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**Correlates of physical activity in school-aged children:
parents' role in active living.**

A comparative study between Italy and Germany

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ABSTRACT

The knowledge that inactivity during childhood predisposes youngsters to a variety of negative outcomes (e.g. lack of socialization, poor emotional aspects, worsening psychological well-being and cognitive abilities, health risks, etc.), in combination with research indicating that many children are not enough physically active, has stimulated interest in better understanding children's physical activity determinants. It is necessary to identify the social, psychological, biological, and developmental factors that contribute to the differences in children's behaviours.

A complex arrangement of determinants seems to be involved, and several social, educational and cultural factors clearly impact children's physical activity and sport involvement. Demographic/biological, psychological, behavioural, social/cultural and environmental variables have been reported as associated with children's physical activity. The family represent an all-encompassing ecology for development. As a starting point, the family constitutes an important initial element of socialization influence for children because they spend, prior to adolescence, the majority of their free-time within the context of the family. Parents have also been found to influence physical activity behaviours of their offspring. Several forms of parental influence have been suggested in the literature: direct modelling, encouragement, support, involvement, restriction or facilitation of physical activity and beliefs on physical activity. The factors most frequently investigated are related to parental role modeling, social support and parental belief systems. In particular, parental support has been found to be positively related to physical activity level of children, and active parents (especially fathers) were more likely to have active children.

Generally, interventions to promote children's physical activity mostly focused directly on children than on parents (e.g. one more hour of physical education per week). To design effective strategies to increase children's physical activity, a clear understanding of how parents influence their children's behaviours is required.

The scientific literature related to physical activity parenting is still limited. Studies reported inconsistent, and mostly null, findings, and types of parental support have not been systematically evaluated yet.

The challenge of health education and sport pedagogy in promoting children regular physical activity is linked with the identification of multiple theory-based factors that influence physical activity behaviours. For these reasons it has been decided to carry out a research that investigates parental correlates with an ecological approach, in order to taking into account personal, cultural and environmental factors, using objective data and valid measurements.

It has been carried out a comparative study in order to investigate the phenomenon of physical activity parenting in different cultural and national policies context. Italy and Germany have been chosen because of their similarity and differences. It is possible to identify three major objectives of the research:

- To examine the roles of supportive social environments (parents' role) and physical environments on children's active living, with an ecological approach;
- To compare Italian and German children's physical activity habits;
- To investigate what variables are strongly associated with higher rates of physical activity participation.

A group of 4th grade children and both their parents participated in the research. Participants filled in a package of questionnaires and a subgroup of the total number of participants wore a tri-axial accelerometer for 7 consecutive days, in order to register physical activity quantity.

The investigated individual variables were children self-report physical activity, enjoyment during physical activity, importance of physical activity, perceived parental support, perceived parents' physical activity level and children self-efficacy. Parents reported answers on importance of physical activity, support, quantity of physical activity and enjoyment.

The findings confirmed scientific literature evidence and further sustain the notion that parental support is a key element in shaping physical activity levels in school-aged children. Moreover it is of relevance to compare results of different countries and cultural context.

Further research is needed to combine quantitative and qualitative data to better understand physical activity parenting. Moreover, sport pedagogy research should focus on the implementation of educational programs among parents about their role in the socialization of children's physical activity behaviours.

Cap. 1

BACKGROUND:

The problem of sedentary behaviour among children

The knowledge that inactivity during childhood predisposes youngsters to a variety of negative outcomes (e.g. lack of socialization, poor emotional aspects, worsening psychological well-being and cognitive abilities, health risks, etc.), in combination with research indicating that many children are not enough physically active, has stimulated interest in better understanding children's physical activity determinants.

In this chapter it is briefly explained which are recognized physical activity benefits and what recommendations and guidelines have been drawn for children by major international institutions.

Then it is described the size of the problem of sedentary behaviour among youth, with particular attention to the situation of Italian and German children and adolescents, identifying trends about physical activity and involved variables.

Which is the interest of health education and sport pedagogy in this field are then delineated, underlying which are the major research needs.

Finally, recognized correlates of children's physical activity are reported, and the objective of the research is presented.

1.1 Physical activity and sedentary behaviour

Over the past 30 years there has been growing interest in the study of the health benefits of regular physical activity. *Physical activity* is generally defined as “any bodily movement product by skeletal muscles that results in energy expenditure” (Caspersen, Powell, & Christenson, 1985). However researchers and organizations, such as American College of Sports Medicine, define physical activity as bodily movement that causes a “substantial increase” of energy expenditure. Another term that is generally used is “exercise”, viewed as a “subset of physical activity that is planned, structured, and repetitive bodily movement done to improve or maintain one or more components of physical fitness” (American College of Sports Medicine, 2006). Since the topic of this research concerns children, exercise is rarely used for younger and moreover there is evidence for total energy expenditure and all-cause mortality (Lee & Skerrettt, 2001), the first broader definition is chosen when speaking about physical activity.

It is important to note that terms in this field of research has been subjected to a change, moving from exercise to physical activity. However from the 1990s, physical activity has been studied also by scholars and professionals of other disciplines different from public health science. Physical activity has been expanded again in a broad term indicating the evolution in which the field of research is conceived. “*Active living*. Is a broader concept that incorporates exercise, recreational activities, household and occupational activities, and active transportation” (Sallis et al., 2006; Sallis, Linton, Kraft, 2005).

The *physical inactivity* definition is more difficult to delineate because it implies an absence of physical activity. However youth physical inactivity can be classified using a norm-referenced approach (when the physical activity level is lower than that of individual with the same socio-demographic characteristics) or a criterion-referenced approach (when the physical activity level is lower than that of a specific threshold). A more proper term for physical inactivity is *sedentary behaviour* because different behaviours could be considered as inactive.

1.1.1 Physical activity health benefits

When considering the general population, it is widely accepted that the regular practice of physical activity reduces the risk for a range of chronic diseases, coronary heart disease and cardiovascular disease morbidity and mortality, obesity, osteoporosis, non-insulin-dependent diabetes and hypertension (Bouchard, Blair, & Haskell, 2007). Evidence is growing concerning the psycho-social benefits of physical activity, particularly improvements on depressive symptoms, anxiety, health related quality of life, cognitive function, self-esteem and self-confidence (American College of Sports Medicine, 2006).

Physical activity is beneficial to health and wellbeing of people at all ages and should be a fundamental part of growth and individual development (Hills, King, & Armstrong, 2007). Adequate participation in physical activity during childhood is considered essential for good health (Bar-Or & Rowland, 2004), and is associated with a number of positive health outcomes. An active lifestyle may reduce the risk of overweight and obesity (Doak, Visscher, Renders, & Seidell, 2006), cardio-vascular diseases (Andersen et al, 2006), type 2 diabetes (Wennlof, Yngve, Nilsson, & Sjostrom, 2005), anxiety and depression (Strong et al., 2005). Regular participation in physical activity and sport during childhood and adolescence supports cognitive functions (Hillman, Erickson, & Kramer, 2008), contributes to increase self-esteem and self-confidence and enhances general health (Strong et al., 2005; Hellal, Victoria, Azevedo, & Wells, 2006).

Children benefit physically, emotionally and socially by participating in physical activity, and research highlighted that physical activity during childhood and adolescence is a predictor of physical activity in adulthood (Telama et al., 2005), although these tracking evidences are not strong (Smith & Biddle, 2008).

1.1.2 Physical activity recommendations for children

On the weight of this evidence, research and organizations focused their interest on the compiling of guidelines for physical activity for all ages group. To derive health and fitness benefits from physical activity, recommendations and guidelines (Corbin & Pangrazi, 2004; Janssen, 2007; USDHHS, 2008; WHO, 2010) suggest that school-age youth should participate in physical activity of at least moderate intensity for 1 hour per

day. Moderate intensity commonly refers to physical activity that make you breathe hard, this includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others, and at least that requires as much effort as brisk walking (Bar-Or & Rowland, 2004).

Country	Youth physical activity guidelines
United States	Children should accumulate at least 30 to 60 minutes of age-appropriate and developmentally appropriate physical activity on all, or most, days of the week. Physical activity could be in periods of 10 to 15 minutes and include moderate to vigorous physical activity. (USDHHS & USDA, 2005)
Canada	Children should engage in 60 minutes of moderate intensity physical activity and 30 minutes of vigorous intensity each day. Inactive children should follow an incremental plan of physical activity over a period of 5 months: - start with 20 minutes of moderate intensity physical activity daily and add 10 minutes per day after each month; - start with 10 minutes of vigorous physical activity daily and add 5 minutes per day each month. (Health Canada, 2002)
United Kingdom	Children should do at least 60 minutes of at least moderate intensity physical activity per day. Two days per week they have to engage in physical activity directed to improve muscle strength, flexibility and bone health. (Department of Health, 2004).
Italy Germany	Children should engage in at least 60 minutes of moderate to vigorous physical activity per day, and they should do 3 times per week strength exercise included in plays and sports. (WHO, 2010)

Table 1.1 Different national youth physical activity guidelines (Adapted from Marshall & Welk, 2008).

The recommended quantity of 60 minutes or more of physical activity daily is now recognized by the major health organizations all over the world. The scientific community accepted the fact that for youth it is recommended the double of the physical activity recommended for adults because, in addition to the health benefits that they can achieve by doing 30 minutes per day, children need more time of physical activity in order to develop the fundamental skills for a future active lifestyle. Despite

the fact that the major health institutions suggest the same guidelines for youth physical activity, some countries have different recommendation from others. In Table 1.1 examples of different national guidelines are reported.

1.1.3 The problem of sedentary behaviour among children

Despite the benefits of physical activity to health and wellbeing in children are largely recognized, epidemiological evidence generally indicates that more than a third of children do not engage in sufficient levels of physical activity, levels that do not lead to reach health benefits (Grunbaum et al., 2004). A survey carried out in the United States by the Centers for Disease Control and Prevention (2003) among children aged from 9 to 13 years, reported that the 61.5% did not engage in any structured physical activity and the 22.6% did not participate in any leisure physical activity in the extra-school time.

Decreasing physical activity levels and increasing sedentary behaviours have been declared one of the most worrying public health problems of the 21st century (Blair, 2009). Increased participation in passive leisure activities (i.e., watching TV, playing computer games, surfing the Internet), and decline in school physical education and community sport programs have been associated to the increasing numbers of overweight and obese youth (Brandl-Bredenbeck et al., 2009; Koplan, Liverman, & Kraak, 2005).

Moreover daily physical activity usually decreases from childhood to adulthood (Armstrong & Welsman, 2006). Biological (e.g., age, gender, body mass index), social (e.g., parents' physical activity habits and attitudes, peer influence, subjective norms), and environmental (e.g., program and facility access, time spent outdoors) factors are likely to contribute to such a marked trend (Hills et al., 2007). For example a key element in the increasing sedentary lifestyle of children may be the decreasing of the opportunities to safely walk or cycle or play in the communities.

Even if the rationale for increasing children physical activity and reducing sedentary behaviours is well outlined by literature evidence, additional research is necessary to determine if and how youth physical activity tracks into adulthood or sedentary behaviours causes the obesity epidemic (McElroy, 2008). To study children sedentary behaviours and physical activity is a topic of an emerging area of the public health

science that integrates different scientific findings to promote and evaluate the effectiveness of community-based interventions.

1.2 The description of the problem in Italy

Despite the growing evidence of the need for the implementation of intervention strategies and general guidelines to promote children and adolescents' physical activity and to contrast sedentary behaviours, the number of studies and interventions developed at today in Italy is low. The available results not always point in the same direction and there is a substantially lack of longitudinal data, so results should be interpreted with caution. In the following paragraphs results of researches carried out in Italy in the most recent years are presented in order to give idea of the dimensions of the problem and of the study approaches.

In 2009, according to the data from the “Indagine multiscopo sulle famiglie, aspetti della vita quotidiana” (ISTAT, Italian National Institute of Statistics, 2009), in Italy people aged 3 and over who played sports were estimated to be little more than 18 million, up 31% of the national population. The 21% of the sample practiced one or more sports regularly, 10% occasionally, people who did not practice a sport but are involved in different physical activities, like long walks, swimming or cycling, were little more than 16 million (28%), while the sedentary were more than 23 million (41% the population in the age groups considered).

In another survey carried out in 2009 about European children lifestyles (Brandl-Bredenbeck et al., 2009) data from the Italian sample (n = 1005 children, aged 9 yrs, lived in the North-east part of the country) showed a high frequency for being sports club members (78.3%), but more than 45% of the sample reported to practice less than 2 hours of sport per week (see Table 1.2).

Hours/week	Frequency	%
0	219	21,8
from ½ to 2 hours	404	23,6
from 2 to 3 hours	178	17,7
from 3 to 4 hours	242	13,8
from 4 to 5 hours	79	7,9
from 5 to 6 hours	75	7,5
from 6 to 7 hours	32	3,2
from 7 to 8 hours	18	1,8
from 8 to 9 hours	11	1,1
from 9 to 10 hours	7	0,7
more than 10 hours	10	1
Total	1005	100

Table 1.2 Time per week spent in sport practice among children aged 9 years in North-east part of Italy (Carraro et al., 2009, unpublished data).

In 2010 a study carried out in the Veneto region (Gobbi & Carraro, unpublished data) reported data for 1146 children (9 to 11 years old) about physical activity habits. Results confirm previous data with a high frequency for being sports club members (76.2%) but with moderate physical activity quantity showed by the PAQ-C (Physical Activity for Older Children Questionnaire) mean value of 3.02.

In a study carried out in the Valle D'Aosta region in 2008 (Turconi et al.), in 532 adolescents (mean age 15.2) only 18.5% of the students had a very active lifestyle, while about one third (29.7%) showed a sedentary physical level not consistent with a healthy lifestyle. In response to the question “what do you prefer to do during free time?” 47.7% of the sample answered watching television, using the computer, listening to music, reading a book, while only 21.7% reported practicing a sport and 17.6% going for a walk.

1.2.1 Gender and Age

Sport is typically an activity for young people. The highest odds for sport participation were found in Italy for both genders in the age group 11-14 years (ISTAT, 2009). With increasing age, the commitment to sport and physical activities decreased. Excluding the pre-school period, the comparison between genders showed a dedication to the sport more pronounced in males, with an opposite trend for physical activity (see Figure 1).

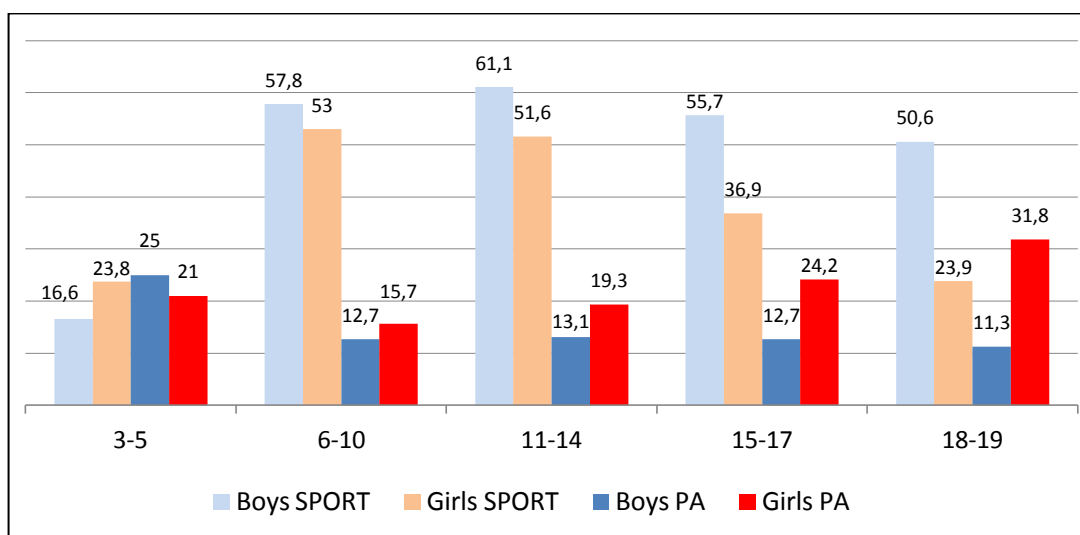


Figure 1. Percentage of sport practice and physical activity among children and adolescents (ISTAT, 2009).

Different outcomes were reported by Toselli and colleagues (2010) who surveyed 598 subjects (321 males and 277 females) 11-14 years old to evaluate weight status, nutritional intake, sport and leisure habits. As results of the investigation carried out in the Emilia Romagna region (northeast part of Italy), the mean hours of physical activity /week increased with age from 11 to 14 years, passing from 3.4 to 4.7 hours in males and from 2.5 to 3.7 hours in females.

Data about sedentary behaviors reported higher percentages of inactivity among girls (see Figure 2) with the highest values of inactivity for girls in the age group 18-19 (ISTAT, 2009).

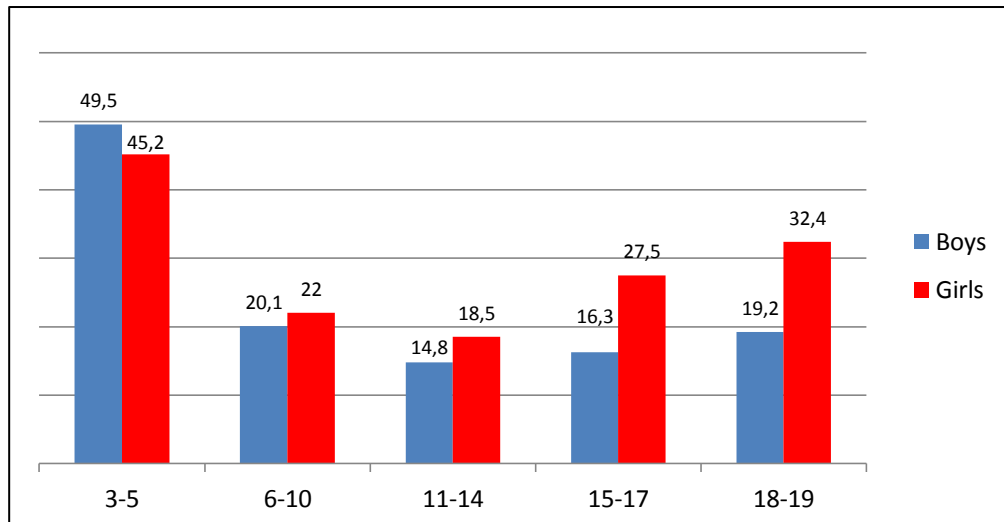


Figure 2. Percentage of inactive children and adolescents (ISTAT, 2009).

Overweight and obesity have been associated with inactivity. A study of 17,500 children and adolescents, aged 6 to 17 years, sampled across all the regions of Italy, showed that 24.2% of participants were overweight (Gargiulo et al., 2004). More recently, the “OKkio alla salute” study carried out on 45,590 Italian students at third grade of primary school (8-9 years old), showed that 23.6% and 12.3% of participants were overweight and obese, respectively. Only 1 child in 10 met daily physical activity recommendations, 58% declared to do physical activity for 2-3 days a week, while only 17% for 4-7 days; the remaining percentage (25%) did not practised any physical activity during their leisure. Analysis by gender showed a slight difference, with a higher prevalence of inactivity in girls (see Figure 3). Differently from previous research, in the “OKkio alla salute” study it was not observed a clear North-South gradient. (Epicentro, Centro Nazionale di Epidemiologia, Sorveglianza e Promozione della Salute, 2010).

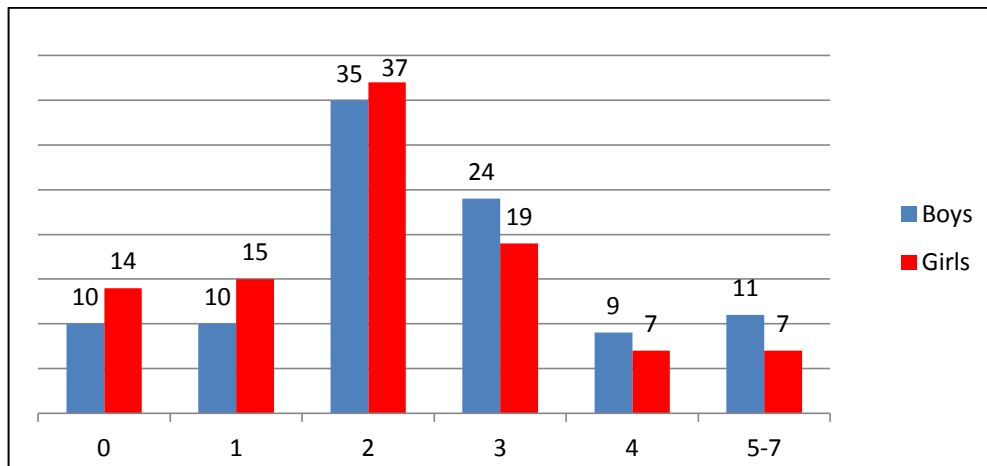


Figure 3. Number of days in which boys and girls practice physical activities (OKkio alla Salute Study - Epicentro, 2010).

Italian findings from the cross-national research HBSC (Health Behaviour in School-aged Children), indicated that only 33.2% of boys and 23.4% of girls 11-years-old were physically active at the recommended level (Currie et al., 2004). Physical activity declined more between the ages of 11 and 13 than between 13 and 15, with boys being most physically active across all the considered age groups (Currie et al., 2004). Also in the study carried out in 2008 by Turconi and colleagues adolescent males reported to be more active than females: 22.3% versus 15.1%; in response to the question “Do you usually practice a physical activity?”, 40.9% and 27.3% respectively of males and females answered “always”.

More recently, a study on a sample of 15,216 Italian children and adolescents aged 6–17 years, showed that about 64% of them participated in moderate or vigorous physical activity at least once a week; among these, about an half declared to practise vigorous physical activity at least once a week (Federico et al., 2009).

In a survey conducted in the Tuscany Region among 1466 girls and 1379 boys (N = 2845) aged 6-12 years in 2007 (Petranelli & Balducci, 2007), it was found that till the age of 10 years sport practice among girls was higher than among boys, with the trend began to be reversed from 11 years old (see Figure 4).

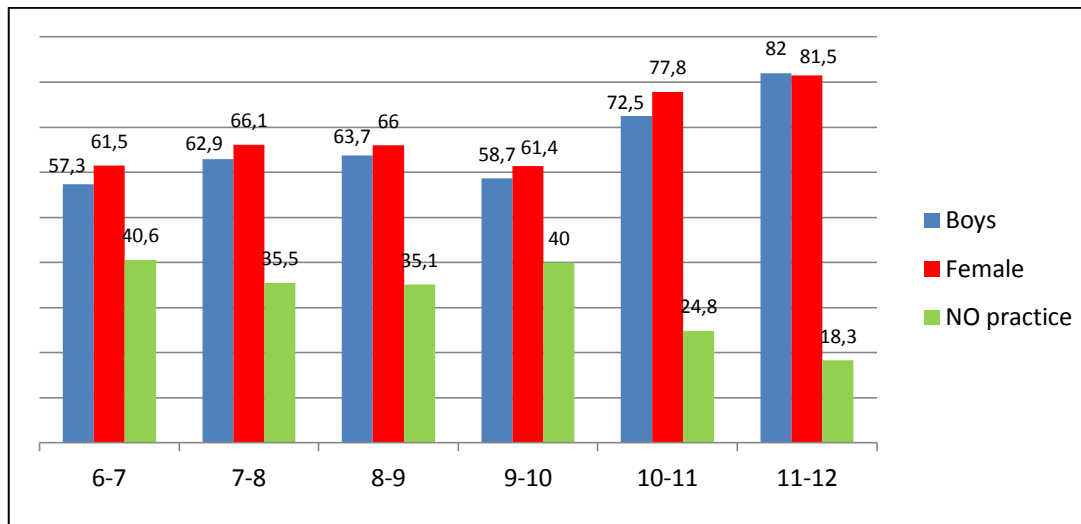


Figure 4. Sport practice level among boys and girls in a survey conducted in the Tuscany Region (Petranelli & Balducci, 2007).

In a more recent investigation carried out among 1250 high school students (712 boys and 538 girls, mean age 16 ± 1 years, range 15–19), Zito and colleagues (2012) found that physical activity was more frequent in boys (71%) than girls (60%) with a significant difference ($p < .001$).

Although theories or conceptual framework examining the nature of youth sedentary behaviours are not strongly developed (Smith & Biddle, 2008), there are evidences that interventions focusing on decreasing inactivity can positively influence health behaviours change and may reduce obesity (for a review see DeMattia et al., 2006). Dobbins and colleagues (2009) suggest that school-based physical activity interventions are effective in improving physical fitness and duration of physical activity, and in reducing time spent watching television in young people ages 6 to 18 years. Conversely, these interventions had no effect on leisure time physical activity rates and body mass index (Dobbins, DeCorby, Robeson, Husson, & Tirilis 2009).

1.2.2 Families and communities

Today, out of the school time, participation in organized sport is perhaps the primary form of physical activity for boys and girls, providing a variety of experience and interactions that may influence individual's involvement and persistence (Smith & Biddle, 2008). Several environmental and social variables influence children and

adolescents' participation in exercise and sport programs. In particular, in younger children, both parents and teachers represent main models and socializing agents with respect to the adoption of healthy behaviours and correct lifestyles. Research showed that parents' sport participation is linked to the child's activity levels in the extra-school time when both parents practiced sport (Wagner et al., 2004). Also the parental beliefs about the importance of the participation in exercise and sport programs are positively related to organized and free-time activity of children ranging in age from 9 to 13 years (Heitzler, Martin, Duke, & Huhman., 2006). Although most health education and physical activity promotion programs for children and adolescents recommend interventions with parents (Smith & Biddle, 2008), Ferreira and colleagues (2007) found that the relationships of parents' activity to the activity of children are generally weak across gender and child age. Concerning this, data collected in 2010 in a sample of 282 children (9 to 11 years old) and both their parents it has been seen that children self reported PA was significantly higher in children with fathers that regularly did physical activity during leisure time ($p < .05$) (Gobbi & Carraro, unpublished data). However, more research is needed to increase understanding of the mechanisms by which different types of parental support influence children across age, gender and other demographic variables.

In addition to parental support and modeling, there are other family influences (such as socioeconomic status) affecting children's physical activity and sedentary behaviours. Beliefs and perceived parental support have been recognised as important correlates of children's physical activity. In the study conducted in 2010 in the Veneto Region among 4th and 5th grade children (Gobbi & Carraro, unpublished data), data showed that children physical activity was significantly and positively correlated with the parental belief of importance of doing sport and with the perceived parental support in doing physical activity ($p < .05$ and $p < .01$ respectively).

Studies on the relationship between physical activity and parent education level showed that adolescents' activity is more positively associated to mother's education and family income (for a review see Ferreira et al., 2007). Conversely, most studies of younger children failed to find any relationship between physical activity and parents' educational level variable (Ferreira et al., 2007). In Italy, in the "OKkio alla salute" study (2010) differences according to mother's level of education were found. In

particular, it was asked how many days a week their child was physically active for at least one hour. It turned out that 25% of children usually made physical activity for one hour a week and 17% was dedicated with continuity (from 4 to 7 days/week). Analyzing this data by level of education of mother, there was a tendency towards higher physical activity levels among children of mothers with higher educational level (the percentage of children engaged in physical activity for only one hour/week was 35% among mothers with low educational level and was reduced to 12% among graduated mothers) (Epicentro, Centro Nazionale di Epidemiologia, Sorveglianza e Promozione della Salute, 2010).

Another interesting aspect emerged from the analysis of the “OKkio alla salute” study regards the relationship between the frequency of physical activity during a typical week and the geographical area where a child lived. In cities with less than 10,000 inhabitants the frequency of children practiced physical activity for 5-7 days/week was 12%, while in urban areas dropped to 7%. Interesting information was also collected about active transportation to school, with results indicated that only one child in four went to school by bike or by walking.

In another research, Tognarelli and colleagues (2004) found that physical habits of 8 years old children living in rural area of Pistoia (city in the Tuscany region) were different from urban children. A significantly higher number of rural children reported to use bike during leisure time compared to urban children (85% vs 75%, $p < .001$).

Differences were found even between south and north region of Italy regarding physical activity practice. Silvestrini and colleagues (2009) carried out a questionnaire investigation on a total of 1 522 children (8-12 years). Over 20% reported not practicing any type of sport; this value was higher among children residing in the Southern regions but, confirming above-mentioned results, lower among the boys than the girls across all regions and age groups.

The “Save the children project” (IPSOS, 2011) investigated children and adolescents lifestyle, respondents were 699 parents and 699 sons, a section of the interview regarded the use of leisure time spent by children and adolescents with their families. More than 50% of participants declared to spend more than 3 hours per day with their parents, in indoor or outdoor activities, a very limited part of this time was spent doing a physical activity or practicing sport (see Figure 5).

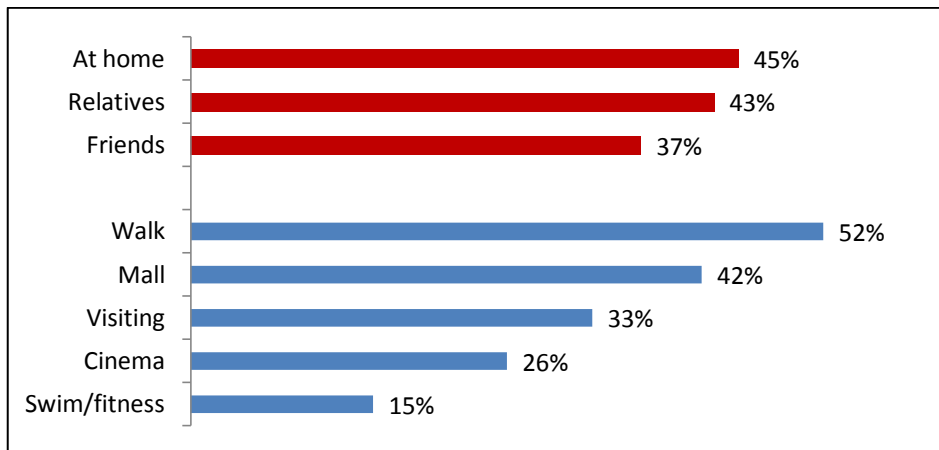


Figure 5. Leisure time with parents (IPSOS, 2011).

Another section of the IPSOS study (2011) investigated how parents experienced different activities, it emerged that outdoors activities were perceived as potentially exposed to risks. The 59% of parents declared to be worried when their children are outdoors, mainly for fear of unpredictable events (51%, it rises up to 62% in Milan), followed by the fear of road accidents (22%), traffic (20%) or friends who attends to dangers (6%), with the latter that is likely to emerge in the disadvantaged social contexts.

In another Italian survey (La Torre et al., 2006) carried out on 1121 boys and 1290 girls aged between 11 and 17 years, educational levels and work activities of parents seemed to play an important role in predicting adolescents' physical activity levels: parents' higher educational level and more remunerative professions appeared predictive of greater involvement of children in extra-school time sports and physical activity. In particular, adolescents with graduated mothers were more likely to practice extra-school physical and sport activities than those whose mothers had a lower educational level. Furthermore, adolescents' physical activity was related to the paternal and maternal work activities. Children whose fathers or mothers were non-skilled workers, unemployed or retired from work undertook less extra-school physical activity than those with fathers or mothers who were managers/professionals or office-workers/skilled workers.

Also Federico and colleagues (2009) found that the practice of physical activity increased with higher parental educational and occupational level and greater availability of material resources. Children and adolescents whose parents held a middle or high educational title were 80% more likely to practice moderate or vigorous physical activity than subjects whose parents had a lower level of education.

However, Gutstafson and Rhodes (2006) concluded that there were not enough studies to permit conclusions about the influence of socioeconomic status or single-parent families on child physical activity levels. In contrast, parents' education was negatively related to children's television watching (Gorely, Marshall, & Biddle, 2004; Hesketh, Crawford, & Salmon, 2006), suggesting that a better understanding of the correlates of physical activity and sedentary behaviours in youth may support the development of effective interventions that promote an active lifestyle and prevent sedentariness.

1.2.3 School physical education

Many studies found that school-based programs involving the provision of additional physical education (PE) time, could increase physical activity and fitness of young people (Cale & Harris, 2005; Sollerhed & Ejlertsson, 2008). However, PE is under threat and hours at school have been recently reduced in many countries (Hardman, 2008).

PE is compulsory in Italian schools. In primary school pupils participate in 2 hours/week of physical education, but teachers are not PE specialists (they receive a university preparation as "generalist" teachers), 2 hours/week are provided also in middle and secondary schools, where teachers are PE specialists with a specific university preparation at master level.

Many schools, in cooperation with public institutions, sport associations and sometimes with private companies, organize additional programs and projects in order to stimulate physical activity and sport participation of students, particularly at primary school level.

In the "Save the children project" (2011) it was been asked to parents if their child practiced PE at school. An average of 91% of the parents reported an affirmative answer, with an higher rates in the north-east part of Italy (94%). Of these, 63%

reported a frequency of 2 times per week and 27% of 1 time per week. Parents of children who attend primary school reported data slightly lower (see Figure 6).

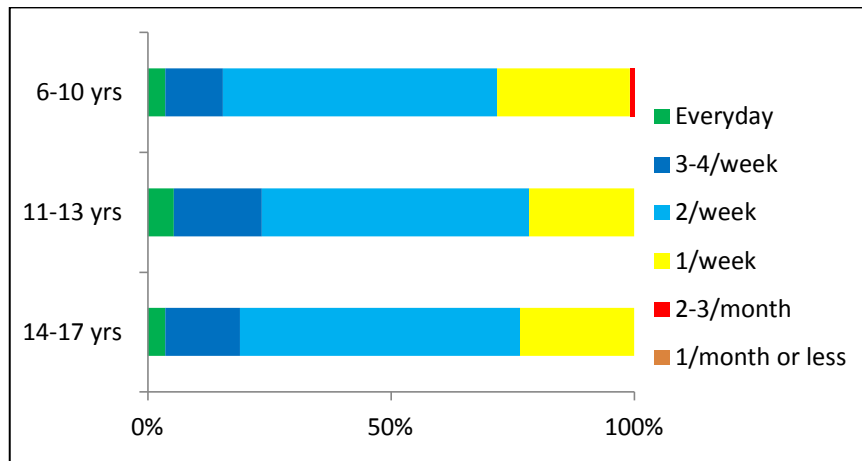


Figure 6. Frequency of PE practice among children and adolescents in the school, on the basis of parents answers (IPSOS, 2011).

Parents who reported that their children did not practice PE at school (an average of 9%) adduced as the cause the absence of equipped spaces (43%), the not compulsoriness of the subject (38 %) and the presence of a child’s physical disability (19%). In particular, on the basis of the age of the students, it seems that in primary school PE is not taught because of the absence of an equipped space, so as in the middle school. Instead, in the secondary school, the highest percentage of cause is attributed to a sort of “interpreted not compulsoriness” of the subject (see Figure 7).

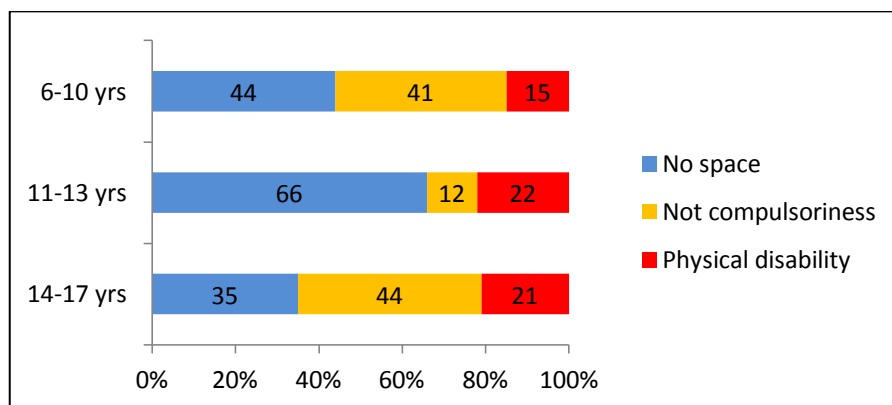


Figure 7. Parents’ perceived causes of absence of physical education in the school (IPSOS, 2011).

Many physical education-based interventions have been successful in increasing students' class-time physical activity, as well as psychological variables (Dishman et al., 2004, 2005; McKenzie et al., 2004). The influence of PE on physical activity seems to be greater when programs increase students' experiences of self-determination and feelings of competence in their own abilities, and when they emphasized enjoyment and positive experiences (Bailey, 2006). Research showed that when student's perceived competence and enjoyment in PE are optimized, they will be more motivated to participate in out-of-school physical activity (Wallhead & Buckworth, 2004). However, few studies have reported changes in psychosocial variables or improvements in students' habitual physical activity (McKenzie et al., 2004; Morano et al., 2009), suggesting that PE-based interventions can increase physical activity only in the short to medium term. There is limited evidence on whether these increases can positively affect health and well-being (Stratton et al., 2008). More specifically, there has been limited research into PE from an active-promoting perspective (Ward et al., 2007) and further examination of active and inactive behaviours is required. In order to improve the quality and quantity of this data, significant research is needed. This could be achieved by developing school-based interventions that build on current successes and have a greater focus on promoting out-of-school physical activity. Research should also design and develop interventions that can improve and reinforce teacher's abilities, in order to create a quality learning context that supports student motivation. Quality learning experiences can permit to develop students' physical competencies and, crucially, to increase the self-perception of competence, that underlies the motivation to physical activity.

1.2.4 Inactivity and leisure time

“Italian children spend too much time at home, watching television or playing computer, and too little fresh air time, they infrequently eat fruit and vegetables and their afternoons with their parents often are spent in the malls”. This is the picture of the Italian children and adolescents lifestyle taken from the online study “Save the children” (IPSOS, 2011). This report is the prelude of a ten-year intervention project (“Pronti, Partenza, Via!”) aimed to involve more than 66,000 people (children and their families) to stimulate the practice of physical activity and sports and to promote

nutritional education of children and adolescents starting from the disadvantaged neighborhoods of different cities.

Examining IPSOS data, it emerges that rate of inactivity in youngsters (it is estimated that almost one-fifth of Italian children and adolescents do not practice any physical activity during their leisure time) was due to dislike of physical activity or to the preference of sedentary activities in approximately 54% of the sample. The absence of sport facilities (16.2 %), the high costs of sport opportunities (20.3 %) and to the fact that parents cannot provide for the transportation (9.8 %) are the others causes (see Figure 8).

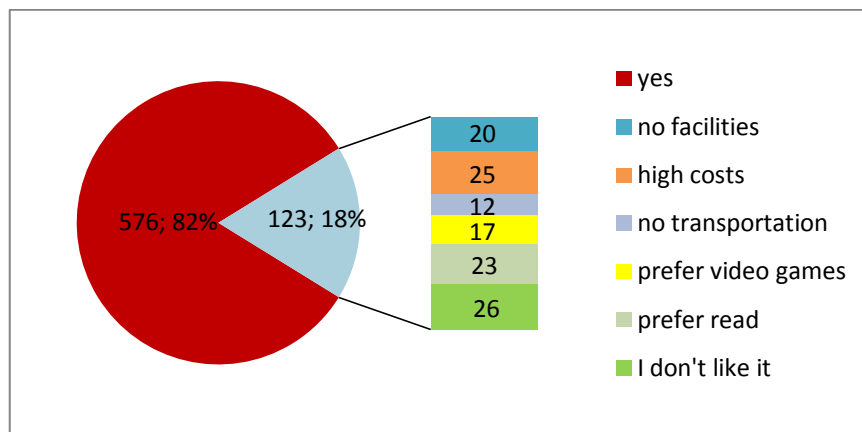


Figure 8. Children and adolescents practice of PA during leisure time and causes of their non practice (IPSOS, 2011).

The highest percentage of children that did not practiced physical activity during leisure time was found in the North-east part of Italy (22%), but the trend along all the national territory is similar (see Table 1.3).

	Tot.	North-west	North-east	Centre	South and Islands
Yes	82%	87%	78%	84%	80%
No	18%	13%	22%	16%	20%

Table 1.3 Geographical differences for the practice of PA during leisure time.

Although the role of television in the house seems to have reduced compared to the past, on average children say they watch TV for about one hour a day and a little more in the weekend. More than 3 hours of TV a day are rule for nearly 1 in 10 children during the week but on weekends it becomes for 1 to 5 (see Figure 9), as it is the use of the Internet. Moreover, 25% of parents said they did not control how long their children are glued to the screen or how long they surf in the Internet (with increased rates in Milan and Turin).

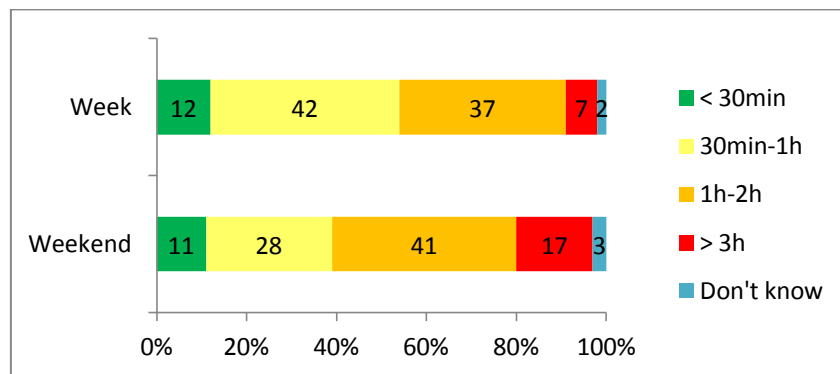


Figura 9. TV consumption rises on the weekend (IPSOS, 2011).

These data are confirmed also by the study of Carandente and colleagues (2009) carried out on 1194 children between 8 and 10 years of age among primary schools of the Province of Milan. The 42.13% of the boys spent more than 3 hours in front of the TV, computer or videogames, and during the weekend this percentage increased to 49.32%. The girls who spent more than 3 hours in front of the TV or computer reached 27.34% during school days, increasing to 46.56% during the weekend.

In adolescents the trend is quite confirmed, Toselli and colleagues (2010) found that the time spent in TV/computer per day was quite stable with age (11 to 14 years), although there was a tendency to an increase in girls. Generally boys spend more hours in TV/computer activities per day than girls.

No differences coming from geographical area have been seen. In the survey carried out by Patriarca and colleagues (2009) were collected data from 1034 children and adolescents aged 11 to 16 years randomly selected 5 public schools in the Campania region (South of Italy). The overall mean length of time spent on daily television

viewing (2.8 hours) and the frequency of watching for at least two hours per day (74.9%) were significantly associated with older age. Moreover adolescents with parents from a lower SES were also more likely to spend more time viewing television. Two-thirds played videogames for 1.6 daily hours and more time was spent by those younger and boys.

Italy was one of the countries with the highest percentage of television consumption also in the study conducted in 2009 on European children lifestyles (Brandl-Bredenbeck et al., 2009). Data indicated that consumption of TV and videogames had similar trends at different ages, while Internet consumptions varied on the basis of the age, with higher rates of consumption among adolescents between 14 and 17 years (see Figure 10a-b-c).

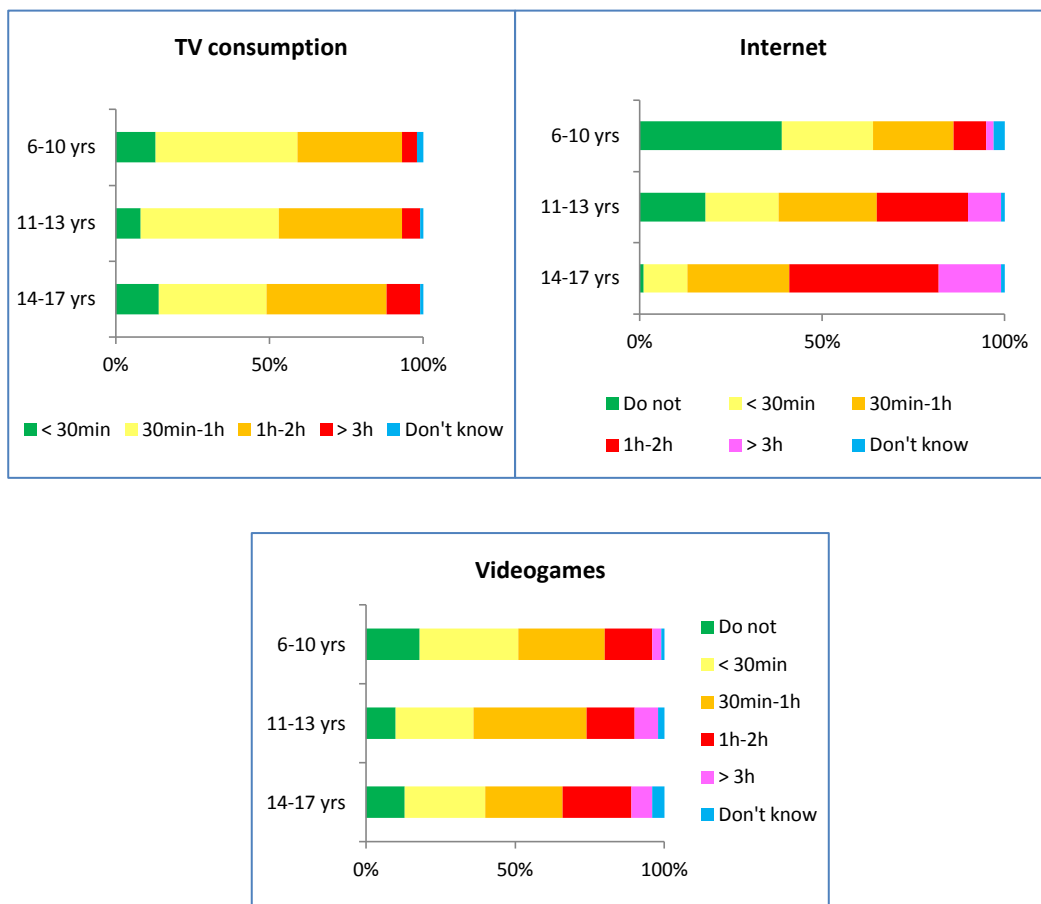


Figure 10 a-b-c TV, Internet and videogames consumption among children and adolescents (IPSOS, 2011).

1.2.5 Programs and strategies to promote physical activity and sport participation in children and adolescents

Several projects and programs aimed to enlarge participation in physical activities and sports at school-age have been proposed in the last years in Italy. Programs were sustained by public Institutions (e.g. the ministries of education and youth and the regions), sport organization (e.g. the sport federations and the CONI -Italian National Olympic Committee -) and by private companies (particularly in the area of food production). In this section we present the most prominent projects developed recently at national and regional levels.

The “Alfabetizzazione motoria project”

The MIUR (Ministry of Education, University and Research) and the CONI sustained the creation of a physical literacy plan to be implemented in the primary school in response to the growing alarm among the scientific community and the international Institutions about the consequences of a sedentary lifestyle and improper eating habits among the youth population. The project “Alfabetizzazione motoria nella scuola primaria” born as a pilot project in 2009-2010 in order to be implemented in subsequent years throughout all the national territory in the primary schools. The project aims to improve motor skills of children and to promote an active lifestyles since the primary school period, by implementing a correct and standardized PE program. Specifically, after experimenting the method in 31 provinces in 2010, the MIUR and the CONI are proposing to consolidate and extend the program to all the provinces during the period 2011-2013.

The project’s core strategy is constituted by the presence of a "consultant PE expert" that assists classroom teacher during curricular time with the aim to support students in achieving the identified target skills. Interventions are offered in two hours per week for a total of 50 hours/year. The project involves pupils, teachers, consultants, school principals, families and some universities.

In order to evaluate the effectiveness of the proposal, the Scientific Committee developed seven specific motor tests. Results from the pilot study conduct in 2010 showed that participants significantly improved their motor skills. The improvements were substantially homogeneous, with higher values in boys (11.1%) than girls (7.6%)

and in classes of the second cycle (3rd, 4th and 5th grades) compared to the first cycle (1st and 2nd grades). The answers given by the parents to the final questionnaire on general satisfaction emphasized that more than 90% of respondents were satisfied with the experience and more than 97% are interested in the fact that children could have the possibility to repeat the experience. Finally, also school principals have reported positive opinions on the initiative, expressing a near-total (over 98% positive responses) positive evaluation on the role of the PE experts and on the support received by the MIUR and the CONI. (For more information: <http://www.alfabetizzazione motoria.it/>).

The “Pronti, partenza, via!” project

The “Pronti, Partenza, Via!” is a 10-year intervention project promoted by Save the Children and Kraft Foods under the patronage of the Italian Ministry of Youth, the project aims to raise awareness, information and involvement of children, parents, teachers and practitioners in the promotion of healthy lifestyles. Particular attention is given to difficult areas of 10 Italian cities distributed all over national territory: Turin, Genoa, Milan, Aprilia, Ancona, Sassari, Naples, Bari, Palermo and Catania. More than 66,400 people, including children aged 6 to 11 years and their families, as well as operators, educators, teachers, pediatricians and nutritionists will be actively involved during the years in the project. Indoor and outdoor spaces and facilities will be saved and recovered, with particular attention to those located in the poorest areas of the above mentioned cities. Moreover, educational intervention in primary schools and information desks will be opened for the whole community.

The Kinder + sport” program

“Kinder + Sport” is a sport program developed by the Ferrero Company, created to disseminate and promote sport participation as a healthy daily habit, particularly for young people. For years Kinder supported some sport federations and Institutions. The Company actually supports the “Giochi della Gioventù” (scholastic youth games), the “Kinderiadi”, the project “School and Young Volley”. the “Trophies of Youth and Kinder + Sport Cup of Athletics”, and the “Juniors Fencing Trophy”. Other events were organized, these include different sports events, competitive tournaments, amateur

sporting events, school sport projects and summer camps (since 2006, including volleyball and athletics, more than 20,000 kits were distributed in the Italian schools). Kinder + Sport involved more than one million children throughout the Italian territory only during the last season. (For more information look at: <http://www.kinderpiusport.it>).

The “Guadagnare salute in adolescenza” project

The project "Guadagnare salute *in* adolescenza", which is coordinated by the Piedmont Region for the Ministry of Health-CCM (Italian Ministry of Health-Centre for Control and Prevention of Diseases), was approved by the Italian Government in 2007. It aims to support nation-wide effective strategies for prevention and health promotion. The project adopted the criteria of the “good practice” in order to support professionals in designing and implementing interventions oriented to ensure to the whole country a satisfactory level of essential prevention and health promotion in adolescents.

An area of the project is specifically oriented to the promotion of physical activity and healthy nutrition and to the reduction of sedentariness in adolescents. In the first phase of the project, during a workshop held in Turin in 2010, it was decided to analyze several projects organized in different Italian regions, in order to select the most prominent experiences from which define future interventions.

The considered projects were the following:

- 1) the project "Quadrifoglio" (developed by the ASL Naples Center), is an intervention within the school curriculum, which includes the involvement of teachers and families mainly on issues of nutrition, its first edition was on school year 1997-1998;
- 2) the project "Paesaggi di prevenzione", is realized in the region Emilia Romagna for students of middle and secondary schools. The project, using multimedia tools, involves several actors on different aspects of “gaining health”, including nutrition and physical activity;
- 3) the project "Ragazzi in gamba", is a project to promote physical activity, coordinated by the Veneto region, developed in six Italian regions: Veneto, Piedmont, Emilia Romagna, Marche Lazio, Puglia. The project, specifically aimed at teenagers, was created as an offshoot of the larger project of the CCM for the

promotion of physical activity in the general population. The project identifies structured interventions both in and out of the school, and is actually under development.

Since it is not currently available a structured final proposal for the project "Guadagnare salute *in* adolescenza", Regions are actually asked to adhere to the program and to participate in the definition of the intervention.

The “Più Sport @ Scuola” program

The Veneto Region promotes since 2004 the program "Più Sport @ Scuola", aimed to increase physical activities in the school and to facilitate sports participation in the sport clubs. The core idea of the program is the creation of direct links and synergies between the schools and the sport clubs in the territory: students have the possibility to meet at school sports experts and be introduced to the practice of different sports. Every school in Veneto, from primary to secondary, can apply for the program, so as to promote relations with sport clubs or federations in its territory, receiving financial support. (For more information see

<http://www.regione.veneto.it/Servizi+alla+Persona/Sport/Progetti/homePage.htm>).

The “Giocampus – Diventiamo grandi insieme” program

“Giocampus - Diventiamo grandi insieme” is a program born in 2001 from the cooperation of the Parma municipality, the University of Parma, the CONI, the Emilia Romagna region, the CUS (University Sport Centre) Parma and the Barilla Company, aimed to offer opportunities for the growth of young people. Giocampus objectives were:

- to allow children and their families to acquire the basics of a proper culture of wellness;
- to make available the best expertise to experience physical activity and proper nutrition awareness.

Contents and activities were designed to accompany children to the learning of good practices for a whole year, integrating the different experiences of daily life (school, home, sport club and recreation). Giocampus gave particular attentions to the figures operating in the different educational contexts (teachers, parents and sport coaches) and

provided additional educational opportunities in relation to dietary needs, variety of sports a child or a kid can practice, different qualities and talents of each person. Giocampus assumed as a value that education is a “team game”, so the project enhanced all educational figures putting them in a network and providing educational materials and updating, including online training.

Examples of the initiatives are the Summer Sport School for children organized in the Campus sport area of the University of Parma and the “Giocampus Scuola”, that provided specific objectives, not only for children, but also for parents and teacher, involving families and the community (more information is available on: <http://www.giocampus.it>).

1.2.6. Final considerations for Italian situation

Sedentariness of young people and sedentary-related problems are consistent worries in Italy and it appears urgent to identify cultural, political and economical strategies to contrast the phenomenon.

It is estimated that the number of children and adolescents regularly involved in physical activities is comparable at the minimum levels described in Europe: the 25% does not practice any physical activity in the leisure time, only one child in ten met daily physical activity recommendations, approximately one in five is overweight or obese and the effectiveness of the projects organized to contrast the phenomenon has to be carefully evaluated.

In particular Italian situation could be summarized in the followed keynotes:

- There is a substantial lack of longitudinal data;
- Girls show a significant lower physical activity involvement ;
- Adolescents reported a higher rates of TV, internet and videogames consumption;
- Those with mother’s low educational level reported lower level of physical activity;
- There are limited intervention strategies implemented in middle and high school.

More research is necessary to know, not only the dimension of this trend, but also multiple domain determinants of sedentariness. Moreover it appears necessary to

coordinate the different programs, linking the scientific community to the community, particularly to the schools, the sport clubs and the families.

1.3 The description of the problem in Germany

Differently from the Italian situation, the number of scientific studies and interventions developed at today in Germany is quite significant. The available data are often results of nation wide research project subsequently published in scientific journals and books also in German language. In the following paragraphs results of researches carried out in Germany are presented starting from a recent summary report on German children's and adolescents' active lifestyle trends (Brandl-Bredenbeck & Biermann, in press).

Sport practice is widespread among German children and youth. Sport clubs offer a lot of possibilities, involving all age groups in all level training and competitions.

Schmidt and colleagues (2008) reported that 80% of all German children and youth have been member of a sport club, at least for a short period of time. Among preadolescents (age 11-14) the rate of those who are members of more than one club represent about one third of the total. In another study by LBS-Initiative Jung Familie (2007) conducted among 10052 students aged 9 to 14 years, it has been reported that 69% of the respondents trained in a sport club at least once a week. More recently, Bandl-Bredenbeck (2011) reported that 45% of youth and the 60% of children are member of a sport club.

Also when considering leisure time unstructured physical activity German children reported to be very active in parks, woods and tracks, and streets majorly (LBS-Initiative Jung Familie, 2007). In particular the 71% of the respondents performed several times per week "sport just for fun", and similarly, Schmidt (2006) showed that 76.8% of 1914 children (10-14 years old) like to play outside the best.

Considering the problem of active living in the perspective of the WHO physical activity guidelines (WHO, 2010), Bös and colleagues (2009), reporting the results of the MoMo-Study (motor activity study), underlined as only the 15,3% of the

respondents (3943 children and adolescents aged 4 to 17 years) performed 60 minutes per day, every day, of moderate to vigorous physical activity (MPVA).

1.3.1 Gender and age

Gender and age of children and youth are variables that significantly influence the trends of physical activity behaviour. It is clear represented in Figure 11, where results about the fulfilment of the WHO physical activity guidelines are presented by gender and age (Bös, Worth, Opper, Oberger, & Woll, 2009).

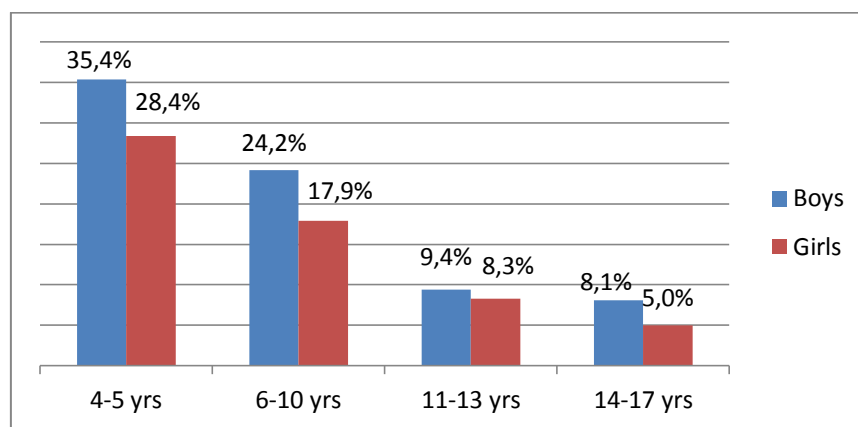


Figure 11 Percentage of children and youth that performed 60 minutes per day, every day, of MPVA, sorted by gender and age (adapted from Bös et al., 2009).

Results of the MoMo-Study (Bös et al., 2009) reported girls significantly lower regularly active than boys (13.1% vs. 17.4%). The same results have been reported in the HBSC-Study (Currie, 2008): boys ($n=3632$) showed higher level of daily physical activity than girls ($n=3592$) for all age classes (11, 13 and 15 years). Moreover, the World Vision Study (Leven & Scheekloth, 2007) reported that 17% of the boys performed 6 or 7 days per week compared to 6% of the girls (among children aged 8 to 11 years).

Also for what concern being member of sports club gender trends are confirmed (Table 1.4), and in addition preadolescents aged 11 years showed the highest percentages compared with older (Schmidt, 2006).

	11 years old n=485	12 years old n=661	13 years old n=536	14 years old n=185
Ø	55.5%	51.7%	50%	40%
Boys	61.9%	59.1%	56.4%	45.1%
Girls	47.5%	44.8%	43.5%	31.4%

Table 1.4 Sports club membership according to age (adapted from Schmidt, 2006).

1.3.2 Families and migration background

Parents' role in physical activity behaviour of their offspring is important. It has been underlined that quantity of parents' physical activity, exercising together and the beliefs system, could affect children behaviour.

In the LBS-Initiative Junge Familie study (2007) was conducted among 6194 children and youth aged 9 to 14 years. It has been reported that only about 25% of the children performed physical activity with their parents, in opposite with the 50% that seldom or never did it. This trend was influenced by age of youth: 4th and 5th grade children perform more physical activity with parents than 7th grade students.

About the influence that the physical activity quantity of parents could have on children's, it has been found that children with both parents active were more active themselves compared to children with one parent active or to those with both parents inactive (Klein, Frölich, & Emrich, 2011).

The same results were reported by Brandl-Bredenbeck and colleagues (2010) when reported data showed in Table 1.5.

	Both parents inactive	Both parents active
Höxter district (<i>n</i> = 803)	56%	77.9%
City of Cologne (<i>n</i> = 1195)	44.6%	67%

Table 1.5 Children's physical activity in reference to parents' activity (Brandl-Bredenbeck et al., 2010).

For what concern parents' attitudes toward physical activity, it has been reported that 10th grade children's sport participation was correlated with perceived parental support, and that girls perceived a more positive support than boys (Burrmann, 2005).

Parents' educational level could also play an important role in children's physical activity. In particular high education level seemed to correspond to a higher support for children's sport (Schmidt, 2006). Educational level often corresponds also to the socio-economic status (SES). In physical activity behaviour also the family's SES influences children. Brandl-Bredenbeck (2011) confirmed this statement with data about children's sport participation in the city of Cologne. In 1195 4th grade children, the 30,2% of those with low-SES parents was member of a sport club, while the 78% of children with high-SES parents. Another consideration is that parents from low and middle low SES are less predisposed to educate their offspring in a healthy and active way compared to high SES parents (Großart, 2009). When considering unstructured physical activity, children from families with low SES showed strange trends (Leven & Scheekloth, 2007): the highest percentage (15%) of inactive children and also the highest percentage of children active 6 or 7 days in a week (21%). However children from the upper class reported the highest frequency for being active 3 to 5 days per week (70%).

Another characteristic that has been seen to be involved in German children physical activity behaviour is the migration background, even if results did not show a univocal line of interpretation. For example Leven & Scheekloth (2007) reported, in the World Vision Study, higher level of regular participation among boys with migration background (24%) compared with German boys (15%). Also in another studies, adolescent boys aged 15 years with migration background were more physically active (Mutz, 2008). Schmidt (2006) confirmed these findings for boys 75.4% of Turkish boys and 56.8% of German boys being members of a sport club. Girls with migration background showed opposite trend: they are less active during leisure time and less frequently are member of a sport club (Boos-Nünning, U., & Karakaşoğlu-Aydin, 2005; Schmidt, 2006; Fussan & Nobis, 2007).

Differently, in the LBS-Initiative Junge Familie study (2007), boys and girls with migration background reported lower level of leisure time physical activity and low participation in sport clubs. This finding corresponds to the KiGGS-Study results that showed that girls without migration background had chance to participate in physical activity 3 times higher than girls with migration background (Lampert, Mensink, Romahn & Woll, 2007).

It is important to underline also that a migration background or a low SES of families is related to the overweight status of the children. Erhart and colleagues (2008) reported data about 7274 children and youth aged 11-15 years showing that overweight and obesity were more frequent among those with a migration background (respectively 12.1% and 3.1%) compared to German youth (10.9% and 1.6%).

1.3.3 School physical education

Before focusing the argumentation in the field of physical education, it is necessary to explain a little bit the German school system. The attendance of school is mandatory for children from the age of 6 years to 18 years with the following differences (Eurydice, 2011). “Full-time education is compulsory from between the ages of 6 and 15 in the majority of the Länder (Baden-Wuerttemberg, Bayern, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen at Gymnasium, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt and Schleswig-Holstein) or 16 (in Berlin, Brandenburg, Bremen, Nordrhein-Westfalen, at other lower secondary education institutions apart from Gymnasium, and Thüringen). Part-time education is compulsory until the age of 18 for those who do not attend a full-time school”.

The first educational level consists in the primary school that covers grades till the 4th. After the primary school, children can choose different levels of education from 5th grade to 10th grades generally basing on teachers’ recommendations. These different secondary schools are Hauptschule, Realschule, Gesamtschule, and Gymnasium (Figure 11). A first certificate for the secondary education could be achieved at 9th grade in the Hauptschule, or at 10th grade in the Realschule. To get a certificate that led to enrol at university, it is necessary to attend the second level of Gymnasium and access to the Abitur.

Physical education is just one of the possibility to do physical activity at school. In fact, extracurricular physical activity proposed by school teachers could be another form to promote children’s and adolescents activity during leisure time (Wanka, von Richthofen & Röwekamp, 2005).

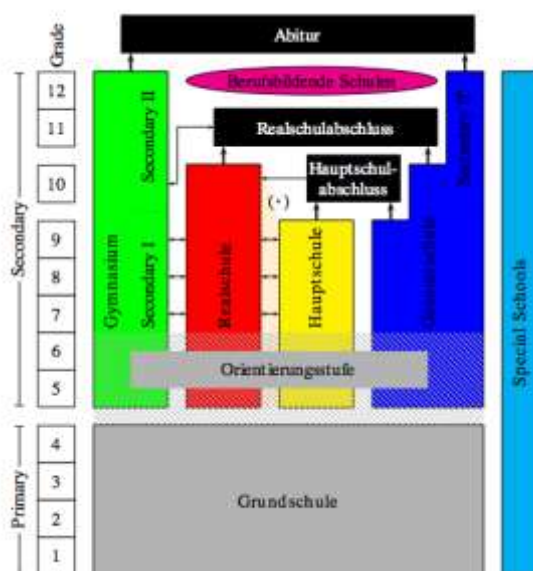


Figure 12. German school system (Retrieved from: http://en.wikipedia.org/wiki/File:German_School_system.svg)

Firstly examining physical education, it is possible to stand that, since it is part of the mandatory lessons, it is an excellent possibility to reach all children (Brettschneider & Brandl-Bredenbeck, 2011). Moreover, 50% of the physical education teacher in primary school are specialized in the area, while in secondary school a percentage from 70% (Hauptschule) to 100% (Gymnasium and Gesamtschule) is representative of the specialists among physical education teachers.

It is supposed that children and adolescents receive three hours per week of physical education. However, the SPRINT study, carried out among 4th, 7th, and 9th grade students reported that physical education lessons are cancelled with a rate of 8% in the Hauptschule, 6% in the Realschule and 5% in the other schools (Brettschneider, 2006). Differently, in the LBS-Initiative Junge Familie study (2007) it has been reported that among 10052 students aged 9 to 14 years the 97% have at least one lesson of physical education per week. Only 3% answered that rarely have lessons. More precisely, children's opinion about frequency of elimination of physical education lessons corresponds to never for 28% of them, rarely-56%, sometimes-13%, often-2% and veryoften-1%.

Referring to extracurricular physical activity (e.g. sport events, cooperation with sport clubs, national sport day, active breaks, inter-school competitions), it has been reported

differences among schools for the percentage of students participating in it (Brettschneider, 2006). The higher rate of participation happens during primary school with a 21% , similar results have been reported for Realschule (14%), Gesamtschule (13%) and Gymnasium (15%).

Contrasting results have been reported from the point of view of headmasters compared with that of students. In general Brettschneider (2006) reported a declared participation rate of 16% among 8863 students, while headmasters answered that the 39% of students actively participate in extracurricular physical activities quite often.

A difference that can be underline is that students of Hauptschule participated in extracurricular activities more than students of other schools (Brettschneider, 2006).

1.3.4 Old/new states of Germany, and communities

In Germany there is a considerable difference between old and new states for what concern the infrastructures, and consequently the possibility to be physically active. Bös and colleagues (2009) found that children and adolescents (aged 4 to 17 years) from old states are about 60 times more likely to be a member of a sport club (among 4502 students), and 25 time more likely to perform unstructured physical activity during leisure time (among 4392 students). In Figure 12 it is possible to see these differences considering also youth gender.

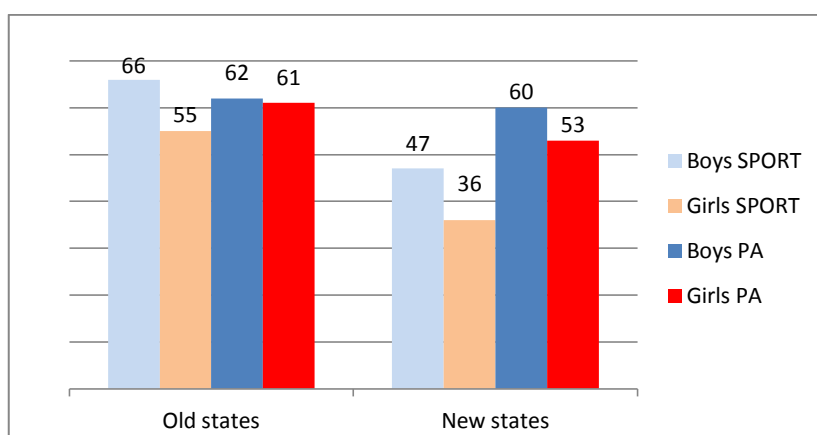


Figure 12. Percentage of boys and girls involved in sport and physical activity in old and new states of Germany (adapted from Bös et al., 2009).

Another variable that influence sport and physical activity participation is the urban area where the children live (Burrmann, 2008). In particular it has been found that children and adolescents living in big metropolitan cities participated less both in sport and in unstructured physical activities than those living in rural or provincial areas (Bös et al., 2009). More specifically, significant differences have been found in girls practice: rural and metropolitan areas resulted respectively in 55% versus 43% for sport practice, and 61% versus 57% for physical activity during leisure time.

1.3.5 Programs and strategies to promote physical activity

The German government, in order to implement national strategies to promote physical activity and active living, instituted two federal ministries: the Federal Ministry of Health (Bundesministerium für Gesundheit, BMG) and the Federal Ministry of Food, Agriculture and Consumer Protection (Bundesministerium für Ernährung, Landwirtschaft & Verbraucherschutz, BMELV). The finalities the Ministries have to search to reach by innovative strategies and programs are mainly the following:

- Promote active living among people of all ages
- Increase knowledge about healthy diet and exercise practice
- Interventions in the physical environment directed to facilitate active living.

Special target groups for the action plans of BMELV and BMG are constituted by immigrant people and women. In order to be more effective, Ministries established also a cooperation with the German Olympic Sport Federation (DOSB), organized educational programs in schools and kindergartens, and involved many health insurance companies to incentive people workout.

Table 1.6 provides an overview of national policy documents identified for Germany that contain specific goals on physical activity (WHO Regional Office for Europe, 2010). For each document, the title, year of publication, coverage (national or subnational), issuing body and sector (public health, sport, transport, education and environment) are listed.

Title	Coverage	Aim	Sector
<i>IN FORM Deutschlands Initiative für gesunde Ernährung und mehr Bewegung</i> (INFORM, 2008)	National	Germany's initiative for a healthy nutrition and more physical activity.	Public health
<i>Strategie der Bundesregierung zur Förderung der Kindergesundheit</i> (Ministry of Health, 2008)	National	National Strategy for the Promotion of Child Health.	Public health
<i>Nationaler Aktionsplan für ein kindergerechtes Deutschland 2005–2010</i> (Ministry for Family, Seniors, Women and Youth, 2005)	National	National action plan for a childfriendly Germany.	Public health
<i>Nationaler Radverkehrsplan 2002–2012 “FahrRad!”</i> (Federal Ministry of Transport, Building and Housing, 2002)	National	National Cycling Plan “Ride your bike!”	Transport

Table 1.6 National policy documents of Germany that contain specific goals on the promotion of physical activity (Adapted from WHO Regional Office for Europe, 2010).

1.3.6 Final considerations for German situation

Sedentariness of young people and sedentary-related problems show different degrees according to SES, gender and cultural background, even if research in this field has pointed out not univocal results.

In order to organize effective projects to contrast the phenomenon of unfit youth, it is useful to carefully evaluate which groups show major unhealthy characteristics.

In particular, German situation could be summarized in the followed keynotes:

- There is a substantial lack of longitudinal data;
- Girls show a significant lower sport and physical activity involvement;
- Lowest rate of physical activity and sport have been reported among children and youth living in big, metropolitan areas and in the new states of Germany;
- Children and adolescents with a migration background or a low SES reported lower level of unstructured physical activity and showed higher rates of overweight and obesity.

More research is necessary to know, not only the dimension of this trend, but also multiple domain determinants of sedentariness. Moreover it appears necessary to analyse differences and similarities across groups and across cultures.

1.4 Health education and physical activity

Public health is a field that comprises many disciplines in an effort to promote and protect health preventing diseases and disabilities: the core of the public health is the prevention focused on populations or substantial portion of them. This science regards the growth of knowledge and also the application of strategies to improve health (Brownson & Powell, 2012). Figure 13 illustrates the five pillars of public health science.

Studies on epidemiology, environment, education, policy and biostatistics contribute to add knowledge and scientific evidence that lead to the constitution of new health promotion strategies and programmes.

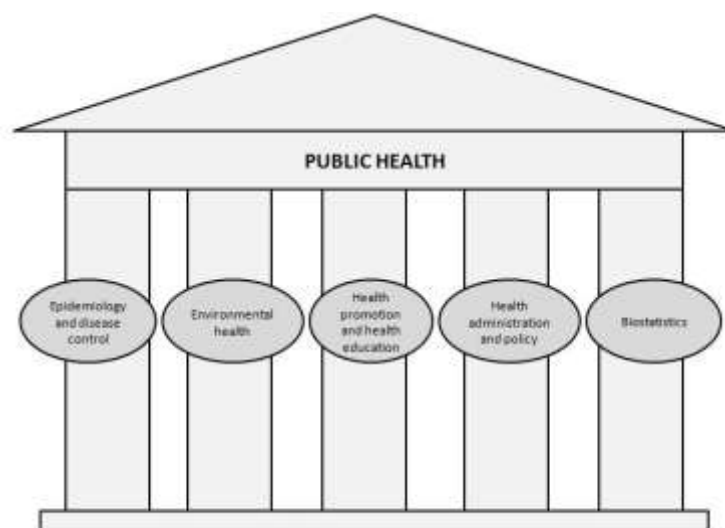


Figure 13. Five pillars of public health (Adapted from Brownson & Powell, 2012).

“Health promotion and health education” is a broad area of specialization of public health in which the main addressed question is how we deal with health threats through

our behaviours. According to Simonds (1976), health education is aimed at “bringing about behavioural changes in individuals, groups, and larger populations from behaviors that are presumed to be detrimental to health, to behaviors that are conducive to present and future health”. Later on, Green and colleagues (1980) defined health education as “any combination of learning experiences designed to facilitate voluntary adaptations of behaviour conducive to health”. Thus health education central core is constituted by health behaviour (Glanz, Rimer, & Viswanath, 2008). Positive changes in health behaviour (e.g. regular physical activity) are generally the aims of health education, considering behaviour as being affected by, and affecting, multiple levels of influence.

Physical activity could be considered a complex health behaviour according to the definition of Gochman (1997), indicating health behaviours as “those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns actions, and habits that relate to health maintenance, to health restoration, and to health improvement”. Moreover physical activity is one of the most significant health challenge because of its positive effects on decreasing risk of the major chronic diseases and negative outcomes on psycho-social well-being. It could be considered a health behaviour in its broadest sense referring to the action of individuals and groups as well as their determinants, correlates, and consequences.

1.5 Correlates of children physical activity

The challenge of health education in promoting children regular physical activity is linked to the identification of multiple theory-based factors that influence physical activity behaviour. Provide a clearer understanding of the correlates and the determinants of children decisions to be physically active could be an important element in the development of effective strategies aimed at the promotion of children health.

Published research on the correlates of physical activity for children has primarily focused on individual level variables such as demographic/biological factors and psychological factors (Sallis et al., 2000; Trost, Saunders, & Ward, 2002; Trost, Kerr, Ward, & Pate, 2001). To limit the attention only to personal level variables determines a lack of investigation on relevant domains such as environmental context (Sallis, & Owen, 2002). Given that physical activity behaviours occur in contexts with social and physical characteristics that may influence the behaviour itself, more recent literature has focused the attention in the environment in which physical activity is performed by children (Ewing, 2005; Ferreira et al., 2007).

Sallis, Prochaska and Taylor (2000) carried out the first comprehensive review of the correlates of physical activity of children and adolescents. The authors screened papers published between 1976 and 1999, from 102 studies they reviewed 54 papers about children physical activity. Different potential variables associated with children physical activity were identified: demographic/biological (e.g. gender, age, body weight, SES, ethnicity); psychological (e.g. perceived barriers, intention, preferences, body-image, self-esteem, self-efficacy, attitudes, perceived competence); behavioural (e.g. TV viewing, healthy diet, previous physical activity, calorie intake); social (e.g. parent influences, parental physical activity, parent participation in child physical activity); physical environment variables (e.g. access to facilities, time spent outdoor, neighbourhood safety, milieu). Variables that resulted consistently associated with children physical activity were: gender (male), parental overweight status, physical activity preferences, intention to be active, perceived barriers (negative association), previous physical activity, healthy diet, facilities access, and time spent outdoors.

On the basis of the cited review of Sallis et al. (2000), Van Der Horst and colleagues (2007) summarized and reviewed studies on youth physical activity correlates between 1999 and 2005. Differently from the previous published review, they found that the correlated variables of physical activity for children were: gender, self-efficacy, parental physical activity for boys, and parental support.

More recently Biddle and colleagues (2011) carried out a review of quantitative systematic reviews published between 2000 and 2010. Demographic/biological correlates of physical activity for children were age and gender. Psychological correlates were positive motivation, positive body image and the existence of barriers

to physical activity. Behavioural correlates of physical activity for children were previous physical activity, sport participation, smoking, and sedentary behaviour. Social/cultural correlates of physical activity for children were parental influence and social support; environmental correlates of physical activity were access to facilities, distance from home to school, time spent outside, and local crime. The evidence is indicative for different types of correlates of PA for children. Further than age and gender most are likely to have only small or small-to-moderate effects in isolation and may work best in interaction with other influences.

The *Lancet Physical Activity Working Group* (Bauman et al., 2012) recently summarized the present knowledge about correlates and determinants of children's and adults' physical activity on the basis of systematic reviews previously published. The Working Group identified individual, social, and environmental correlated of physical activity also of children aged 5-13 years, searching for reviews published after January 1, 1999. Authors used a five-category classification system indentifying demographic or biological, psychosocial, behavioural, social and cultural and environmental factors. Seven reviews were used for the final synthesis of correlates of physical activity of children, and it has been choose to report the summary limited to correlates and determinants of the school-aged children reporting in Table 1.7 the results. A total of 6 published reviews' results (Sallis et al., 2000; Van Der Horst et a., 2007; Edwardson & Gorely, 2010; Craggs, Corder, van Sluijs, & Griffin, 2011; Uijtdewilligen et al., 2011; Ding, Sallis, Kerr, Lee, & Rosenberg, 2011) are reported as in the work of The Lancet Working Group to provide an overview of children physical activity associated factors. Variables were coded describing the consistency, and not the magnitude, of associations (Bauman, Sallis, Dzewaltowski, & Owen, 2002). Each factor was coded as a correlate (association) or a determinant (causal relationship) on the basis of clear evidence; as not a correlate or not a determinant if there was evidence of no relationship; as inconclusive evidence or as not reported in the case of no evidence.

	Sallis, 2000	Van Der Horst, 2007	Edwardson, 2010	Craggs, 2011	Craggs, 2011	Uijtdewilligen, 2011
Study characteristics						
Ages	3-12 years	4-12 years	6-11 years	4-9 years	10-13 years	4-12 years
Publication period	1970-98	1999-2005	to 2009	to 2010	to 2010	2004-10
N° of quantitative studies included	54	57	41	46	46	30
Demographic and biological variables						
Gender: male	Corr	Corr	NR	Det	Inc	Inc
Ethnic origin: white	Inc	NC	NR	Inc	Inc	NR
Marital status of parent	NCorr	NCorr	NR	Inc	NDet	NR
BMI or anthropometry	Inc	NCorr	NR	Inc	NDet	NR
Psychosocial variables						
Perceived Competence	Inc	NR	NR	Inc	Inc	NR
Self-efficacy	Inc	Corr	NR	NR	Det	NR
Attitude	NCorr	NR	NR	Inc	Inc	NR
Perceived behavioural control	NR	NR	NR	NR	Inc	Inc
Value of health status	NR	NR	NR	NR	NDet	NR
Barriers to PA	InvAss	NCorr	NR	NR	NDet	NR
Behavioural variables						
Previous PA	Corr	NR	NR	NR	Det	Inc
Smoking	NCorr	NR	NR	NR	NDet	NR
Social and cultural variables						
Perceived parental role models	NR	NR	NR	NR	NDet	NR
Parental activity	Inc	NR	NCorr	Inc	NDet	Inc
Support for PA	NR	NR	NR	NR	NR	NR
Support for PA from parents and family	NR	Corr	NR	Inc	NDet	NR
Environmental variables						
Ding, 2011						
The most consistent correlates were walkability, traffic speed and volume (inversely), land-use mix, residential density, access or proximity to recreation facilities.						

Note. NR = not reported; Corr = ; NCorr = not a correlate; Inc = inconclusive; InvAss = Inverse Association; Det = determinant; NDet = not a determinant.

Table 1.7. Systematic reviews of correlates and determinants of physical activity in children (Adapted from Bauman et al., 2012).

1.6 The objective of the research

It has been identified social and psychological factors influencing children's physical activity experiences and a complex arrangement of determinants seemed to be involved. In addition several social, educational and cultural factors clearly impact children's physical activity and sport involvement.

Generally, interventions to promote children's physical activity mostly focused directly on children than on parents or on environment or on policies (e.g. one more hours of physical education per week in the school). However to design effective strategies to increase children's physical activity, a clear understanding of social and physical environment is required. The core concept of a socio-ecological approach to health is that behaviour (in this case physical activity) has multiple levels of influences, including intrapersonal, interpersonal, organizational, community, physical environment, and policy (Sallis, Owen, & Fisher, 2008).

The challenge of health education and sport pedagogy in promoting children regular physical activity is linked with the identification of multiple theory-based factors that influence physical activity behaviours. Provide a clearer understanding of the correlates and the determinants of children decisions to be physically active can represent a key element in the development of effective policies aimed at the promotion of children health and well-being. In the field of health education and sport pedagogy, parents and families have a critical role. In fact the first educational actions are given by parents or tutors to their offspring, and till the identity of the child is not completely built, parents influence their offspring's behaviours. Also physical activity behaviour, and more in general the adoption of an active living style, could be promote or restrict by parents. However the scientific literature related to parental correlates of physical activity behaviours in children is still limited. Studies investigating the influence of parent activity level and parental prompts to increase physical activity reported inconsistent, and mostly null, findings, and different types of parental support has not been systematically evaluated yet.

For these reasons there is the need for a better understanding of how, and how much, parents can promote physical activity in children. Thus the purpose of this research was

to investigate parental correlates with an ecological approach, in order to taking into account personal, cultural and environmental factors.

It is possible to identify three major objectives:

- To examine the roles of supportive social environments (parents' role) and physical environments on children's active living, with an ecological approach;
- To compare Italian and German children's physical activity habits;
- To investigate what variables are strongly associated with higher rates of physical activity participation.

We hypothesized that parents with favourable orientations towards physical activity would provide greater levels of support for physical activity which, in turn, results in greater participation in physical activity of children.

Cap. 2

THEORETHICAL PERSPECTIVES

To explain theoretical framework to the research is important in order to define the field of investigation, to support objectives and hypotheses, and to better explore data. In this chapter it is carried out a state of the art for what concerns the physical activity parenting, giving definition, questions and possible solutions.

Thus it is summarized the theories that are implicated in the explanation of the phenomenon: the Self-determination theory, the Social-cognitive one, the Youth Physical Activity Promotion Model, and the more comprehensive Ecological Model. Finally, it is presented the model built during the last ISBNPA conference (International Society for Behavioural Nutrition and Physical Activity, 2012) by a working group on physical activity parenting in which I took part. The model presented and the suggested recommendations correspond to a possible solution to better investigate physical activity parenting.

2.1 Parenting practice

Everyone has had parents, everyone succeed because of parenting, and everyone has an opinion about parenting. However scant evidence about this subject exists (Bornstein, 2001). Generally speaking, parenting refers to childhood oversight and care-giving, but to be a parent involves many actions and also consequences for parents themselves. Parents educate their offspring in the family, but contemporary they are educated and supported by the formal and informal system of the society (Milani, 2002).

Beyond the historically recognized roles of mothers and fathers, the modern world has driven parenting to a change: single-parent family, teen parents, divorced families are examples of a pluralistic way that significantly affect children's lives. Moreover not always biological parents take care of their children, adoptive parents could be an option, but sometimes grandparents, older siblings, or institutional figure (non familiar caregivers) cover the role of parents. Thus, parenting takes place every time that a person caregives infants, toddlers, school-aged children and adolescents, and parenting constitutes an all-encompassing ecology for development.

Parents socialize their offspring in a direct and indirect way, and parenting is constituted by all the concerns involved in the socialization and education of the children. The direct effects of the parenting could be the genetic and biological endowment that parents enhance to children, but could also be the experiences provided by parents. Experiences are the principal stimulus to development, and are constituted by beliefs and behaviours ((Bornstein, 2001).

Parenting beliefs include attitudes, ideas, perceptions, values, and expectations that may conduct children's caregiving and parenting in general. Parenting behaviours are constituted by the concrete experience that parents provide children. All the behaviours that parents adopt in relation with their offspring are parenting actions. For example, provide for the biological needs, socially interact, support emotions' regulation, mediate interpersonal relationship, demonstrate and teach, give the time to observe and imitate, organize home environment, etc., are practices of parenting that directly affect children.

Speaking about the indirect parenting, it is possible to identify all the external relations that parents have with other people in the community, in a narrow and wide sense

contemporary. For example, the relationship between the mother and the father influence children as well; parents' relations with the social environment in which they are include modify their relation with the offspring and, as a consequence, offspring's development (Bornstein, 2001).

Thus, parenting include genes and experiences, beliefs and behaviours, indirect influences. However, for a deep understanding of what parenting is and determines, it is necessary to make clear that children themselves affect parenting with their temperament, personality and intellectual characteristics. Moreover, to have a full comprehension, it is required to look at ecologies in which parenting takes place: family configuration, educational institutions, formal and informal support systems, physical environment (both natural and infrastructures), etc.,. For this reason it is important to contextualize the phenomenon of parenting, and an ecological approach could be a comprehensive approach to better investigate fundamental variables implicated as correlates and determinants.

2.2 Theories of exercise behaviour

A theory is “a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specific relations among variables, with the purpose of explaining and predicting phenomena” (Kerlinger, 1973).

The most general recommendation is that research on physical activity, focusing all age groups and phenomena, be grounded in theory. Thus, to investigate parenting practice in children's physical activity it is necessary to identify which theories could be an effective framework for the phenomenon's understanding.

The most applied theories in the field of physical activity have been the theory of reasoned action/planned behaviour (Ajzen, 1991), the social cognitive theory (Bandura, 1986), the transtheoretical model of behaviour change (Prochaska & DiClemente, 1983), the self-determination theory (Deci & Ryan, 1985; Chatzisarantis, Biddle, & Meek, 1998), the health action process approach (Schwarzer, 1999), and over the last decades, the broader social ecological model (Stokols, 1992; Sallis & Owen, 1997).

Biddle and colleagues (2007) proposed five categories in which theories fall in, basing on broader concepts (Figure 14).

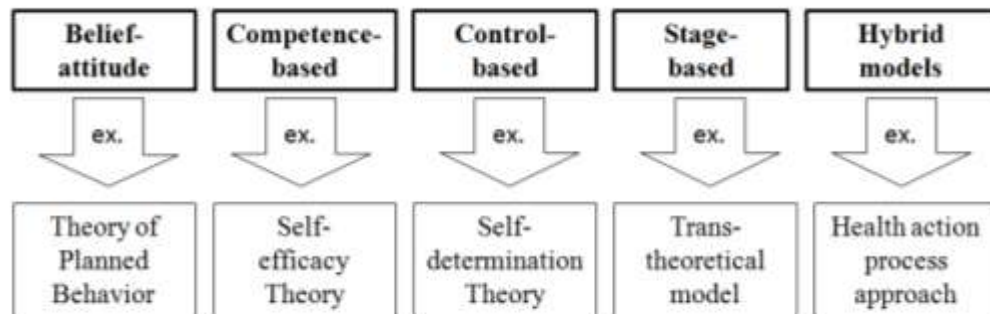


Figure 14 A framework for classifying theories of physical activity (Adapted from Biddle et al., 2007).

Substantially, Biddle and colleagues identified major concepts that could help the organization of research in this field, however the divisions between concepts are not always clear-cut.

In the next paragraphs it is briefly explain major theories that could be implicated in the study of physical activity parenting. It is given example of control-based theories, such as self-determination theory, in which physical activity behaviour starts from individual's control and motivation; interpersonal theories, such as social cognitive theory, suggesting that physical activity behaviour is strongly influenced by environments; social ecological approach in which behaviour has different levels of influence (individual, social, cultural, physical, institutional).

2.2.1 The Self Determination Theory

Self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000) is a theoretical framework that could be applied to the study of physical activity parenting practice, explaining children's physical activity motivation and behaviour. Self-determination is a feeling that moves human behaviours. Therefore the theory analyzes

how different types of motivations cause different behaviours, and the social conditions effects on various aspects of human well-being.

Deci and Ryan (1985) proposed a continuum of self-determination, ranging from intrinsic motivation to amotivation. Extrinsic motivation is situated in the middle of these two extremes on the continuum. It is divided in another continuum including integrated regulation, identified regulation, introjected regulation and external regulation.

According to SDT intrinsic motivation is the most desirable and long-lasting level of motivation. It is involved in highly autonomous behaviours, that is for example physical activity is practiced for the feeling of pleasure and interest that it provides. People intrinsically motivated freely choose to engage in physical activity for its own sake rather than for an external contingency. For this reason, intrinsic motivation is the most wanted form of motivation regarding the adoption, adherence, and maintenance of a behaviour such as physical activity.

Following the continuum, extrinsic motivation refers to activities that are carried out as a means to an end that is valued (i.e., praise, extrinsic reward) and not for the sake of the activity itself (Deci & Ryan, 1985). According to SDT, extrinsic motivation includes the four dimensions, above mentioned, that differ in their degree of relative autonomy. However with youth three levels of extrinsic motivation are studied: identified regulation, introjected regulation, and external regulation. Identified regulation corresponds to the higher level of autonomy and refers to behaviours that are freely performed and not necessary enjoyable, but are considered important for the sense of self. Introjected regulation refers to behaviours that people perform to avoid feelings of guilt. External regulation is the motivation that drives a person when performs behaviours just to receive a reward or to avoid constraint.

Finally, amotivation occurs when there is a complete lack of motivation, both intrinsic and extrinsic, and person perform a behaviour without any perceptions of purpose or outcomes (Deci & Ryan, 1985).

According to SDT, people acts and behave on the basis of different motivations searching the satisfaction of three innate and universal psychological needs: autonomy, competence, and relatedness. These needs are fundamental to understand the beginning

and regulation of a behaviour (Deci & Ryan, 2000), and they have been pooled into a variable labelled “psychological need satisfaction” (Ryan & Deci, 2002).

Autonomy corresponds to the need for a person to endorse and be the origin of one’s behaviour. Competence is described as the need to effectively interact with the environment. Relatedness refers to the need for a person to feel part of a social community, it corresponds to the need to be supported by others when performing behaviours.

The satisfaction of psychological needs is the mechanism through which individuals move toward more self-determined motivation (Deci, Ryan, & Williams, 1996). For example, people are more likely to be intrinsically motivated, and practice physical activity just for the feeling of pleasure and interest that it provides, when they freely choose to do physical activity (autonomy), when they experience competence doing physical activity (competence), and when they are supported by important people, such as parents, teachers, or classmates (relatedness).

Research has shown that autonomy-supportive environment is positively associated with self-determined type of motivation (Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005). Research has been focused majorly on the investigation on the different effects that an autonomy-supportive in opposition to a controlling environment produced on psychological need satisfaction. Even if research on this topic is still scant, it has been seen that climate of environment create by most important social agents, such as parents, teachers and coaches, influenced youth need satisfaction (Standage, Duda, & Ntoumanis, 2003, 2005) and consequently motivation to engage in physical activity behaviour.

2.2.2 The Social Cognitive Theory

The social cognitive theory (SCT; Bandura, 1986) was built on previous social learning theories (Rotter, 1954), accommodating the notion that learning happens also from experience, observation, and symbolic communication. According to SCT, human behaviour is explained by reciprocal determinism, it is the product of dynamic interplay of personal, behavioural, and environmental influences. “In this model of reciprocal causality, internal personal factors in the form of cognitive, affective, and biological

events, behavioural patterns, and environmental influences all operate as interacting determinants that influence one another bidirectionally” (Bandura, 2001).

The constructs of SCT have been often used in physical activity research, in parental influences investigations too. In Table 2.1 concepts of the SCT are reported.

Concept	Definition
Reciprocal determinism	Environmental factors influence individuals and groups, that contemporary influence their environments and regulate their own behaviour.
Outcome expectations	Beliefs about the likely outcomes of behaviour and values people place on expected outcomes.
Self-efficacy	People’s confidence in their ability to perform a certain desired task or function.
Collective efficacy	Beliefs about a group to perform concerted actions that bring desired outcomes.
Observational learning	Learning to perform new behaviours by exposure to interpersonal or media displays of them, particularly through peer modeling.
Incentive motivation	The use and misuse of rewards and punishments to modify behaviour.
Facilitation	Providing tools, resources, or environmental changes that make new behaviours easier to performed.
Self-regulation	Controlling oneself through self-monitoring, goal-setting, feedback, self reward, self-instruction.
Moral disengagement	Ways of thinking about harmful behaviours and the people who are harmed that make infliction of suffering acceptable disengaging self-regulatory moral standard.

Table 2.1 Concepts of SCT (Adapted from McAlister, Perry, & Parcel, 2008)

The concepts of observational learning, incentive motivation, and facilitation have been of particular interest in the field of physical activity parental influences research. Generally social modeling, verbal persuasion and reinforcement, and provision of tools

and facilities have been studied as factors related to parents that have an influence on children's physical activity behaviour.

For example using SCT, Trost and colleagues (1997) investigated demographic, psychosocial, and environmental variables as potential determinants of 5th grade children's physical activity. Family variables investigated were social influences and parental activity behaviour.

Generally SCT has been extensively applied to study parental modeling, parent support and parents' provision of facilitation to be engaged in physical activity among children. However there are difficulties in the interpretations of results because of differences in instruments used and in operationalization of concepts. For example, parental influence has been examined in many studies, but it has been operationalized differently as parental modeling, parental encouragement, family support, and parental barriers.

In the Youth Physical Activity Promotion Model proposed by Welk in 1999, it was supposed that family could influence children's physical activity primarily through reinforcing factors. Parental encouragement has been shown to play a significant role (Brustad, 1996), but further research was necessary to clarify the role of parental socialization influence.

2.2.3 Ecological Models

In the last decades the relative influences of the relevant social and physical environment in which physical activity behaviours take place have received increased attention (Ewing, 2005; Ferreira et al., 2007). This means that also in the research field of physical activity there has been an increase in interest in applying social ecological model.

“Social ecological” refers to individuals' interactions with their physical and socio-cultural environment (Moos, 1980). The core concept is that behaviour has multiple level of influences: biological and psychological represent intrapersonal level, social and cultural represent a interpersonal level of influence, organizational, community, physical environment and policy (Figure 15).

Moreover four core principles could be underlined according to Sallis and colleagues (2008):

1. Health behaviours have multiple level of influences: intra and interpersonal, organizational, community and public policy levels;
2. The influences of different levels interact each others;
3. Ecological model is behaviour specific, with the important possibility to identify the most relevant influences at each level;
4. Changing behaviour strategies should be multi-level in order to be effective.

Ecological models can use and include theories on influences of psychological, social, and organizational levels providing an integration of multiple theories. It is now recommended to use ecological model in investigation of health behaviours; moreover it is clear that healthy behaviours are maximized when there are simultaneously an environment and policy organization that support the healthy behaviour and an educational/motivational involvement of the people.

The strength of ecological model is based on a rich conceptual tradition on ecological approach, passing from the idea that just perception of environment influence behaviours, to the suggestion that environment has direct effects on human behaviours.

Table 2.2 presents the historical background for ecological models.

Author, Model	Concepts
Lewin K. (1951) <i>Ecological psychology</i>	The study of the influence of the outside environment on the person. The concept that perception of the environment is important.
Barker R. (1968) <i>Environmental psychology</i>	It is focused on behaviour setting: where the behaviour takes place could influence more than people characteristics.
Moos R. (1980) <i>Social Ecology</i>	Environment is operationalized in four factors: physical setting, organizational setting, human aggregate, and social climate.
Bronfenbrenner U. (1979) <i>System Theory</i>	Hierarchies of behavioural influences are described as: microsystem (family and work groups), mesosystem (physical family, school, work setting), exosystem (is the larger social system of economics, culture, and politics,
Glass T. & McAtee M. (2006) <i>Ecosocial Model</i>	Hierarchies of behavioural influences are within biology and society, which has physical and social dimensions.

Table 2.2 Historical ecological model designed to explain behaviour (Adapted from Sallis et al., 2008).

The ecological models have been used as organizational frameworks for research and interventions in many disciplines, such as tobacco control (Elder & Stern, 1986), human development (Bronfenbrenner, 1979), or diabetes self-management (Fisher et al., 2005), and physical activity behaviour (Sallis et al., 2006).

The use of social ecological models in the health field was first introduced in the study of lifestyle chronic diseases (McLeroy, Bibeau, Steckler, & Glanz, 1988). Health behaviour could be investigated by using an ecological model addressing both the dynamics of individual and design intervention strategies (Booth et al., 2001).

This is the strength of ecological models: they are suitable for health promotion research and interventions because the models recognize the multiple levels of influences rather than having a focus on individual-level factors (Sallis & Owen, 2002). Therefore, the effectiveness of a strategy aimed to change a behaviour is linked to encompassing multiple levels of influences, such as intrapersonal, interpersonal, , environmental, and public policy (Brownson, Baker, Housemann, Brennan, & Bacak, 2001).

The strength of ecological models in health behaviours research is demonstrated also by the wide acceptance awarded them by the major institution. The World Health Organization's strategy for diet, physical activity, and obesity (WHO, 2004), Healthy People 2010 (USDHHS, 2000), and the Institute of Medicine (IOM) reports on health behaviours (IOM, 2001) are examples of application of ecological models to health behaviours promotion.

What is important to underline in the application of ecological models to develop effective behavioural change, is that interventions should address both individual with educational projects, and environment and policy with changes and adaptations. According to Sallis and colleagues (2008) the challenge for health promotion research consists in using ecological models to study multiple levels of behavioural influence, and to generate evidence on the effectiveness of multidimensional interventions on health behaviours.

2.5.1 Ecological model in physical activity

Ecological models resulted particularly suited also to studying physical activity behaviour and active living (Sallis et al., 2006). In fact, using an ecological approach, it

is possible to address those environmental and policy factors that could be responsible for the increase of sedentary behaviour among children and adults in the modern age. Stokols (1992) asserted that physical environmental factors are essential elements of ecological models of health behaviour, and are constituted by the objective factors that are physically external to the persons. The field of research on physical activity has moved on ecological model for studying physical activity behaviour because they must take place in specific contexts that are likely to influence an individual's choice to be physically active.

This means that the physical and social context could frame individual cognitions and perceptions that either encourage or discourage physical activity (Figure 15).

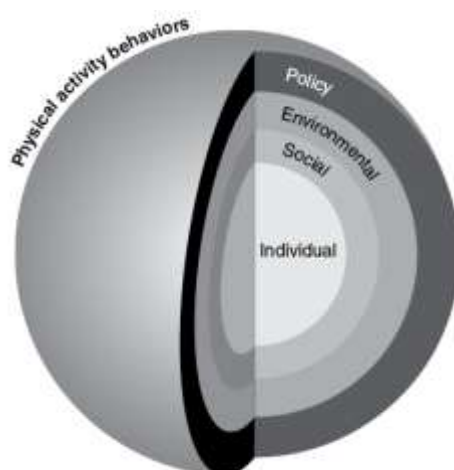


Figure 15 Multiple levels of influence on physical activity behaviours (From Harold Kohl III & Tinker Murray, 2008)

Giles-Corti, Timperio, Bull, and Pikora (2005) for example proposed an ecological model to study physical activity of leisure time and of transportation. The same investigation has been proposed by Saelens and colleagues (2003). Moreover, Owen and colleagues (2004) used an ecological approach to the study of walking for different purposes.

Basing on previous ecological models of physical activity (Sallis, Bauman, & Pratt, 1998; Booth et al., 2001; Koplan et al., 2004), Sallis and colleagues (2006) proposed an ecological model of active living (Figure 16) in which four domains have been identified.

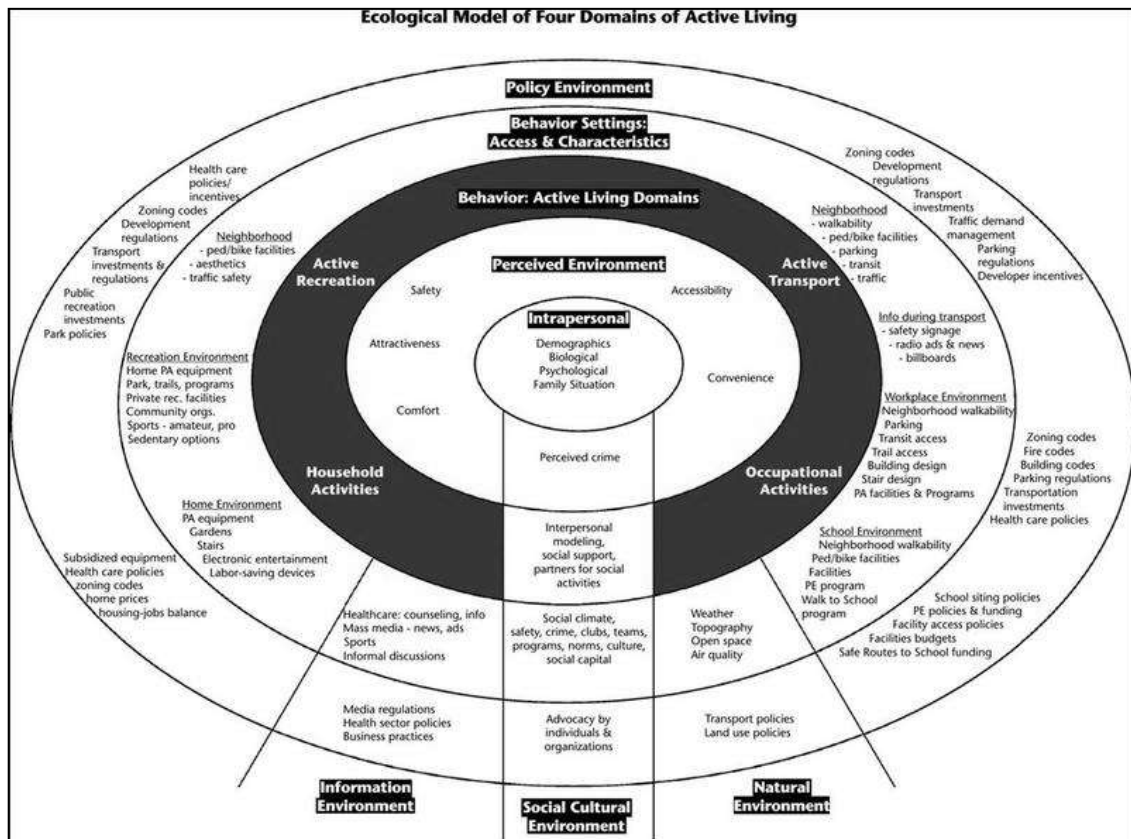


Figure 16 An ecological approach to creating active living communities (From Sallis et al., 2006)

The ecological model provides complete and complex theoretical framework to guide the investigation of multiple factors influencing active living, physical activity behaviour, and physical activity behaviour change. Examples of the social influences might include parents' support and teachers' support in the physical education classes. Environmental influences include factors such as the availability of physical activity facilities, the presence of sidewalks, and the safety of physical activity settings. Public policies might consist of laws, or regulations, or national plans that shape environmental or policy attributes conducive to physical activity.

For example, ecological model has been used to examine interactive relationships between personal and environmental factors, to understand when and how people initiate, adopt, and maintain physically active lifestyles (Green, Richard, & Potvin, 1996; Owen, Leslie, Salmon, & Fotheringham, 2000).

In addition, in the last decades several researches have supported the use of multidimensional ecological models as theoretical framework to identify specific correlates that may influence adults' physical activity (e.g., Addy et al., 2004; Ainsworth, Wilcox, Thompson, Richter, & Henderson, 2003; Ball, Bauman, Leslie, & Owen, 2001; Catlin, Simoes, & Brownson, 2003; De Bourdeaudhuij, Sallis, & Saelens, 2003; Young & Voorhees, 2003). For example, Addy and colleagues (2004) reported that perceptions of active neighbours, having access to sidewalks, and using malls were positively associated with regular walking. Additionally, good street lighting, and use of private and public recreational facilities, parks, and playgrounds, were associated with more likely to be physically active people.

Recent literature on physical activity focus on physical environment factors that facilitate active living, however it is widely recognized that further research, incorporating intrapersonal, interpersonal, environmental and policy factors, is needed to examine correlates and increase our understanding about interactions across levels of influence of physical activity behaviour (Sallis, Hovell, & Hofstetter, 1992; Sallis et al., 2006).

The adoption of an ecological model in investigating physical activity behaviours among school-aged children is an important next step in physical activity research.

In fact, there is limited empirical evidence of the application of the ecological model for physical activity behaviour among school-aged children (Welk, 1999). It would be fundamental to increase children's activity levels and achieve public health goals, and there is an emerging trend calling for ecological approaches investigations that incorporate individual, social, environmental and policy factors to add to the previous research paradigm of individual-focused influences on physical activity.

2.3 Physical activity parenting practice

Physical activity parenting practices refers to the behaviours and beliefs with which parents influence their children's physical activity. To provide the conceptual framework for family-based interventions to increase children's physical activity, it is necessary to deeply investigated physical activity parenting practice. Investigations

have shown different levels of parental influence on children's physical activity behaviours, but there is still a lack of rigorous measurement of physical activity parenting (Troost & McDonald, in press; Sleddens et al., 2012). Measures has been frequently of uncertain validity and reliability, developed in the context of a specific study and not applicable to other groups, and are poorly documented with little information on the items included or the scale's psychometric properties. Even if evidence has shown the influence of parents on children's physical activity behaviours (Edwardson & Gorely, 2010; Gustafson & Rhodes, 2006; Troost et al., 2003; Troost & Loprinzi, 2011; Beets, Cardinal, & Alderman, 2010; Welk, Wood, & Morss, 2003), the lack of rigor in research on parenting practice led to the consequence that (, results have not translated into effective family-based interventions (O'Connor, Jago, & Baranowski, 2009).

As it has been reported in chapter 1, children's physical activity is influenced by many factors, ranging from individual, social, and environmental variables. Family constitutes the most proximal source of influence just after biological and personal characteristics of children and youth. Family factors have been recognized as of prominent importance even if are influenced by developmental stage of the children (Duncan, Duncan, Strycker, & Chaumeton, 2004).

Considering the relevance of parenting in the field of education and of health education, it is an emergent need to better investigate parental correlates using an ecological approach. This need is justified by the necessity to implement health promotion program on children's physical activity with effective family-based interventions.

Speaking about parental influences, it is referring to all the factors underlined in the general paragraph on parenting. Specifically, referring to physical activity parenting, behaviours, attitudes, beliefs, demographic and psychological characteristics of parents are included. These parental factors are linked together and could exert both a direct or indirect effect on children's physical activity (Troost et al., 2003; Davison, Cutting, & Birch, 2003). Generally parental factors have been categorized in active or passive influences. Active influences could be encouragement and support, also in a logistic way. Passive influences could be constituted by parental modeling, SES, beliefs on

physical activity and attitudes of parents. The most investigated variables have been parent support and parental modeling.

For what concern parental modeling, the major hypothesis is that more active parents have more active children, basing on the social cognitive model proposed by Bandura (1986). Sallis and colleagues (2000) found that only 38% of the reviewed study reported a positive significant relationship between physical activity of children and parents. Gustafson and Rhodes (2006) reported similar results. The most of the studies reviewed have used questionnaires to measure physical activity, and they investigated the overall amount of physical activity. Heitzler and colleagues (2006) found that parents active together with their offspring resulted in a higher children's physical activity. Therefore Ferreira and colleagues' (2007) literature review showed inconsistent results about parental modeling positive outcomes, in the sense that published data has been not univocal.

Parent support refers to verbal encouragement to be more active, logistic support (e.g. provide transportation or paying physical activity fees), or provide accessibility for sport equipments at home. Generally parent support has been found as positively related to children's physical activity level (Adkins, Sherwood, Story, & Davis, 2004; Sallis et al., 2000; Gustafson & Rhodes, 2006): children more supported were also more active.

Evidence on physical activity parenting, considering differences in measurements and research designs, has been significant only for parental modeling and parent support, however also these results did not conduce to an unique conclusion. For this reason there is the urgent need to better operationalized physical activity parenting practice, and adopt ecological model of investigation considering the usefulness it has on physical activity behaviour research.

2.6 Latest recommendations on physical activity parenting research

In May 2012, researchers interested in physical activity parenting and its effect participated in a preconference workshop preceding the International Society for Behavioral Nutrition and Physical Activity (ISBNPA) annual meeting in Austin (TX).

The workshop focused on the state of the science of parenting research, and the physical activity parenting working group discussed about similarities and differences across parenting measures specific to diet and physical activity, current theoretical perspectives and their role in organizing the development of parenting measures (Davison et al., in press).

The first identified need has been to map research on physical activity parenting onto the more mature field of food parenting in order to unifying perspective or approach across all domains of parenting research.

The overarching themes that emerged during the working group discussions included:

- a) challenges in the measurement and conceptualization of physical activity parenting;
- b) possible explanations for these challenges;
- c) solutions that could realign physical activity parenting research and foster an integrated perspective.

Starting from the fragmented nature of physical activity parenting research both in regard to its measurement and its conceptualization, Trost and McDonald (in press) reported that up to 40% of studies do not cite any evidence of a scale's reliability and validity and many studies use modified instruments that have not been tested. As a result, there is little consistency in the operationalization of physical activity parenting. Therefore, there is a list of subdomains of physical activity parenting that are weakly measured and inconsistently labelled (e.g., modeling, explicit modeling, facilitation, logistic support, encouragement, general support, and guiding support) (Davison et al., in press).

Physical activity parenting has received less attention and is a less developed area of inquiry than food parenting. For example, there is reason to believe that physical activity parenting can have both positive and negative implications for children, however the negative implications of physical activity parenting have not been explored.

In addition, there is a notable absence of research on factors that could modify the relationship between physical activity parenting and child physical activity outcomes. For example, the effect of child and parent gender has received limited empirical attention. This is despite early indications that mothers and fathers may employ

different physical activity parenting strategies (Gustafson & Rhodes, 2006; Bauer, Nelson, Boutelle, & Neumark-Sztainer, 2008), that support may be provided differentially to boys and girls (Trost & Loprinzi, 2011), and that some parenting practices, such as encouragement, appear to be more influential when provided by a same-sex parent (Gustafson & Rhodes, 2006).

Additionally, influencing factors to consider include family composition, child temperament, child age, family demographic factors and cultural and national context. Furthermore, there is limited research on contextual factors that affect physical activity parenting. As a result, we know very little about policies and community and organizational contexts that might support positive physical activity parenting (Davison et al., in press).

The discussion of the working group focused on explanations for this haphazard approach to the operationalization and measurement of physical activity parenting. One possible explanation was identified in the general failure to utilize theory to develop and test physical activity parenting measures, and to examining determinants and outcomes of physical activity parenting.

According to Cronbach & Meehl (1955), establishing the construct validity of a scale requires investigators to:

- a) articulate a set of theoretical concepts and their interrelations;
- b) develop ways to measure the constructs outlined by the theory;
- c) test the hypothesized relations.

Thus, without a theory there is no construct validity.

Concerning underutilization of theory when examining determinants and outcomes of physical activity parenting, social cognitive theory (Bandura, 1986), self-determination theory (Ryan & Deci, 2000), the youth physical activity promotion model (Welk, 1999), and ecological models (Sallis et al, 2008) could be useful theories.

A second explanation for the indiscriminate approach to scale development is a lack of agreed-upon measurement standards. Citing the use of a scale by another study as evidence of the scale's reliability and validity, rather than studies with published evidence supporting a scale's psychometric properties, has become common practice in the physical activity parenting literature (Davison et al., in press).

Solutions to these challenges focused on the need to gain from general parenting and food parenting research and theory, promote recommended practices for rigorous scale development, and propose a model of physical activity parenting that integrates terminology adopted in general parenting research.

Pertinent constructs under general parenting are presented in Table 2.3, and a summary of these parenting dimensions and their history is provided in Powers (in press).

Responsiveness	
Encouragement	Parent provides positive comments about the value of PA, encourages child PA participation, and praise/reward child participation in PA.
Co-participation	Parent participates in activities with the child or vice versa.
Joint attention	Parent attends events where the child is physically active and watches the child participate or perform PA (i.e., is not reading a book or doing another activity)
Foster PA intrinsic motivation	Parent identifies and support aspects of physical activity that are pleasurable to the child
Autonomy support	Parent makes decisions about the child's involvement in PA based on input from the child
Demandingness	
Pressure	Parent pushes the child to be active beyond the child's interest or schedules child involvement in PA leaving little time for free play.
Criticism	Parent is overly critical or provides negative comments about child's PA
Monitoring	Parent keeps track of child's physical activity and compares it to a defined marker
Restriction	Parent prevents child from being active
Structure	
Family activity planning	Parent actively plans PA for the family (e.g., hiking activities etc...)
Facilitation	Parent creates opportunities for PA by enrolling the child in organized activities and providing transportation to recreational venues
Instruction	Parent teaches child how to play active games and sports.
Equipment access	Parent provides PA and sporting equipment.

Table 2.3 Parenting constructs and their application to physical activity (PA) parenting.

The constructs of responsiveness, demandingness and structure have been consistently used in the field of food parenting. Transferring them also to physical activity parenting research it is expected a conceptually consistent body of research and evidence from which to develop effective family-based interventions (Davison et al., in press).

Building on the development of the table 2.3, it has been mapped out precursors and outcomes of physical activity parenting reported in the literature, or supported by theory, to create a consolidated physical activity parenting framework (see Figure 18).

Looking first at links between parenting dimensions and child physical activity outcomes, research supports positive effects of responsiveness and structure on children's enjoyment of physical activity (Dowda et al., 2011), perceived competence (Pfeiffer, Dowda, McIver, & Pate, 2009), self-efficacy and motivation for physical activity (Gagne, Ryan, & Bargmann, 2003), active transport (Hohepa, Scragg, Schofield, Kolt, & Schaaf, 2007), outdoor playtime, and minutes of moderate-to-vigorous physical activity (MVPA) (Davison et al., 2012).

In contrast, there is preliminary evidence suggesting that demandingness or control are linked with negative physical activity outcomes such as decreases in children's enjoyment of physical activity.

Moving to parent physical activity attributes and perceptions, research suggests that parents who are more active, who value and enjoy physical activity, and who have high self-efficacy to promote child physical activity are more likely to adopt physical activity parenting practices that promote child physical activity (Dowda et al., 2011).

An ecological framework was added to the model to emphasize that families are embedded within contexts which have bidirectional implications when working with families to address physical activity parenting. However research on links between ecological factors and physical activity parenting is in its infancy. Furthermore, historical context - which includes parents' physical activity history and physical activity-related experiences within their family of origin - was added to the model as a precursor to parents' physical activity attributes.

Additional moderators outlined (e.g., parent and child gender and age, child temperament, and family race/ethnicity, income and country or region) are consistent with social cognitive theory.

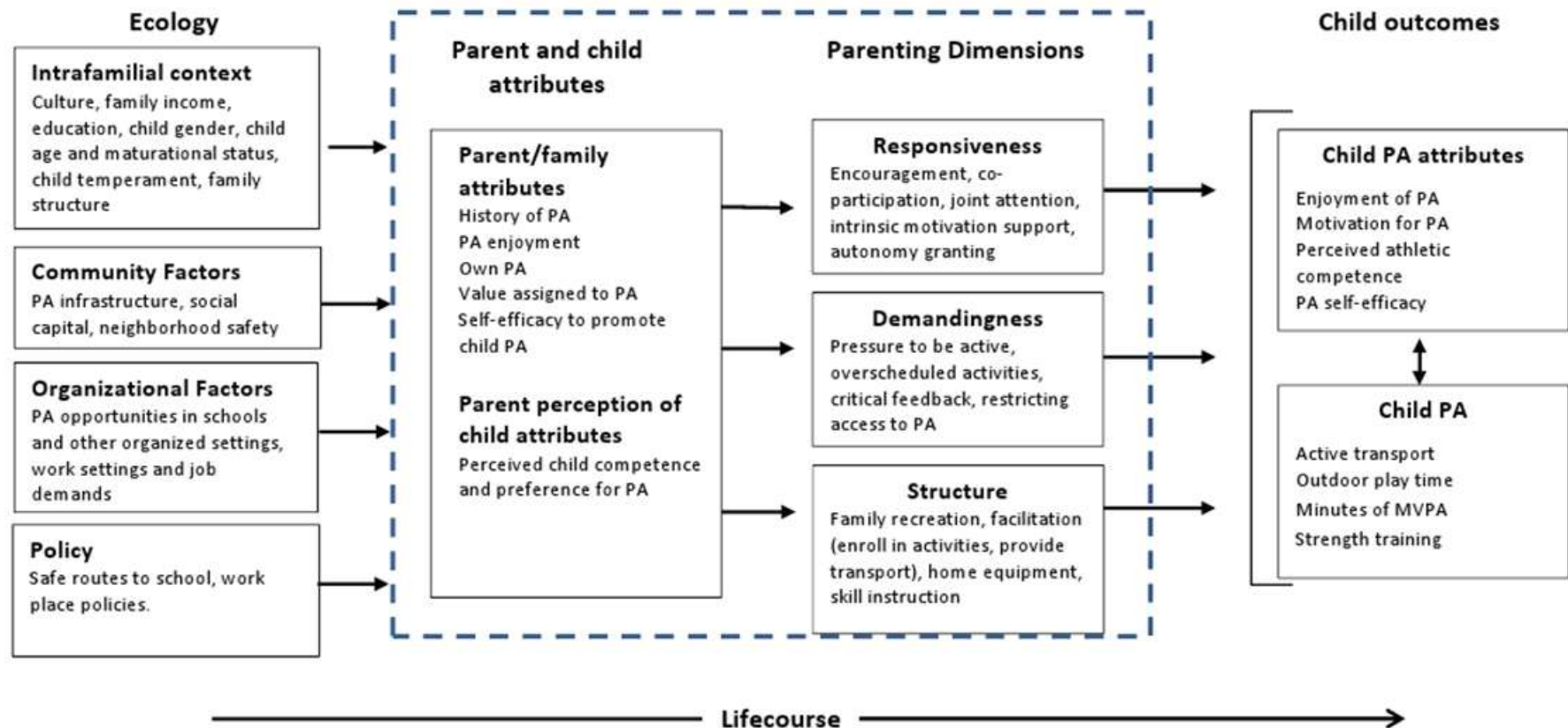


Figure 17 conceptual model linking physical activity parenting and its dimensions, precursors and outcomes (from Davison et al., in press).

Trost and McDonald (in press) highlighted the need to develop comprehensive and multidimensional measures of physical activity parenting that have evidence of factorial validity, factorial invariance and sensitivity to change.

Authors recommend that investigators:

1. only use measures that have evidence of validity and reliability in the population under study;
2. conduct the appropriate analyses to confirm a scale's validity and reliability when developing new measures, modifying existing measures, or using a validated measure in a different population;
3. cite methodological studies that report the psychometric properties of the measure utilized;
4. comprehensively describe scale and item properties when developing a new scale.

Working group add to this list the need to utilize theory to structure scale development and the need to employ a broad range of methods, including qualitative methods, throughout the scale development process (Davison et al., in press).

The model builds on prior research, integrates theory, links physical activity parenting to general parenting research, and encourages exploration of the roles of gender, culture, context, and life stage. Also, given that food parenting research has already integrated parenting constructs, the model will serve to calibrate physical activity parenting and food parenting research, which in turn will benefit family-based interventions.

The aim was not to imply that this is the only model of physical activity parenting that should be adopted moving forward or that researchers should endeavour to test the model as a whole. Rather, the model is one example of how theory and prior research can inform a macro, or higher-order, representation of physical activity parenting and guide its future conceptualization, measurement, and research.

Finally, it is recommended to test the proposed structure of physical activity parenting, develop and validate corresponding measures, test relationships outlined in the conceptual model, and utilize the results to refine the model as needed.

Cap. 3

PRELIMINARY RESEARCHES

In this chapter are summarized two preliminary researches carried out in order to do a first step validation of the Physical Activity Questionnaire for Older Children (PAQ-C), and of parental support scale. Then it has been carried out a first exploratory research on parents' role in physical activity of their offspring.

The PAQ-C is a widely used self-report measure designed to assess habitual moderate to vigorous physical activity levels of school aged children from grades fourth to eighth. It has been conducted a back translation and an Italian adaptation.

Statistical results of descriptive analysis of items were examined separately for boys and girls as well as for the total group.

The exploratory research on parental influences on children's physical activity was carried out in order to test the reliability of the instruments, and correlations among variables. This research was mainly aimed to adjust and implement the following comparative research project on the basis of the obtained results.

3.1 Introduction

Investigating in the field of health education the phenomenon of physical activity parenting is strongly recommended. However, after having considered scientific literature of possible theoretical frameworks and involved variables, it is necessary to explore the availability of the measurements. It is of fundamental importance to choose instruments directed to measuring right data, meeting the requirements of the objectives of the research.

Studying a phenomenon such as that of physical activity parenting, it is of primary importance to have available instruments directed to measuring the principal outcome: children's physical activity behaviour.

In recent literature it is underlined the call for adoption of objective measure of physical activity, however the use of self-report instruments are still the most used in large population studies because of their cost-effectiveness.

To date in Italy there is no validated questionnaires, internationally recognized, aimed at the investigation of physical activity levels among children.

Considering that in Italy, specific research on physical activity parenting has not been carried out, also instruments aimed at measuring parental support have not been developed both for children and parents.

In order to conduct, in the Italian context, a first step validation study of instruments that lead investigations in the field of physical activity parenting, questionnaires about children's physical activity and parental support were screened.

The Physical Activity Questionnaire for Older Children (PAQ-C, Crocker, Bailey, Faulkner, Kowalski, & McGrath, 1997) is a questionnaire designed to assess habitual MVPA levels of school aged children from grades fourth to eighth. It has been widely used in children's physical activity research, and it is specific related to the year school time (it is season specific: spring, autumn, and winter). It is of simple understanding and it is possible to administrate it also in a group-based situation. In a recent review on physical activity questionnaires for children, it was identified as a promising questionnaire evaluated in multiple studies (Chinapaw, Mokkink, Poppel, Mechelen, & Terwee, 2010). For these reasons PAQ-C appeared to be a good instrument to administer to Italian children too for collecting data about self-report physical activity.

Concerning measurements about parental influences, it has been difficult to find comprehensive instruments with good psychometric characteristics and reliability, and directed to collect data comparable with other research findings. This is a consequence of the lack of research in the field of physical activity parenting. Study findings are generally difficult to compare because instruments vary among investigations, reporting data for different constructs.

However, starting from the assumption that parental support has been reported as one of the factor that could majorly influence children's physical activity together with parental modeling, questionnaires on parent support have been screened. The research carried out by Trost and colleagues (2003) reported parental support for and parental importance of physical activity. They used the same measures applied in the International Life Science Institute national phone survey (Sallis, Prochaska, Taylor, Hill, & Geraci, 1999). It is important to underline that the parental support scale could be administered as a parent-report survey (i.e Trost et al., 2003) or a child-report survey (Prochaska, Rodgers, & Sallis, 2002). For these reasons it has been decided that these measurements could be applied also among Italian group, in order to begin to study physical activity parenting influences. Recently, in a review (Sleddens et al., 2012) of existing physical activity parenting questionnaires, it has been reported that the parental support scale originally developed by Sallis and colleagues has been the most used, highlighting its validity, and psychometric performance.

Italian versions of the PAQ-C, parental support scale, both for parents and children, and perception of importance were obtained by means of a back translation procedure and of a cultural adaptation, and they were administered to a large group of children and parents in order to investigate statistical reliability.

The primary objective of this preliminary study was to explore questionnaires validity in Italian population, then to use the instruments in subsequent research aimed at the investigation of parental influences.

Thus, the Italian PAQ-C and parenting questionnaires have been used in a second exploratory research with a group of children and parents studying physical activity parenting practice, involving 4th and 5th grade children and both their parents. The major objective of this second preliminary research was to investigate reliability of the

questionnaires used and looking at correlated variables between children and parents in order to adjust or implement the research program on the basis of results.

To design effective family-based interventions to promote physical activity among children, a clear understanding of how parents influence their children's physical activity behaviour is required. Scientific literature related to parental correlates of activity behaviour in children is still limited and reports inconclusive findings. Moreover to date, in Italy, none research has addressed the psychosocial correlates of children's physical activity.

Given the urgent need for a better understanding of how parents can promote physical activity in children, the purpose of this exploratory research was to investigate the Italian trends about parental correlates using an adaptation of the conceptual model proposed by Trost and colleagues (2003). This model linked parental physical activity orientations (parental physical activity, parental enjoyment of physical activity, perceived importance of physical activity), parental support for physical activity, with children's participation in physical activity. It has been adapted as in Figure 19: perceived parental support and enjoyment during physical activity were added among children psycho-social factors. In particular perceived support belongs to social environmental variables and enjoyment to individual factor, according to the social cognitive theory.

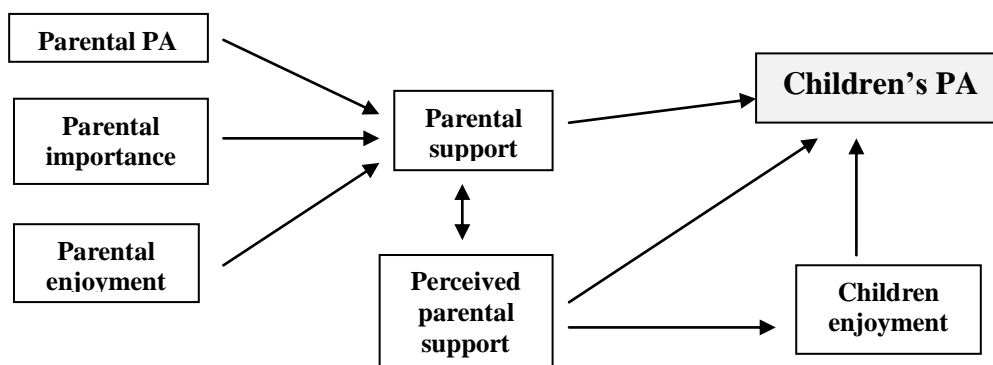


Figure 19 Adapted model from Trost and colleagues (2003) used in the preliminary research.

It has been hypothesized that parents with favourable orientations (enjoyment and importance) towards physical activity would provide greater levels of support for physical activity which, in turn, results in greater participation in children's physical activity.

3.2 Method

The research was organized in two phases, for this reason it is possible to speak about a preliminary research about the first step validation study of the PAQ-C and parental scales, and a second moment consisting in a exploratory research on parental influences on children's physical activity behaviour.

Concerning the preliminary study it was involved a group of 4th and 5th grade children, that completed the Italian version of the PAQ-C during a physical education lesson, with a class administration method, in April 2010.

General test score characteristics of the Italian version of the PAQ-C were investigated. Descriptive analysis of items were examined separately for boys and girls as well as for the total group. Statistical analyses were conducted on the basis of the original first validation study by Crocker and colleagues (1997).

In the exploratory study on parental influences in children's physical activity, children of 4th and 5th grade and both their parents were involved. Children filled in a package of questionnaires in classroom, with a grouped-based administration. Questionnaires included demographic and personal information, the PAQ-C, and questions on psychosocial influencing factors of physical activity behaviour. Questionnaires for parents have been sent at home through the children, and parents were asked to give filled in questionnaires back within 4 days. Data were analysed associating each child's scores with those of their parents, in order to investigate parents' influence on children's physical activity behaviour.

3.2.1 Participants

In the preliminary research on the first step validation study of the PAQ-C, 1143 children of five primary schools participated. Students who indicated that they did not

perform the normal physical activity during previous week were excluded from the analysis. The final considered group consisted of 576 boys and 517 girls (N = 1093) with a mean age of 9.3 years (SD = 0.6 years).

For the group of parents, 1795 took part in the research (mothers $n = 938$, and fathers $n = 857$), and completed the parental support scale.

In the exploratory research on parental influences, a group of 282 4th and 5th grade children (boys=137, girls=145) of two primary schools in the North-east of Italy and their two parents (N=564) participated in the research. Children's and parents' mean age was 10.5 years (SD = 0.6) and 41.3 years (SD = 8.9) respectively.

The purpose of the study was explained to school principals and teachers to obtain permission to conduct the investigation. Parents provided informed consents for children to participate and their agreement to take part in the research.

3.2.2 Materials

Children that took part in the first preliminary study completed the Italian version of the PAQ-C and of parental support scale for children (perceived parental support scale, PPSS). Parents completed an Italian version of the parental support scale (PSS).

Children and parents that participated in the second exploratory study on parental influences completed a package of questionnaires that included demographic information and questionnaires to investigate variables highlighted in the model (Figure 19).

Follows a brief description of the questionnaire that have been used:

Demographic and personal information

Children's demographic information included age and gender, and as personal information it was asked if they were member of a sports club (yes/no), and how much important they valued physical activity (anchors from 1 to 10), using the questions from the HBSC study. Moreover, as important variable of modeling, children were asked how often their mother and father exercised during a week, corresponding to the perceived parental physical activity (frequency Likert scale from 1 to 5).

Parents reported data for gender, age, and level of education. For what concern physical activity they were asked to indicate if they did/do it (yes/no) and the level of their past

and present physical activity (choosing between recreational, competitive or professional).

Parents' perceived importance of children physical activity was recorded on a 5-point scale with endpoints ranging from 1 (very unimportant) to 5 (very important).

The Physical Activity Questionnaire for Older Children (PAQ-C)

It is a 7-day recall instrument, consists of 10 items and it lastly scores by means of 9 items between 1 (low physical activity) and 5 (high physical activity). The first question is an activity checklist of common sports and games, other six questions assess physical activity in specific moment of the previous week: physical education lesson, recess, lunch time, right after school, in the evening, and during the weekend. The eighth question asks which statements "describes you best for the last 7 days", and the last question is a frequency checklist on physical activity of the previous week. The tenth question, not useful for the scoring, asks children if something prevents them from doing their regular physical activity.

The Parental Support

The *Perceived Parental Support Scale (PPSS)*, corresponding to the child-report survey, consists of five items assessing parental encouragement, praise, transportation to physical activity setting, physical activity participation with the child together, and watching the child's participation in physical activity or sport. Frequency of perceived support was rated on a 5-point scale ranging from never to every day.

The parent-report survey consists in the *Parental Support Scale (PSS)*, a five-item scale that assess the weekly frequency with which parents "encouraged their child to do physical activities or play sports", "done a physical activity or played sports with their child", "provided transportation so their child could go to a place where he or she can do physical activities or play sports", "watched their child participate in physical activity or sport", and "told their child that physical activity is good for his or her health". Responses range from none to daily.

The Physical Activity Enjoyment Scale (PACES)

Children's and parents' enjoyment of physical activity was assessed using PACES (Motl et al., 2001; Italian version by Carraro, Young & Robazza, 2008). It is a 16-item scale with ratings on a 5-point Likerttype scale that ranges from 1 ("Disagree a lot") to 5 ("Agree a lot"). The stem for each item is "When I am active ...", with nine items

positive (e.g. “I enjoy it”, “I find it pleasurable”, “It gives me energy”), and seven items negative (e.g. “I feel bored”, “I dislike it”, “It’s no fun at all”). Final total score range from 16 to 80, with higher scores corresponding to higher perception of enjoyment during physical activity.

3.3 Results and discussion

Results of the preliminary study

As in the study of Crocker and colleagues (1997) the first item reported a low mean and variance and the physical education item reported a high mean (Table 3.1).

		Girls (<i>n</i> = 517)		Boys (<i>n</i> = 576)		All (N = 1093)	
		Mean	SD	Mean	SD	Mean	SD
Checklist	PAQ-C_1	1.78	.38	1.82	.41	1.80	.40
PE class	PAQ-C_2	3.86	1.17	4.07	1.07	3.97	1.12
Recess	PAQ-C_3	3.70	1.18	4.05	1.19	3.88	1.20
Lunch	PAQ-C_4	2.67	1.39	2.85	1.55	2.76	1.48
After school	PAQ-C_5	3.15	1.14	3.44	1.2	3.30	1.18
Evenings	PAQ-C_6	2.45	1.20	2.70	1.32	2.58	1.27
Weekend	PAQ-C_7	2.81	1.26	3.07	1.34	2.95	1.31
Description	PAQ-C_8	2.94	1.24	3.28	1.27	3.12	1.27
Week Summary	PAQ-C_9	2.99	.90	3.23	.97	3.12	.95
PAQ-C	PAQ-C_TOT	2.93	.66	3.17	.65	3.05	.67

Table 3.1 Means and SD for individual items and total PAQ-C, for girls, boys and all group.

Concerning the gender effect also in the Italian sample it was statistically significant as reported by the MANOVA (Wilks Lambda = 0.957; $p < .001$). A univariate ANOVA shown significant differences on all items’ scores with boys scoring higher than girls (p

< .01 on all item with exception for item 4 with $p < .05$) with exception for the first item in which boys and girls reported similar values (Table 3.2).

		df	Mean Square	F	p
PAQ-C_1	Between Groups	1	.363	2.299	.130
PAQ-C_2	Between Groups	1	11.627	9.309	.002
PAQ-C_3	Between Groups	1	33.112	23.540	.000
PAQ-C_4	Between Groups	1	8.819	4.050	.044
PAQ-C_5	Between Groups	1	23.545	17.139	.000
PAQ-C_6	Between Groups	1	17.125	10.697	.001
PAQ-C_7	Between Groups	1	18.004	10.652	.001
PAQ-C_8	Between Groups	1	32.444	20.492	.000
PAQ-C_9	Between Groups	1	16.401	18.575	.000

Table 3.2 Results of the ANOVAs on the differences by gender.

An independent sample t-test reported boys' PAQ-C values significantly higher than girls' ones ($t(1091) = 6.04, p < .01$). Scale reliability for girls ($\alpha = .76$), boys ($\alpha = .71$) and total group ($\alpha = .74$) was acceptable, and corrected item-total scale correlations were higher than .30 for almost all items, both for total and divided by gender analysis (Table 3.3).

		Girls (<i>n</i> = 517)	Boys (<i>n</i> = 576)	All (<i>N</i> = 1093)	α if Item Deleted All (<i>N</i> = 1093)
Checklist	PAQ-C_1	.56	.46	.50	.732
PE class	PAQ-C_2	.24	.26	.26	.745
Recess	PAQ-C_3	.33	.21	.28	.743
Lunch	PAQ-C_4	.26	.21	.24	.760
After school	PAQ-C_5	.53	.46	.50	.706
Evenings	PAQ-C_6	.51	.47	.49	.706
Weekend	PAQ-C_7	.56	.49	.53	.700
Description	PAQ-C_8	.61	.60	.61	.683
Week Summary	PAQ-C_9	.64	.61	.63	.692
MEAN		.47	.42	.45	

Table 3.3 Corrected item-total scale correlations and Cronbach's α if item deleted.

The Italian version of the PAQ-C resulted homogeneous with the original version and could be useful in assessing the habitual moderate to vigorous physical activity among large population studies. However further research is necessary to confirm the reliability of the questionnaire for example in a 1-week test-retest administration and over a year period.

For what concern the parental support, descriptive statistics for boys, girls and all group are presented in table 3.4, and in table 3.5 for parents.

		Girls (n = 517)		Boys (n = 576)		All (N = 1093)	
		Mean	SD	Mean	SD	Mean	SD
Encouragement	PPS_1	2.5	1.5	2.4	1.5	2.5	1.5
PA with	PPS_2	1.9	1.2	2.1	1.3	1.9	1.3
Transport	PPS_3	2.8	1.4	2.9	1.5	2.9	1.5
Watching	PPS_4	2.6	1.4	2.8	1.6	2.7	1.5
Telling	PPS_5	3.7	1.5	3.4	1.6	3.5	1.6
TOTAL	PPS_TOT	2.7	.9	2.7	.9	2.7	.9

Table 3.4 Means and SD for individual items and total PPS (perceived parental support), for girls, boys and all group.

		Mothers (n = 938)		Fathers (n = 857)		All (N = 1795)	
		Mean	SD	Mean	SD	Mean	SD
Encouragement	PS_1	2.9	1.4	2.7	1.4	2.8	1.4
PA with	PS_2	1.6	.9	1.7	.9	1.6	.9
Transport	PS_3	2.9	1.3	2.3	1.3	2.6	1.3
Watching	PS_4	2.6	1.3	2.3	1.3	2.5	1.3
Telling	PS_5	3.8	1.4	3.6	2.3	3.7	1.9
TOTAL	PS_TOT	2.7	.9	2.5	1.0	2.6	0.9

Table 3.5 Means and SD for individual items and total PS (parental support). for mothers, fathers, and all group of parents.

Cronbach alpha were quite acceptable for girls (.71), boys (.69), and for the total group of children (.70) in the perceived parental support scale, and no gender effect was reported. Moreover, Cronbach alpha were acceptable for mothers (.77), fathers (.70), and for all the group of parents (.73) in the parental support scale. Analysis of variance showed a gender effect ($F(1, 1793)= 21.8; p < .001$) with mothers scoring higher than fathers.

Results of the preliminary parental influences study

Children reported to be member of a sports club in the 80% of the cases. to be no more a member for the 6%. and to not be a member in the 14% of the cases.

Descriptive statistics of questionnaires scores for children and parents are presented in Table 3.6 and 3.7 respectively. No gender differences were found in children's variables.

	α	All (N = 282)		Boys (n = 137)		Girls (n = 145)		p
		Mean	SD	Mean	SD	Mean	SD	
IMPORTANCE	-	8.9	2.1	9,0	2,2	8,8	1,9	n.s.
PPS	.71	2.7	1.1	2,6	1,2	2,7	1,2	n.s.
PAQ-C	.76	2.7	.6	2,7	.6	2,6	,6	n.s.
PACES	.82	71.0	7.7	70,8	7,9	71,1	7,6	n.s.

Table 3.6 Descriptive statistics for children's questionnaires. PPS = perceived parental support; PAQ-C = physical activity questionnaire for older children; PACES = physical activity enjoyment scale.

	α	Min	Max	Mean	SD
Importance DAD	-	1	5	4.4	.7
Importance MUM	-	2	5	4.3	.7
PS DAD	.78	1	5	2.4	1.0
PS MUM	.75	1	5	2.6	.9
PACES DAD	.86	37	80	68.2	7.5
PACES MUM	.89	34	80	67.4	7.6

Table 3.7 Descriptive statistics for parents' questionnaires. PS = parental support; PACES = physical activity enjoyment scale.

Positive associations (Table 3.8) were found between children’s physical activity and children’s personal variables such as enjoyment of physical activity, perceived parental support, and importance of practising sport ($p < .001$).

		IMPORTANCE	PPS	PAQ-C
PPS	Pearson Correlation	.261		
	Sig. (2-tailed)	.000		
PAQ-C	Pearson Correlation	.359	.414	
	Sig. (2-tailed)	.000	.000	
PACES	Pearson Correlation	.392	.264	.397
	Sig. (2-tailed)	.000	.000	.000

Table 3.8 Pearson Correlation on children’s variables. PPS = perceived parental support; PAQ-C = physical activity questionnaire for older children; PACES = physical activity enjoyment scale.

In addition, positive associations (table 3.9) were found between children physical activity and parental correlates: father’s and mother’s support ($p < .01$) and mother’s belief of sport importance ($p < .05$).

		Importance mother	PS father	PS mother
PAQ-C	Pearson Correlation	.132	.225	.162
	Sig. (2-tailed)	.027	.000	.006

Table 3.8 Pearson Correlation between children’s physical activity and parental variables. PS = parental support; PA = physical activity.

Since no gender differences were found in children’s variables, ANOVA analyses were conducted in all the group of children. Some determinants appeared to be involved in children physical activity (table 3.10): father’s physical activity ($p < .05$), perception of father’s and mother’s quantity of physical activity ($p < .05$), and father’s physical activity in the past ($p < .05$).

Correlates	Children's outcomes	df	ANOVA F	p value
Education FATHER	PA	3, 278	1.072	n.s.
	PPS	3, 278	1.386	n.s.
	EN	3, 278	.319	n.s.
	IMP	3, 278	.102	n.s.
Education MOTHER	PA	3, 278	.809	n.s.
	PPS	3, 278	.806	n.s.
	EN	3, 278	.69	n.s.
	IMP	3, 278	.654	n.s.
PA FATHER	PA	1, 280	5.04	.03
	PPS	1, 280	1.922	n.s.
	EN	1, 280	.11	n.s.
	IMP	1, 280	9.067	.003.
PA MOTHER	PA	1, 280	1.211	n.s.
	PPS	1, 280	1.702	n.s.
	EN	1, 280	1.446	n.s.
	IMP	1, 280	.159	n.s.
Perception of FATHER's sport	PA	4, 277	5.488	.00
	PPS	4, 277	3.511	.01
	EN	4, 277	1.241	n.s.
	IMP	4, 277	1.965	n.s.
Perception of MOTHER's sport	PA	4, 277	2.652	.03
	PPS	4, 277	3.719	.01
	EN	4, 277	2.26	n.s.
	IMP	4, 277	1.803	n.s.
PA past FATHER	PA	1, 280	12.247	.00
	PPS	1, 280	2.086	n.s.
	EN	1, 280	6.54	.01
	IMP	1, 280	1.07	n.s.
PA past MOTHER	PA	1, 280	.411	n.s.
	PPS	1, 280	2.151	n.s.
	EN	1, 280	.613	n.s.
	IMP	1, 280	1.675	n.s.

Table 3.10 Results of ANOVAs for correlates of children's physical activity (PA). perceived parental support (PPS), enjoyment (EN), and importance (IMP).

Looking at the results, children's physical activity appeared to be positively associated with children's enjoyment, value of importance and perceived parental support. So children that perceived more support or with a more favourable thinking on physical activity are more likely to be involved in sports or physical activity in the leisure time. These findings are similar to the overviewed scientific literature (Adkins et al., 2004; Sallis et al., 2000; Gustafson & Rhodes, 2006): children more supported were also more active.

It is important to underline that perceived parental support and children's importance were in turn determined by a more higher perception of mother's and father's practice of sport. The idea that children have on the practice of physical activity or sport of the parents constitutes the real factor linked to parental modeling. Thus, it seemed that direct modeling influenced physical activity quantity of children, and their perception of support.

According to literature (Biddle et al., 2011), father's role seemed to be more relevant in the determination of children's physical activity, with his physical activity practice both in the present and in a past time.

First of all, from results it is possible to support the use of the Italian version of the PAQ-C and the parental support scale both for child-survey and parent-survey.

These findings further sustain the notion that parental support is a key element in shaping physical activity levels in elementary school-aged children. Further research is needed in order to better investigate the phenomenon of physical activity parenting in a more comprehensive way, adopting for example an ecological model.

In a more general perspective, health promotion interventions should reinforce the importance of parents' role as well as supply safe and enjoyable opportunities for children to be active.

Cap. 4

A COMPARATIVE STUDY BETWEEN ITALY AND GERMANY

In this chapter a comparative research on physical activity parenting practice is explain. It has been carried out in order to explore parents' role in physical activity of their offspring with an ecological approach.

Basing on the results of the preliminary researches, some adjustments have been implemented in the research project.

First of all the investigation has been carried out in two European country, Italy and Germany, and children with both their parents have been involved.

Then more dimensions have been explored, adding important personal characteristics of children such as height and weight, SES and perceived environment accessibility and safety.

The more important variables implemented in this research has been the objective measure of children's and parents' physical activity, using a triaxial accelerometer. Results showed findings in line with the scientific literature, and further sustain the need of more comprehensive investigations in the field of physical activity parenting.

4.1 Introduction

Promoting regular physical activity participation among children is a public health priority and challenge (USDHHS 2000; 2008). In fact, despite well-documented health benefits of regular physical activity, often large percentages of school-aged children do not meet recommended and optimal levels of guidelines for health promotion. Moreover, engagement in regular physical activity during childhood can positively influence lifetime activity levels, and scientific evidence suggested that adult obesity often has its roots in childhood and adolescence and is influenced by early socialization mechanisms (Reilly et al., 2003). Thus, children's level of physical activity may impact on their future health and lifestyle, causing an impact not only in the fundamental health of people, but also in the economy of the community system. Health diseases often correspond to social costs.

Research on the correlates of children physical activity have explored personal, psychological, social, and environmental factors that influenced the behaviour in order to promote effective intervention strategies.

Several authors (Baumann et al., 2012; Biddle et al., 2011; Ferreira et al., 2006; Gustafson & Rhodes, 2006; Pugliese & Tinsley, 2007; Sallis et al., 2000) have reviewed research on correlates of children's physical activity, and it is widely acknowledged that parents play a significant role in shaping the physical activity behaviours of children.

The family has been considered an important agent of socialisation, also because children spend the majority of their time within the family during the formative years (Lau, Quadrel, & Hartman, 1990). Parents influence children teaching them skills and introducing beliefs that can help to shape important attitudes and behaviours associated with physical activity (McEloy, 2002). In fact, it has been reported that socialization of health-related behaviour occurs within the family, with parents' beliefs, attitudes, and behaviours (Tinsley, 2003).

More specifically, parents can influence their children's physical activity through numerous mechanisms, including support such as encouragement or transport and fee paying, beliefs and attitudes towards physical activity, role modeling, involvement and facilitation such as equipment accessibility at home.

Considering the potential influence that parents may have on their children's physical activity, a comprehensive understanding of how parents influence their children's behaviour is needed. This will implement family-based intervention programmes with educational cues to behave in the most effective way to increase children's physical activity and also to identify any areas for future research.

However to date no univocal results have been reported about parental influences on children's physical activity, and the main limitations could be represented by the use of different measurements, measures without good parametric performance, different constructs investigated, and the use of self-report rather than more direct measures of physical activity, such as accelerometers, on most of the studies. The need to examine the impact of both parents on children's physical activity using objective measures has been called for (Trost & McDonald, in press).

Another underrated factor in the field of parental influences on children's physical activity is that physical activity may be performed in different contexts. For example, children may participate in organised sports and other recreational activities in their leisure time which could be performed in formal and informal settings. The importance of the context has received more interest in the last years, by the applying of ecological framework to investigate children's physical activity correlates.

Also to have a full comprehension of physical activity parenting it is required to look at ecologies in which parenting takes place: family configuration, educational institutions, formal and informal support systems, physical environment (both natural and infrastructures), etc.,.

For these reasons it has been decided to carried out a research that investigates parental correlates with an ecological approach, in order to taking into account personal, cultural and environmental factors, using objective data and valid measurements.

It has been decided to carried out a comparative study in order to investigate the phenomenon of physical activity parenting in different cultural and national policies context. Italy and Germany have been chosen because of their similarity and differences about important factors. For example both countries adopt the WHO guidelines as health indication, and the trend about the fulfilment of the physical activity guidelines among youngsters is similar (see chapter 1). In contrast, primary school physical education is different. Germany is a country in which physical

education in primary school is taught by specialized teachers and they provide 3 hours per week of physical education. In Italy, primary school teachers are generalists and they teach physical education 1 or 2 hours per week.

Other differences could be identified in the physical environmental characteristics, with Germany equipped with cycle paths, parks and playgrounds, quite everywhere in the urban areas, while in Italy there is a lack of physical activity facilities.

Thus, it has been established a collaboration between the University of Padua and the University of Paderborn, in order to carried out a comparative study on parental correlates, with the same protocol and instruments.

To better investigate the phenomenon of physical activity parenting it has been chosen to involved 4th grade children for two main reasons. At that age children are still highly influenced by parents, while growing up it seemed that peers are more responsible for the social support and influence of behaviours (Eccles, 1999). Moreover, older children have major cognitive advances that facilitate their ability to report their attitudes and behaviours (Harter, 1999). Another secondary reason to choose 4th grade children is linked to the educational system of the countries involved, in fact primary school in Germany lasts till the 4th grade, so it could be of much variability to involve children of secondary level education.

In addition both parents have been involved in order to investigate possible gender differences in parental influences.

It is possible to identify three major objectives of the research:

- To examine the roles of supportive social environments (parents' role) and physical environments on children's active living, with an ecological approach;
- To compare Italian and German children's physical activity habits;
- To investigate what variables are strongly associated with higher rates of physical activity participation.

It has been hypothesized that parents with favourable orientations towards physical activity would provide greater levels of support for physical activity which, in turn, results in greater participation in physical activity of children.

4.2 Method

Children in grade 4th from primary schools in Italy and Germany and both their parents filled in a package of questionnaires and a subgroup wore an accelerometer for up to 7 days. The data collection took place during the spring in Italy and at the end of the summer in Germany, in order to have similar weather conditions.

Since available accelerometers were 30 devices, it was needed a time of about 10 days to collect data for 10 children with both their parents (20 people), consisting in 7-day registration time and 2 to 3 days to download data and recharge devices. Thus, collection of objective data took more than 3 months, but weather conditions were substantially similar across weeks and countries. Involvement of families occurred through the class teacher and with a preliminary meeting for parents to explain the intention of the research.

Questionnaires investigated children and parents' personal and psychological variables as shown in figure 20.

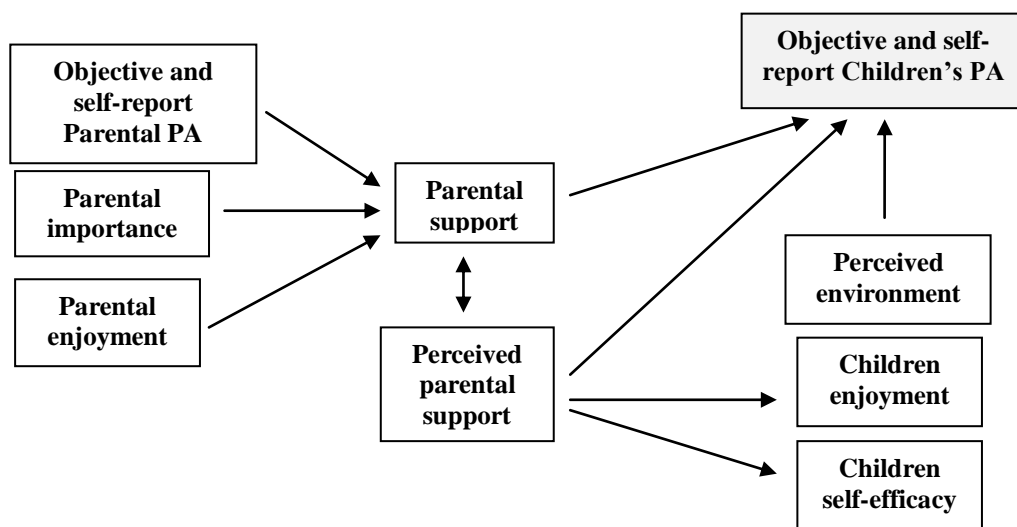


Figure 20 Adapted model from Trost and colleagues (2003) used in the comparative research.

In particular demographic information on age, gender, ethnicity and SES were collected among children. The most important outcome was physical activity, and individual factors collected were importance of physical activity, self-efficacy and enjoyment of

physical activity. The perceived accessibility and safety of equipment and environment was investigated as individual factor linked to the physical environment. While perceived parental support as social environmental factor. The perception of parents' physical activity constitutes the variables of the parental modeling.

Parental variables were self-report physical activity, weekly frequency of parental support, including encouragement and transportation, parental enjoyment and importance corresponding to beliefs and attitudes to physical activity.

4.2.1 Participants

Participants in this study were 215 children from the 4th grade, and living in the Veneto region, North-east part of Italy, and in the North Rhine-Westfalia region, North-west part of Germany. Children involved in the study were enrolled in public schools, located in the surrounding area of Padua (Italy) and Paderborn (Germany), and that offered physical education taught by generalist teachers in Italy while by certified physical education teachers in Germany. A brief description of the physical and social environmental characteristics are reported in table 4.1.

Characteristics	Italy	Germany
Certified PE teachers	no	yes
h/week of PE	1 or 2 h/week	3 h/week
Gym in the school	no	yes
Garden in the school	no	yes
Sidewalk to school	yes	yes
Cycle path to school	no	yes

Table 4.1 Social and physical major characteristics in Italian and German school environment.

All parents signed an inform consent to take part in the research and to allow the confidential treatment of the data.

Analyses were carried out after excluding data of children that do not meet inclusion criteria consisting in having data from both parents, and having valid wear time of the accelerometer. Final group of participants, consisted in a total 180 children from the 4th

grade (Italian $n = 87$ and German $n = 93$) and both their parents ($N = 360$). A subgroup of 84 children (Italian $n = 54$ and German $n = 30$) and both their parents carried out the objective measurement protocol with an accelerometer.

4.2.2 Accelerometer protocol and data reduction

Physical activity was objectively measured using the ActiGraph GT3X+ accelerometer (ActiGraph, LLC; Pensacola, FL). The GT3X+ is a small (4.6 cm x 3.3 cm x 1.5 cm), lightweight (19 grams) accelerometer-based motion sensor that records time varying accelerations ranging from +/- 6 g's. A sampling rate of 100 Hz was used in the current study.

Accelerometers were worn on the waist above the right hip using an elastic belt. Participants were instructed to wear the GT3X+ continuously during the 24 hour day, except while sleeping, bathing, or swimming, for 7 consecutive days.

Upon return of the GT3X+ unit, ActiGraph propriety software (ActiLife Version 5.10) was used to download and convert the raw acceleration data into activity counts per 15 seconds (epoch). Data were analyzed in order to establish wear time and time spent in sedentary (SED), light (LPA), and moderate-to-vigorous physical activity (MVPA).

Non-wear time was defined as intervals with at least 60 consecutive minutes of zero counts. Counts were classified into the different physical activity intensity categories using the cut-points developed by Evenson and colleagues (2008) that seemed to be the most accurate of all currently available ActiGraph cut-points for youth (Troost, Loprinzi, Moore, & Pfeiffer, 2011). A day was considered a "valid monitoring day" if daily wear time exceeded 9 hours.

4.2.3 Measures for children

Children filled in a package of questionnaires investigating demographic, personal, psychological, and social characteristics, in a group-based administration during a school-hour lesson (complete package in APPENDIX).

Then children's height and weight were measured using a portable stadiometer (SECA 213) and a portable digital scale (SECA 877). They were assessed just after the administration of the questionnaires, without shoes and wearing light clothing.

Follows a brief description of the questionnaire that have been used:

Demographic and personal information

Children's demographic information included age, gender, and ethnicity were investigated. Moreover using the questions from the HBSC study, it was asked if they were member of a sports club (yes/no), how much important they valued physical activity (anchors from 1 to 10), and, as important variable of modeling, children were asked how frequently their parents exercised during a week (frequency Likert scale from 1 to 5).

Socio-economic Status (SES)

As a measure of SES it has been used the Family Affluence Scale (FAS; Boyce, Torsheim, Currie, & Zambon, 2006) that is conceptually related to common consumption indices of material deprivation and home affluence. It is constituted of 4 items, asking children about things they are likely to know about in their family (car, bedrooms, vacations, computers). A composite score is calculated and it is possible to use a three point ordinal scale, where FAS low (final score 0,1,2) indicates low affluence, FAS medium (final score 3,4,5) indicates middle affluence, and FAS high (final score 6,7,8,9) indicates high affluence.

The Physical Activity Questionnaire for Older Children (PAQ-C)

The Physical Activity Questionnaire for Older Children (PAQ-C, Crocker et al., 1997) is a questionnaire designed to assess habitual MVPA levels of school aged children from grades fourth to eighth. It is a 7-day recall instrument, consists of 10 items and it lastly scores by means of 9 items between 1 (low physical activity) and 5 (high physical activity). The first question is an activity checklist of common sports and games, other six questions assess physical activity in specific moment of the previous week: physical education lesson, recess, lunch time, right after school, in the evening, and during the weekend. The eighth question asks which statements "describes you best for the last 7 days", and the last question is a frequency checklist on physical activity of the previous week. The tenth question, not useful for the scoring, asks children if something prevents them from doing their regular physical activity.

Perceived Parental Support (PPS)

The Perceived Parental Support (PPS; Prochaska et al., 2002) consists of five items assessing parental encouragement, praise, transportation to physical activity setting, physical activity participation with the child together, and watching the child's

participation in physical activity or sport. Frequency of perceived support referring to previous 7 days was rated on a 5-point scale ranging from never to every day.

The Physical Activity Enjoyment Scale (PACES)

Children's and parents' enjoyment of physical activity was assessed using PACES (Motl et al., 2001; Italian version by Carraro, Young & Robazza, 2008). It is a 16-item scale with ratings on a 5-point Likerttype scale that ranges from 1 ("Disagree a lot") to 5 ("Agree a lot"). The stem for each item is "When I am active ...", with nine items positive (e.g. "I enjoy it", "I find it pleasurable", "It gives me energy"), and seven items negative (e.g. "I feel bored", "I dislike it", "It's no fun at all"). Final total score range from 16 to 80, with higher scores corresponding to higher perception of enjoyment during physical activity.

Self-efficacy

A questionnaire developed by Motl and colleagues (2000) has been used. It is constituted of 8 item with answers recorded on a 5-point Likert scale that ranges from 1 ("Disagree a lot") to 5 ("Agree a lot"). It investigates children's self-efficacy in engaging in regular physical activity, and example items were "I can be physically active during my free time on most days", "I can be physically active during my free time on most days even if it is very hot or cold outside". Total score range from 8 to 40, with higher scores corresponding to higher self-efficacy.

Perceived Environment

The measure of perceived environment included four items (Motl et al., 2005), rated on a 5-point scale with anchors of 1 (Disagree a lot) and 5 (Agree a lot). The items were: (1) At home there are enough supplies and pieces of sports equipment (like balls, bicycles, skates) to use for physical activity; (2) There are playgrounds, parks, or gyms close to my home or that I can get to easily; (3) It is safe to walk or jog alone in my neighborhood during the day; and (4) It is difficult to walk or jog in my neighborhood because of things like traffic, no sidewalks, dogs, and gangs.

Item number four is a reverse-scored item. The scale is constituted of two factors: equipment accessibility (EAcc; items 1 and 2) and neighborhood safety (NSaf; items 3 and 4), both scoring from 2 to 10 with higher scores indicating more positive environment perception.

4.2.4 Measures for parents

Parents received package of questionnaires at home through their child, and they were asked to complete it and give it back to the school teacher in 4 days. The package included demographic and personal information, and questionnaires investigating physical activity quantity, parental support, and enjoyment of physical activity (complete package in APPENDIX).

Follows a brief description of the questionnaire that have been used:

Demographic and personal information

Parents reported data for gender, age, height, weight, and level of education. For what concern physical activity they were asked to indicate if they did/do it (yes/no) and the level of their past and present physical activity (choosing between recreational, competitive or professional).

Parents' perceived importance of children physical activity was recorded on a 5-point scale with endpoints ranging from 1 (very unimportant) to 5 (very important), according to Trost and colleagues (2003).

Baecke Physical Activity Questionnaire (BAECKE)

The Baecke Physical Activity Questionnaire (Baecke, Burema, & Frijters, 1982) consists of 16 questions organized in three subscales: physical activity at work (eight items), sport during leisure time (four items), and physical activity during leisure time excluding sport (four items). Questions are scored on a five-point Likert scale, ranging from 'never' to 'always' or 'very often'. The two most frequently reported sports are explored in additional questions about the number of months per year and hours per week of participation. The three subscales, work, sports, and leisure, are scored in arbitrary units ranging from one to five. Higher scores indicate a higher physical activity participation level. Among Italian group a version used by Perseghin and colleagues (2007) was used.

Parental Support (PS)

The Parental Support (PS) questionnaire (Trost et al., 2003) consists in a five-item scale that assess the weekly frequency with which parents "encouraged their child to do physical activities or play sports", "done a physical activity or played sports with their child", "provided transportation so their child could go to a place where he or she can do physical activities or play sports", "watched their child participate in physical

activity or sport”, and “told their child that physical activity is good for his or her health”. Responses range from none to daily (1 to 5) referring to previous 7 days.

Physical Activity Enjoyment Scale (PACES)

This questionnaire is the same of that used with children.

4.2.5 Statistical analysis

Data were analyzed using SPSS 19 software. Descriptive statistics for children’s and parents’ variables are provided. Then correlations between children individual factors are investigated, and correlations between children’s and parental source of influence basing on the model proposed in Figure 20.

ANOVA analysis of variance was conducted on children variables in order to identified correlates and determinant involved in the behaviour of physical activity.

Finally regression analyses were conducted on the dependent children’s physical activity, in order to explore possible causal association between factors.

Statistical significance was establish with $p < .05$.

Cap. 5

RESULTS

In this chapter data analyses are presented.

Descriptive analyses for children's and parents' variables are reported considering Italian and German subsamples.

Then to investigate physical activity parenting, correlation analyses are presented, and ANOVAs in order to explore which parental factors determine differences in children's outcomes differences between countries.

Finally results of regression analyses are presented to underline possible causal association between children's and parents' variables, explaining physical activity parenting.

5.1 Descriptive statistics

Italian children reported a mean age of 9.4 years (SD = 0.4 yrs) and German of 9.6 years (SD = 0.4 yrs). Mean anthropometric measures of children were 1.38 meters (SD = .06 m) and 34.6 kg (SD = 6.9Kg) among Italian; 1.44 meters (SD = .07 m) and 35.6 Kg (SD = 6.6 Kg) for German children. Mean demographic and anthropometric measures of parents, based on self-report information, are reported in table 5.1.

	Italy (n = 174)		Germany (n = 186)	
	Mothers	Fathers	Mothers	Fathers
Age (yrs)	41.4 (4.4.)	43.5 (4.2)	38.8 (5.8)	41.1 (5.7)
Weight (Kg)	61.9 (12.8)	79.6 (12.9)	68.7 (12.3)	87.1 (13.7)
Height (m)	1.65 (.06)	1.77 (.07)	1.68 (.07)	1.80 (.07)

Table 5.1 Descriptive statistics for demographic and anthropometric measures of parents.

Descriptive statistics of participants, divided in the Italian and German subgroups, are presented in Table 5.2 for children and in Table 5.3 for parents.

It is possible to note similar distribution for demographic characteristics of children, with exception for the transport to school, with German and Italian children showing opposite percentage in the use of an active or inactive way (69% vs. 29%). Moreover in the BMI categories, identified according to Cole and colleagues' indexes (2000), it is possible to see Italian percentage of overweight and obese children slightly higher than German ones (25% vs. 12%).

German parents appeared to be more active (55%) than Italian ones (34%). A different trend has been reported for the physical activity in the past, with Italian parents more involved in physical activity than German ones. When looking at the type of physical activity, it is reported that among German parents was more frequent a professional or competitive participation than for Italian parents, that seemed more involved in leisure time physical activities. For what concern educational level of parents it appeared similar percentage between Italian and German subgroups.

		Italy (n = 87)			Germany (n = 93)		
		Boys	Girls	%	Boys	Girls	%
Ethnicity	Non-immigrant	39	36	86%	31	35	71%
	Immigrant	8	4	14%	12	15	29%
FAS_category	Low	1	0	1%	0	1	1%
	Middle	12	10	25%	10	17	29%
	High	34	30	74%	33	32	70%
Sports club member	yes	38	32	80%	30	38	73%
	no more	7	7	16%	8	9	18%
	no	2	1	4%	5	3	9%
Way to school	Active	14	11	29%	27	37	69%
	Non-active	33	29	71%	16	13	31%
BMI	normal weight	34	31	75%	34	48	88%
	overweight	11	7	21%	9	1	11%
	obese	2	2	4%	0	1	1%

Table 5.2 Descriptive statistics of children.

		Italy (n = 174)			Germany (n = 186)		
		Mothers	Fathers	%	Mothers	Fathers	%
PA	yes	30	29	34%	55	48	55%
	no	57	58	66%	38	45	45%
PA level	recreational	29	22	86%	45	35	78%
	competitive	1	7	14%	10	9	18%
	professional	0	0	-	0	4	4%
past PA	yes	70	73	82%	64	71	73%
	no	17	14	18%	29	22	27%

Table 5.3 continued Descriptive statistics of parents. PA = physical activity; First sec. = first level of secondary school.

		Italy (n = 174)			Germany (n = 186)		
		Mothers	Fathers	%	Mothers	Fathers	%
past PA level	recreational	45	33	54%	31	21	39%
	competitive	19	36	38%	17	24	30%
	professional	6	4	8%	16	26	31%
Education	Elementary	0	0	-	0	1	1%
	Middle	20	28	28%	6	12	10%
	First Sec.	10	12	12%	8	10	10%
	High school	41	27	39%	55	44	53%
	Degree	16	20	21%	23	25	26%

Table 5.3 continued Descriptive statistics of parents. PA = physical activity; First sec. = first level of secondary school.

Others descriptive statistics for variables investigated with questionnaires are reported in table 5.4 for children and table 5.5a-b for parents, showing also Cronbach α for questionnaires. Since no gender differences have been found for children's questionnaires, data are presented for the total group.

	Italy (n = 87)			<i>p</i>	Germany (n = 93)		
	α	Mean	SD		α	Mean	SD
PAQ-C	.65	2.7	.6	< .001	.76	3.1	.6
PPS	.70	2.5	.8	n.s.	.71	2.6	.9
PACES	.86	71.5	6.7	n.s.	.92	72.9	8.8
Importance	-	9.4	1.1	.001	-	8.6	1.9
SELF-EFFICACY	.75	25.9	6.5	.001	.79	29.2	6.7
Equipment Accessibility	-	7.7	2.0	.001	-	8.7	1.8
Neighbourhood safety	-	6.4	2.9	< .001	-	8.6	2.0

Table 5.4 Descriptive statistics and Cronbach α for children's questionnaires. PAQ-C = Physical activity questionnaire for older children; PPS = Perceived parental support; PACES = Physical activity enjoyment scale.

	Italy (<i>n</i> = 87)			<i>p</i>	Germany (<i>n</i> = 93)		
	α	Mean	SD		α	Mean	SD
Importance	-	4.4	.5	.001	-	4.7	.6
PS	.65	2.8	.7	n.s.	.65	2.9	.6
PACES	.92	65.7	9.9	< .001	.94	71.7	9.5
Baecke							
Work	.86	2.8	.7	n.s.	.81	2.7	.7
Sport	.60	2.3	.6	< .001	.73	2.6	.6
Leisure time	.55	2.9	.7	n.s.	.61	2.9	.5

Table 5.5a Descriptive statistics and Cronbach α for mothers' questionnaires. PS = Parental support; PACES = Physical activity enjoyment scale.

Children, mothers, and fathers reported acceptable α in almost all questionnaires both in Italian and German subgroups. German children reported significantly higher values in self-report physical activity, importance of physical activity, self-efficacy and perception of environment.

A similar trend is shown in mothers' questionnaires results: German mothers reported significantly higher values on importance of physical activity, perception of enjoyment, and in the subscale "sport" of the Baecke questionnaire.

Italian and German fathers did not show any significant difference in questionnaires scores.

	Italy (<i>n</i> = 87)			<i>p</i>	Germany (<i>n</i> = 93)		
	α	Mean	SD		α	Mean	SD
Importance	-	4.5	.6	n.s.	-	4.5	.7
PS	.85	2.6	.9	n.s.	.82	2.6	.8
PACES	.92	68.0	8.3	n.s.	.91	70.3	8.4
Baecke							
Work	.89	2.8	.8	n.s.	.85	2.9	.8
Sport	.80	2.4	.8	n.s.	.81	2.5	.7
Leisure time	.65	2.7	.9	n.s.	.63	2.7	.6

Table 5.5a Descriptive statistics and Cronbach α for fathers' questionnaires. PS = Parental support; PACES = Physical activity enjoyment scale.

In addition to self-report measures, a subgroup of children and parents wore a triaxial accelerometer (GT3X+) for 7 consecutive days.

In figure 21 are reported results of mean minutes per day in the different intensities of sedentary (SED), light physical activity (LPA), and moderate to vigorous physical activity (MVPA) on the week days. Descriptive statistics are reported in table 5.7.

In figure 22 are represented results of mean minutes per day in the different intensities of sedentary (SED), light physical activity (LPA), and moderate to vigorous physical activity (MVPA) during the weekend days. Descriptive statistics are reported in table 5.8.

It is possible to observe that sedentary time is always higher among Italian subgroups, with only one exception. Moreover Italian population seemed to do not fulfil physical activity recommended level of the guidelines to health promotion.

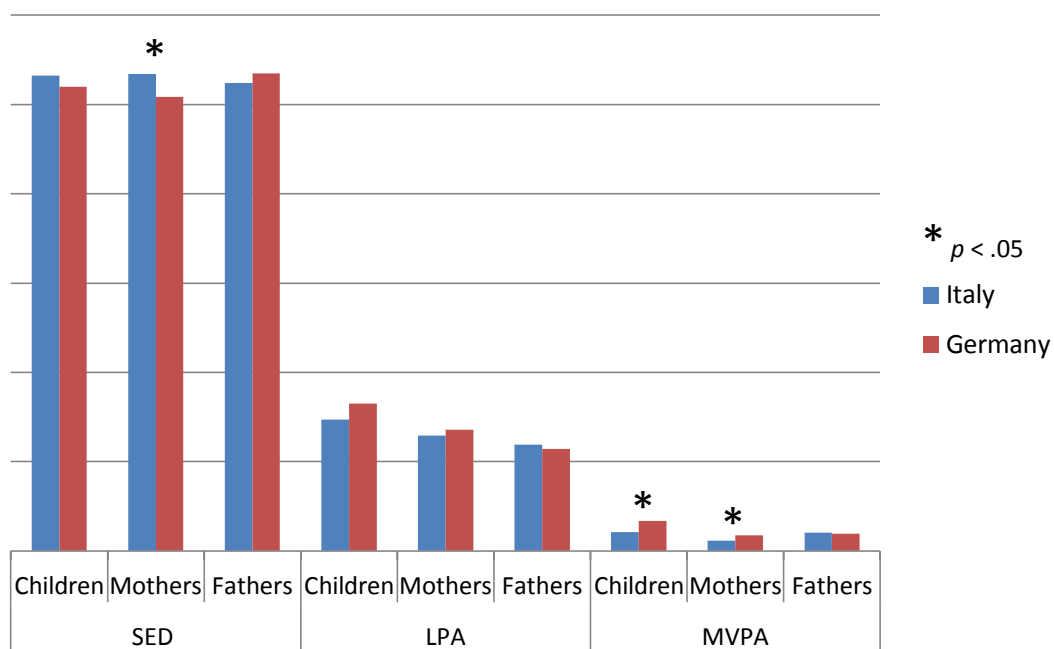


Figure 21 Mean minutes per day on week days of different physical activity intensities, for children, mothers and fathers.

Statistically significant differences have been found between Italian and German children’s quantity of MVPA during week days and weekend days, with German children registering more minutes of moderate to vigorous physical activity.

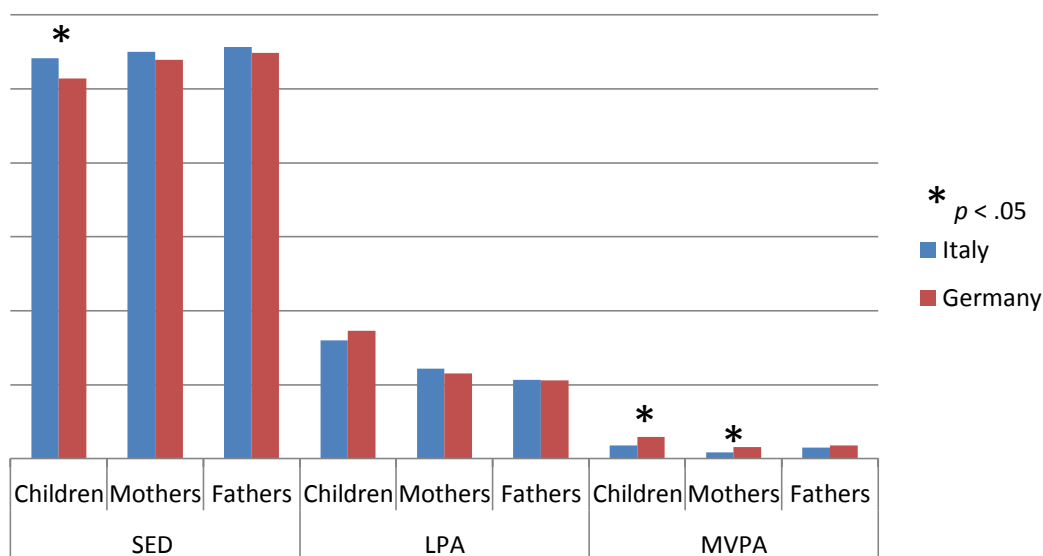


Figure 22 Mean minutes per day on weekend days of different physical activity intensities. for children, mothers and fathers.

The same findings have been reported for mothers, with German scoring higher.

In addition concerning sedentary time, it has been seen that Italian children significantly engaged for more time in inactivity period during the weekend in comparison with Germans. Italian mothers registered higher sedentary time during week days comparing to German mothers.

To better investigate children trends a gender specific means for MVPA are provided in table 5.6 considering that

	Italy (n = 54)		Germany (n = 30)	
	Girls	Boys	Girls	Boys
MVPA week days	16.4 (3.1) **	23.7 (4.6)	16.2 (4.2) *	29.8 (7.7)
MVPA weekends	23.2 (4.5) *	36.9 (7.1)	20.8 (5.4) *	33.3 (8.6)

Note. * $p < .05$; ** $p < .01$ in gender comparison.

Table 5.6 Gender specific means and standard deviations for MPVA of children.

	SED			LPA			MVPA		
	Children	Mothers	Fathers	Children	Mothers	Fathers	Children	Mothers	Fathers
Italy	1064.5	1068.7	1048.5	294.2	258.5	238.0	42.6	23.0	40.2
Germany	1040.3	1016.6	1069.7	330.0	271.9	228.1	66.8	35.1	38.0
<i>p</i>	n.s.	.02	n.s.	n.s.	n.s.	n.s.	< .001	.005	n.s.

Table 5.7 Mean minutes per day on week days of different physical activity intensities. for children. mothers and fathers

	SED			LPA			MVPA		
	Children	Mothers	Fathers	Children	Mothers	Fathers	Children	Mothers	Fathers
Italy	1083.3	1100.6	1113.3	320.1	243.6	213.4	36.6	17.0	30.1
Germany	1028.4	1078.8	1097.9	346.1	230.8	211.7	59.0	32.0	36.3
<i>p</i>	.02	n.s.	n.s.	n.s.	n.s.	n.s.	.003	.001	n.s.

Table 5.8 Mean minutes per day on weekend days of different physical activity intensities. for children. mothers and fathers.

5.2 Correlations

Bivariate correlations for sedentary and MVPA stratified by child and parent gender, are presented in table 5.9 for Italy and in table 5.10 for Germany. Positive and significant associations were found between daughters' and mother's sedentary time and between daughters' and fathers' MVPA time in the weekend days in Italian subgroup. Among German group, sons' and Fathers' MVPA in the weekend appeared to be positively and significantly associated.

Italy	SED			MVPA		
	Daughters	Sons	All	Daughters	Sons	All
Weekend						
Mothers	.41*	.05	.21	.10	.06	.10
Fathers	.04	-.22	-.10	.52**	.19	.29*
Week days						
Mothers	.12	.19	.20	.18	-.03	.06
Fathers	.02	.15	.10	.06	.31	.15

Note. * $p < .05$; ** $p < .01$

Table 5.9 Bivariate correlations (r) between children's, mothers', and fathers' sedentary and MVPA levels during weekend and week days, in Italian subgroup ($n = 54$).

Germany	SED			MVPA		
	Daughters	Sons	All	Daughters	Sons	All
Weekend						
Mothers	.04	.14	.24	-.34	.19	.11
Fathers	.35	.12	.26	-.18	.67**	.23
Week days						
Mothers	-.06	.15	.10	-.47	.47	.12
Fathers	-.05	-.20	-.17	-.38	.37	-.05

Note. * $p < .05$; ** $p < .01$

Table 5.10 Bivariate correlations (r) between children's, mothers', and fathers' sedentary and MVPA levels during weekend and week days, in German subgroup ($n = 30$).

By Pearson's correlation analysis, among German children positive associations were found between children's self-report physical activity (PAQ-C) and children's personal variables such as enjoyment of physical activity ($r = .51$), perceived parental support ($r = .33$), importance of practising sport ($r = .30$), self-efficacy ($r = .64$), perceived equipment accessibility ($r = .31$) and safety of neighbourhood ($r = .24$), with a statistical significance of $p < .01$. PAQ-C was also positively related to objective MVPA measured during the weekend days ($r = .49$; $p < .01$).

Positive associations were found also in Italian children subgroup, showing PAQ-C significantly correlated with children's personal variables such as enjoyment of physical activity ($r = .33$), perceived parental support ($r = .55$), importance of practising sport ($r = .24$), self-efficacy ($r = .47$), with a statistical significance of $p < .01$.

Others significant associations were found between children's variables (Table 5.11 for German results and Table 5.12 for Italian data).

		PPS	Self-efficacy	Eq Accessibility	NeighbSafety	PACES
Importance	Pearson Correlation	.289	.269	.260	.210	.458
	Sig. (2-tailed)	.005	.009	.012	.044	.000
PPS	Pearson Correlation		.363	.165	.101	.242
	Sig. (2-tailed)		.000	.114	.334	.020
Self-efficacy	Pearson Correlation			.432	.363	.522
	Sig. (2-tailed)			.000	.000	.000
Eq Accessibility	Pearson Correlation				.469	.186
	Sig. (2-tailed)				.000	.076
NeighbSafety	Pearson Correlation					.229
	Sig. (2-tailed)					.028

Table 5.11 Pearson Correlation on German children's variables. PPS = perceived parental support; PACES = physical activity enjoyment scale.

It is important to note self-efficacy correlates. Since it is supposed to be a mediator of the children's physical activity quantity, it is substantial that children's self-efficacy was positively and significantly associated with perceived parental support, environmental perception, and enjoyment of physical activity.

		Self-efficacy	PACES
PPS	Pearson Correlation	.215	.253
	Sig. (2-tailed)	.046	.018
Self-efficacy	Pearson Correlation		.345
	Sig. (2-tailed)		.001

Table 5.12 Pearson Correlation on Italian children’s variables. PPS = perceived parental support; PACES = physical activity enjoyment scale.

Looking at variables presented in the model that was intended to explore, it is meaningful to report bivariate correlations for children’s and parents’ psychosocial factors. In Table 5.13 and 5.14a-b are presented German and Italian results in significant association. Perceived parental support was significantly related to mother’s support and enjoyment, and children’s PAQ-C was positively related to mother’s support.

		Mother Support	Mother Enjoyment	Father Support
PPS	Pearson Correlation	.284	.370	.200
	Sig. (2-tailed)	.006	.000	.056
PAQ-C	Pearson Correlation	.204	.129	.269
	Sig. (2-tailed)	.050	.218	.010

Table 5.13 Pearson Correlation on German children’s variables. PPS = perceived parental support. Only significant correlations have been reported.

		Father Importance	Father Baecke Work	Father Support	Father Enjoyment
Importance	Pearson Correlation	.376	-.072	.299	.219
	Sig. (2-tailed)	.000	.505	.005	.042
PPS	Pearson Correlation	.336	-.301	.120	.366
	Sig. (2-tailed)	.001	.005	.268	.000
PAQ-C	Pearson Correlation	.326	-.163	.220	.337
	Sig. (2-tailed)	.002	.132	.041	.001
Self-efficacy	Pearson Correlation	.292	.077	.287	.086
	Sig. (2-tailed)	.006	.478	.007	.429
PACES	Pearson Correlation	.170	-.238	.296	.323
	Sig. (2-tailed)	.116	.026	.005	.002

Table 5.14a Pearson Correlation on Italian children’s variables and fathers’ variables. PPS = perceived parental support. PACES = physical activity enjoyment scale.

		Mother Importance	Mother Support
Importance	Pearson Correlation	.306	.280
	Sig. (2-tailed)	.004	.009
Self-efficacy	Pearson Correlation	.141	.254
	Sig. (2-tailed)	.144	.018

Table 5.14b Pearson Correlation on Italian children’s variables and mothers’ variables.

5.3 ANOVAs

ANOVA analyses were conducted for children data by parental characteristics, such as mother and father educational level, SES, physical activity practice in the present and in the past, and the perception of parental physical activity.

Children’s dependent variables investigated were self-report physical activity (PAQ-C) and objective measured MVPA, importance of physical activity, perceived parental support, self-efficacy and enjoyment of physical activity.

Analyses were conducted both among Italian and German subgroup, and statistically significant findings have been reported in table 5.15 for Italian group of children.

In particular among Italian group, level of education of fathers influenced MVPA on the weekdays: offspring of fathers with middle school level of education practiced more physical activity in the weekend days than offspring of fathers with high education and degree level. Education of mothers seemed to have a role in enjoyment with higher education corresponding with higher enjoyment. Enjoyment was influenced also by perception of parents’ physical activity, and mothers’ physical activity in the past. Perceived parental support seemed to be positively influenced by perception of father’s physical activity. In contrast, it has been seen that physical activity of parents and SES did not influence Italian children variables.

Ethnicity determined a differences in MVPA both during weekdays and weekend days, with immigrant children engaging in higher quantity of MVPA, and the same trend occurred for what concern the importance of physical activity.

Among German children none parental correlate seemed to have a role in causing differences among children’s outcomes, with exception for perceived mother’s frequency of physical activity that determined a differences in perceived parental

support, with children that perceived their mother more active perceived in turn higher support ($F(4, 88) = 2.547; p < .05$).

Correlates	Children's outcomes	df	ANOVA F	p value
Education FATHER	MVPA weekend	3, 83	3.867	.02
Education MOTHER	ENJ	3, 83	4.400	.01
Ethnicity	MVPA weekdays	1, 52	6.557	.01
	MVPA weekend	1, 52	15.202	.00
	Importance	1, 85	5.318	.02
Perception of FATHER's sport	PPS	4, 82	3.468	.01
	ENJ	4, 82	4.460	.00
Perception of MOTHER's sport	ENJ	3, 83	2.913	.04
PA past FATHER	MVPA weekend	1, 52	5.991	.02
PA past MOTHER	MVPA weekend	1, 52	5.857	.02
	ENJ	1, 85	8.830	.00

Table 5.15 Results of ANOVAs for correlates of children's physical activity (PA). perceived parental support (PPS), and enjoyment (ENJ), among Italian group.

Among factors that may determine differences in MVPA or variables linked to children's physical activity such as perceived parental support or self-efficacy, it has been analyzed the role of the transport to school (active or inactive) and of the BMI condition.

Concerning BMI status, among Italian children the condition being normal weight determined higher scores on PAQ-C compared with the condition being overweight ($F(2, 84) = 4.887; p < .01$); among German children BMI did not result in any differences on children's variables.

Taking into consideration the way of transport to school, among Italian children active transport determined differences in MVPA of both week days ($F(1, 52) = 5.397; p <$

.05) and weekend days ($F(1, 52) = 23.789; p < .001$) with children that adopted and active way to school showing higher MVPA.

In Germany the way to school determine a difference in the MVPA during the weekend days: children that adopted non-active way of transport to school resulted in higher MVPA during weekend ($F(1, 28) = 4.780; p < .05$).

5.4 Linear Regression Analyses

Regression analyses were conducted in order to explore possible causal associations regarding children's physical activity, with particular attention to parental correlates.

Variables presented in the summary model of the main involved factors on children's physical activity (figure 20) have been investigated by country.

Regarding only children variables (table 5.16), for Italian group linear regression analysis showed significance for perceived parental support and self-efficacy with children's physical activity quantity (PAQ-C), no significant results have been found for objective MVPA.

Dependent variable PAQ-C	β	t	p
Perceived parental support	.468	5.351	.000
Self-efficacy	.344	3.863	.000
Equip Accessibility	-.021	-.248	.805
Neighb Safety	.091	1.078	.284
PACES	.098	1.087	.280

Table 5.16 Linear regression analysis for children variables with PAQ-C among Italian children.

Among German children, self-efficacy appeared to be causally linked to PAQ-C ($\beta = .470; p < .001$). Beyond children psychosocial variables, in the model parental correlates, such as parents' physical activity, parental support, and parents' importance and enjoyment, were included as possible determinants of children's physical activity.

Both for Italian and German group no significant predictors were found among parents' variables, either for PAQ-C or MVPA.

Investigating a possible mechanism of mediation by perceived parental support between parental correlates and children's physical activity, it has been explored with regression analyses parental correlates with perceived parental support and self-efficacy.

Splitting the group of Italian children by gender, it has been found that boys' perceived support could be predicted by father's Baecke sport score ($\beta = -.642$; $p = .007$). While no predictors have been found for girls.

By analyzing also the German group by gender, it has been found that girls' self-efficacy could be predicted by mother's Baecke sport score ($\beta = -.511$; $p = .034$). While boys' self-efficacy was significantly predicted by father's Baecke work score ($\beta = -.571$; $p = .038$).

No other significant results have been found for regression analyses conducted for children variables.

CONCLUSION

In the last years much concern has been expressed about poor participation in physical activity among children and school-aged students. Despite well-documented health benefits of regular physical activity, evidence showed that children do not meet the guidelines to promote health. To contrast this trend, in the scientific field of physical activity research there is an emerging calling to investigate multilevel factors or correlates of children physical activity using ecological model to study multiple interrelations among involved variables.

Concerning the field of health education and sport pedagogy, it is of relevance to better investigate the phenomenon of physical activity parenting, in fact to date no univocal results or consistent findings have been shown for this topic.

The primary purpose of this dissertation, therefore, was to explore the role of parents and physical environments on 4th grade children physical activity by using ecological model as theoretical frameworks and carrying out a comparative study.

First of all, Italian and German group showed significant differences in children perceived environment and physical activity quantity, both self-report and objectively measured. Children physical activity resulted positively associated with perception of equipment accessibility and of neighbourhood safety, confirming previous literature findings (Ferreira et al., 2006; Sallis et al., 2001; Haug et al., 2008). In the comparative study the physical environment could explain the differences in physical activity trends. In fact, Italy and Germany do not have different policies or recommendations, but characteristics such as the possibility to safely go to school by bike or on foot, and the engagement in 3 hours per week of physical education, could be crucial elements to increasing daily MVPA.

Concerning the role of the parents in active living, these findings are in line with those of the scientific literature (Sallis et al, 2000; Fuemmeler, Anderson, Masse, 2011). Perceived parental support has been found to be significantly related to mother's support and enjoyment, and children's PAQ-C was positively related to mother's support. Of clear interest it has been reported that father's role seemed to be of particular importance: fathers' beliefs and values and behaviour were positively associated with children's individual factors and physical activity. Also this findings

related to fathers' role have been underlined in previous research (Sleddens et al., 2012; Biddle et al., 2011).

Moreover demographic characteristics have been found to determine differences on MVPA: ethnicity and the level of education of fathers resulted determining level of physical activity as recently found in Jimenez-Pavon and colleagues (2012).

Another significant variable has been the parental physical activity in the past, as suggested by Davison and colleagues (in press) when referring to history of physical activity of parents.

Perceived parental support appear to be a predictor of children's physical activity, sustaining the notion that parents function as the major agent of socialization in the first years of life.

Possibly, some variables did not occur in any significant association because of a lack of consideration of some factors. The present study has strength in the use of recognized instruments, application of an ecological model, and the search in a comparative study between two countries. However, several limitations could be underlined. Cross-sectional studies do not lead to suppose any causal relation in the results. More prospective studies are needed in order to increase knowledge about physical activity parenting.

Another limitation consists in the number of participants. Objective data were collected among 54 and 30 parent-child triads across countries (a total of 84 children and 168 parents), and about 25 data (25 children and 50 parents) were excluded because of incompleteness (this correspond to a 45.5% exclusion rate in the German group). A number of cases so small does not lead to applied more sophisticated statistical analyses such as modelization, and also high variability within small group could cause misunderstanding of the results or lack of significance. The reason of the quite small number of collected cases is linked to schools, teachers and parents agreement to take part in the research.

The data collection has been the last phase of the research process in contact with people. Before to administrate questionnaires and give accelerometer to children and parents, it was necessary to get in touch with schools, so a meeting with the headmasters or a teacher has been carried out in order to explain research purposes. Then a second step consisted in getting in touch with parents in order to get consents to

participate in the research for them and their offspring. Generally it has been organized a meeting with the parents, in which also the class teacher took part, aimed at the explanation of the methodology, the time schedule, showing the accelerometer and questionnaires they were asked to complete. In the same occasion an informed consent was given to families with the please to give it back to the class teacher indicating if they would like or not to take part in the data gathering. All these preparation phases were necessary to the success of the participation rate as a first point, and also of the adherence to the protocol and goodness in the questionnaires answering as second point.

Especially in Germany a lot of time has been spent searching for available schools and teachers, and then parents were not always willing with the purpose of the research. Wearing accelerometer for 7 days was not well accepted by all people involved and parents argued that they were worry about the possibility to break the device and in some cases they were not so happy to be interviewed on their habitual behaviours.

For these reasons the number of involved people was not so high and also among participants there were cases to be excluded due to the not valid wear time of accelerometer or questionnaires not filled in properly.

For a better understanding of the investigated phenomenon it would be important to carry out qualitative researches. Concerning this ,there is the intention to continue the research administrating focus groups with children in order to explore what they think about physical activity parenting, how they describe it, which are the words that they would use, and which parental behaviours they recognized as related to this phenomenon. To have children's point of view could be a crucial stage to better operationalized physical activity parenting. This could be very useful also to connect physical activity parenting behaviours, relations, and beliefs, to the more mature field of food parenting. It could be a fundamental step to realign research on parental influences and foster an integrated perspective.

Parents are the first socialization agents, they provide children with education and teach them skills and knowledge, but since the school instruction is mandatory for pupils from the age of 3 years, other adult figure are supposed to influence physical activity behaviour of children. For this reason another important step in this field of research would be to gathering data also among teachers, and with older children with coaches,

exploring the role of other adults with important roles in the socialization of the physical activity behaviour.

In particular, a consideration linked to the role of physical education teachers is possible when thinking about that children are enrolled in physical education lessons from the age of 6 – at minimum – to the age of 18 years. Looking at the trend of sedentariness, it is clear as after primary school the percentage of drop out increases and adolescents lose the interest in doing physical activity in the leisure time.

Causes of this lack of motivation have been recently explored by means of interviews to adolescents and preadolescents (Carraro, Bresolin, & Gobbi, in preparation). Concepts in the field of physical activity of the leisure time, physical environment, parents' opinions and motivation were investigated, and sedentary students generally told about negative feeling in respect of physical activity. Internal barriers were frequently reported among the causes of inactivity. Especially lack of pleasure and negative emotions such as felt not enough skilful and feeling lazy were accounted as principal descriptions.

This is generally translated in negative image of the physical self, low self-efficacy and self-esteem, and it is possible to support the idea that physical education lessons during primary school could be not positively relevant, and physical education teachers did not serve as good role modeling, at least concerning health behaviours.

It is fundamental to offer positive physical education experiences during childhood, because if children feel pleasure and satisfaction it is more probable that they are going to search for that enjoyment sensation also later on in the adolescence and adult age. Thus, teachers and more specifically physical education teachers could themselves indirectly influence children's physical activity behaviour.

Basing on these considerations and that the findings suggest to promote physical activity practice and attitudes also among parents, it is of important interest to carry out strategies to promote children's physical activity in a more comprehensive way.

Sport pedagogy research should focus on the implementation of educational programs among parents about their role in the socialization of children's physical activity behaviours. By making parents aware of their fundamental role could in turn affect parents' behaviour itself and indirectly children's physical activity patterns.

It would be of innovative and great interest to build strategies focused on parent-child physical activity. To date a very limited number of studies investigate family-based strategies to promote children's physical activity, and the core has been just contact parents by email or telephone and search to train them on this topic. However, a good intervention program could consist in the organization on parent-child physical activity sessions. It could be a moment for parents to be educated and became aware of the importance of physical activity, and a situation in which children try the maximum of the role modeling from parents.

The necessity to educate also teachers pass across training and academic course that generally teachers do. It would be of fundamental importance to provide primary schools with specialist teachers of physical education, a condition that in Italy is not possible right now if when generalist teachers are helped by physical activity experts for short period basing on some regional projects.

Since childhood is the period in which socialization of physical activity behaviours happen, it is suggested that the research continue to investigate adults' role, with ecological approach, and in perspective ways.

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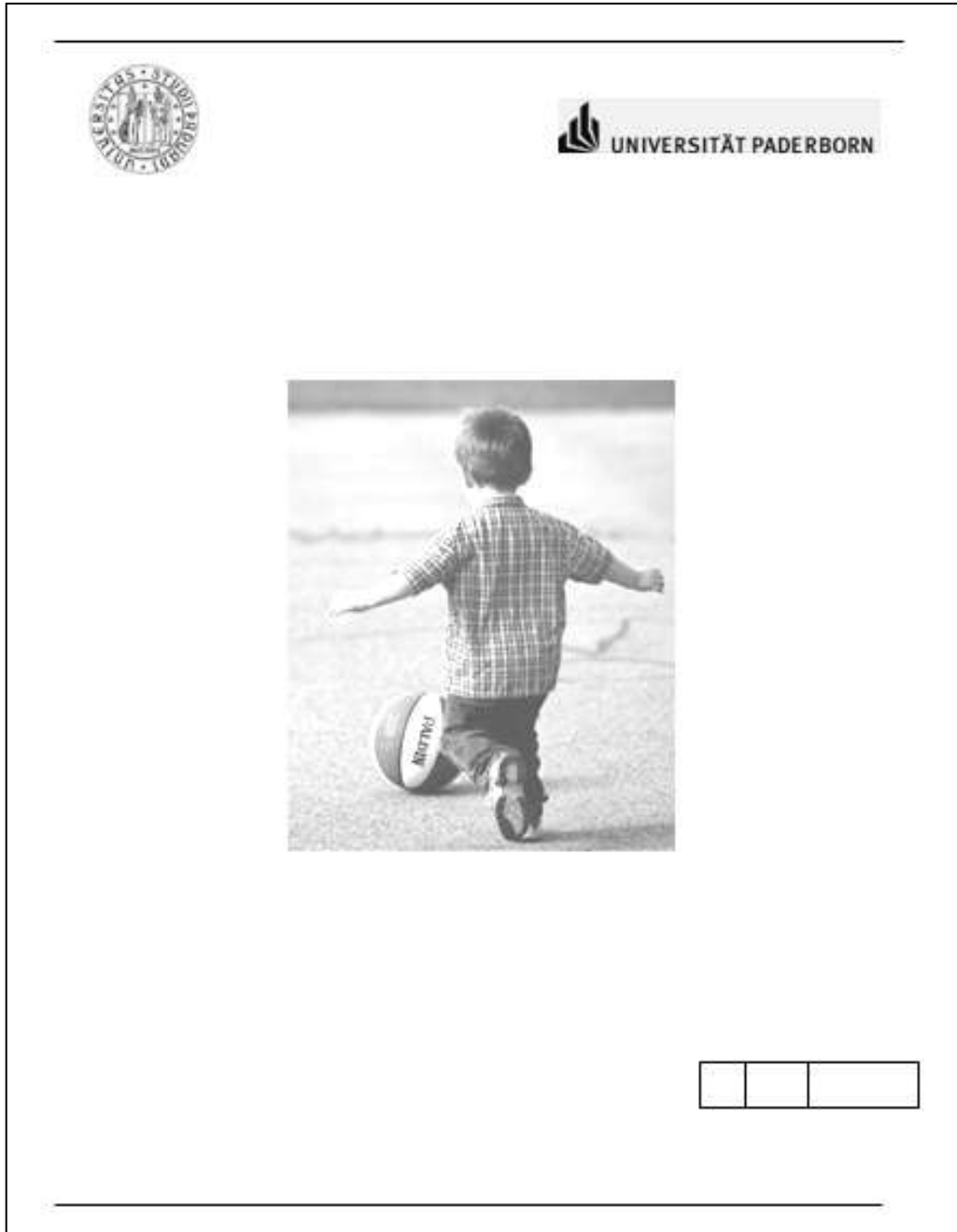
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APPENDIX: Materials

On the following pages the English version of the questionnaires package for children are reported.



We would like to know some simple things:

1. I am ... Boy  Girl 

2. I was born in ...

Month

Year

<p>3. My height (in Meters) _____</p>	<p>3.1 My weight (in Kilogram) _____</p>
---	--



How do you usually go to school?

- On foot
- By bike
- By bus
- On foot and by bus
- By car

Now we have some questions about your family:

		no	one	two or more	
4.	Does your family own a car, van or truck?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
		no	yes		
5.	Do you have your own bedroom for yourself ?	<input type="radio"/>	<input type="radio"/>		
		not at all	once	twice	more than twice
6.	During the past 12 months, how many times did you travel away on holiday with your family??	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		none	one	two	more than two
7.	How many computers does your family own?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Where are your parents from?

	Italy	from another country
8. My mother comes from...	<input type="radio"/>	<input type="radio"/> and which  _____
9. My father comes from...	<input type="radio"/>	<input type="radio"/> and which  _____

Now there are some questions about sport:



10. Practice sport for me is ...

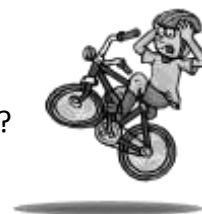
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1	2	3	4	5	6	7	8	9	10

11. Are you member of a sports club? yes no more no

Some parents practice sport, others do not, how is the situation in your family?



	every day	more times per week	once a week	seldom	never
12. My mother practice sport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. My mother practice sport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. During **last week**, how often has your parent or guardian:

- 14.1 Encouraged you to do physical activities or play sports
- None
 - Once
 - Sometimes
 - Almost every day
 - Every day
- 14.2 Done a physical activity or played sports with you
- None
 - Once
 - Sometimes
 - Almost every day
 - Every day
- 14.3 Provided transportation to a place where you can do physical activities or play sports
- None
 - Once
 - Sometimes
 - Almost every day
 - Every day
- 14.4 Watched you participate in physical activities or sports
- None
 - Once
 - Sometimes
 - Almost every day
 - Every day
- 14.5 Told you that you are doing well in physical activities or sports
- None
 - Once
 - Sometimes
 - Almost every day
 - Every day

15. We are trying to find out about your level of physical activity from **the last 7 days** (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

1. There are no right and wrong answers — this is not a test.
2. Please answer all the questions as honestly and accurately as you can — this is very important.

15.1 Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	None	1-2	3-4	5-6	7 times or more
Skipping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rowing/canoeing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In-line skating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walking for exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bicycling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jogging or running	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aerobics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Swimming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Baseball.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dance.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Football.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Badminton.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skateboarding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soccer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	None	1-2	3-4	5-6	7 times or more
Street hockey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volleyball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Floor hockey	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basketball	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice skating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cross-country skiing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice hockey/ringette	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other:					
_____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
_____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15.2 In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)

- I don't do PE
- Hardly ever
- Sometimes
- Quite often
- Always

15.3 In the last 7 days, what did you do most of the time at recess? (Check one only.)

- Sat down (talking, reading, doing schoolwork)
- Stood around or walked around
- Ran or played a little bit
- Ran around and played quite a bit
- Ran and played hard most of the time

15.4 In the last 7 days, what did you normally do at lunch (besides eating lunch)? (Check one only.)

- Sat down (talking, reading, doing schoolwork)
- Stood around or walked around
- Ran or played a little bit
- Ran around and played quite a bit
- Ran and played hard most of the time

15.5 In the last 7 days, on how many days right after school, did you do sports, dance, or play games in which you were very active? (Check one only.)

- None
- 1 time last week
- 2 or 3 times last week
- 4 times last week
- 5 times last week

15.6 In the last 7 days, on how many evenings did you do sports, dance, or play games in which you were very active? (Check one only.)

- None
- 1 time last week
- 2 or 3 times last week
- 4 or 5 last week
- 6 or 7 times last week

15.7 On the last weekend, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

- None
- 1 time
- 2 — 3 times
- 4 — 5 times
- 6 or more times

15.8 Which one of the following describes you best for the last 7 days? Read all five statements before deciding on the one answer that describes you.

- A. All or most of my free time was spent doing things that involve little physical effort
- B. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics)
- C. I often (3 — 4 times last week) did physical things in my free time
- D. I quite often (5 — 6 times last week) did physical things in my free time
- E. I very often (7 or more times last week) did physical things in my free time

15.9 Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little	Medium	Often	Very often
Monday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tuesday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wednesday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thursday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Saturday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sunday	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15.10 Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

- Yes
- No

If Yes, what prevented you? _____

16. Please, read the statements and indicate an answer that better represents your idea:

		Disagree a lot	Disagree a little	No Opinion	Agree a little	Agree a lot
16.1	I can be physically active during my free time on most days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.2	I can ask my parent or other adult to do physically active things with me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.3	I can be physically active during my free time on most days even if I could watch TV or play video games instead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.4	I can be physically active during my free time on most days even if it is very hot or cold outside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.5	I can ask my best friend to be physically active with me during my free time on most days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.6	I can be physically active during my free time on most days even if I have to stay at home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.7	I have the coordination I need to be physically active during my free time on most days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.8	I can be physically active during my free time on most days no matter how busy my day is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please select the answer that better represents your idea about the following statement:

When I am active

		Disagree a lot	Disagree a little	No Opinion	Agree a little	Agree a lot
17.1	I enjoy it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.2	I feel bored	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.3	I dislike it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.4	I find it pleasurable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.5	It's no fun at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.6	It gives me energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.7	It makes me depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.8	It's very pleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.9	My body feels good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.10	I get something out of it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.11	It's very exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.12	It frustrates me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.13	It's not at all interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.14	It gives me a strong feeling of success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.15	It feels good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17.16	I feel as though I would rather be doing something else	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. How do you feel about each of the following statements?

		Disagree a lot	Disagree a little	No Opinion	Agree a little	Agree a lot
18.1	At home there are enough supplies and pieces of sports equipment (like balls, bicycles, skates) to use for physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.2	There are playgrounds, parks, or gyms close to my home or that I can get to easily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.3	It is safe to walk or jog alone in my neighborhood during the day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.4	It is difficult to walk or jog in my neighborhood because of things like traffic, no sidewalks, dogs, or gangs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You have finished!!!!

Thank you very much for your help !!!



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gr (m)

On the following pages the English version of the questionnaires package for parents are reported.



PARENTS AND PHYSICAL ACTIVITY



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The University of Padua (Italy) and the University of Paderborn (Germany) are promoting research into the habits of movement of parents and children. We are asking for your valuable assistance to help us make this survey.

Privacy statement conforming country law system.

Please make a cross next to the answer that you want to give or, when necessary, write on the dotted line. Please provide the information required to answer all the questions.

Date/...../.....

Father **Mother** **Age:** years

Heightm Weight Kg

Please, indicate your highest level of education completed.....

How many people live in your home (including you)?

How far is your home from your child's school? Km

Do you regularly participate in sports or physical activity in your spare time? Yes
No

If so, at what level? Recreational Competitive Professional

Did you participate regularly in sports or physical activity in the past? Yes No

If so, at what level? Recreational Competitive Professional

How important is that your children participate in physical activities and/or sports?

- Very unimportant
- Somewhat unimportant
- Neutral
- Somewhat important
- Very important

1) What is your main occupation?

2) At work I sit

- never
- seldom
- sometimes
- often
- always

3) At work I stand

- never
- seldom
- sometimes
- often
- always

4) At work I walk

- never
- seldom
- sometimes
- often
- always

5) At work I lift heavy loads

- never
- seldom
- sometimes
- often
- always

6) After working I am tired

- very often
- often
- sometimes
- seldom
- never

7) At work I sweat

- very often
- often
- sometimes
- seldom
- never

8) In comparison of others of my own age I think my work is physically:

- much heavier
- heavier
- as heavy
- lighter
- much lighter

9) Do you play sports?

no

yes

If yes, which sport do you play most frequently?

How many hours a week? _____

How many months a year? _____

If you play a second sport

Which one is it?

How many hours a week? _____

How many months a year? _____

- 10) In comparison with others of my own age I think my physical activity during leisure time is:
- much more
 - more
 - the same
 - less
 - much less
- 11) During leisure time I sweat
- very often
 - often
 - sometimes
 - seldom
 - never
- 12) During leisure time I play sport
- never
 - seldom
 - sometimes
 - often
 - always
- 13) During leisure time I watch television
- never
 - seldom
 - sometimes
 - often
 - always
- 14) During leisure time I walk
- never
 - seldom
 - sometimes
 - often
 - always
- 15) During leisure time I cycle
- never
 - seldom
 - sometimes
 - often
 - always
- 16) How many minutes do you walk and/or cycle per day to and from work school and shopping?
- < 5 minutes
 - 5-15 minutes
 - 15-30 minutes
 - 30-45 minutes
 - > 45 minutes

Please select the answer that better represents your idea about the following statement:

“When I am active”

	Disagree a lot	Disagree a little	No Opinion	Agree a little	Agree a lot
1. I enjoy it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I feel bored	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I dislike it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I find it pleasurable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. It's no fun at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. It gives me energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. It makes me depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. It's very pleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. My body feels good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I get something out of it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. It's very exciting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. It frustrates me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. It's not at all interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. It gives me a strong feeling of success	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. It feels good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I feel as though I would rather be doing something else	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate the weekly frequency with which **last week** you:

1. Encouraged your child to do physical activities or play sports None
 Once
 Sometimes
 Almost every day
 Every day
2. Did a physical activity or played sports with your child None
 Once
 Sometimes
 Almost every day
 Every day
3. Provided transportation so your child could go to a place where he or she can do physical activities or play sports None
 Once
 Sometimes
 Almost every day
 Every day
4. Watched your child participate in physical activity or sport None
 Once
 Sometimes
 Almost every day
 Every day
5. Told your child that physical activity is good for his or her health None
 Once
 Sometimes
 Almost every day
 Every day

Thank you for completing this survey,

Please return it to your child's teacher.