(n = 791)	**36**
	2 -3 times	(n = 515)	**33**
	0 - 1 times	(n = 288)	**20 ***)**
How easy / hard do you find it to talk to friends about your personal problems	very easy	(n = 272)	**36**
	easy	(n = 681)	**31**
	hard	(n = 642)	**32 n.s.**
Would you know what to do if you got an unexpected free afternoon from school	yes, always	(n = 882)	**37**
	yes,would think of something	(n = 603)	**26**
	no	(n = 110)	**28 ***)**
Do you have a real close friend	yes	(n =1380)	**33**
	no	(n = 214)	**22 **)**
How easy / hard do you find it to make new friends	always easy	(n = 514)	**40**
	mostly easy	(n = 886)	**30**
	find it hard	(n = 196)	**20 ***)**
How often do you do exercise with friends	always	(n = 515)	**40**
	sometimes	(n = 629)	**31**
	usually on own	(n = 393)	**28**
	do not exercise	(n = 58)	**10 ***)**

Test for homogeneity (χ^2-test) *) $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table 5.53 shows the extent of variation between children on social network indicators, relationships with family excepted. The picture that emerges from the data is that children who are highly integrated in their social network are more active that those who have less contact with friends and / or those who have difficulty relating to others.

The relationship of social integration to activity behaviour was also examined using index

categories for both variables. The association is significant and positive, and confirms the evidence of association observed on individual integration indicators. The relationship is shown in Table 5.54.

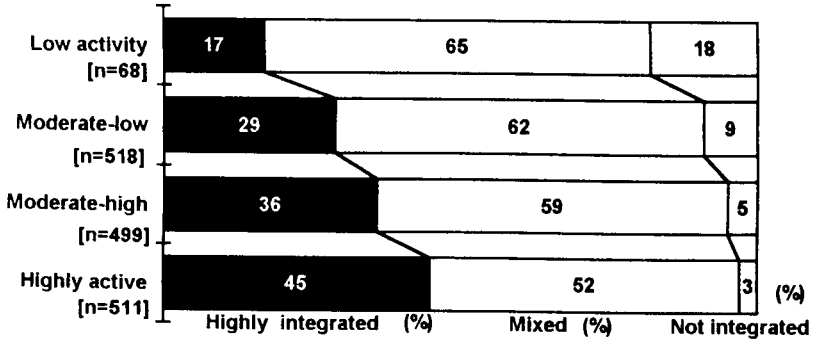
Table 5.54 *Physical activity by social integration*

		Social Integration		
		Not integrated	Mixed	Highly integrated
Physical activity	*Low activity*	12.4	4.8	2.1
	Low-moderate	45.4	35.0	26.2
	Moderate-high	25.8	31.6	31.6
	Highly active	16.5	28.6	40.1
	Total (n=1596)	N = 490	N = 533	N = 573
	$\chi^2 = 59.228$	$p < 0.001$		

40% of those labelled 'highly integrated' are in the '*highly active*' group, compared to 17% of the 'poorly integrated'. 45% of the 'poorly integrated' are in the '*low-moderate*' activity group compared to 26% of the 'highly integrated'.

The pattern shown in corollary data, viz. percentages of children in respective integration groups by activity category, is broadly parallel to that tabled above [Figure 5.22]

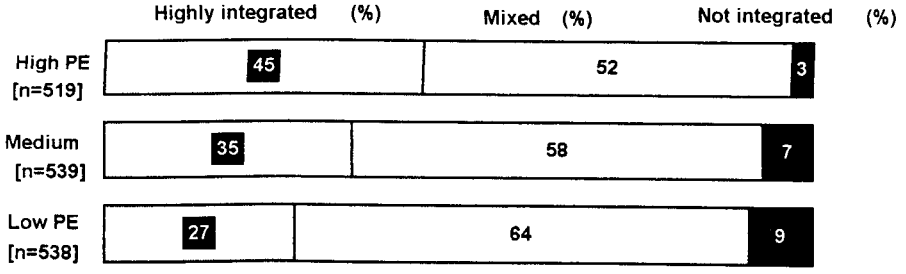
Figure 5.22 *Physical activity and social integration*



Relationship persists when boys and girls are analysed separately or together. Goodman and Kruskal's Gamma is used for the measurement of strength of relationship [Table 5.55].

Physical education experience was also observed to be significantly and positively related to social integration, both for boys [χ^2 = 22.034, p<.001] and for girls [χ^2 = 26.920, p<0.001]. The relationship observed for both groups collectively is graphically illustrated in Figure 5.23

Figure 5.23 *Physical education experience and social integration*



Physical activity, physical education and social integration appear to cluster together as mutually reinforcing elements in the activity socialisation process. High participation in physical activity seems to lead to increased social integration and vice versa. Primary physical education experience influences recreational activity, and perhaps through the provision of socialisation opportunity, has a positive effect on social integration.

Table 5.55 *y - values and significance levels for the relationships between social integration, physical education and physical activity*

Relationship	Goodman & Kruskal's Gamma	Boys	Girls	All
Physical activity and social integration	*y*	.33	.19	.26
	Sig.level	.00	.00	.00
Physical activity and physical education	*y*	.36	.20	.27
	Sig.level	.00	.00	.00
Physical education and social integration	*y*	.23	.28	.26
	Sig.level	.00	.00	.00

5.8 Psychological influences on physical activity behaviour

The relationship of psychological factors to activity behaviour, and potential interaction of these with other influences, are important in studying the socialisation process. Results of a brief assessment of the relationship of motivation, physical self-perception, and health knowledge to children's recreational activity are presented below.

5.8.1. Motivation

Children were asked to evaluate the importance of 9 possible motives for participating in sport and physical activity [response alternatives: '*very important*', '*important*' and '*not important at all*']. Data in the first column of Table 5.56 show that the most important motives for 11-12 year old children are 'to have fun'(66.1%), to 'improve my health'(55.5 %), and 'to be good at the activity' (50.3%).

The second column shows the percentage of children who are *highly active* among those who reported the motive as being "very important". The ratio in column 3 is the percentage of the *highly active* among children who reported "very important" divided by the percentage of *highly active* children who reported "not important at all".

Table 5.56 *Percentage of children who report that the listed motives for activity are very important to them, and percentage of these children who are highly active.*

Motives	Percent of pupils who reported "very important"	Percent of these children who are *highly active*	Ratio
To have fun	66	32 n.s.	1.4
To improve my health	55	33 n.s.	1.3
To be good at the activity	50	37 ***)	1.5
To get into good shape	40	33 n.s.	1.2
To make new friends	35	37 *)	1.3
To win	22	39 *)	1.3
To please my parents	22	36 n.s.	1.2
To look good	20	36 n.s.	1.2
To be like a sports star	19	43 ***)	1.6

Test for homogeneity (χ^2-test) *) $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

The ratio (column 3) expresses in a very simple way the correlation between the motive and actual activity participation. Data in Table 5.56 show that the motives 'to be good

at the activity' and 'to be like a sports star' are the most strongly associated with activity. Two other motives 'to make new friends' and 'to win' are weakly associated, whereas 'to have fun' and 'to improve my health', although most frequently mentioned as being very important, have no relation to activity level.

Boys give significantly higher priority to *being like a sports star* [31 vs.6%], *to win* [31 vs.13%] and to *please my parents* [27 vs.17%] than girls ($p<0.001$). Boys also give higher priority than girls to *looking good* [23 vs.17%] and to *be good at the activity* [55vs.45%] ($p<0.05$).

Four of the motives listed were significantly more frequently mentioned by children from the lower socio-economic groups. 62% of children in the lower social classes report *to be like a sports star* as 'very important' compared to 38% of those in the higher classes. *To please my parents* was 'very important' for 65% of the lower classes compared to 35% of the higher classes ($p<0.001$), while *to make new friends* [52 vs.48%] and *to be good at the activity* [51 vs.49%] differed only marginally ($p<0.05$).

The listed order of the motives on the questionnaire was observed in field research to be an influence on children's response, and this may have biased the ranking of health and enjoyment motives as *very important*. A less ordered listing of motives may have produced an alternative result. Enjoyment and physique motives have been shown in a study of adolescents (11-15 years) to be strongly associated with activity (Holstein, Ito & Due, 1990).

The impact of PE on activity motivation

An interesting finding was the significant association between the two performance motives and the child's experience in physical education. 57% of children who have extensive PE experience report that 'to be good at the activity' is a very important reason for participation, compared to 42% who have low levels of PE experience.

Table 5.57 *The impact of physical education experience on performance motivation*

		Physical Education Experience		
		High PE	Average PE	Low PE
'Being good at the activity'	*Very important*	57	52	42
	Important	36	38	44
	Not important	7	10	14
	Total (n=1594)	N = 518	N = 539	N = 537
	χ^2 = 29.194	$p < 0.001$		

The activity motive 'to be like a sports star' was also significantly associated with levels of PE experience (Chi-square17.432, $p < .01$). 22% of children with 'high PE' experience considered this a 'very important' motive compared to 14% with 'low PE'.

5.8.2 Health knowledge

The child's knowledge of health accrues not alone from school health education programmes and health promotion in school via external agencies, but also from parents, peers, and diffuse sources such as advertising media, film media, peers and parents.

In a brief health knowledge assessment, children were asked to select a 'true / false' response to the scale item. Results are shown in Table 5.58.

Table 5.58 *Percentages of children by correct responses to health statements*

	No. of correct answers			
	3 or less	4	5	6
Percentages of children	5	15	37	43

Health knowledge is reasonably high, with 80% of children selecting the correct responses on 5-6 statements. However, only 43% of children had six correct responses.

Scores were fairly consistent across scale items [Table 5.59]. There was no difference in overall scores between boys and girls, but on two statements, significant differences in response were observed..

Table 5.59 *Correct responses to individual health knowledge statements*

Health statement	%
Vigorous exercise makes the heart muscle stronger	80
Girls do not need as much exercise as boys to be healthy **	83
Exercise strengthens the bones, so they will not break as easily	82
Exercise helps to keep the body in good shape	98
Exercise makes the heart beat faster *	84
Eating junk food is always necessary for energy	89

** Boys score lower than girls, $p<0.001$
* Girls score lower than boys, $p<0.05$

On the gender biased statement, 21% of boys answered incorrectly compared to 12 % of girls. On the heart knowledge question, 18% of girls answered incorrectly compared to 13% of boys.

Health knowledge of Irish adolescents has been shown to be related to social class (O'Reilly & Shelley, 1991). In this study differences in health knowledge between class groups were also observed. 84% of children in the higher social classes had 5-6 correct responses, compared to 77% of those in the lower classes ($p<0.05$). Differences were also significant when analysed by individual class groups. For example, of those children who had a low score of 4, only 8% were in social class 1, compared to 22% in social class 6, and 21% in the unemployed category ($p<0.05$).

The extent of the school PE programme also appears to have an influence on children's health knowledge. Children who were in the *high PE* category had higher scores than those in the *low PE* group ($p<0.05$). 46% of children in the *high PE* group had all 6 correct compared to only 38% of the *low PE* group. Conversely 7% of the *low PE* group had only 3 (or less) correct compared to 3% of the *high PE* group.

Curriculum time allocated to health education, as reported in the most recent school survey (INTO, 1996), is not at all extensive. Only 21% of teachers explore this area once a week, while 65.5% teach it on a monthly basis. Information on health in relation to physical activity does not rank at all among the most common topics covered by teachers (*ibid.*) This suggests that much of children's health knowledge of physical activity is accrued from sources outside of school. It also supports the finding of differences in knowledge between social class groups. Health topics are likely to receive less attention in more disadvantaged families.

Perhaps the most encouraging finding is that a comprehensive primary PE programme contributes, either directly or indirectly, to increased knowledge of health. A disappointing finding is that one-fifth of pre-adolescent boys believe that girls need less exercise than boys for good health, and knowledge of heart health is low amongst approximately one fifth of all children.

Health knowledge was not associated with children's physical activity. This finding is consistent with the literature on health behaviour.

5.8.3 Televised sports viewing and physical activity

Media influence is multifaceted and diverse, and requires extensive qualitative research to be fully understood. In the study, only one aspect, viz. sports viewing on television was investigated.

Table 5.60 *Frequency of televised sports viewing*

	Boys %	Girls %	All %
2 or more times weekly	62	27	44
Once a week	9	18	13
Only an important sports event	22	37	30
Never or hardly ever	7	18	13

Gender differences are significant [χ^2 = 205.48, $p< 0.001$]. Boys watch sports much more frequently than girls. The more extensive coverage and priority given to male sport must be a contributory factor. High media-profile sports, such as soccer, are also played more frequently by boys and hence are likely to attract a predominantly male audience.

Televised sports viewing was also examined in relation to participation in activity. A significant association was observed between TV viewing of sports and activity level [χ^2 = 98.179, df = 12, p = .000]. Examining aggregated activity groups, viz. higher and lower, it is apparent that the children in the *higher* groups watch considerably more sport than those in the *lower* activity groups.

Table 5.61 *Televised sports viewing by activity groups*

	Activity groups	Higher %	Lower %
Viewing frequency	*2 or more times weekly*	50	28
	Once a week	12	13
	Important sports event only	29	34
	Never or hardly ever	9	25

A dual direction of the association between TV viewing and activity is suggested. Sports 'fans' are suggested, in general, to be drawn from those young people already favourably disposed towards sport and to the values, such as competitiveness, associated with sport (Hendry et al.,1993). Thus highly active children may also spend more time at TV sports viewing than the less active. Young sports spectators on the other hand are observed to emulate their sports 'heroes', and spend considerable periods of time at sports skills and games practice. In this respect, televised sports viewing has a positive role to play in children's activity patterns. It is interesting that, as shown in Table 5.61, children who spend '2 or more periods weekly' at televised sports viewing also have time for high levels of activity. Inferences drawn from such limited inquiry however must be tentative. Further research and exploration of media influence is required.

5.8.4 Physical Self-Perception Profile [PSPP]

In a structured alternative format, children were asked to respond to seven items relating to self-perception in the physical and motor competence domains. For each item, children indicated whether the statement selected was 'really true' or 'sort of true' for them. The 'really true' responses represent those who are very positive [score = 4] or very negative [score = 1] on each scale item [Table 5.62]. 'Sort of true' responses represent those who are intermediately placed on the continuum.

Table 5.62 *Total positive / negative self-perception scores [% of children]*

Physical self-perception scale item	Intermediate and positive (total) %	Intermediate and negative (total) %
Competence in all sports ##	49	51 [competent in1or 2]
Facility in skill acquisition	74	26
Perception of body shape ##	61	39
Priority in selection for teams ##	46	54
Competence in PE #	74	26
Participant / spectator status ##	88	12
Performance image ##	70	30

Boys higher than girls $p > 0.001$ # Boys higher than girls $p > 0.05$

The direction of physical self-perception is positive overall on motor competence items. 73% of children are competent in sports (including those *very* competent in one or two), 74% have little difficulty in learning new physical skills, and 74% think they are good enough at all aspects of PE. It is less positive on items relating to physique and physical performance image. 39% of children have a negative image of their body shape, and 30% think they look awkward/clumsy doing physical activity.

Gender differences are observed on six profile indicators, boys scoring higher than girls on all such [Table 5.63]

Table 5.63 *Physical self-perception within gender groups*

Physical self-perception indicator	Boys %	Girls %
Some kids do well at all sports	19	10 ***)
Some kids think that their body shape is good	22	11 ***)
Some kids are always picked first for teams	19	9 ***)
Some kids are good enough at all things in PE	28	21 *)
Some kids prefer to play games	64	53 ***)
Some kids think that they look good doing sporting activities	30	11 ***)

Test for homogeneity (χ^2-test) *) $p < 0.05$ ***) $p < 0.001$

Disconcerting gender-related results are that 43% of girls perceive their body shape to be 'not so good', and 36% think they look 'awkward' at physical activity. Thus at the early age of 11-12 years, negative perceptions of physique among girls are already very evident.

An index of physical self-perception [PSPP] was derived from the sum of responses on all scale items [index range 6-28], and cases were grouped into three categories. As shown in Table 5.64, few children of this age-group have, overall, very low physical self-perception [score 6-13].

PSPP	Boys %	Girls %	All %
High [n=459]	36	22	29
Moderate [n=1063]	60	73	67
Low [n=66]	4	5	4

Table 5.64
Physical self-perception profile of children

Confirming the results observed on individual scale items [Table 5.63], gender differences within groups are significant. The percentage of boys with a *very positive* image of the physical self is much higher than the percentage of girls in the same group [36 vs.22%] ($p < 0.001$).

5.8.4 (a) Relationship of physical self-perception and physical education experience

One of the teaching objectives in primary physical education is to improve children's self esteem through heightening perceptions of self in both the physical competence and physique domains. The relationship of children's scores on the physical self-perception index and their experience in PE is shown in Table 5.64 and Figure 5.24

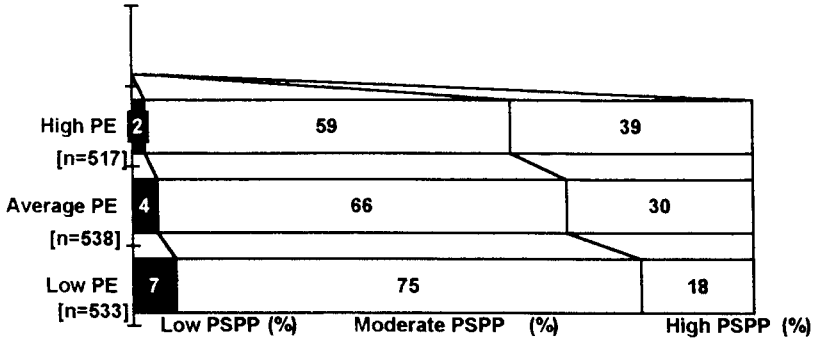
Table 5.64 *Percentages of children with very high self-perception and percentages within high PE experience category*

Physical self-perception indicator	Percent for whom statement is 'really true'	Percent with high PE experience
Some kids do well at all sports [%]	14	21 ***)
Some kids find new physical skills easy to learn [%]	25	32 ***)
Some kids think that their body shape is good	17	18 *)
Some kids are always picked first for teams [%]	15	16 ***)
Some kids are good enough at all things in PE [%]	24	32 ***)
Some kids prefer to play games [%]	58	64 ***)
Some kids think that they look good doing sporting activities [%]	17	17 ***)

Test for homogeneity (χ^2-test) *) $p < 0.05$ ***) $p < 0.001$

The pattern is consistent. Children who have extensive physical education have very positive self-image in relation to both participation and performance in physical activity. The relationship was also examined using index categories for both variables [Figure 5.24].

Figure 5.24 *Physical education experience and physical self-perception*



The association is significant and positive ($p<.0005$), and persists whether boys and girls are analysed separately or together [Coefficients shown in Table 5.68].

5.8.4 (b) Relationship of physical self-perception and recreational activity

Physical self-perception was examined in relation to the child's level of recreational activity [Table 5.65]

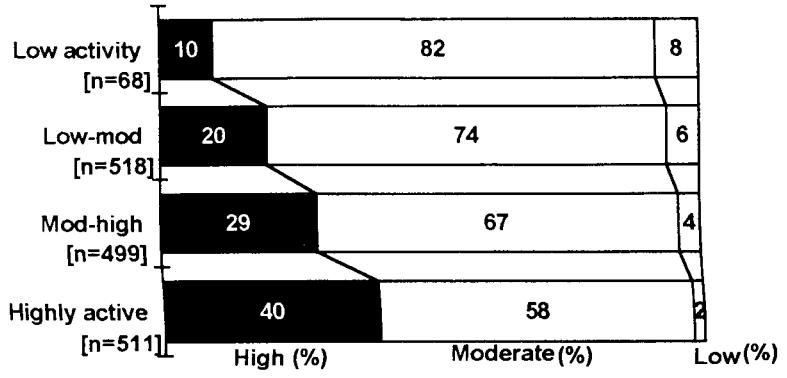
Table 5.65 *Impact of physical self-perception on physical activity*

		Physical self-perception		
		Low (% of group)	Moderate (% of group)	High (% of group)
Physical activity	*Low activity*	7	5	2
	Low-moderate	46	36	22
	Moderate-high	32	31	32
	Highly active	15	28	44
	Total (n=1588)	N = 66	N = 1063	N = 459
	χ^2 = 67.923	$p < 0.0005$		

The association is significant and positive ($p<0.0005$), and remains thus when boys and girls are analysed separately. The largest proportion of children with high self-perception (44%) are among the *highly active*, and the largest proportion of those with low self-perception (46%) are in the *low-moderate* activity group.

Examining corollary data, viz. percentages within physical activity index groups, the positive relationship is also shown [Figure 5.25] [Coefficients in Table 5.68].

Figure 5.25 *Physical activity and physical self-perception*



The cross-sectional nature of the study does not allow causal inferences to be drawn between physical activity and physical self-perception. Children who feel good about the physical self and who are confident in motor performance are likely to participate more in activity than those with poor physical self-image. Reciprocally, extensive participation in activity increases self-image and performance image. Coefficients of asymmetric measures support the dual direction of influence suggested [Table 5.67].

Table 5.67 *d_y values and significance levels for the relationships between physical education, physical activity and physical self-perception*

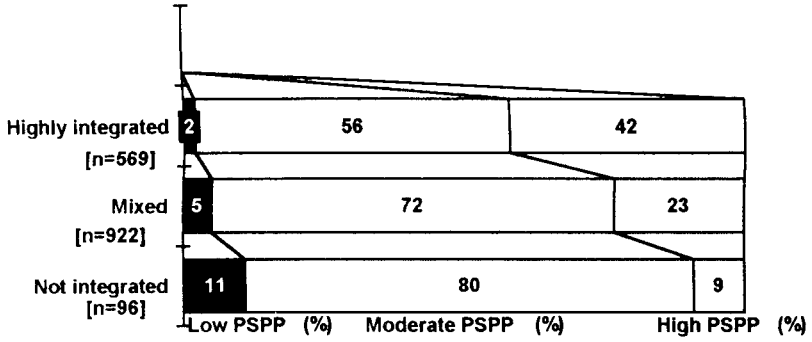
Relationship	Somer's d		Boys	Girls
Physical education and physical self-perception	PSPP dependent	d_y	.17	.14
	Sig.level		.00	.00
	Physical ed. Dependent	d_y	.23	.22
	Sig.level		.00	.00
Physical activity and physical self-perception	PSPP dependent	d_y	.16	.11
	Sig.level		.00	.00
	Phys.activity dependent	d_y	.22	.19
	Sig.level		.00	.00

The measures of association are significant with either variable analysed as dependent.

5.8.4 (c) Physical self-perception and social integration

As discussed in study introduction, many of the factors which influence children's behaviour are interactive. A highly significant association is also observed between physical self-perception and social integration [Table 5.68]. Thus both factors, social integration and self-perception, may interactively influence, and be influenced by activity behaviour.

Figure 5.26 *Physical self-perception and social integration*



The relationship is striking. Among the 'highly integrated', 42% have high physical self-perception compared to 9% among the 'not integrated'. Goodman and Kruskal's gamma used for the measure of the relationships illustrated in Figures 5.24, 5.25 and 5.26 are presented in Table 5.68.

Table 5.68 *y - values and significance levels for the relationships between physical education, physical activity, social integration and physical self-perception*

Relationship	Goodman & Kruskal's Gamma	Boys	Girls	All
Physical activity and physical self-perception	*y*	.32	.27	.33
	Sig.level	.00	.00	.00
Physical education and physical self-perception	*y*	.34	.33	.33
	Sig.level	.00	.00	.00
Social integration and physical self-perception	*y*	.40	.48	.44
	Sig.level	.00	.00	.00

Physical activity, social integration and physical self-perception form an apparent feedback loop. Social integration and self-perception may be increased by physical

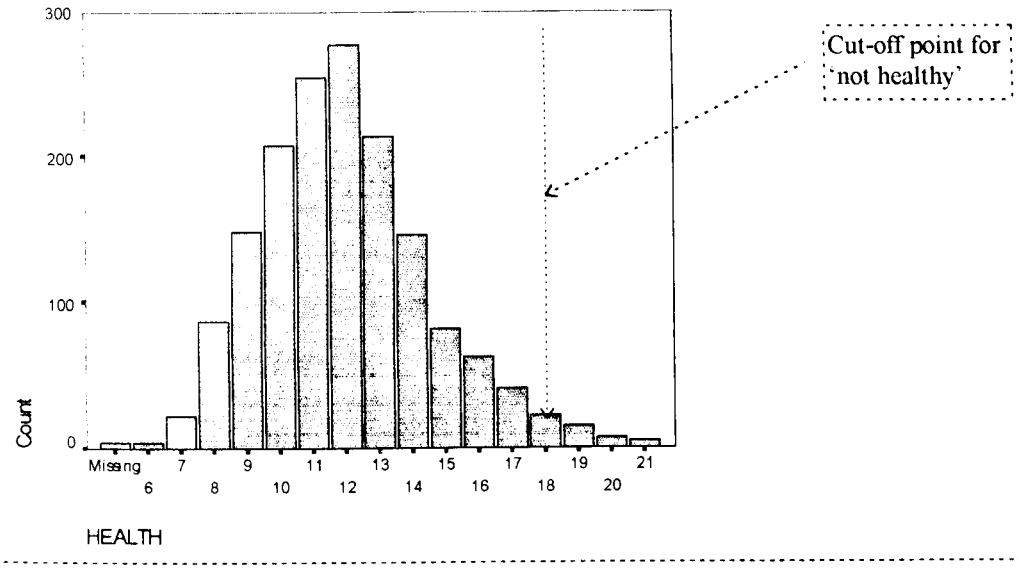
activity and vice versa. These variables appear to be interactive influences in the process of socialisation into activity.

The PSPP used in the study is a simple psychological rating scale, with no subscale measurement. Although the measure is not comprehensive, the association observed between high physical self-perception and high levels of physical activity supports the construct's predictive validity. The measure appears to adequately discriminate between large groups of cases.

5.9 Health and well-being status

A seven-item index was used to examine children's self-assessed health and well-being status. The index was constructed from responses to questions on health status, emotional well-being and a subscale of the malaise inventory (Grant et al.,1990). Social desirability bias was not evidenced in 11-12 year old children's response to health and well-being questions. Scores lie within the range 6 to 22 [Appendix E10], the lower scores indicating the more positive health status. Distribution of scores [Figure 5.27] shows that the clustering occurs at the lower end of the distribution, reflecting the more positive health status of the majority of children.

Figure 5.27 *Distribution of health and well-being index*



Response to the health status questions suggests that children of this age-group perceive both their health and fitness to be good [Tables 5.69 and 5.70].

Health status	Boys %	Girls %	All %
Very good	56	52	54
Good	41	46	44
Not good	1	2	2

Table 5.69 *Children's perceptions of health status*

a clear dislike of school. Almost one third of children 'always' feel tired in the morning. Always feeling tired may be indicative either of deregulated bed-time, low emotional well-being, a combination of both, or of another factor.

The large number of children reporting feelings of loneliness is surprising. Further analysis of this variable shows that frequency of feeling lonely is significantly higher for girls than for boys ($p<0.001$). Almost two-thirds (64%) of girls feel lonely 'sometimes' compared to half (50%)of the boys. While almost half of all boys (47%) 'never' feel lonely compared to less than one third of girls [Table 5.71]

Table 5.71 *Feeling of loneliness by gender*

Feeling lonely	Gender	
	Boys	Girls
Nearly always	3	5
Sometimes	50	64
Never	47	31
[n = 1594]		
Chi-square 45.65 $p < 0.0005$		

No significant differences were observed in analysis of loneliness by social class groups when aggregated as *higher* and *lower*. However in analysis of individual class groups the difference was significant ($p<0.05$). Frequency of feeling lonely is lowest for children in Social class 1. Almost 51% of these children never feel lonely compared to 35% of children in social class 4, and to 39% in social class 5 and unemployed respectively. The percentage of children of unemployed parents who feel lonely 'sometimes' or 'always' is high by comparison to the proportion of those in all other social classes.

The evidence strongly suggests that children who are not integrated are most prone to feelings of loneliness [Table 5.72].

Table 5.72 *Feeling of loneliness by social integration status*

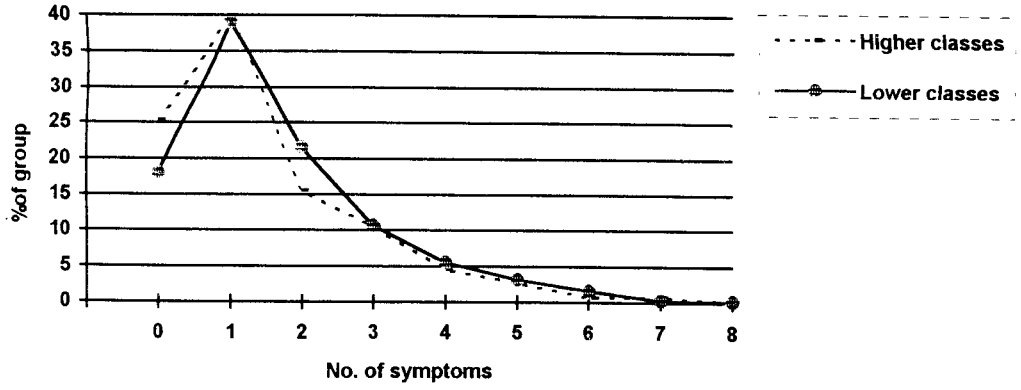
Feeling lonely	Integration status		
	Not integrated	Mixed	Highly integrated
Nearly always	15	5	1
Sometimes	71	62	46
Never	13	33	53
[n = 1594]			
Chi-square 115.85	$p < 0.0005$		

Frequency of feeling lonely was not significantly related to physical activity level.

5.9.1 Somatic symptom subscale

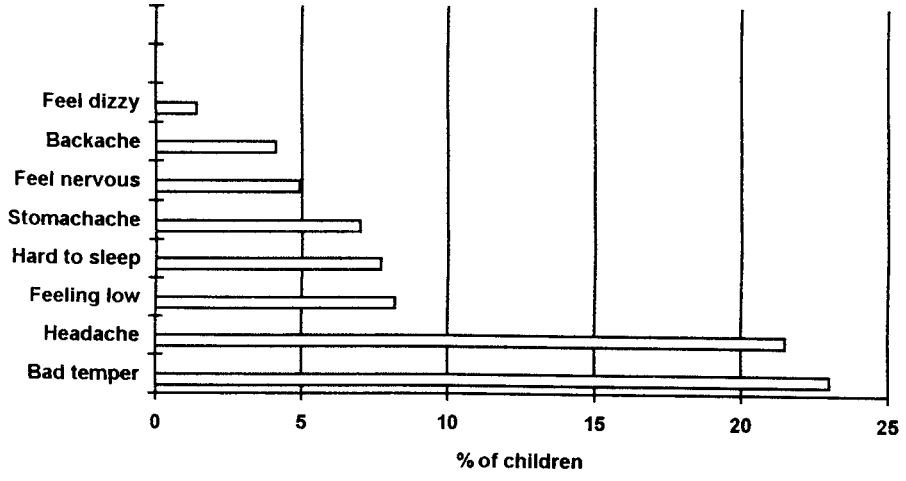
The 8-item subscale of the malaise inventory identifies the number of symptoms, if any, of which children regularly complain. Extensive symptoms of malaise are manifest in approximately 10% of children. 21.4% of children were symptom free, 39.4% reported just one symptom, a further 29.2% complained of 2-3 symptoms, and 9.7% of children identified with four or more symptoms. A significant association between aggregate social class groups, and extent of malaise symptoms was observed [Figure 5.29]

Figure 5.29 *Somatic symptom scores by percentages of children in social class groups*



Children in the lower social classes report more symptoms of malaise than those in the higher classes. ($p < 0.01$).The frequency of symptoms reported [79% of sample] is shown in Figure 5.30.

Figure 5.30 *Frequency of malaise symptoms [percentages of children]*



5.9.2 Relationship of health and well being to gender, social class and physical activity.

There is a consistently higher proportion of boys on almost all health and well-being indicators. On only one well-being item, 'liking of school', is the proportion of girls higher. On four indicators, boys are significantly more positive in assessment than girls.

Table 5.73 *Health and well-being within gender groups*

Health and well-being indicator	Boys	Girls
In very good health [%]	56	52 n.s.
Symptom free [%]	24	19 ***)
Never tired in the morning [%]	13	10 ***)
Very fit [%]	26	16 ***)
Never feeling lonely [%]	47	31 ***)
Liking school a lot [%]	13	22 ***)
Feeling very happy about life [%]	85	82 n.s.

***) $p < 0.001$

There is a higher proportion of children from the higher social classes on five health and well-being indicators. However, the difference is significant on only two of these.

Table 5.74 *Health and well-being within social class groups[aggregated]*

Health and well-being indicator	Higher [1 - 3]	Lower [4 -6 ;unemployed]
In very good health [%]	57	52 **)
Symptom free [%]	25	18 **)
Never tired in the morning [%]	10	12 **)
Very fit [%]	21	21 n.s.
Never feeling lonely [%]	40	38 n.s.
Liking school a lot [%]	19	16 n.s.
Feeling very happy about life [%]	86	82 n.s.

**) $p < 0.01$

On the indicator 'very fit' classes are equally represented. Although there is a marginally higher proportion of children form the lower social classes on the well-being indicator 'never tired in the morning', the response is anomalous. The proportion of those who are 'always' tired in the morning is higher for children in the lower classes [35 vs. 27 %].

The pattern of association between health and well-being and activity is not consistent. Although good health and well-being is significantly associated with higher activity on three scale items, the association is statistically robust on only of these. The numbers of children who 'never feel lonely' and who are 'in very good health' are greater in the higher activity groups, but the associations are not significant.

Table 5.75 *Health and well-being in respective activity groups*

Health and well-being indicator	Low activity (n = 68)	Moderate to low (n = 518)	Moderate to high (n = 499)	Highly active (n = 511)	Total (n=1,596)
In very good health [%]	50	51	60	54	54 n.s.
Symptom free [%]	24	21	24	19	21 *)
Never tired in the morning [%]	7	8	13	13	11 *)
Very fit [%]	12	15	22	27	21 ***)
Never feeling lonely [%]	28	35	40	43	39 n.s.
Liking school a lot [%]	18	20	18	15	18 n.s.
Feeling very happy about life [%]	68	81	86	86	84 *)

*) $p < 0.05$ ***) $p < 0.001$

5.9.3 Health and well-being index

An index of health and well-being was constructed using the aggregate of scores on all scale items. Cases were then sorted into one of three groups labelled 'healthy, 'mixed', and 'not healthy.

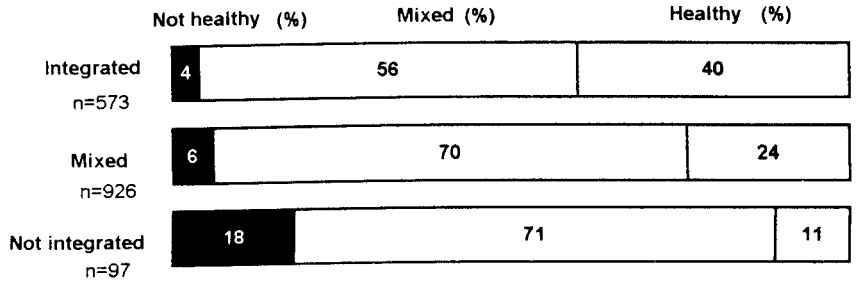
		Boys %	Girls %	All %
Healthy	[n=470]	31	28	29
Mixed	[n= 1036]	65	65	65
Not healthy	[n=90]	4	7	6

Table 5.76
Health and well-being status

The highest proportion (65%) of children are in the 'mixed' category, somewhat less than a third (29%) are in the 'healthy' category, and only a very small proportion (6%) are classified as 'not healthy'. Gender differences were significant ($p<0.05$). Boys self-assessed health status is higher than that of girls in the upper and lower ranges, but only marginally so.

There was no significant relationship between activity level and health status as measured by the aggregate health and well-being index, thus supporting the inconsistency observed on individual scale items. An interesting finding however was the relationship between health status and social integration [Figure 5.31].

Figure 5.31 *Social integration and health and well-being*



The evidence of association shown in Figure 5.31 is convincing. Among the group of children who were labelled 'integrated', the proportion of 'healthy' children is almost

four times higher than among the 'not integrated'. Among the group categorised as 'not integrated', the proportion of 'not healthy' children is more than four times higher than among the 'integrated'.

The measurement of the strength of the relationship is shown in Table 5.77. (Relationship is inverse since lower scores on health index indicated the more positive health status).

Goodman& Kruskal's Gamma	Boys	Girls	Total
y	– .35	– .38	– .37
Sig.level	.00	.00	.00

Table 5.77
Relationship between social integration and health and well-being

Data support the association between social integration and health already observed by Eder (1990) in the cross-cultural study of 11-15 year old children. Eder *(ibid.)* reports *y* values for 11-year old boys in a range 0.23, p=.00 [Norway] to 0.36, p=.01 [Austria], and for girls, 0.36, p=.00 [Norway] to 0.41, p=.00 [Austria].

5.10 Multiple regression on physical activity index

Prior analysis has established that variables significantly related to physical activity are primary PE [PEI], social integration [SOCIND], gender, physical self-perception profile [PSPP], participation in sports clubs [CLUB], and parental influence [PARENTS]. To further assess the relative influence of each of the substantive and relevant demographic variables on physical activity scores, a step-wise multiple regression model was computed. Four of these variables were entered as continuous independent variables, gender and club membership were entered as indicator or dummy variables. For variable 'gender', girls were coded 1, boys 0.

Records for physical activity are time (x MET) units, while records for PE, social integration, parental influence and physical self-perception are index values. Hence for regression analysis physical activity scores were transformed into logarithm units [Naperian log, base *e*]. Transformation of physical activity index data to Naperian log base *e* effected a reduction in the number of extreme values from 55 (in base 10) to 26.

A correlation matrix was plotted to determine the magnitude of *r* values, and to examine coefficients for evidence of multicollinearity which might affect regression outcome.

Table 5.78 *Matrix of Pearson product-moment correlation coefficients (zero-order)*

	LNPAI	PEI	SOCIND	GENDER	PARENTS	PSPP	CLUB
LNPAI	1.00	.259	.246	-.197	.162	.256	.244
PEI	.259	1.00	.192	-.020	.137	.252	.143
SOCIND	.246	.192	1.00	-.070	.211	.318	.170
GENDER	-.197	.-.020 n.s	-.070	1.00	.078 #	-.201	-.196
PARENTS	.162	.137	.211	.078	1.00	.148	076
PSPP	.256	.252	.318	-.201	.148	1.00	.252
CLUB	.244	.143	.170	-.196	.076 #	. 252	1.00

Significance (2-tailed) = .000 # $p < .01$ n.s. not significant

A weak inverse relationship (r = -.197) is observed between physical activity and gender and a stronger direct relationship between physical activity and physical education

(r = .259), physical self-perception (r =.256), social integration (r = .246) and club membership (.244)

5.10.1 Stepwise Multiple Regression

The model uses data only for those cases (n=1512) which have values for each of the independent variables [see Appendix D 'Descriptive statistics']. The physical education index is selected for entry into equation on step no.1 as the variable PEI has the highest correlation coefficient with the dependent variable LNPAI (0.259). Each variable is then entered according to its contribution to R^2 . Criterion measure selected for entry and removal of variables was the Probability of F [Probability-of-F-to-enter = < .050; Probability-of-F-to-remove = .100].

Table 5.79 *Status of the variables at steps 1 and 2*

1

Multiple R	.259			F (1, 1510) = 108.642, $p < 0$ .0001	
Adjusted R Square	.067				
Variable	B	Std. Error B	Beta	Sig.	95% Conf Interval B
PEI	.024	.002	.259	.000	.020 to.029
(Constant)	3.407	.07			

2

Multiple R	.333			F (2, 1509) = 94.136, $p < 0$ .0001	
Adjusted R Square	.110				
Variable	B	Std. Error B	Beta	Sig.	95% Conf Interval B
PEI	.021	.002	.229	.000	.017 to .026
CLUB	.309	.002	.211	.000	.239 to .379
(Constant)	3.295	.069			

Dependent variable: LNPAI

Standardised regression coefficients indicate that higher levels of PE experience are associated with higher levels of activity, and furthermore, that those who are members of a sporting organisation are more likely to be highly active than non-members.

At step no.1, the percentage of variation in physical activity explained by the physical education index is almost 7%. Entry of club membership contributes to an r^2 change of .044. Both physical education experience and club membership status combine to explain approximately 11% of the variation in physical activity.

Table 5.80 *Status of the variables at steps 3 and 4*

3

Multiple R .374
Adjusted R Square .138

F (3, 1508) = 81.898, $p < 0$ .0001

Variable	B	Std. Error B	Beta	Sig.	95% Conf Interval B
PEI	.019	.002	.199	.000	.014 to .023
CLUB	.271	.036	.186	.000	.202 to .341
SOCIND	.054	.008	.176	.000	.039 to .069
(Constant)	2.671	.111			

4

Multiple R .402
Adjusted R Square .160

F (4, 1507) = 72.779, $p < 0.0001$

Variable	B	Std. Error B	Beta	Sig.	95% Conf Interval B
PEI	.019	.002	.201	.000	.014 to.023
CLUB	.229	.036	.157	.000	.159 to.300
SOCIND	.052	.007	.170	.000	.038 to .067
GENDER	-.214	.034	-.151	.000	-.281 to -.147
(Constant)	2.824	.112			

Dependent variable: LNPAI

The non-standardised regression coefficient for PEI (B=.019) is lower at the third step due to the association between PE and social integration. Entry of the variable 'gender' does not effect a change in the coefficient for PEI (B=.019). No significant association was observed between physical education index scores and gender in prior analysis. The negative coefficient for gender indicates that boys are significantly more active than girls.

The linear relation is highly significant [F=72.779, df=3,1508, p<0.0001]. These four variables combine to explain approximately 16% of the variation in physical activity. [22]

Parental influence and physical self-perception profile (PSPP) were entered at steps 5 and 6 respectively [Table 5.81].

Table 5.81 *Status of the variables at steps 5 and 6*

5				F (5, 1506) = 62.706, $p < 0.0001$	
Variable	B	Std. Error B	Beta	Sig.	95% Conf Interval B
PEI	.018	.002	.191	.000	.013 to .022
CLUB	.222	.036	.152	.000	.000 to .152
SOCIND	.046	.008	.150	.000	.031 to .061
GENDER	-.230	.034	-.162	.000	-.297 to -.163
PARENTS	.022	.005	.106	.000	.012 to .033
(Constant)	2.659	.118			

6				F (6, 1505) = 54.742, $p < 0.0001$	
Variable	B	Std. Error B	Beta	Sig.	95% Conf Interval B
PEI	.016	.002	.175	.000	.012 to .021
CLUB	.201	.036	.138	.000	.131 to .272
SOCIND	.039	.008	.128	.000	.024 to .055
GENDER	-.209	.035	-.147	.000	-.277 to -.141
PARENTS	.021	.005	.098	.000	.011 to .031
PSPP	.018	.005	.092	.000	.008 to .028
(Constant)	2.459	.130			

Dependent variable: LNPAI

Entry of the variable 'parents' at step no.5 marginally increased the unstandardised coefficient for gender. Adjustment for physical self-perception at step no.6 reduced the gender gap by approximately 2%.

Status of the variables shows that although the physical education index provides the smallest unstandardised regression coefficient (.016), it has the largest standardised coefficient (.175).[23]

[22] Adjusted R^2 is the preferred measure of goodness of fit because "..it is designed to compensate for the optimistic bias of R^2" (SPSS Inc.,1997) 176.

Parental influence contributes only a 1% increase in the explained variance, and physical self-perception profile 0.6%. Although physical self-perception profile (PSPP) accounts for less than 1% of the variance, this variable is included in the regression.

The estimated model is:

physical activity = 2.659 + .016 PEI - .209gender + .201 club membership +.039social integration +.021parental influence + .018 PSPP + e

Status of the variables in the regression is presented in Table 5.82

Table 5.82 *Multiple regression on physical activity index*

Multiple R .423 F (6, 1505) = 54.742, $p < 0.0001$
Adjusted R Square .176

Variable	B	Std. Error B	Beta	t	Sig.	95% Confidence Interval for B
PEI	.016	.002	.175	7.148	.000	.012 to .021
CLUB	.201	.036	.138	5.590	.000	.131 to .272
SOCIND	.039	.008	.128	5.079	.000	.024 to .055
GENDER	-.209	.035	-.147	-6.046	.000	-.277 to -.141
PARENTS	.021	.005	.098	4.063	.000	.011 to..031
PSPP	.018	.005	.092	3.539	.000	.011 to .031
(Constant)	2.459	.130		18.879	.000	2.203 to 2.714

Dependent variable: LNPAI

The four most important predictor variables, as indicated by the standardised coefficients and by t values > 2 are PE experience (.175), gender (-.147), club membership status (.138) and social integration status (.128). Since the dependent variable is in log units, the coefficient of -.209 for gender when girls are coded as 1, indicates that girls' physical activity is estimated to be approximately 21% less than boys after statistical adjustment for PE, social integration, parental influence and club membership status.

[23] The magnitude of the un-standardised coefficient is affected by the nature of the measurement scale for the variable itself: range of values for physical education index (1 to 60) vis-à-vis range, for example, for social integration (5 to 18).

The full equation was highly significant [F = 54.742, df = 6,1505, sig.=.000].[24] The significance levels for individual regression coefficients (t values calculated) are consistent with the analysis using the F ratio. The standard error of the estimate decreased from .686 at step 1 to .645 at step 6. The six variables combine to explain approximately 18% of the variation in physical activity.

Table 5.83 *Model summary - dependent variable: LNPAI*

Step	Variables	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	PEI	.259	.067	.067	.686
2	CLUB	.333	.111	.110	.670
3	SOCIND	.374	.140	.138	.660
4	GENDER	.402	.162	.160	.651
5	PARENTS	.415	.172	.170	.647
6	PSPP	.423	.179	.176	.645

The multiple regression suggests several findings. The significant association observed between primary physical education and extent of recreational activity suggests that physical activity is higher among children with extensive PE experience. Membership of a community club or sporting organisation and social integration status also contribute to the variability in physical activity behaviour. The physical activity index is inversely related to gender. Thus girls engage in less physical activity than boys. After adjustment for these factors, there is also a significant independent positive association between parental influence and physical activity and a positive, though somewhat weaker, association between physical self perception and activity. The child's experience in primary PE appears to be the best predictor of recreational activity, at least among the variables included in this study. This association is independent of gender.

[24] F ratio test for the computed equation suggests that it is extremely improbable that R in the population is zero.

5.10.2 Diagnostics

The appropriateness of the regression model and potential violation of model assumptions were examined in several diagnostic procedures.

Distributions

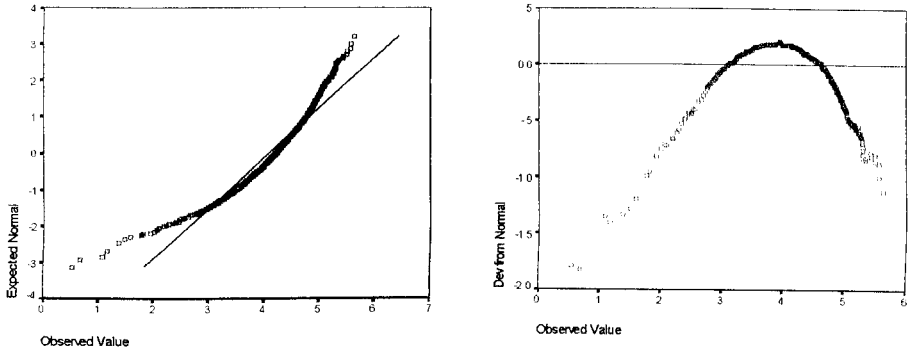
The Kolmogorov-Smirnov Goodness-of-Fit test results [Table 5.84] show that distributions of continuous variables are approximately normal ($p < .0001$).

Variable		Kolmogorov-Smirnov Z	Asymp.Sig. (2-tailed)
LNPAI	[Physical activity]	3.36	.000
PEI	[Primary PE]	4.91	.000
SOCIND	[Social Integration]	2.44	.000
PSPP	[Physical self-perception]	2.11	.000
PARENTS	[Parental influence]	4.95	.000

Table 5.84
Normality tests

When the sample size is large, almost any goodness of fit test results will result in rejection of the null hypothesis. Thus for large data sets it is important to look not only at the observed significance level but also at the actual departure from normality. Probability plots of transformed physical activity index values are shown in Figure 5.32.

Figure 5.32 *Probability plot [LNPAI] and detrended probability plot [LNPAI]*



In the probability plot [LNPAI], the points fall more or less on a straight line. In the detrended probability plot, although deviations of eleven points are greater than -1.0, the deviations of the remaining points are adequately clustered around the horizontal line through 0, suggesting that the sample is from a normal distribution.

Probability plots of predictor variables are illustrated in Figures 5.33 to 5.36

Figure 5.33 *Probability plot and detrended probability plot of physical education index*

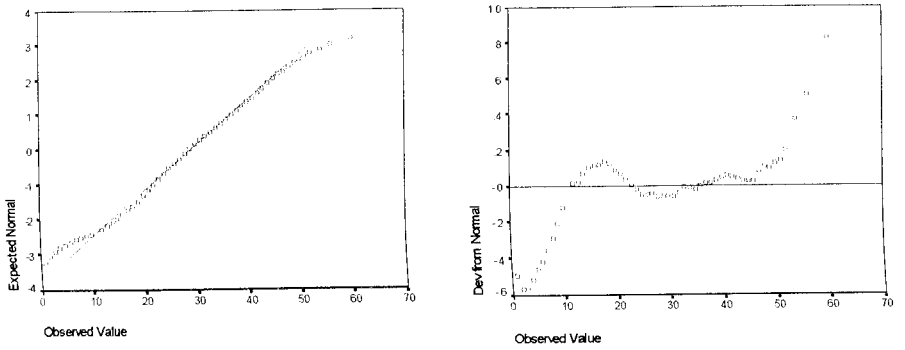


Figure 5.34 *Probability plot and detrended probability plot of social integration index*

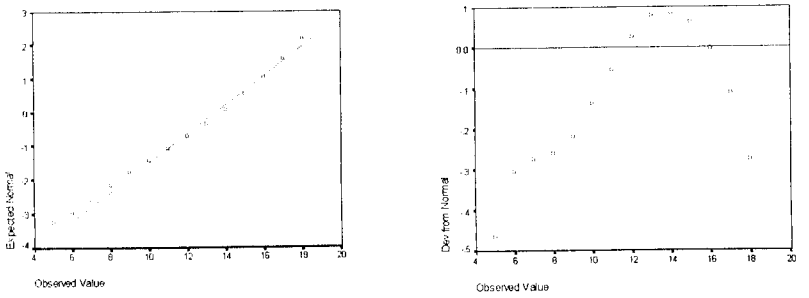


Figure 5.35 *Probability plot and detrended probability plot of parental influence index*

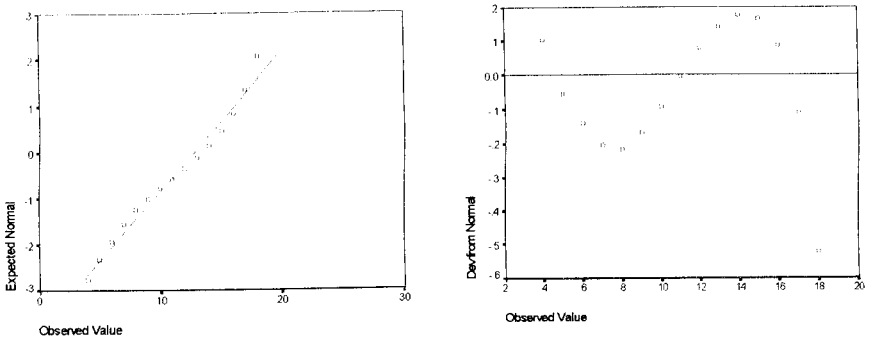
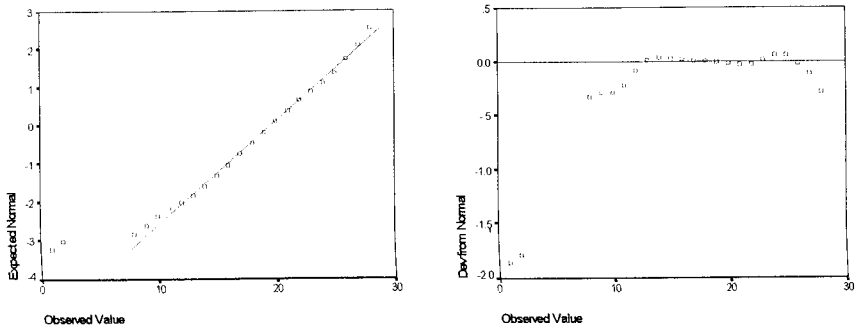


Figure 5.36 *Probability plot and detrended probability plot of PSPP index*



In the detrended probability plot of the physical education index, deviations of the points lie between - .6 and + .9, while in the detrended plots of the three other independent variables, deviations lie between -.5 and +.5. There is little evidence in the plots of these variables (non-transformed data) to suggest departure from normality.

Collinearity

In the correlation matrix [Table 5.78] variables other than PEI and gender, were observed to be significantly inter-correlated (p<.001). Coefficients for the relations however were low (< 0.35). Collinearity statistics examined in Table 5.85 support the assumption that multicollinearity is not an influence on regression model.

Table 5.85 *Collinearity statistics for regression model*

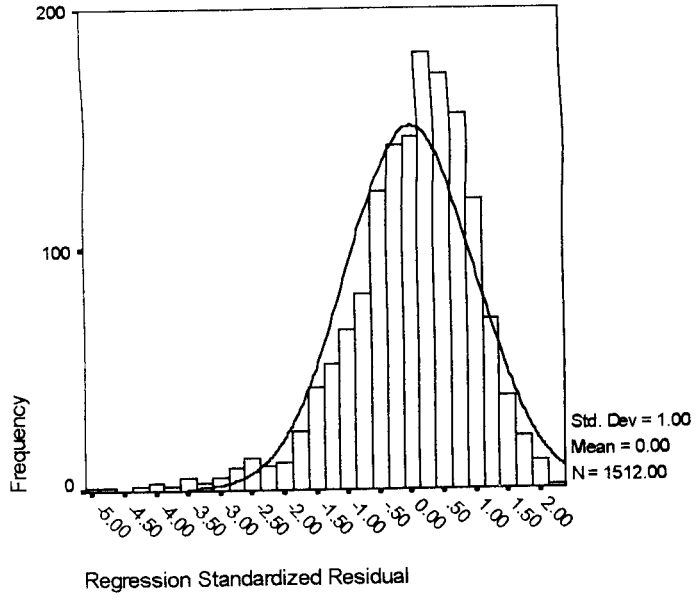
	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
PEI	.910	1.099
CLUB	.899	1.113
SOCIND	.855	1.169
GENDER	.922	1.084
PARENTS	.928	1.077
PSPP	.802	1.247

Tolerance values of the independent variables are high, ranging from 0.802 to 0.928, and reciprocally the variance inflation factors are low (1.077 to 1.247). Regression is therefore unlikely to be affected by multicollinearity.

Residuals

If the model is appropriate for the data, residuals or estimates of the true errors (ε) should follow a normal distribution. Distribution of standardised residuals is shown in histogram (with superimposed normal curve) [Figure 5.37].

Figure 5.37 *Histogram of standardised residuals*



If distribution is normal, 95% of cases should fall between -2 and + 2. Distribution illustrated appears to be approximately normal.

Outliers

To identify potential outliers or unusual values in the dependent variable casewise diagnostics were computed. 19 cases (1.25% of sample) had residuals more than 3 standard deviations below the mean [Appendix D2]. The model does not appear to be a good fit for these cases. Leverage statistics were computed to identify potential outliers among the values of the predictor variables. Centred leverage values for each case ranged from a minimum of .001 to a maximum of .024 [Mahalanobis distance (n=1512) 1.519 - 35.643]. All values are less than 0.2 which suggests that none of the values of the independent variables stands apart from the rest of the sample.

A violation of model assumptions is not indicated and the regression model appears to be appropriate for the data.

5.11 Discussion

The activity levels of 11-12 year old Irish children observed in this study are encouraging. Almost 85% of children participate in physical activity four or more times weekly. Only 4.1% of Irish preadolescents are categorised as 'inactive', taking part in one hour or less of physical activity weekly. Findings are consistent with epidemiological evidence which suggests that this age-cohort is the most active of the youth population. Irish children appear to be more extensively engaged in recreational activity outside of school than many other preadolescent populations.

Physical activity is a complex behaviour for which there is no standard measurement, and all instruments, objective and self-report, are imperfect measures. The criterion measure used in data analysis, the physical activity index [PAI], takes into account both frequency and age-adjusted measures of activity intensity. In reporting of activity behaviour however, some Hawthorne effects can be expected, as self-assessment of actual health behaviour is influenced by competence in age-relevant areas of importance. PAI values greater than 150 are suggested by the researcher to reflect such effects, although the constant play patterns reported by some of the children in this score category may be consistent with actual behaviour. Cases with values >150 constituted less than 5% of the population sampled. At the lower end of the distribution 'lowest' values were fewer in number. Only 3.3% of values were less than or equal to 10 [Appendix E]. In analysis of the distribution (stem and leaf plot) 28 cases were identified as outside values ($\geq$ 188), accounting for just 1.75% of the sample.

Demographic, social and cultural factors contribute to a highly active young population. By comparison with many of the more densely populated European countries, environment constraints on physical activity in Ireland are few. Ireland also remains relatively safe, and independent mobility contributes to increased outdoor activity. Social and cultural factors perhaps play the most influential role in shaping patterns of activity behaviour. Gaelic games are extensively played in Ireland parallel to multicultural sports such as rugby, soccer and basketball. Irish children therefore have choice and access to a variety of activities. Recent developments in youth promotion of both Gaelic games and

leprechaun rugby have also contributed to wider participation at school level and to increased female participation. The Gaelic games tradition has an extensive rural network, both historically and contemporarily. This may largely account for the differential observed between city children's level of activity and that of village and rural area schoolchildren. Finland, for example, has similar topography and urbanisation patterns to Ireland, yet adolescents in rural areas of Finland were found to have much lower participation in activity than those living in urban conglomerations (Telama et al.,1994). Further, the percentage of 12-year old Finnish children categorised as 'inactive' (18%) is much higher than that observed in this study. The incremental effect of rural activity on the percentage of the population classified as 'active' may thus be considerable.

The primary school plays an important role in children's socialisation into activity, both within and outside the formal school curriculum. Voluntary commitment by teachers to after-school sports is characteristic of many Irish primary schools. Within the formal educational structure, the primary school has a responsibility to provide all pupils with opportunities to be active. Implicit in educational responsibility is the provision of structured opportunity, which in physical education implies an ordered sequence of educational experiences which allow children to acquire the fundamental motor skills. While approximately half of the children (50.7%) interviewed reported to have PE lessons at least once a week, and less than one-third (30.6%) had PE twice weekly, 12% of the children had no regular PE lessons. Statutory curriculum entitlement is one hour weekly (Department of Education,1973). Findings in relation to educational experiences show that 40-50% of children were introduced to a range of PE subject areas. More than two-thirds of the children were introduced to soccer and basketball, and 50% of pupils have been introduced to swimming. Although no historic data are available, the latter is a significant curriculum development, as swimming was not a feature of primary PE in the 1980's. The data indicate that while many children have a diverse and extensive range of PE experiences, some have very limited experiences in physical activity.

The numbers of children who have no introduction to the major skill acquisition areas is a cause of concern. Over a fifth of the sample never experience kicking skills, and 17%

of the children had no experience of a stick game or activities requiring batting/striking skills. The latter is particularly disappointing as games such as mini-hockey (unihoc) and rounders are relatively easy to organise, and skill techniques can be confidently taught by the non-specialist teacher. This area needs to be addressed, as the uptake of lifestyle activities later in life, such as squash, tennis, badminton, golf, are greatly facilitated by early acquisition of stick skill. Certainly, schools must select subject areas from within the wide and diversified PE curriculum. However, when one or more fundamental skill acquisition areas is underrepresented in this selection, then the child's primary PE experience is impoverished.

Another area of concern is the large number of children (48%) who have no movement education outside of the games programme. 60% have no gymnastics experience and 75% have no introduction to dance whatsoever. This is not solely a facility-dependent phenomena as 38% of children who reported no movement experience were pupils of schools with indoor PE areas. The existence of basic facilities however does impact on the overall PE experience. 47% of pupils in such schools are in the 'low' PE experience category compared to 30% of pupils who have both indoor and outdoor facilities ($p <$ .0005). It is also evident that many teachers compensate for lack of facilities by extra provision of outdoor activity. The physical education index mean for pupils with outdoor facilities was 25.80 compared to 30.10 for pupils with an indoor facility ($p < .0005$). Class size is suggested by many teachers to limit the scope of PE activities that can be offered in a secure environment. Declining numbers of primary school pupils however have been a demographic feature since the 1990s, and the downward trend is expected to continue. If teachers are retained in the so-called 'demographic dividend' smaller class sizes will reduce the real and very restrictive safety concerns in PE, and widen the scope of PE sub-disciplines the teacher can explore.

An encouraging finding of the study was the absence of gender differences in the extent of the overall primary PE experience. Some evidence of socialisation into gender-specific activity however was observed, particularly in movement education. Curriculum content for boys may be strongly influenced by their stated activity preferences, in that the teacher's assurance of enjoyment therein confines teaching to major games areas. The

under provision of movement education however not alone impacts on boys' overall development, but also particularly disadvantages those who dislike, or feel isolated within, the playing of team games.

Selection of PE curriculum activity may be contributory to the gender differences observed in recreational activity outside of school. Girls show greater recreational preference for dance and gymnastics yet such teaching in school is limited to 30% and 55% of girls respectively. Wider introduction to this area would give more recreational opportunities to girls. Girls also show a stronger recreational preference for rounders yet 40% of girls had no introduction to this game in school. Soccer has become increasingly popular among girls as recreational activity, ranking second in the list of popular activities [Table 5.9]. Girls curriculum experience of this activity however is still small by comparison to boys. 56% of girls had no introduction to such football skills in school ($p < .0005$). Teachers and schools, as agents of socialisation, should endeavour to provide non-stereotypical activity so that each sex can enjoy the benefits typically accruing only to the opposite. Further, the developmental ideal of androgyny is that the positive attributes of the play of each sex become incorporated into the personalities and behaviours of both sexes, and negative characteristics are mitigated by the counterbalance.

The need to broaden the children's curriculum experience is made all the more urgent by the finding that girls' activity levels in 6th class are significantly lower than those of girls in 5th class. The decline in female activity has already been observed in several studies of adolescents [Tables 2.4, 2.5]. Evidence of the decline in the preadolescent years however is particularly disconcerting. This may be indicative of the earlier onset of puberty in young girls and concomitant self-consciousness in physical activity. Influences of the media however may also be significant in the adoption of patterns of behaviour and leisure interests formerly associated with adolescent developmental stages. The teaching of PE at senior class level must therefore endeavour to provide both team and individual activity experience so that girls may find at least some enjoyable and satisfying activity therein. Integrative possibilities, such as music and movement, may also offer 'contemporary' relevance and appeal to senior class girls. Knowledge of the health

benefits of activity is an important component of curriculum integration, but knowledge is not significantly associated with actual behaviour. Priority therefore must be given to the maintenance of girls' interest in physical activity during preadolescence, and senior class teachers professionally prepared, through pre-service and inservice education, to provide children with diversity of activity experience.

There was some evidence of 'social class' effect on primary PE. 37% of children in the lower classes were in the 'low' PE category compared to 30% among the higher classes (p <0.05). Parents of lower socioeconomic status and low educational attainment may be less likely to question the extent to which teachers implement the curriculum. The difference may also reflect a reliance of schools on fund-raising activity to provide equipment for PE. Recent survey data suggest that 45% of schools are thus dependent (INTO, 1997). Additional funds are available to schools in 'designated areas of disadvantage'. This scheme applies however to only 9% of schools nationally. In the latter schools, some teachers provide children with a variety of PE experiences. 36% of children in 'disadvantaged area' schools were in the 'high' PE category compared to 32% of pupils in more advantaged schools (p < 0.05). The relationship however is not easily understood, as conversely the greater proportion among the 'low' PE groups were the 'disadvantaged' (36% vs. 33%).

Some children develop a positive or negative outlook toward physical activity during the early elementary years. Indeed 'dislike of PE' has been shown to be a covariant of sedentary behaviour in children as young as 11 years (Terre et al.,1990). An important objective of the primary programme is to provide children with positive experiences in movement. Attitudinal findings confirm that children enjoy their PE lessons, which are taught in the main by their own non-specialist teacher. 85% of children reported very positive attitudes to primary PE, a higher percentage than observed for many other primary school populations. Professional achievement on this measure is indeed commendable.

Physical education experience was positively associated with the child's physical self-perception [y =.33, p = .000]. The consistent pattern observed on individual profile

indicators demonstrates that children who have extensive physical education are more likely to have positive self-image in relation to both participation and performance in physical activity. Physical education experience was also observed to be significantly and positively related to social integration, both for boys [y =. 23, p = .000] and for girls [y =.28, p = .000]. These findings confirm the significant contribution of primary PE to increasing the child's self esteem, to increasing opportunity for socialisation among peers, and to the child's holistic development.

Analysis of the combined physical education index scores (PEI) and the physical activity index (PAI) demonstrated a significant and positive relationship between children's PE experiences in school and recreational activity outside of school [y =.27, p <.0005]. The relationship appears to be stronger for boys (y =.36) than girls (y =.20). Children with higher levels of PE are more likely to be highly active than those with limited PE experiences [χ^2 = 87.292, p = .000]. The association with curriculum-specific activity and the practice of same outside of school was observed also to be highly significant for 13 activity areas, correlation being highest in the three Gaelic games. In regression analysis PEI was observed to be a significant and independent predictor of recreational activity [B, .016, p =.000], and the most important predictor variable of those included in the study [Beta =.175]. This is the first non-intervention study to demonstrate the positive role played by the primary school in the child's socialisation into physical activity, and highlights the importance of primary PE in the development of lifetime health behaviour.

Gender is a fundamental sociocultural influence on perceptions and behaviour in most societies. Gender was observed to be a significant independent predictor of recreational activity [B, -.209, p =.000]. Girls are approximately 21% less active than boys. Lower activity levels for girls have also been recorded in a range of studies using self-report methods in the period 1985-1995 and in the most recent epidemiological literature (Sallis et al.,1996; Trost et al.,1996). Activity studies using objective measures have observed the gender difference to be approximately 22%.[25] Only in the Scandinavian countries do

[25] Summary data of studies (1985-1995) are shown in Tables 2.3, 2.4, 2.5.

girls appear to have caught up with boys (Telama et al.,1994; Engstrom, 1990) and this trend is primarily observed for organised sport only. A significant difference was observed between girls activity scores in 5th class and those recorded for 6th class. Pubescent and post-pubescent declines in female activity have been reported in almost all studies of adolescent behaviour. The evidence herein suggests that the decline is now manifest in the final years of primary school.

Greater physical activity among males related to their participation in active sports and exercise has been suggested by Dean (1989) to be in part "...learned behaviour related to feelings of group identity and acceptance".[26] Group identity influences are suggested in the greater percentages of boys playing team sports, and the concomitant higher membership of boys in community clubs and sporting organisations. Group activity patterns were also observed on two social integration scale items. Frequency of being with friends after school is higher for boys (p <.001) and boys participate in activity more often with friends than girls (p <.001) Boys recreational activity however is not confined to team sports, as individual activities such as swimming and cycling are equally popular in both gender groups. The lifetime health implications of gender-selected activity in terms of 'team' versus 'individual' are often debated. Contrasting team sports to individual activities and classifying the latter as 'lifetime' skills may no longer be a valid exercise with the growth of organised activities for all age categories, such as 'over 35's' and 'veterans'. Neither is the team/individual distinction useful as an evaluation along an intensity continuum. Differences however in overall levels of activity between boys and girls at such an early age are a source of concern.

Lifestyle development has been suggested in mid-adolescence and late adolescence to be strongly linked to young people's educational-occupational trajectories and to their 'life chances' (Hendry et al.,1993). Some cohort studies of children have found significant differences in activity behaviour between children of different social classes (Holstein & Due, 1990; Steptoe & Butler, 1996), others have observed modest relationships

[26] Dean, K.1989. Self-care components of lifestyles: the importance of gender, attitudes, and the social situation. *Social Science and Medicine.* 1989, 29, 138.

(Gottlieb & Chen, 1985; Aaro et al.,1986) while no differences were observed in others (Aaron et al.,1993; Telama et al.,1994). In a recent cohort study (Sallis et al.,1996), socioeconomic differences were not found on specific physical activities but such differences were apparent on 10 of 25 potential correlates of activity. In this study, there were no significant differences between children in analysis of activity by social class of parent. Absence of significant differences may be a result of almost equal access and exposure to physical activities in school. Such class-similarity was observed in initial PE data analysis. Inaccuracy in the reporting of parent's occupation by 11-12 year old children may also affect results. When social class groups were aggregated into 'higher' and 'lower' categories however, a modest association was observed [$\chi^2 = 9.541$, $p < .05$]. Among children in the higher classes, 34% were *highly active* compared to 30% of those in the lower classes.

It is inherently plausible that parental support and socio-economic status may interactively influence behaviour. Families in the lower socio-economic classes have less resources for such support mechanisms as transport to activity, sports equipment, membership of more expensive sporting organisations. The marked differences observed between the higher and lower social classes on the measure 'parental support' may reflect such income inequalities. Behavioural differences however, as in role modelling, may also be contributory. Among children in the lower social classes, 42% were in the 'low' parental support category, compared to only 28% among those in the higher classes ($p < .001$). The interactive effect of parent support and social class is thus strongly indicated.

Results of previous studies on the role of parents are not consistent, and in only one study (Stucky-Ropp & Lorenzo, 1993) was parental support found to be a significant predictor of both boys and girls exercise behaviour. In this study, parental support as measured on a combined index of three indicators was significantly and positively associated with both boys and girls activity [$y = .17$, $p = .000$] the relationship being somewhat stronger for girls. The association between children's activity and the level of parental encouragement was highly significant [$\chi^2 = 59.105$, $p < .001$]. Of the group of children receiving 'lots of' encouragement, 36% were *highly active,* more than twice the

proportion of those who received little encouragement (17%). Although the relationship between parental role-modelling and child's activity was significant for mother's exercise ($p<.001$)and to a lesser extent for father's exercise ($p<.05$), low reliability of children's reporting of parents' behaviour may confound comparisons among activity groups. In a validation study of this measure (Anderssen et al.,1995), Pearson's between self-reports by parents and the reports by their children varied between 0.56 ($p<.001$) and 0.07 (non-significant). Caution in the use of this measurement instrument is clearly indicated by such results. Parental support, index measured, was observed to be an independent but weak predictor of activity behaviour [B, .021, p =.000] contributing only a 1% increase in the explained variance. Findings are accordant with developmental psychology theory, which suggests that as children move towards adolescence, the influence of parents weakens and the influence of peers strengthens.

Children who are highly integrated in their social network are observed to be more active than those with lower peer socialisation patterns. On four integration indicators the association was highly significant ($p < .001$). 'Talking to friends about personal problems' was the only dimension not associated with activity. In analysis of activity by integration categories, the association was observed to be statistically significant, and higher for boys [y = .33, p =.000] than for girls [y =.19, p =.000]. Adjusted for gender, the social integration index remained a significant independent predictor of activity [B, .039, p=.000]. It appears that frequency of being with friends outside of school leads to higher involvement in physical activities. On the other hand the competing hypothesis may also be true. Greater involvement in such activity may lead to increased social integration. One could also argue that, in the associations observed between PE, physical activity and social integration, provision of activity opportunity in school facilitates social integration within and outside of school and in a feedback type mechanism, contributes to higher levels of activity.

Children in 5th and 6th classes are cognisant of their ability, or perceived ability, in motor performance and motor skill acquisition. The manifest high level of self confidence in the physical perception domain is encouraging. High levels of physical self-perception facilitate more complex skill acquisition in the short term. High physical self-worth may

also have long-term benefits, exerting positive psychosocial influences on the uptake of activity post-adolescence and even in later years. On the negative side, a quarter of the children interviewed feel that they are not good at PE, a similar proportion find new skills difficult to learn, and almost one-third think they look clumsy at physical activity. Is a limited PE activity range contributory to these children's expressions of physical inadequacy? Children who are constantly confronted with failure in team games, for example, are more likely to develop negative self-image. Is teaching method also contributory? A disproportionate amount of time devoted to playing 'the game' as opposed to skill practice, leaves the weaker child isolated as better skilled children dominate game play.

Perhaps performance is also compared by children more to media images than to peers? Certainly the high percentage of girls (43%) reporting negative perceptions of body shape reflects strong media influences. Adolescents, particularly females, are observed to often hold a concept of attractiveness that does not conform to reality (Collins, 1988; Felts,1992), and girls select thinner ideal figures than boys (Wardle et al.,1995). Percentages of girls reporting dissatisfaction with their bodies varies between study populations from 25% (Felts, 1990) to 67% (Moore, 1988). Health education in the senior classes of primary school therefore must help children to balance the cultural pressure for the 'ideal' shape and its associated thinness. Gender-related differences in self-perception are disconcerting. Boys scored significantly higher than girls on all profile indicators. Only in relation to PE is the margin decreased, although the percentage of boys with very positive image on this dimension remains higher than girls ($p<.05$). Physical self-perception and gender are likely to exert an interactive influence on behaviour. If the gender gap in activity is to be decreased, girls clearly need more positive reinforcement on all dimensions of the physical self.

Psychosocial variables have been shown to be significantly related to physical activity in adolescents. In two such studies, self-efficacy was observed to be weakly predictive of behaviour (Reynolds et al.,1990; Douthitt, 1994). This appears to be true for preadolescents. Physical self-perception was significantly and positively associated with activity [y =.33, p =.000], and in regression analysis was observed to be a significant

independent, though weak, predictor of activity [Beta = .092, p =.000]. As with all cross-sectional data, causal inferences cannot be drawn. Children who feel good about the physical self are more likely to participate in physical activities. On the other hand, high levels of participation are likely to enhance confidence in performance and self-efficacy. The highly significant association observed between the physical education index and PSPP [y=.33, p=.000] suggests that structured series of successful exercise experiences, or an extensive range of successful experiences, can increase self-efficacy and physical self-worth. The PSPP measure is a simple seven-item index and results derived from same must be interpreted with caution. Although findings support its predictive validity, the researcher acknowledges that its psychometric properties are limited.

In the examination of children's motives for activity, enjoyment was cited as a very important reason by two thirds of children. However being 'good at the activity' is cited as equally important by half (50.6%) of the population sampled. Both enjoyment and health motives have been shown to be associated with behaviour (Holstein & Due, 1990), and intrinsic motivation predictive of affect has been suggested to lead to increased participation (Frederick et al.,1996). In this study, the two performance motives, 'to be good at the activity' and 'to be like a sports star' were the only motives strongly associated with actual behaviour. The relative homogeneity of the ratios other than performance-related, may indicate that, for this age group, response to cognition questions on behaviour rationale, may not be a good indicator of the behaviour itself. [27] On the other hand, performance-associated motivation may be indicative of a change in focus of children's activity, and reflect the increasing influence of the media on children's behaviour. Performance related motivation has important implications for the teaching of primary PE. Progressive skill practices and skill acquisition opportunity must be provided if children thus motivated are to benefit fully from curriculum experience. This also means that teachers must be familiar with the sub-disciplines of PE. An interesting and positive finding was the association between performance motives and

27 Ratio is computed as the percentage of the *highly active* among children who reported "very important" divided by the percentage of *highly active* children who reported "not important at all".

PE experience. Children with more extensive PE have increased motivation to be 'good at the activity' ($p < .001$).

Results of the brief health knowledge assessment confirm that most children can grasp the fundamental principles and understand the relationships among exercise and health. While a spin-off benefit might be an appreciation among children of the necessity to exercise, it is widely accepted that knowledge on its own does not change health behaviour. Absence of association between knowledge and physical activity behaviour has already been observed for Irish adolescents (O Reilly & Shelley, 1991) and the limitations of knowledge in effecting behaviour change for the same population have also been demonstrated (Nic Gabhainn & Kelleher, 1995). Absence of an observed relationship between information and physical activity in this population therefore was not unexpected. Health knowledge however may have more important long-term behaviour implications, when sources of motivation for activity, pertinent in childhood, become less relevant.

Children in the lower social classes are less informed about exercise-health relationships. This finding highlights the importance of information diffusion via the agency of the school. Children in the lower social classes are less likely perhaps to accrue health information from external sources. Children with *high PE* experience were observed to have greater health knowledge than those with *low PE* experience ($p < .05$) suggesting that perhaps the cross-curricular approach within an activity-promoting school is, where implemented, an effective strategy in health education. Primary programmes however cannot be solely responsible for the provision of information children need for their lifetime, and secondary programmes must play a major role in providing the information required to make adult choices.

A disappointing finding of the study was the low habitual activity observed in relation to the children's school travel. More than half of the journeys (51%) Irish children make to and from school are inactive. Walking accounts for approximately 40% of journeys, and cycling a mere 8%, most of which is done by boys. The extremely low proportion of children cycling to school in the city (2%) is undoubtedly due to heightened safety

consciousness, and the very real hazards presented by increased traffic volume and absence of cycle paths. Least active of the school population are village and rural schoolchildren. 71% of this group are now transported to school while only 20% walk and a further 9% cycle. The very large percentage of rural children being transported to school reflects the wider social trend of increased car usage, school transport policy, and enforced usage of bus and car transport consequent to school closures and amalgamations.

Among town and city schoolchildren, there are also large numbers who are escorted to school by car (35% and 24% respectively). Unlike their rural counterparts, distance is less likely to be the prevailing reason for such choice. Safety-induced restrictions on independent mobility may be contributory. Spoiling of children by parents may also be a factor. Socioeconomic status is clearly a contributory factor in school travel choice. Significantly greater numbers of children in the higher social classes are escorted to school by car than in the lower classes (45% vs. 25%). These results are consistent with findings of British and overseas studies which show socioeconomic status to be a covariant of travel. Data for British youth have shown that poor children have a risk of pedestrian injury some three times greater than the least poor, and census area unemployment is strongly correlated with census area child pedestrian injury rates (Office of Population Censuses and Surveys, 1988; Doughery et al.,1990; Roberts et al.,1992; Roberts, 1993; DiGuiseppi et al.,1997).[28]

These studies however report an overall decline in pedestrian and pedal cycling deaths, and researchers argue that neither prevention programmes nor improvements in medical care are a plausible explanation. A substantial proportion of the decline has been achieved at the expense of children's walking and cycling activities. The study of British schoolchildren aged 10-14 years reports a 35% decline in walking and a 26% decline in cycling within the period 1985-1992 (DiGuiseppi et al.,1997). Research of the Policy Studies Institute (Hillman et al.,1990) has shown that nearly four times as many children (aged 7-15 years) were chauffeured to school in 1990 as compared to 1971. There are

28 Rates pertain to all travel (school included) reported in weekly diary recalls

no comparative historic data for Irish children, but similar trends in school travel are readily apparent.

The British epidemiologist Geoffrey Rose (1981) has argued that in disease prevention two broad types of strategy can be distinguished: those that restore biological normality and those that take us further from the conditions for which we were genetically adapted.[29] In this context limiting children's independent mobility is a clear departure from biological normality. Reduced cycling and walking undoubtedly contribute to declines in overall physical activity, and may impact on cardiovascular health. The curtailment of independent mobility may have important adverse effects on children's mental, physical, and emotional development (Hillman, 1993). Methods by which 'active' patterns of school travel can be increased must be considered. Where travel choice is not predetermined, for example in town and city neighbourhood schools, health messages may need to be specifically targeted to parents. Certainly parents need to be more informed of the future health problems and societal costs caused by increased car travel for children.

Interesting observations emerged from the investigation of children's activity patterns in school lunch-break periods There appears to be a significant shift in playground activity from the chasing/rhyme variety described by Opie & Opie (1984) to sports play and games skills practice. Of those children who were allowed to play with balls, 42% chose to practice a sport, compared to 15% who chose a playground game. From a health perspective, this might be viewed as a beneficial shift, as intensity of activity during sports practice is likely to be higher than that required for a playground game. On the other hand, those children who do not have adequate space for sports practice may be less willing, or lack direction to participate in a playground activity, and therefore opt to 'stand around'. Playground space and adjacent areas for sports practice may be significant factors in maintaining and increasing activity levels during play periods. Where space is a confining factor, children may need leadership from teachers to devise and participate in playground games. Many such games include challenging ball play and

29 Rose, G., 1981. Strategy of prevention: lessons from cardiovascular disease. *British Medical Journal.* 1981, 282, 1847-1851

team-work, and do not present the safety hazards of major games. Although these games are classified as 'mild intensity', participation in such activity would be more beneficial, in health and well-being terms, than the inactivity consequent to 'standing around'.

Health and well-being status, self-assessed by children, is generally very positive. Only 6% of children were categorised as 'not healthy'. The frequency of reported feelings of loneliness however is worrying, and raises questions concerning the 'new' psychosocial risk factor, social isolation, to which Eder (1990) has referred. Reported feelings of loneliness and reports of having been the victim of bullying have been shown to correlate strongly with each other in this age group (*ibid.*). On four health indicators, boys scored more positively than girls ($p < .001$) and were significantly less subject to feelings of loneliness than girls ($p < .0005$). Emotional well-being, physical self-perception and social integration may be mutually reinforcing, and their cumulative influence contributory to gender differences in activity observed. Certainly boys' expressed self-confidence concerning the physical and emotional self is consistently higher across these three variables.

It might be expected intuitively that social class would have a strong impact on the general health and well-being of young people. Surprisingly, contemporary studies have found little evidence for such class-based health inequalities during the school years, although striking differentiation occurs in infancy and in adulthood (West, 1988; 1991). Recent evidence has emerged of social class-health relationships in adolescents. In the large English cohort study (Steptoe & Butler,1996) social class contributed to variability both in the psychological symptom and somatic symptom subscales of the malaise inventory. The pattern is broadly similar in this study, in that no significant class differences were evidenced in general health and well-being, but children in the lower social classes had higher scores on the somatic symptom subscale ($p < .01$).

Research with adolescents in Scotland and England (Hendry et al.,1993; Steptoe & Butler,1996) points to significant associations between self-assessed health (as measured

by the GHQ)[30] and participation in sport. No significant association was observed between physical activity and health, as measured by the health and well-being index, and the activity behaviour of preadolescents in this study. There are several possible explanations. The distribution of health and well-being values, although approximately normal [Kolmogorov-Smirnov Z = 4.871, Asymp.Sig.=.000], showed substantial clustering in a positive direction (Figure 5.27). Secondly, the raw scores (index values) may not constitute a sufficient statistic (Anderssen, 1977). Although such a scale has been used in cross-cultural research (Eder,1990), the 25-item General Health Questionnaire is a more comprehensive measure. In the item reliability test a low-moderate standardised item alpha of 0.54 was recorded for this population. The Centre for Statistics in Medicine recommends that in scales used to compare groups, other than in clinical applications, α values of 0.7 to 0.8 are desirable.[31] Quite apart from difficulties in statistical inference, it is inherently plausible that the intrinsic motivation of preadolescent children for physical activity is not mediated by low emotional well-being.

The highly significant relationship observed between social integration of preadolescents and self-assessed health [γ = .37, p <.0005] independently corroborates evidence reported in the WHO cross-cultural study (Eder, 1990). It is hypothesised in the latter that absence of social interactions is a major psychosocial risk for health, because it results in a lack of possibilities to check the consistency between an individual and his/her social environment. Though causality cannot be assumed, one could reasonably argue that impairment of health by lack of social interactions is a more probable direction than inability to socially interact as a result of impaired health.

The observable lower health/lower social integration certainly raises questions concerning the impact of 'normal' socialisation and maturation processes on psychosocial and psychosomatic health. Eder (*ibid.*) suggests that in "...trying to formulate common denominators of psycho- and sociosomatic research results, as a 'rule of thumb for psychosocial health', researchers probably have to postulate that

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30 Goldberg, D., 1978 *Manual of the general health questionnaire.* Windsor: National Foundation for Educational Research.

31 Bland, J & D.Altman, 1997. Cronbach's alpha. *British Medical Journal.* 1997, 314, 572.

functioning patterns of interaction with others are a basic prerequisite for health".[32] Participation in physical activity with peers, parents, and with significant others are patterns of such interaction in childhood, and might be viewed as 'normal' processes of socialisation. Is this perhaps the connection between physical activity and well-being in the preadolescent years?

[32] Eder, A.,1990. Risk factor loneliness. On the interrelations between social integration, happiness and health in 11-13- and 15-year-old children in 9 European countries. *Health Promotion International.* 1990, 5 (1), 21.

Commentary

Epidemiological studies of health behaviour offer a foundation for preventive medicine, and as such they are appropriate. Epidemiological studies cited in the overview (Chapter 1) have been conducted both at the observational end of the cognitive continuum for clinical sciences[1] and at the more controlled extreme, viz., in clinical trials. Evidence from these studies demonstrates that physical activity is positively related to health. Some would argue that there is no *conclusive* evidence from controlled trials that regular exercise reduces the number of deaths, for example, from coronary heart disease, or that exercise substantially prolongs life. Absence of such proof does not detract from the main point about physical activity, which is that it is valuable for the numerous other benefits it confers, and for its provision of the feeling of well-being. Thus population strategies to enhance physical activity throughout the life-span are appropriate.

Strategy formulation requires basic knowledge about the target behaviours, about the contexts in which they occur, and about the factors that determine and stabilise them. Empirical evidence is provided in this study of a significant and positive relationship between the child's activity experience in the primary school and the child's recreational activity. The highly significant positive associations also observed between primary PE, social integration and physical self-perception, and the inter-relationship of social integration and well-being, all indicate that the activity promoting school plays a significant role in the holistic development of the child.

In the early nineties, documented health benefits of physical activity for adult health fuelled drives for changes in school PE. A focus on health related fitness was widely advocated and indeed its adoption into the Irish primary PE curriculum was formally proposed.[2] The exclusive or predominant direction towards health-related fitness was considered by the education profession to be inappropriate at primary level. The revised curriculum (NCCA, 1997) has a lifestyle-oriented dominant health ideology. Based on

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[1] Hammond, K.R., 1980. *The integration of research on judgement and decision making.* Boulder: University of Colorado.

[2] Department of Education, 1992. *Education for a changing world: Green paper on Education.* Dublin: Department of Education.

concepts of variety and diversity, its primary aim is to equip children with attitudes, skills and values which will help them to lead active healthy lives.[3] Findings in this study suggest that the lifestyle objective can be realised, at least in the shorter term. Longitudinal research is required to monitor activity behaviour patterns over the lifetime.

While the progress made in primary PE in the last decade is observable and commendable, the finding that almost 12% of the 1997 preadolescent cohort have no structured physical education whatsoever presents a bleak educational picture. Why many teachers achieve so much and some so little must now be the focus of careful inquiry. The next stage of the research should address the promotion of active lifestyles from the primary teaching perspective. Pedagogical concerns in curriculum implementation need to be identified. A national targeted inservice initiative, school environment appropriate, may be the most strategic sequitur. Ireland's entry to the new millennium must be marked by the guaranteed provision of structured, progressive and varied PE experiences for all children enrolled in our national primary schools.

Lifetime health might be viewed as a continuum wherein the individual makes personal lifestyle choices. As discussed in the preface to this study, personal 'choices' are conditioned by structurally and environmentally based life 'chances'. The primary school child's educational environment is one such life chance. Educators and the education authorities therefore share a collective social responsibility to give young people at least equal educational opportunity to choose a lifestyle that is active.

Study findings have shown that many children in the lower socio-economic groups are disadvantaged in the provision of primary PE. Children in these social groups were also observed to receive significantly lower levels of parental support for physical activity than their peers in the higher social classes. Recent policy documents have invoked activity promotion for socially and economically disadvantaged youth (Community Response, 1997; Department of Education, 1997). Disadvantage in Ireland however is a widely dispersed phenomenon (Kellaghan et al.,1995). The social structure of the

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[3] National Council for Curriculum and Assessment,1997. *Curriculum for primary schools: Physical Education* [Draft] April, 1997.

national primary school is inclusive of children from all socio-economic strata within both conglomerate *and* dispersed communities. It is thus the agent of socialisation that can best redress the imbalance in parental support, and the most appropriate channel for the promotion of active lifestyles in the youth population.

From a public health viewpoint it is agreed that, while many of the health benefits of childhood activity are transitory, the major impact of physical activity in youth is likely to be the reduction of chronic disease risk in adulthood. Childhood is a critical period when dietary and lifestyle patterns are initiated which have long term implications for diseases and degenerative conditions such as osteoporosis and coronary heart disease. The Royal College of Physicians affirms that "...the habit of regular exercise is most beneficial when acquired young."[4] Another major assumption for the rationale behind youth health promotion is that a certain proportion of children and adolescents are at excess physiological and behavioural disease risk. While physiological risk factors are known to track from childhood into adulthood, few studies have systematically examined the stability of health behaviours over time. Some longitudinal studies however have identified physical *inactivity* as that which tracks most consistently (Raitakari et al., 1994; Kelder et al.,1994), and evidence in these studies suggests that health behaviours may be consolidated as early as sixth grade. Thus the primary school years are recognised as critical for the initiation of positive health behaviour.

Findings of this study demonstrate that the child's primary physical education experience is positively related to physical activity outside of school, and provides a significant increment in the prediction of activity over and above the effects explained by demographic and sociometric variables. Physical education experience is also positively associated with social integration and with the child's perception of the physical self: factors which may influence personal well-being and lifestyle choice, both in the short *and* in the longer term. These findings attest to the importance and to the centrality of the primary school in the socialisation of children into active lifestyles, and in their education for lifetime health.

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[4] Medical aspects of exercise: Benefits and risks. Summary of a report of the Royal College of Physicians. *Journal of the Royal College of Physicians of London*. 1991, 25 (3), p.195.

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APPENDICES

APPENDIX A

SURVEY SAMPLE OF IRISH NATIONAL PRIMARY SCHOOLS

LISTED BY COUNTY

Sampling Unit No.	School and Address	Principal and Telephone no.	No. of pupils	Population
Pre-test unit	St.Senan's CBS Sexton St. Limerick	Brother R. Hanley 061-413950	26	Boys
Pre-test unit	Presentation Girls NS Roxboro Road Limerick	Ms M O Connor 061-311286	18	Girls
Pre-test unit	Scoil Ide Corbally Limerick	Mr. Peter Long 061-345495	24	Co-ed
	CLARE			
1	Mercy Convent NS Ennistymon Co Clare	Sr Rosario 065-71722	11	Girls
2	Inagh NS Inagh Co Clare	Mr Garvey 065-36778	26	Co-ed
3	St. Conaire's N.S. Shannon Co.Clare	Mr.S.Cleary 061-364694	30	Co-ed
4	Holy Family N.S. Ennis Co.Clare	Sr.Ann Ryan 065-29808	32	Girls
5	Sixmilebridge N.S. Sixmilebridge Co.Clare	Mr.Bradley 061-369544	32	Co-ed
6	Tulla Convent NS, Tulla, Co.Clare.	Sr.Sheila 065-35118	26	Girls
7	Feakle NS, Feakle, Co.Clare.	Mr.Harrington 061-924116	24	Co-ed

8	Lissycasey NS Co Clare	Mr G O Sullivan 065-34454	31	Co-ed
9	Convent of Mercy Kilrush Co Clare	Sr.Mary 065-51792	28	Co-ed
	CORK			
10	Scoil Oliver Ballyvolane Cork	Mr Jim Hayes 021-309171	31	Co-ed
11	Riverstown NS Riverstown Cork	Mr Moloney 021-82209	22	Co-ed
12	St Anne's NS Charleville Co Cork	Sr Colette 063-89451	28	Girls
13	Mitchelstown CBS Co Cork	Brother Healy 025-24505	36	Boys
14	Scoil Colmcille CBS Blarney St Cork	Brother Ryan 021-397000	30	Boys
15	Rathcormac N.S. Co Cork	Mr Hegarty 025-36616	25	Co-ed
16	Midleton CBS Co Cork	Br. Cunningham 021-631419	28	Boys
17	Maria Assumpta Girls Ballyphehane Cork	Sr Margaret 021-961820	25	Girls
18	Scoil Muire Naofa Bishopstown Co Cork	Mrs J Twomey 021-543305	35	Girls

DUBLIN

19	Scoil Seamus C.B.S. James St Dublin 8	Brother Jacob 01-4534321	31	Boys
20	Mater Dei N.S. Basin Lane Dublin 8	Sr.Rita 01-4548461	18	Girls
21	C.B.S. Boys Primary Sch. Nth Brunswick St. Dublin 7	Brother B Murray 01-8722167	43	Boys
22	Christ the King Girls NS Cabra Dublin 7	Mrs Ann Garvey 01- 8680155	22	Girls

GALWAY

23	St Brendan's NS Portumna Co Galway	Sr Patrice 0905-41465	23	Co-ed
24	Kiltormer NS Ballinasloe Co Galway	Mrs Hanny 0905-27109	32	Co-ed
25	Gort Inse Guaire Gort Co Galway	Mr Conroy 091-31627	25	Co-ed

KERRY

26	Knocknagoshel NS Co.Kerry	Mr Larry Keane 068-46011	17	Co-ed
27	Castleisland Boys NS Co Kerry	Mr Nelligan 066-42420	15	Boys
28	Fibough NS Castlemaine Co Kerry	Mr Sheehy 066-66301	13	Co-ed

29	Scoil Iognaid Ris, Dingle, Co. Kerry.	Brother Keane 066-51321	32	Co-ed
30	Annascaul NS Co Kerry	Mr Donal Sheehy 066-57436	25	Co-ed
31	Castledrum NS Co Kerry	Mr O Sullivan 066-66256	19	Co-ed
	KILKENNY			
32	Scoil Lachtain Freshford Co Kilkenny	Mr Doheny 056-32400	40	Co-ed
33	Scoil Ciaran Johnstown Co Kilkenny	Mr Connolly 056-31611	18	Co-ed
34	Scoil Eoin De Coote's Lane Kilkenny	Mr Gerry Moran 056-22569	23	Boys
	LAOIS			
35	The Paddock N.S. Mountrath Co.Laois	Mr.Sean Mullaney 0502-32160	11	Co-ed
36	St.Paul's N.S., Portlaoise Co.Laois	Mr. Des Sutton 0502-21132	27	Boys
	LIMERICK			
37	St.John's N.S. John Square, Limerick.	Mr.Colm Cregan 416752	24	Girls
38	Salesian N.S. Caherdavin, Limerick.	Sr.Elis Ni Bhaceir 454149	25	Girls

39	Mercy Convent N.S. Doon. Co.Limerick.	Mrs Haugh 061-380149	22	Girls
40	Patrickswell N.S. Co Limerick	Mr Ciaran Crowe 061-355057	20	Co-ed
41	Shountrade N.S. Co.Limerick	Mrs Kennedy 061-396765	23	Co-ed
42	Tineteriffe N.S. Cappamore Co.Limerick.	Mrs O Mahoney 061-384055	19	Co-ed
43	Monaleen N.S. Monaleen Co Limerick	Mrs Finucane 061-336048	27	Co-ed
44	Presentation Convent Senan Street Limerick	Sr Melissa 061-412494	23	Girls
45	Corpus Christi NS Moyross Limerick	Mr Tony O Gorman 061-455166	30	Co-ed
46	Scoil Chriost Ri Caherdavin Limerick	Mr Treacy 061-453484	29	Boys
47	Ballybrown NS Co Limerick	Mr Michael Lynch 061-353276	27	Co-ed
48	St Nicholas NS [Cof I] Adare Co Limerick	Mrs Brickenden 061-396683	9	Co-ed
49	St Senan's NS Isand Rd Limerick	Mr M O Sullivan 061-410338	14	Boys

OFFALY

50	Crinkle NS Birr Co Offaly	Mrs Sally Nugent 0509-20803	48	Co-ed
51	Scoil Eoin Pol Tullamore Co Offaly	Mr. Walsh 0506-51894	24	Boys
52	Muire Boys NS Ferbane Co Offaly	Mr Halloran 0902-34249	33	Boys

TIPPERARY

53	St John the Baptist Cashel [Cof I] Co Tipperary	Mrs M Thompson 062-61833	10	Co-ed
54	Mercy Convent Newport Co Tipperary	Sr M Mgt Costigan 061-378622	27	Girls
55	Mercy Convent Primary Nenagh Co Tipperary	Mrs Spain 067-31895	28	Girls
56	Knockavilla N.S. Dundrum, Co.Tipperary.	Mr Morrissey 062-71533	40	Co-ed
57	Monard N.S. Co Tipperary	Ms O Connor-Ryan 062-47557	26	Co-ed

WATERFORD

58	Scoil Mochuda [C of I] Lismore Co Waterford	Mrs England 058-54848	8	Co-ed
59	St Mary's Girls NS Dungarvan Co Waterford	Sr Mary 058-41346	44	Girls

WICKLOW

60	St.Brigid's Girls Kilcoole Co.Wicklow	Sr.Kathleen Ling 01- 2874649	26	Girls
61	St.Kevin's Boys Greystones Co.Wicklow	Mr. G O Sullivan 01- 2876660	34	Boys
62	St.Brigid's Girls NS Newtownmountkennedy Co Wicklow	Mrs Dempsey 01- 2819142	26	Girls

APPENDIX B

SAMPLE OF SCHOOLS REGISTERED UNDER THE DESIGNATED AREAS OF DISADVANTAGE SCHEME (DEPARTMENT OF EDUCATION, 1995/1996)

Sampling Unit No.	School Address	Principal and Telephone No.	No. of pupils	Population
1	Scoil Seamus C.B.S. James St Dublin 8	Brother Jacob 01-4534321	31	Boys
2	Mater Dei N.S. Basin Lane Dublin 8	Sr.Rita 01-4548461	18	Girls
3	C.B.S. Primary School North Brunswick St. Dublin 7	Brother Murray 01-8722167	43	Boys
4	Christ the King Girls NS Cabra East Dublin 7	Mrs Garvey 01-8680155	22	Girls
5	Scoil Colmcille Blarney St Cork	Brother Ryan 021-39700	30	Boys
6	Maria Assumpta Girls Ballyphehane Cork	Sr Margaret 021-961820	25	Girls
7	Corpus Christi NS Moyross Limerick	Mr Tony O Gorman 061-416752	30	Co-ed
8	St.John's N.S. John Square, Limerick.	Mr.Colm Cregan 061-416752	24	Girls
9	Presentation N.S. Sexton Street Limerick	Sr Melissa 061-412494	23	Girls
10	St Senan's NS Island Rd	Mr Michael O Sullivan	14	Boys

	Limerick	061-410338		
11	St.Brigid's Newtownmount--- kennedy Co Wicklow	Mrs Dempsey 01- 2819142	26	Girls
12	Scoil Eoin Pol Tullamore Co Offaly	Mr. Walsh 0506-51894	24	Boys
13	Mercy Convent NS Ennistymon Co Clare	Sr Rosario 065-71722	11	Girls
14	Fibough NS Castlemaine Co Kerry	Mr Sheehy 066-66301	13	Co-ed

APPENDIX C

AGE-ADJUSTED MET VALUES FOR PHYSICAL ACTIVITIES OF 11-12 YEAR-OLD CHILDREN [QUESTIONNAIRE ORDER]

ACTIVITY		AGE-ADJUSTED MET
Basketball		8
Soccer		8
Swimming		* 6
Hurling	$	9
Camogie	$	9
Roller Skating or Blade Skating		8
Rugby		11
Running or Jogging		7.5
Gaelic Football	$	10
Squash		13
Mountain Bicycling or BMX		* 8.5
Hockey		9
Rowing or Canoeing		* 7
Handball		13
Karate / Judo		11
Bicycling		* 6
Volleyball		3.5
Irish Dancing		6.5
Tennis		8
Gymnastics		4.5
Badminton		8
Jazz Dancing or Disco Dancing		5.5
Skateboarding		5.5
Ballet		6
Dodge ball or 4-square		5.5
Skipping		6.5
Horseback riding		* 4
Rounders or Baseball		5.5
Ballroom Dancing		3.5
Walking		4
Golf or Pitch and Putt		5
Table tennis		4.5
Bowling		3.5
Other [Fishing / Sailing / Cricket ...]		4

$ Not categorised by Ainsworth et al. (1993). Hurling and camogie estimated as EE [hockey + 1 MET]. Gaelic Football estimated as EE [rugby - 1 MET].

* Non weight-bearing activities. Values are not adjusted for age.

APPENDIX D

DESCRIPTIVE STATISTICS

Descriptive Statistics

Variable	N	Mean	Std.Deviation
PAI	1600	74.06	43.09
LNPAI	1592	4.103	.725
PEI	1600	29.10	7.65
SOCIND	1596	13.49	2.34
PARENTS	1526	12.83	3.34
PSPP	1588	19.55	3.66
HEALTH	1596	11.97	2.56

Descriptive Statistics: Gender Groups

Variable	Gender	N	Mean	Std.Deviation
PAI	Boy	790	82.07	42.52
	Girl	810	66.18	42.21
PEI	Boy	790	29.25	7.24
	Girl	810	28.95	8.03
SOCIND	Boy	787	13.64	2.30
	Girl	809	13.34	2.36
PARENTS	Boy	758	12.57	3.39
	Girl	768	13.08	3.27
PSPP	Boy	782	20.27	3.65
	Girl	806	18.86	3.54
HEALTH	Boy	787	11.78	2.43
	Girl	809	12.15	2.67

Descriptive Statistics: Regression Variables

Variable	N	Mean	Std.Deviation
LNPAI	1512	4.11	.711
PEI	1512	29.18	7.61
SOCIND	1512	13.50	2.31
PARENTS	1512	12.84	3.34
PSPP	1512	19.62	3.64

Regression Model Residuals: Casewise Diagnostics

Case No.	Standardised Residual	LNPAI	Case No.	Standardised Residual	LNPAI
236	-3.050	1.39	1409	-3.571	1.50
304	-4.693	.56	1413	-4.244	1.39
559	-3.599	1.61	1433	-4.243	1.18
566	-3.496	1.39	1443	-3.952	1.18
601	-3.717	1.18	1483	-3.689	1.50
632	-3.951	1.10	1489	-3.241	1.79
694	-3.137	1.39	1514	-3.262	2.01
902	-3.482	1.39	1559	-3.029	2.11
1319	-3.970	1.39	1560	-3.387	2.08
1408	-5.038	.56			

Dependent variable: LNPAI

APPENDIX E

CONDENSED FREQUENCIES

Frequency Table

Physical Activity Index [PAI]

Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct
.00	8	1	1	20.50	1	0	8	32.50	1	0	17
1.75	2	0	1	20.75	1	0	8	32.75	3	0	17
2.00	1	0	1	21.00	7	0	8	33.00	6	0	17
3.00	1	0	1	21.25	1	0	8	33.25	2	0	17
3.25	4	0	1	21.50	2	0	9	33.50	4	0	18
4.00	7	0	1	22.00	5	0	9	34.00	4	0	18
4.50	2	0	2	22.25	1	0	9	34.50	2	0	18
5.00	3	0	2	22.50	3	0	9	34.75	3	0	18
6.00	2	0	2	22.75	1	0	9	35.00	9	1	19
6.25	1	0	2	23.00	6	0	10	35.25	1	0	19
7.00	2	0	2	23.25	1	0	10	35.50	4	0	19
7.50	1	0	2	23.50	3	0	10	35.75	2	0	19
8.00	6	0	3	23.75	2	0	10	36.00	6	0	19
8.25	2	0	3	24.00	7	0	10	36.25	4	0	20
9.00	7	0	3	24.25	4	0	11	36.50	4	0	20
9.25	1	0	3	24.50	3	0	11	36.75	1	0	20
9.75	2	0	3	24.75	2	0	11	37.00	6	0	20
10.00	1	0	3	25.00	2	0	11	37.25	2	0	21
10.50	1	0	3	25.25	3	0	11	37.50	4	0	21
11.00	4	0	4	25.50	1	0	11	37.75	4	0	21
11.25	1	0	4	25.75	1	0	11	38.00	4	0	21
11.75	2	0	4	26.00	2	0	12	38.25	4	0	22
12.00	8	1	4	26.25	2	0	12	38.50	3	0	22
12.25	1	0	4	26.50	1	0	12	38.75	2	0	22
12.50	1	0	4	26.75	1	0	12	39.00	6	0	22
12.75	1	0	5	27.00	6	0	12	39.25	2	0	22
13.00	3	0	5	27.25	4	0	12	39.50	3	0	23
14.00	7	0	5	27.50	2	0	13	39.75	4	0	23
14.50	4	0	5	27.75	1	0	13	40.00	7	0	23
15.00	1	0	5	28.00	6	0	13	40.25	3	0	23
15.50	1	0	6	28.25	3	0	13	40.50	2	0	24
16.00	3	0	6	28.50	1	0	13	40.75	4	0	24
16.25	1	0	6	28.75	4	0	13	41.00	4	0	24
16.50	1	0	6	29.00	4	0	14	41.25	3	0	24
16.75	1	0	6	29.25	4	0	14	41.50	4	0	24
17.00	7	0	6	29.50	3	0	14	41.75	3	0	25
17.50	1	0	6	29.75	2	0	14	42.00	6	0	25
17.75	1	0	6	30.00	5	0	15	42.25	3	0	25
18.00	4	0	7	30.50	3	0	15	42.50	3	0	25
18.25	1	0	7	30.75	3	0	15	42.75	2	0	26
18.50	2	0	7	31.00	8	1	15	43.00	8	1	26
19.00	4	0	7	31.25	1	0	16	43.25	4	0	26
19.25	1	0	7	31.50	3	0	16	43.50	4	0	26
19.50	2	0	7	31.75	4	0	16	43.75	4	0	27
19.75	2	0	7	32.00	7	0	16	44.00	6	0	27
20.00	6	0	8	32.25	2	0	17	44.25	3	0	27

Physical Activity Index [contd.]

Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct
44.50	4	0	28	56.75	1	0	40	69.00	2	0	51
44.75	2	0	28	57.00	5	0	40	69.25	2	0	51
45.00	3	0	28	57.25	2	0	40	69.50	2	0	51
45.25	3	0	28	57.50	8	1	41	69.75	3	0	51
45.50	7	0	29	57.75	4	0	41	70.00	5	0	52
45.75	1	0	29	58.00	5	0	41	70.25	6	0	52
46.00	9	1	29	58.25	1	0	41	70.50	6	0	52
46.25	4	0	29	58.75	3	0	41	70.75	4	0	53
46.50	4	0	30	59.00	2	0	42	71.00	9	1	53
46.75	4	0	30	59.25	4	0	42	71.25	1	0	53
47.00	6	0	30	59.50	6	0	42	71.50	3	0	54
47.25	2	0	30	59.75	5	0	42	71.75	2	0	54
47.50	5	0	31	60.00	5	0	43	72.00	5	0	54
48.00	5	0	31	60.25	1	0	43	72.25	1	0	54
48.25	3	0	31	60.50	3	0	43	72.50	4	0	54
48.50	5	0	32	60.75	1	0	43	72.75	4	0	55
48.75	4	0	32	61.00	9	1	44	73.00	3	0	55
49.00	4	0	32	61.25	1	0	44	73.25	2	0	55
49.25	1	0	32	61.50	6	0	44	73.50	6	0	55
49.50	4	0	32	61.75	1	0	44	73.75	6	0	56
49.75	2	0	32	62.00	3	0	44	74.00	9	1	56
50.00	4	0	33	62.25	2	0	44	74.25	1	0	56
50.25	3	0	33	62.50	6	0	45	74.50	3	0	56
50.50	3	0	33	62.75	2	0	45	75.00	5	0	57
50.75	4	0	33	63.00	6	0	45	75.50	12	1	57
51.00	6	0	34	63.25	4	0	46	75.75	3	0	58
51.25	1	0	34	63.50	10	1	46	76.00	8	1	58
51.50	5	0	34	63.75	1	0	46	76.25	2	0	58
51.75	1	0	34	64.00	3	0	46	76.50	2	0	58
52.50	8	1	35	64.25	3	0	47	76.75	4	0	59
52.75	5	0	35	64.50	3	0	47	77.00	5	0	59
53.00	6	0	35	64.75	13	1	48	77.25	4	0	59
53.25	2	0	35	65.25	5	0	48	77.50	7	0	60
53.50	6	0	36	65.50	3	0	48	77.75	1	0	60
53.75	4	0	36	66.00	1	0	48	78.00	6	0	60
54.00	11	1	37	66.25	4	0	48	78.25	3	0	60
54.25	5	0	37	66.50	3	0	49	78.50	5	0	61
54.50	4	0	37	66.75	2	0	49	78.75	2	0	61
54.75	5	0	38	67.00	6	0	49	79.25	1	0	61
55.00	8	1	38	67.25	3	0	49	79.50	4	0	61
55.25	4	0	38	67.50	5	0	50	79.75	1	0	61
55.50	5	0	39	67.75	2	0	50	80.00	2	0	61
55.75	3	0	39	68.00	9	1	50	80.25	1	0	61
56.00	8	1	39	68.25	1	0	50	80.50	4	0	62
56.25	2	0	40	68.50	4	0	51	80.75	2	0	62
56.50	1	0	40	68.75	3	0	51	81.00	1	0	62

Physical Activity Index [contd.]

Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct
81.25	3	0	62	93.25	4	0	71	105.75	1	0	78
81.50	1	0	62	93.50	3	0	71	106.00	4	0	79
81.75	1	0	62	93.75	2	0	71	106.25	4	0	79
82.00	7	0	62	94.25	1	0	71	106.50	1	0	79
82.25	3	0	63	94.50	4	0	72	106.75	4	0	79
82.50	6	0	63	94.75	3	0	72	107.00	1	0	79
82.75	3	0	63	95.00	4	0	72	107.50	1	0	79
83.00	5	0	64	95.50	5	0	72	107.75	2	0	80
83.25	4	0	64	95.75	2	0	73	108.00	1	0	80
83.50	4	0	64	96.00	3	0	73	108.50	2	0	80
83.75	6	0	64	96.25	2	0	73	108.75	3	0	80
84.00	3	0	65	96.50	1	0	73	109.00	2	0	80
84.25	2	0	65	96.75	1	0	73	109.25	1	0	80
84.50	3	0	65	97.00	5	0	73	109.50	3	0	80
84.75	2	0	65	97.25	2	0	73	109.75	1	0	80
85.00	5	0	65	97.50	4	0	74	110.00	3	0	81
85.25	1	0	65	97.75	3	0	74	110.25	2	0	81
85.50	2	0	66	98.00	1	0	74	110.50	2	0	81
85.75	2	0	66	98.50	4	0	74	110.75	1	0	81
86.00	3	0	66	98.75	5	0	74	111.00	2	0	81
86.25	1	0	66	99.00	3	0	75	111.25	1	0	81
86.50	5	0	66	99.25	1	0	75	111.50	2	0	81
87.00	7	0	67	99.50	2	0	75	111.75	5	0	81
87.25	2	0	67	99.75	1	0	75	112.00	2	0	82
87.50	3	0	67	100.00	1	0	75	112.25	1	0	82
87.75	2	0	67	100.25	2	0	75	112.50	1	0	82
88.00	6	0	67	100.50	1	0	75	112.75	4	0	82
88.25	1	0	68	100.75	2	0	75	113.00	3	0	82
88.50	3	0	68	101.00	3	0	75	113.25	1	0	82
88.75	4	0	68	101.25	1	0	76	113.75	5	0	83
89.00	2	0	68	101.50	1	0	76	114.00	1	0	83
89.25	4	0	68	101.75	1	0	76	114.25	3	0	83
89.50	1	0	68	102.00	5	0	76	114.50	2	0	83
89.75	1	0	68	102.50	2	0	76	114.75	5	0	83
90.00	3	0	69	102.75	3	0	76	115.00	3	0	83
90.25	3	0	69	103.00	2	0	76	115.25	2	0	84
90.50	1	0	69	103.25	1	0	76	115.50	1	0	84
90.75	3	0	69	103.50	3	0	77	115.75	1	0	84
91.00	4	0	69	103.75	4	0	77	116.00	5	0	84
91.25	1	0	69	104.00	3	0	77	116.25	2	0	84
91.50	4	0	70	104.25	2	0	77	116.75	1	0	84
92.00	4	0	70	104.50	9	1	78	117.25	3	0	84
92.25	3	0	70	104.75	1	0	78	117.50	2	0	84
92.50	3	0	70	105.00	3	0	78	117.75	2	0	85
92.75	2	0	70	105.25	1	0	78	118.00	1	0	85
93.00	6	0	71	105.50	5	0	78	118.25	1	0	85

Physical Activity Index [contd.]

Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct
119.00	3	0	85	133.50	2	0	91	150.25	2	0	95
119.25	1	0	85	134.00	1	0	91	150.50	1	0	95
119.75	2	0	85	134.50	1	0	91	151.25	1	0	95
120.00	1	0	85	134.75	1	0	91	151.75	1	0	95
120.25	4	0	85	135.00	1	0	91	152.25	1	0	95
120.50	4	0	86	135.25	2	0	91	152.50	2	0	95
120.75	1	0	86	136.00	3	0	91	153.00	1	0	95
121.00	3	0	86	136.25	1	0	91	153.50	1	0	95
121.25	2	0	86	136.50	1	0	91	153.75	3	0	96
121.50	2	0	86	137.00	1	0	92	154.00	1	0	96
121.75	2	0	86	137.50	1	0	92	155.25	1	0	96
122.00	2	0	86	137.75	3	0	92	156.25	2	0	96
122.25	1	0	86	138.00	2	0	92	156.75	3	0	96
122.50	3	0	87	138.25	2	0	92	157.00	3	0	96
122.75	1	0	87	138.75	2	0	92	157.75	1	0	96
123.25	1	0	87	139.00	1	0	92	158.00	2	0	96
123.50	2	0	87	139.25	1	0	92	158.25	1	0	96
123.75	2	0	87	139.50	1	0	92	158.75	2	0	97
124.00	3	0	87	139.75	1	0	92	159.00	1	0	97
124.50	2	0	87	140.25	1	0	92	159.75	1	0	97
124.75	5	0	88	140.75	2	0	93	160.25	1	0	97
125.25	1	0	88	141.00	3	0	93	161.75	1	0	97
125.50	1	0	88	141.25	2	0	93	162.50	1	0	97
125.75	1	0	88	141.75	1	0	93	163.00	1	0	97
126.00	1	0	88	142.00	1	0	93	164.25	1	0	97
126.50	2	0	88	142.75	1	0	93	164.50	1	0	97
127.00	5	0	88	143.25	2	0	93	164.75	1	0	97
127.50	2	0	88	143.50	1	0	93	165.00	1	0	97
127.75	3	0	89	143.75	1	0	93	166.75	1	0	97
128.00	1	0	89	144.00	1	0	93	167.50	2	0	97
128.25	1	0	89	144.50	1	0	93	168.25	1	0	97
128.50	3	0	89	145.00	1	0	94	169.25	1	0	97
128.75	1	0	89	145.25	1	0	94	170.00	1	0	98
129.00	2	0	89	145.50	1	0	94	170.75	2	0	98
129.75	1	0	89	145.75	2	0	94	174.50	1	0	98
130.00	2	0	89	146.00	1	0	94	177.25	1	0	98
130.25	2	0	89	146.25	1	0	94	177.75	1	0	98
130.50	2	0	90	146.50	1	0	94	178.00	1	0	98
130.75	1	0	90	147.00	2	0	94	178.50	1	0	98
131.25	2	0	90	147.25	1	0	94	179.00	1	0	98
131.75	2	0	90	147.50	1	0	94	180.50	1	0	98
132.00	5	0	90	147.75	2	0	94	180.75	1	0	98
132.25	1	0	90	148.00	2	0	94	181.50	1	0	98
132.75	3	0	90	148.75	2	0	95	183.50	1	0	98
133.00	2	0	91	149.50	1	0	95	188.00	1	0	98
133.25	1	0	91	149.75	1	0	95	188.25	1	0	98

Physical Activity Index [contd.]

Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct	Value	Freq	Pct	Cum Pct
188.75	1	0	98	200.50	2	0	99	231.00	1	0	100
189.25	2	0	99	201.25	1	0	99	234.50	1	0	100
191.50	1	0	99	202.25	1	0	99	247.25	1	0	100
194.25	1	0	99	203.00	2	0	99	250.50	1	0	100
195.00	1	0	99	204.25	1	0	99	264.00	1	0	100
195.75	1	0	99	204.50	1	0	99	266.00	1	0	100
197.25	1	0	99	209.25	1	0	100	282.25	1	0	100
199.25	1	0	99	213.75	1	0	100				

Valid cases 1600 Missing cases 0

Frequency Table

Physical education index

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	.1	.1	.1
	2	1	.1	.1	.1
	3	1	.1	.1	.2
	4	1	.1	.1	.3
	5	1	.1	.1	.3
	6	2	.1	.1	.4
	7	1	.1	.1	.5
	8	2	.1	.1	.6
	9	1	.1	.1	.7
	10	3	.2	.2	.9
	12	8	.5	.5	1.4
	13	6	.4	.4	1.8
	14	7	.4	.4	2.2
	15	9	.6	.6	2.8
	16	17	1.1	1.1	3.8
	17	18	1.1	1.1	4.9
	18	21	1.3	1.3	6.3
	19	36	2.3	2.3	8.5
	20	47	2.9	2.9	11.4
	21	49	3.1	3.1	14.5
	22	70	4.4	4.4	18.9
	23	70	4.4	4.4	23.3
	24	85	5.3	5.3	28.6
	25	84	5.3	5.3	33.8
	26	77	4.8	4.8	38.6
	27	78	4.9	4.9	43.5
	28	97	6.1	6.1	49.6
	29	74	4.6	4.6	54.2
	30	88	5.5	5.5	59.7
	31	75	4.7	4.7	64.4
	32	50	3.1	3.1	67.5
	33	67	4.2	4.2	71.7
	34	78	4.9	4.9	76.6
	35	56	3.5	3.5	80.1
	36	43	2.7	2.7	82.8
	37	49	3.1	3.1	85.8
	38	41	2.6	2.6	88.4
	39	35	2.2	2.2	90.6
	40	28	1.8	1.8	92.3
	41	28	1.8	1.8	94.1
	42	25	1.6	1.6	95.6
	43	20	1.3	1.3	96.9
	44	12	.8	.8	97.6
	45	11	.7	.7	98.3
	46	7	.4	.4	98.8
	47	3	.2	.2	98.9
	48	7	.4	.4	99.4
	49	2	.1	.1	99.5
	50	3	.2	.2	99.7
	51	1	.1	.1	99.8
	52	1	.1	.1	99.8
	54	1	.1	.1	99.9
	56	1	.1	.1	99.9
	60	1	.1	.1	100.0
	Total	1600	100.0	100.0	
Total		1600	100.0		

Frequency Table

Social Integration Index

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5	1	.1	.1	.1
	6	2	.1	.1	.2
	7	11	.7	.7	.9
	8	27	1.7	1.7	2.6
	9	56	3.5	3.5	6.1
	10	84	5.3	5.3	11.3
	11	135	8.4	8.5	19.8
	12	174	10.9	10.9	30.7
	13	250	15.6	15.7	46.4
	14	283	17.7	17.7	64.1
	15	250	15.6	15.7	79.8
	16	196	12.3	12.3	92.0
	17	82	5.1	5.1	97.2
	18	45	2.8	2.8	100.0
	Total	1596	99.8	100.0	
Missing	System Missing	4	.3		
	Total	4	.3		
Total		1600	100.0		

Frequency Table

Physical Self-Perception Profile

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	.1	.1	.1
	2	1	.1	.1	.1
	8	2	.1	.1	.3
	9	6	.4	.4	.6
	10	11	.7	.7	1.3
	11	10	.6	.6	2.0
	12	10	.6	.6	2.6
	13	25	1.6	1.6	4.2
	14	50	3.1	3.1	7.3
	15	82	5.1	5.2	12.5
	16	103	6.4	6.5	19.0
	17	156	9.8	9.8	28.8
	18	144	9.0	9.1	37.8
	19	192	12.0	12.1	49.9
	20	173	10.8	10.9	60.8
	21	163	10.2	10.3	71.1
	22	133	8.3	8.4	79.5
	23	90	5.6	5.7	85.1
	24	73	4.6	4.6	89.7
	25	77	4.8	4.8	94.6
	26	48	3.0	3.0	97.6
	27	23	1.4	1.4	99.1
	28	15	.9	.9	100.0
	Total	1588	99.3	100.0	
Missing	System Missing	12	.8		
	Total	12	.8		
Total		1600	100.0		

Frequency Table

Parent Support Index

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	8	.5	.5	.5
	5	16	1.0	1.0	1.6
	6	36	2.3	2.4	3.9
	7	65	4.1	4.3	8.2
	8	80	5.0	5.2	13.4
	9	87	5.4	5.7	19.1
	10	99	6.2	6.5	25.6
	11	110	6.9	7.2	32.8
	12	129	8.1	8.5	41.3
	13	149	9.3	9.8	51.0
	14	172	10.8	11.3	62.3
	15	188	11.8	12.3	74.6
	16	179	11.2	11.7	86.4
	17	150	9.4	9.8	96.2
	18	58	3.6	3.8	100.0
	Total	1526	95.4	100.0	
Missing	System Missing	74	4.6		
	Total	74	4.6		
Total		1600	100.0		

Frequency Table

Health and Well-Being Index

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6	4	.3	.3	.3
	7	22	1.4	1.4	1.6
	8	87	5.4	5.5	7.1
	9	149	9.3	9.3	16.4
	10	208	13.0	13.0	29.4
	11	254	15.9	15.9	45.4
	12	277	17.3	17.4	62.7
	13	214	13.4	13.4	76.1
	14	147	9.2	9.2	85.3
	15	82	5.1	5.1	90.5
	16	62	3.9	3.9	94.4
	17	41	2.6	2.6	96.9
	18	22	1.4	1.4	98.3
	19	15	.9	.9	99.2
	20	7	.4	.4	99.7
	21	5	.3	.3	100.0
	Total	1596	99.8	100.0	
Missing	System Missing	4	.3		
	Total	4	.3		
Total		1600	100.0		

APPENDIX F

QUESTIONNAIRE*

* School questionnaire is colour printed in booklet format (typeface pitch 12) and illustrated with activity graphics

UNIVERSITY OF LIMERICK

Irish National Primary School Survey

Physical Activity Behaviour of Preadolescent Schoolchildren

This survey is being undertaken as part of a health behaviour research project entitled: "Socialisation of the primary school child into a physically active lifestyle: A lifetime health perspective".
The research is being conducted by Sylvia O Sullivan, Senior Lecturer in Education, University of Limerick: Mary Immaculate College.

This section to be completed by researcher

Id No.		___ ___ ___ ___
Sc		___ ___
No of Teachers	2 - 3	___
	4 - 6	___
	7 - 10	___
	11 +	___
Playground Veto	none	____
	skipping ropes	____
	balls	____
	running games	____
	other	____
Term	summer	____
	autumn	____

PHYSICAL ACTIVITY IN SCHOOL

1 **Place a tick mark √ opposite the sentence that describes your school**

Our school is in the city or near the city ____

Our school is in the town or near the town ____

Our school is in the village or near the village ____

Our school is in the country - not close to any village ____

2 **Are you** a boy ____ **or** a girl ____ **Tick √ one line**

3 **Place a tick mark √ opposite to the correct sentence**

We have a hall or a classroom in the school where we can do PE ____

We have no place inside the school where we can do PE ____

4 **Is your father working ?** Yes ____ No ____

If he is working, what does he do _____

5 **Is your mother working away from home ?** Yes _____ No _____

If the answer is yes, what does she do _____

6 **How often do you have PE ? Tick √ the correct line**

Once a week ____

Two or three times a week ____

About once a month ____

Never ____

Every week when the weather is fine ____

Sometimes when the weather is fine ____

7 **Who teaches you PE this term**

My class teacher ____
Another teacher in our school ____
A teacher who comes in to the school to teach us games ____

A teacher who comes in to the school to teach us dancing ____
A teacher who comes in to the school to teach us gymnastics ____
A swimming teacher ____
A special PE teacher ____
No one ____

8 **Look at each of the following activities. Decide how much you have practised the activity IN SCHOOL. Then put a mark √ in the space you think is correct.**

	Lots of practice in school	**Some practice in school**	**No practice in school**
Gymnastics	____	____	____
Gaelic football	____	____	____
Soccer	____	____	____
Rugby	____	____	____
Basketball	____	____	____
Volleyball	____	____	____
Rounders	____	____	____
Hurling	____	____	____
Camogie	____	____	____
Hockey / Unihoc	____	____	____
Irish Dancing	____	____	____
Dance [creative or folk]	____	____	____
Swimming [with your class]	____	____	____
Athletics [running /high jump etc.]	____	____	____
Racket Sport [short tennis/ tennis/badminton]	____	____	____
Other ..... [please name]	_____	____	____

9 **Do you play on a school games team ?** **Yes** ____ **No** ____

10..**Are you in an activity club in your school ?**
[such as dance / gym / games / athletics] **Yes**____ **No**____

11 **How do you travel to school**

By bus ____

Walking ____

Cycling ____

By car ____

12 **During your school lunch break, what do you mostly do ?**

I usually stand around talking to my friends ____
I usually play a game with a skipping rope ____
I usually take part in a playground game (e.g.agie, 3-score, tag game) ____
I usually practice a sport (e.g. basketball, soccer, hurling) ____
I go home for lunch, and have no time left for playing ____

13 **Which one of these sentences describes how you feel about PE in school ? Draw a circle around ONE of the letters**

I hate it	a
It is the worst thing we do in school	b
It is always boring	c
It is OK sometimes	d
I think it is good	e
It is most enjoyable	f
It is good fun and I like it very much	g

14 **Is your class teacher** male ____
female ____

15 **Put one mark √ opposite to the sentence that you think is the most true**

One of the teachers in our school gives us lots of encouragement to do physical and sporting activities ____

One of the teachers in our school gives us some encouragement to do physical and sporting activities ____

One of the teachers in our school gives us a little encouragement to do physical and sporting activities ____

PHYSICAL ACTIVITY AFTER SCHOOL

REMINDER

DO NOT COUNT ACTIVITIES YOU DO DURING

SCHOOL HOLIDAYS

16 Look at each activity. If you usually do the activity for **half an hour or more** at one time. write down **how many times** you do this activity before and after school **(Monday-Friday)**

Then write down **how many times** you do the activity for **half an hour or more** on the week-end **(Saturday - Sunday)**

	Monday - Friday	**Week-End**
Basketball	____	____
Soccer	____	____
Swimming	____	____
Hurling	____	____
Camogie	____	____
Roller Skating or Blade Skating	____	____
Rugby	____	____
Running or Jogging	____	____
Gaelic Football	____	____
Squash	____	____
Mountain Bicycling or BMX	____	____
Hockey	____	____
Rowing or Canoeing	____	____
Handball	____	____
Karate / Judo	____	____
Bicycling	____	____
Volleyball	____	____
Irish Dancing	____	____
Tennis	____	____
Gymnastics	____	____
Badminton	____	____
Jazz Dancing or Disco Dancing	____	____
Skateboarding	____	____
Ballet	____	____
Dodge ball or 4-square	____	____

Skipping	____	____
Horseback riding	____	____
Rounders or Baseball	____	____
Ballroom Dancing	____	____
Walking	____	____
Golf or Pitch and Putt	____	____
Table tennis	____	____
Bowling	____	____
Other _____ [Please name the activity]	____	____

17 **Are you a member of your local community sports club ?** yes ____ no ____

18 **Are you a member of any other sports club** [Other than a school club] yes ____ no ____

19 **Put one mark √ opposite to the sentence that you think is the most true**

My parents give me lots of encouragement to do physical and sporting activities ____

My parents give me some encouragement to do physical and sporting activities ____

My parents hardly ever encourage me to do physical and sporting activities ____

20 **How often do you watch sports on television?**

Never or hardly ever ____

Only if it is an important sports event ____

About once a week ____

About 2 or 3 times a week ____

21 **Why do you do sports and physical activities ?**
Look at each of the possible reasons. Decide how important each one is *for you*
Then draw a circle around the correct letter

	Very important	*Important*	*Not important at all*
To improve my health	V	I	N
To get in good shape	V	I	N
To have fun	V	I	N
To make new friends	V	I	N
To be like a sports star	V	I	N
To please my parents	V	I	N
To look good	V	I	N
To win	V	I	N
To be good at the activity	V	I	N

22 **For each sentence, decide whether you are most like the kids described on the right or the kids on the left. Then decide whether the sentence is *sort of true* or *really true* for you, and put a mark √ on the line**

Really true for me	**Sort of** true for me			**Sort of** true for me	**Really** true for me
____	____	Some kids do well at all sports *but*	Other kids do well at one or two sports	____	____
____	____	Some kids find new physical skills easy to learn	Other kids are slow at learning new skills	____	____
____	____	Some kids think that their body shape is good	Other kids think their body shape is not so good	___	____
____	____	Some kids are always picked first for teams *but*	Other kids are never the first picked	____	____

____	____	Some kids are good enough at all the things we do in PE	Other kids are not really good at PE	____	____
____	____	Some kids prefer to be playing games	*but* Other kids are happy to be watching a game	____	____
____	____	Some kids think they look good doing sport activities	Other kids think they look awkward at activities	____	____

23 **In a week, how often are you with your friends after school**

4 - 5 times ____
2 - 3 times ____
0 - 1 times ____

24 **How easy / hard do you find it to talk to your friends about your personal problems ?**

very easy ____
easy ____
hard ____

25 **Would you know what to do if you got an unexpected free afternoon from school ?**

yes, I would always find something to do ____
yes, I would think of something to do ____
no, I would not know what to do ____

26 **Do you have a real close friend ?**

yes ____
no ____

27 **Which of the following is true for you ?**

I always find it easy to make new friends ____
I mostly find it easy to make new friends ____
I find it hard to make new friends ____

28 **Which of the following is most true for you ?**

I always exercise [do physical activity] with friends ____
I sometimes exercise with friends ____
I usually exercise on my own ____
I do not exercise at all ____

29 **Which of the following is most true for you ?**

I often exercise with my family [one or more persons in the family] ____
I sometimes exercise with my family ____
I never exercise with my family ____

30 **Which of these sentences is most true ?**

My health is very good ____
My health is good ____
My health is not good at all ____

31 **Look at the following lists**
Tick √ only the items that you complain of MORE THAN ONCE A WEEK

headache	____	bad temper	____
stomach ache	____	feeling nervous	____
feeling low	____	hard to sleep	____
backache	____	feeling dizzy	____

32 **Which of the following is most true for you ?**

I am never tired in the morning ____
I am sometimes tired in the morning ____
I am always tired in the morning ____

33 **Which of the following is most true for you ?**

I think that I am very fit ____
I think that I am fit enough to do most activities ____
I think that I am not fit at all ____

34 **How often do you feel lonely ?**

never ____
sometimes ____
nearly always ____

35 **Do you like school ?**

yes, I like school a lot ____
I like school sometimes ____
no, I do not like school at all ____

36 **How do you feel about life ?**

I feel very happy ____
I do not feel very happy ____
I do not feel happy at all ____

37 **Read each sentence. Decide whether it is *true* or *false* and put a mark √ on the line**

	True	False
Vigorous exercise makes the heart muscle stronger	____	____
Girls do not need as much exercise as boys to be healthy	____	____
Exercise strengthens the bones, so they will not break as easily	____	____
Exercise helps to keep the body in good shape	____	____
Exercise makes the heart beat faster	____	____
Eating junk food is always necessary for energy	____	____

38 **What class are you in ?**

5th Class ____
6th Class ____

THIS IS YOUR LAST QUESTION

39 **How often do you think your mother exercises ?**
[doing a sport / aerobics / walking etc.] every day ____
two or three times a week ____
about once a week ____
about once a month ____
now and then ____
never ____

40 **How often do you think your father exercises ?**

every day	____
two or three times a week	____
about once a week	____
about once a month	____
now and then	____
never	____

WELL DONE

Thank you very much for answering all the questions
