

The Children's Leisure Activities Study

(CLASS)

Summary report

Jo Salmon

Amanda Telford

David Crawford

July 2004

C-PAN

Centre for Physical Activity and Nutrition Research



D E A K I N U N I V E R S I T Y

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Executive Summary

There is some evidence to suggest that in recent decades children have become less active than their counterparts 50 years ago. Accounting for 7% of Australia's total disease burden physical inactivity is second only to tobacco smoking as a behavioural risk factor for lifestyle related diseases. Reduced opportunities for incidental physical activity and increased sedentary alternatives to physical activity are hypothesised to be significant contributors to the overall decline in physical activity that has been observed in Australia.

Evidence for the social, mental and physical health benefits experienced by physically active children is accumulating. Children who are physically active experience improved cardiovascular health, increased bone density and are leaner compared to physically inactive children. Reductions in stress, anxiety and depression and enhanced social skills and self esteem are also associated with physical activity in children.

Despite the importance of these health behaviours we do not currently have a sufficient knowledge base upon which to develop targeted strategies and programs that promote physical activity and reduce sedentary behaviour in Australian children.

The Children's Leisure Activities Study (CLASS) was undertaken to explore the family environment as a potentially potent source of influence on children's physical activity and sedentary behaviours. CLASS is the first study in Australia to examine children's physical activity levels objectively using activity monitors (accelerometers).

Families were recruited from 19 state primary schools in high and low socio-economic status (SES) areas in Melbourne. This included more than 1200 families with children aged 5–6 years and 10–12 years. Measures of physical activity and sedentary behaviours included a parent's survey, children's survey, height and weight measures and objectively measured physical activity.

This preliminary report is primarily descriptive and is not intended to be a comprehensive exploration of all the study findings. The findings that we present include those that we consider are most relevant to the development of strategies for the promotion of children's physical activity.

The findings highlight that between the ages of 5-12 years, physical activity declines substantially; they also highlight that the family environment is important in terms of children's physical activity and sedentary behaviour.

Background

Physical activity is associated with positive social, mental and physical health outcomes. Physical inactivity is an independent risk factor for a number of chronic health conditions, including non-insulin dependent diabetes mellitus, coronary heart disease, and hypertension (USDHHS, 1996). Physical inactivity in children is linked to the development of these chronic health conditions in adulthood (Baranowski et al., 1992). Physical activity confers positive mental health outcomes including reduced symptoms of depression and anxiety, and improvements in general well-being. Enhanced social skills are also observed in children who are physically active compared to their inactive counterparts.

Physical inactivity also plays an important role in the obesity epidemic. Overweight and obesity are the consequence of energy imbalance where energy intake exceeds energy output. Overweight and obesity are the result of the interplay between genetic characteristics, increased availability and consumption of energy dense food and beverages, decreased requirement and opportunities for physical activity and psychosocial factors. With one in five Australian children currently overweight or obese (Margarey et al., 2001) a thorough understanding of the influences on physical inactivity is essential.

Declines in children's physical activity, such as walking to school (Morris et al., 2001) and increased access to electronic games and computers (ACNielsen Media International, 2001) may be critical to children's immediate and long-term health. Recent national data show that participation in organised sport peaks at 11 years of age, and declines by 10-15% by the age of 14 years (Australian Bureau of Statistics, 2000). In addition, children spend a great deal of time being inactive. Australian children watch an average of 2.5 hours of television each day. In recent years there has been a three-fold increase in the proportion of homes with access to pay TV, and 82% of teenagers have access to a personal computer at home (ACNielsen Media International, 2001).

Much of the existing research on children's physical activity has focused on participation in organised sport, or has examined only some aspects of physical activity, such as walking to school. While there is some information regarding fitness levels of Australian children, surprisingly there is almost no information of the physical activity habits of children aged below 12 years. Much of what is known about children's physical activity comes from research conducted in the United States. In addition to a lack of good information regarding the physical activity habits of Australian children, we possess a poor understanding of the influences on children's physical activity.

Social cognitive theory suggests that the range of potential influences on health is diverse and includes individual, environmental and social forces. The family environment is a potentially potent source of influence on children's physical activity and sedentary habits. We define family environment as the physical home setting, family structure (parents, siblings, and grandparents), pets, rules and restrictions, support, the community setting in relation to the home setting, as well as barriers and other individual factors such as self-efficacy or beliefs. Surprisingly, there has been relatively little research that has comprehensively assessed the family environment (Sallis et al., 2000). Most of the existing information that is available comes from a limited number of studies conducted in the United States. We therefore do not have sufficient evidence upon which to develop effective strategies to promote physical activity and reduce sedentary pursuits among Australian children.

A better understanding of the influence of the family environment on physical activity and sedentary pursuits among Australian children will inform the development of targeted programs aimed at promoting physical activity and preventing sedentary behavior. The 'Children's Leisure Activities Study', or CLASS was initiated in order to explore the influence of the family environment on physical activity and sedentary habits of children at primary school entry age (5–6 years) and primary school exit age (10–12 years).

Study Aims

To enhance the knowledge and understanding of physical activity and sedentary behaviour patterns of Australian children and how the family environment influences physical activity and sedentary behaviour among children.

The purpose of this report is to provide an overview of the key findings to emerge from this study. This report will be of interest and relevant to: parents and those involved in the care of primary school aged children, health practitioners and policy makers, teachers and others in the education sector, and government and non-government organisations with an interest in children's health.

Some findings from this study have already been reported in the scientific literature (see reference list).

Study Methods

Study design

Participants in this study included:

- Parents of children aged 5–6 and 10–12 years.
- Primary school children aged 5–6 years.
- Primary school children aged 10–12 years.

Recruitment

Participants were recruited from school communities in high and low socioeconomic status (SES) suburbs. A total of 19 state primary schools in the Eastern (high SES) and Western (low SES) metropolitan regions of Melbourne participated in the study. This included more than 1200 families: 296 families of children aged 5 – 6 years and 919 families of children aged 10 – 12 years. All children in grades Prep, 5 and 6 were eligible to participate.

Ethics approval and informed consent

Approval for this study was obtained from the Deakin University Human Ethics Committee and from the Department of Education and Training Victoria. Department of Education and Training Regional directors were also notified of the study. Parents gave consent on behalf of their child and themselves to participate in the study.

Procedures

- Parents completed a detailed questionnaire at home about their child's physical activity, sedentary pursuits, and about factors in their home and community environments.
- The older children (10–12 year olds) completed a questionnaire in class at school.
- The height and weight of all children in the study was measured using a stadiometer and digital scales respectively.
- The physical activity levels of all children involved in the study were also assessed using activity monitors.

Measures

1 Parent's Questionnaire

The parents questionnaire collected a range of data including:

- Socio-demographic information relating to socio-economic status, marital status, primary language spoken in the household and number of children younger than 18 years who reside in the household.
- Parent's physical activity and sedentary pursuits – parents self-reported their participation in physical activity (i.e. frequency and duration in vigorous and moderate physical activity) and sedentary pursuits (eg, time spent watching television, using the computer and playing electronic games) during a typical week.
- Children's physical activity – parents proxy-reported on their child's participation in a range of physical activities during a typical week (Telford et al., 2004).
- Children's sedentary pursuits – parents proxy-reported on the time their child spends in different sedentary pursuits, such as reading, using the computer and watching television, during a typical week.
- Barriers to physical activity – included reasons why their child does not participate in more activity than they currently do.
- Rules and restrictions - Parents were asked how often they restrict their child's participation in various physical activities as well as television viewing and electronic game use. Supervision of children's activities was also explored within this construct.
- Social support - Parents were asked to report how often the mother, father and grandparents provide encouragement and transportation for sport or other physical activity, money for physical activity, clothing, and sports club fees or physical activity equipment for their child.
- Parental perceptions of their child's physical activity - parents reported the time their child typically spends outdoors on weekdays after school and on weekends during warmer and cooler months. Parents were also asked to estimate how far they would consider to be an acceptable walking distance for their child.
- Physical environment – included an environmental audit of the home and yard, sedentary opportunities within the home and accessibility of public amenities such as shops, schools and parks within their local communities.
- Weight concerns – assessed parental concerns regarding their child's weight now and as an adult.
- Family activities - The frequency of family physical activities (i.e. going to the park, walking, and swimming together as a family with the child) and sedentary pursuits (i.e. watching television, going to the movies, visiting friends/relatives) was assessed.

2 Children's Questionnaire

The children's questionnaire collected data on the following:

- Barriers to physical activity- children were administered a similar list of barriers to those asked of their parents. In addition, children were also asked about some different barriers, for example, 'I am worried about strangers' and 'I think it is too cold in winter to play outside'. Children's perceptions of their parent's beliefs about the physical environment were also explored, for example 'My mum and dad think the roads aren't safe'.
- Enjoyment of physical activity and sedentary pursuits - children were asked to report their enjoyment of various physical activities and sedentary pursuits on their own and with others (i.e. mother, father, siblings and friends). For example 'I like watching television with my brother or sister'.
- TV and snacking - children were asked to report what foods they most commonly snack on while they are watching television.

3 Children's measured height and weight

Each child had their height (cm) and weight (kg) measured. Body mass index, computed as weight (in kilograms) divided by height² (in meters), was used to describe overweight and obesity, according to the child's age and sex (Cole, 2000).

4 Children's measured physical activity

Children's physical activity was objectively assessed using activity monitors. The activity monitor is a matchbox-sized device worn on a belt around the waist to measure movement during waking hours. Children wore an activity monitor for an eight day period, during waking hours, except in water. We calculated children's time spent in sedentary, light, moderate and vigorous-intensity activity. Average movement counts per day were also calculated and were collapsed into quartiles, with quartile one being the lowest activity category and quartile four the highest activity category.

Characteristics of Participants

Who took part?

A total of 1,210 families participated in the study: 291 families of children aged 5–6 years and 919 families of children aged 10–12 years (Table 1). Most families reported usually speaking English in their household and most parents or guardians were married. While maternal education was generally evenly distributed among mothers with children aged 10–12 years, more mothers with children aged 5–6 years had a higher level of education. More than 60% of all families owned at least two cars, and dog ownership was also common. On average, the children in the study had 1.5 siblings.

How common is overweight and obesity?

Childhood obesity is now recognized as a major public health concern and many Australian states have recently held public forums on this issue (for example, *A Healthy Balance: Victorians Respond to Obesity*, 2002). According to national figures one in five Australian children is either overweight or obese (Magarey, et al., 2001). The proportion of overweight and obesity in the CLASS study is consistent with national estimates with approximately 29% of the children falling within the overweight or obese categories.

Figure 1 shows similar proportions of boys and girls in the 5–6 year age category were overweight or obese. Twelve percent of 5–6 year old boys were overweight and 7% were obese, 13% of 5–6 year old girls were overweight and 10% were obese. Figure 2 shows that in the older children 13% of 10–12 year old boys were overweight and 11% were obese and 12% of 10–12 year old girls were overweight and 10% were obese.

There were significant differences between older children living in the eastern suburbs of Melbourne (10% overweight, and 9% obese), compared to children living in the western suburbs (16% overweight, and 13% obese). There were no differences in weight status of the children by parents' education level.

Table 1 Family characteristics of participating 5–6 and 10–12 year old children

	5–6 years		10–12 years	
	Boys (n=150)	Girls (n=141)	Boys (n=424)	Girls (n=495)
Overall (%)	51	49	46	54
Mothers' age (%)				
<30 yrs	6	6	1	1
30-39 yrs	69	70	42	43
40-49 yrs	24	24	54	52
≥50 yrs	1	0	3	4
Fathers' age (%)				
<30 yrs	0	0	1	1
30-39 yrs	48	40	25	23
40-49 yrs	39	53	63	65
≥50 yrs	13	7	11	11
Cultural Demographics (%)				
Father born in Australia	74	67	57	57
Mother born in Australia	76	86	69	71
Usually speak English	93	96	93	93
Employment status (%)				
Father employed	77	86	87	88
Mother employed	54	53	66	70
Maternal education level (%)				
Some high school or less	24	23	29	31
High school or technical cert.	33	37	39	35
University/tertiary qualification	43	40	32	34
Marital status (%)				
Married	80	75	76	75
Defacto/living together	5	9	4	6
Separated/divorced	10	11	16	15
Widowed	1	0	1	1
Never married	4	5	3	3
Area of residence (%)				
Western suburb — low socio-economic stratum	45	43	36	39
Eastern suburb — high socio-economic stratum	55	47	64	61

Figure 1 Body Mass Index category by sex of 5–6 year olds

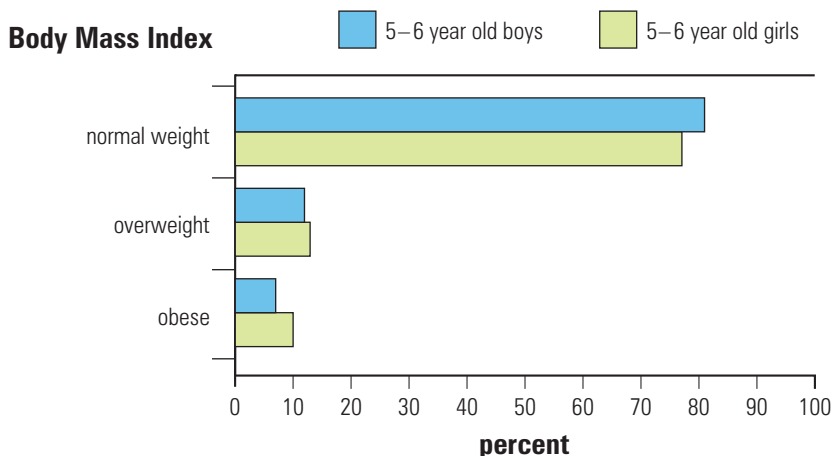
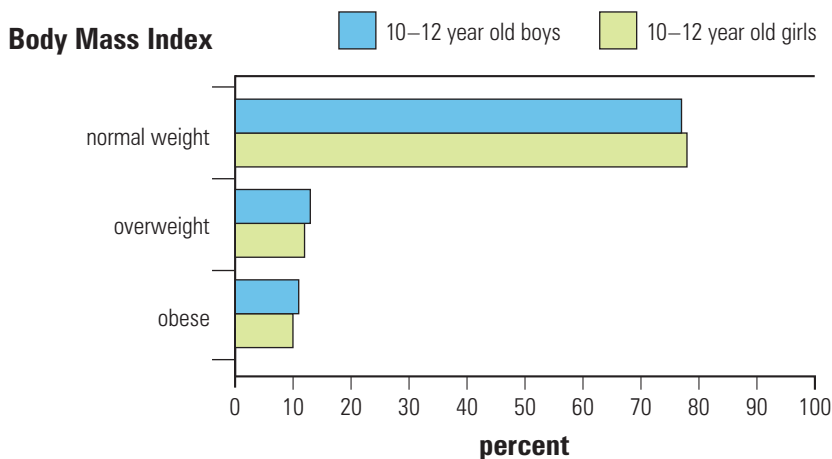


Figure 2 Body Mass Index category by sex of 10–12 year olds



How concerned are parents about their children’s weight?

Thirteen percent of parents with 5–6 year old boys, and 20% of parents with 5–6 year old girls are concerned about their child’s current weight status (Figure 3). Twenty-six percent of parents with 5–6 year old boys and 37% of parents with 5–6 year old girls are concerned about their child’s weight status as adults (Figure 4).

Figure 3 Parents' level of concern about their 5–6 year old child's current weight

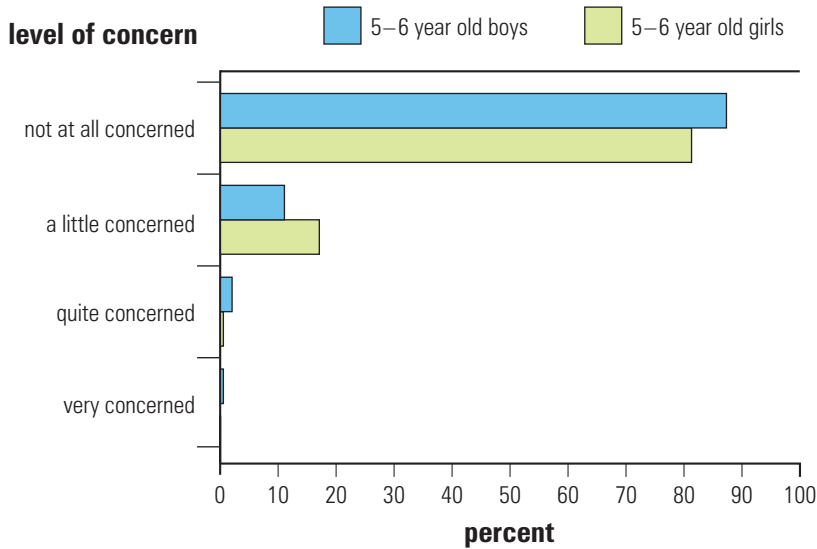
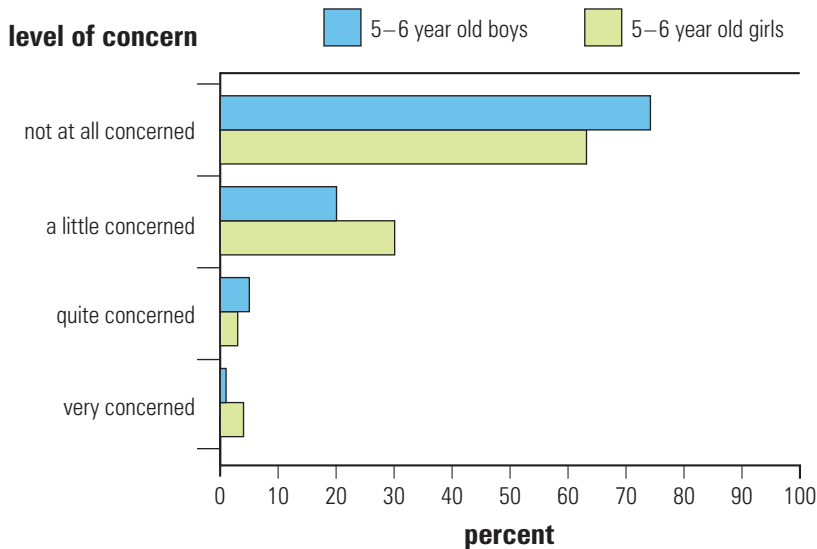


Figure 4 Parents' level of concern about their 5–6 year old child's weight as an adult



Parent's level of concern about their child's current weight status and weight status as an adult was higher across all categories amongst parents of 10–12 year old children as compared to parents of 5–6 year old children. Thirty percent of parents with 10–12 year old boys, and 33% of parents with 10–12 year old girls are concerned about their child's current weight status (Figure 5). Thirty-eight percent of parents with 10–12 year old boys and 38% of parents with 5–6 year old girls are concerned about their child's weight status as adults (Figure 6).

Figure 5 Parents' level of concern about their 10–12 year old child's current weight

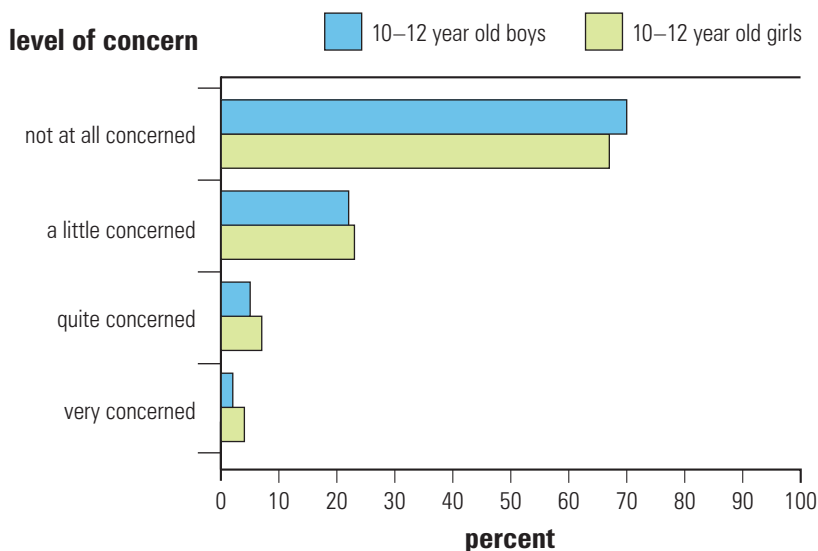
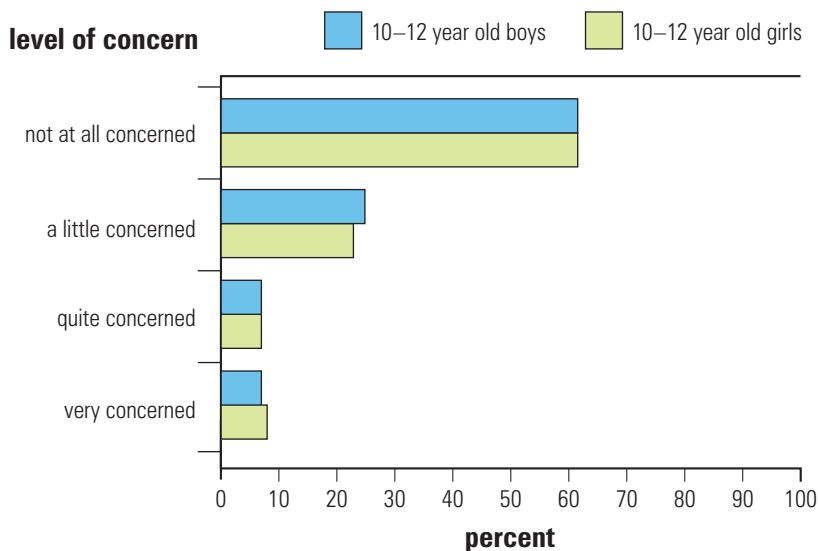


Figure 6 Parents' level of concern about their 10–12 year old child's weight as an adult



There were significant differences in level of concern by children's weight status. Parent's level of concern about their child's current weight status was significantly higher for 5–6 year old girls who were overweight or obese (38%) compared to 5–6 year old girls who were not overweight or obese (12%). Among 5–6 year old boys parental concern was similar for their child regardless of whether he was overweight or obese or not overweight or obese (13% for both groups). Among the older boys and girls

a significantly higher proportion of parents were concerned about their child's current weight status if they were overweight or obese compared to not overweight or obese. Fifty percent of parents of overweight or obese boys were concerned about their child's current weight status compared to 19% of parents of boys who were not overweight or obese. Similarly, a significantly higher proportion of parents of 10–12 year old girls who were overweight or obese were concerned about their child's current weight status (60%) compared to parents of 10–12 year old girls who were not overweight or obese (22%).

Parents of 5–6 year old boys who were overweight or obese were almost twice as likely to be concerned about their child's weight status as an adult (39%) compared to parents of 5–6 year old boys who were not overweight or obese (22%). A similar proportion of parents were concerned about their daughters weight status as an adult regardless of whether the child was overweight or obese (54%) or not overweight or obese (30%). Parental level of concern about their child's weight status as an adult was higher for the older children. A significantly higher proportion of parents whose child was overweight or obese were concerned about their child's weight status as an adult. Fifty-six percent of parents with 10–12 year old boys who were overweight or obese were concerned about their child's weight status as an adult compared to 29% of parents with 10–12 year old boys who were not overweight or obese. Similarly, a significantly higher proportion of parents with 10–12 year old girls who were overweight or obese were concerned about their child's weight status as an adult (65%) compared to parents of 10–12 year old girls who were not overweight or obese (28%).

Key Findings

- Overweight and obesity was common in children who participated in this study, with the prevalence being higher in 10–12 year olds compared to 5–6 year olds.
- A higher proportion of children living in the western suburbs of Melbourne were overweight or obese.
- Many parents were concerned about their child's current weight, with parents of older children more likely to be concerned than parents of younger children.
- Between 30-40% of parents held concerns that their child may become overweight as an adult.

Preliminary Findings — Physical Activity

Time Spent in Physical Activity

Physical activity is important for children's health. Children who are active have better blood lipid profiles, are less at risk of overweight or obesity, have lower percentage body fat, and have better bone health compared to children who are inactive (Rowland, 1990). A better understanding of the factors that might explain physical activity is important for the development of strategies to promote children's physical activity during these influential years.

How active are parents?

To benefit health, physical activity guidelines in Australia recommend that adults accumulate 30-minutes of at least moderate-intensity physical activity (e.g., a brisk walking pace) most, if not all, days of the week (Commonwealth Department of Health and Aged Care, 1999). Compared to the most recent national estimates, a slightly lower proportion of fathers (40-50%) were sufficiently active for health benefits in the CLASS sample compared to men in the Australian population (60%) (Bauman et al., 2002). Conversely, a similar proportion of mothers (53-56%) in CLASS were sufficiently active for health when compared to the proportion of women in the Australian population (54%).

How active are children?

Australia is currently developing recommendations regarding how much and what type of physical activity children should do. Guidelines in the United Kingdom suggest children should do at least one hour/day of moderate to vigorous activity (Cavill et al., 2001).

Figure 7 shows that the average time spent in moderate to vigorous activity amongst 5-6 year old children was 4.5 and 4.1 hours for boys and girls respectively. Amongst 10-12 year old children the average time spent in moderate to vigorous activity was 2.4 and 2 hours for boys and girls respectively.

Figure 8 shows that the majority of younger children in the CLASS study met or exceeded the UK physical activity guidelines for children. Figure 9, however, illustrates that whilst most of the older children met the UK physical activity guidelines (1hr/day), the proportion of children exceeding 90 minutes, 2 hours and 3 hours/day of moderate to vigorous activity decreased dramatically.

Young girls who lived in the western suburbs were half as likely to be in the highest activity category (as assessed by the activity monitor) compared to young girls who lived in the eastern suburbs. Conversely, older boys living in the western suburbs were 65% more likely to be in the most active category.

Figure 7 Average time (hrs/day) children spent being moderately to vigorously active according to activity monitors

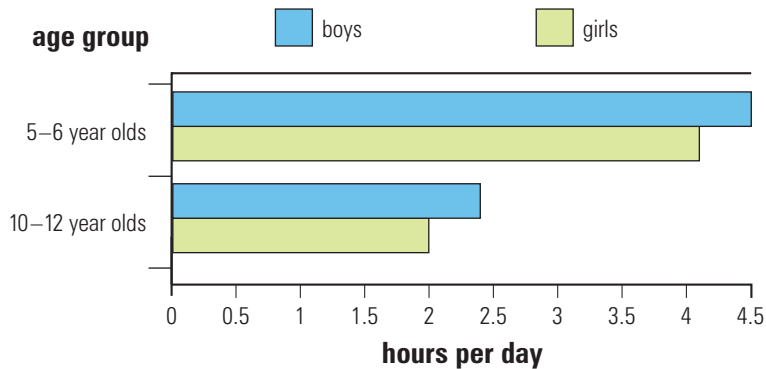


Figure 8 Proportion of 5-6 year old children in moderate to vigorous activity (mins/day)

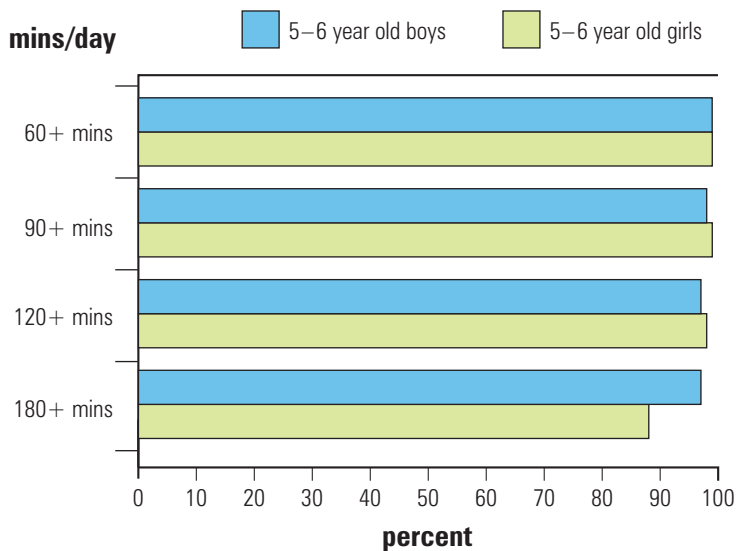
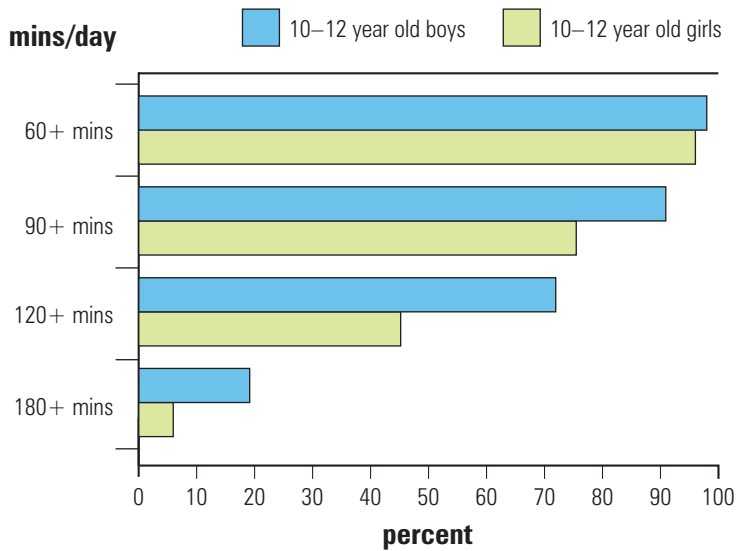


Figure 9 Proportion of 10–12 year old children in moderate to vigorous activity (mins/day)



How much time do children spend being active outdoors?

The time that parents reported their child spent outside in summer and in winter was associated with higher levels of physical activity amongst the older children. There were no differences in time spent outside in summer or winter by geographic location (eastern versus western suburbs).

Figure 10 Average time (hrs/wk) spent outside in summer and winter among 5–6 year olds

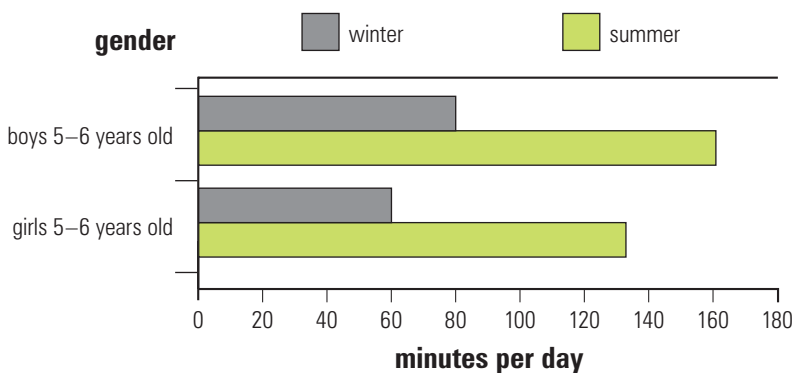
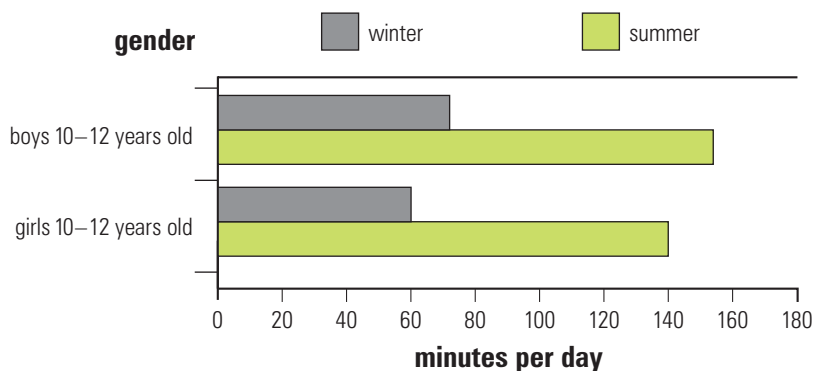


Figure 11 Average time (hrs/wk) spent outside in summer and winter among 10–12 year olds



Key findings

- Regardless of their age boys were consistently more active than girls.
- The older children were only half as active as the younger children.
- Children spend double the amount of time outside in summer compared to in winter.
- Boys spend significantly more time outside than girls.

Physical Activity Choices

Surprisingly, very little is known about children's physical activity in Australia. While we know about children's participation in organised sport, and walking or cycling to school, few data are available regarding children's unstructured physical activity (eg, free play, or non-organised sport participation). In addition, very little is known about the influence of a child's local neighbourhood environment on their physical activity.

What are children's top ten physical activity choices?

Twenty-seven activities were measured in the study. The top ten activity choices for children are presented below (Figure 12 and Figure 13).

Physical activities frequently reported for boys included playground, bike-riding, down ball, sport class, and Australian Rules Football (AFL). Boys were more likely than girls to participate in ball or team sports. Among girls, commonly reported activities included, playground, bike-riding, tag/chasey, sport class and playing with pets.

Girls were more likely to participate in locomotor activities and/or activities that could be considered lifestyle physical activities, for example walking, jogging, bike riding, scooter and rollerblading.

Figure 12 Physical activity choices of 5–6 year olds

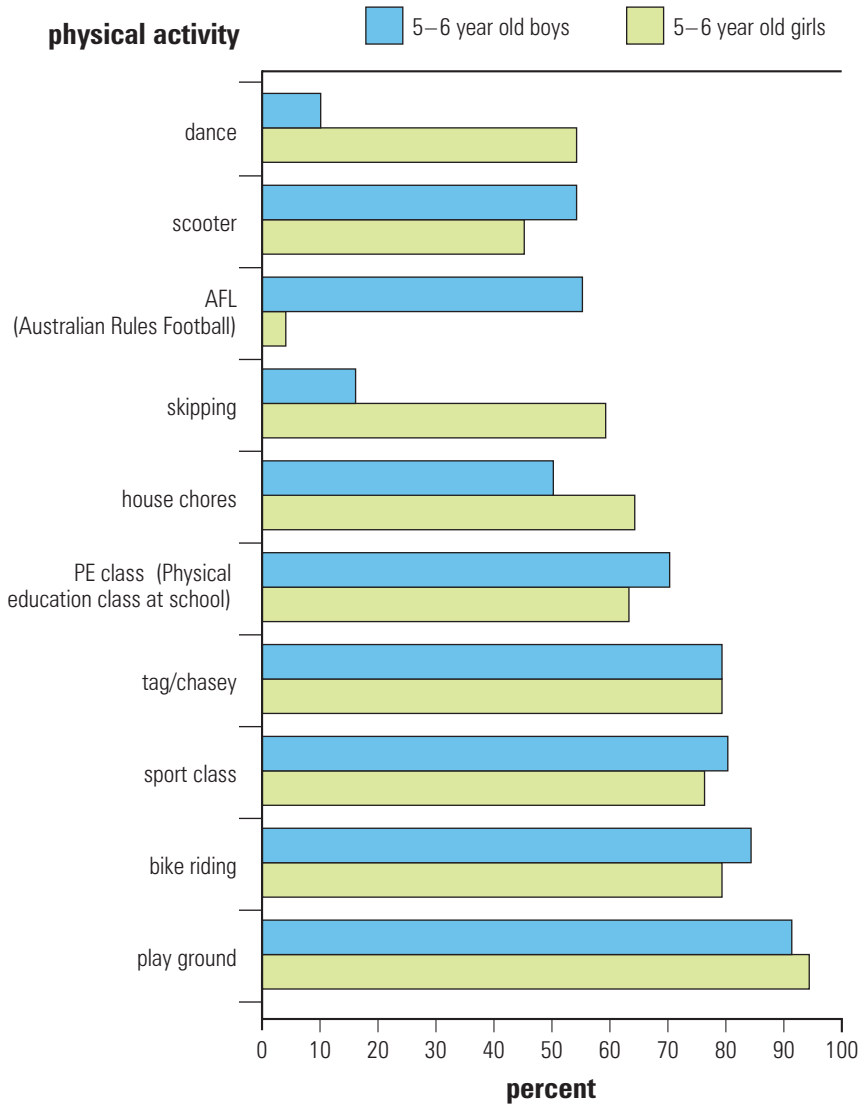
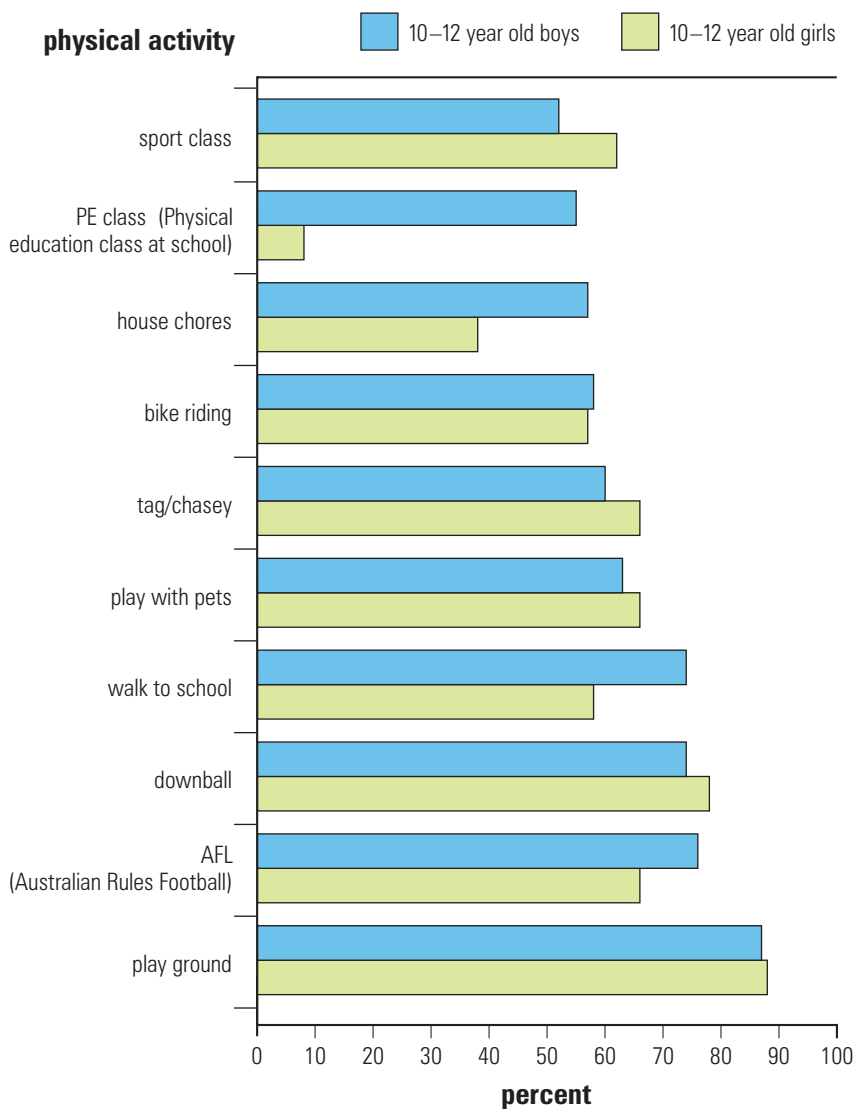


Figure 13 Physical activity choices of 10–12 year olds



What activities are families doing together?

Figures 14 and 15 illustrate the proportion of families who do these types of activities together. For families with young children, going to the park as a family is the most prevalent activity, whereas for families with older children, playing sport together is the most common. Among the younger children, those in the highest activity group played sport together as a family more often (1.5 times/wk) compared to children in the less active groups (less than once/wk). This finding was consistent among the older children as well.

Figure 14 Proportion of families with 5–6 year old children who undertake physical activities together at least once per week

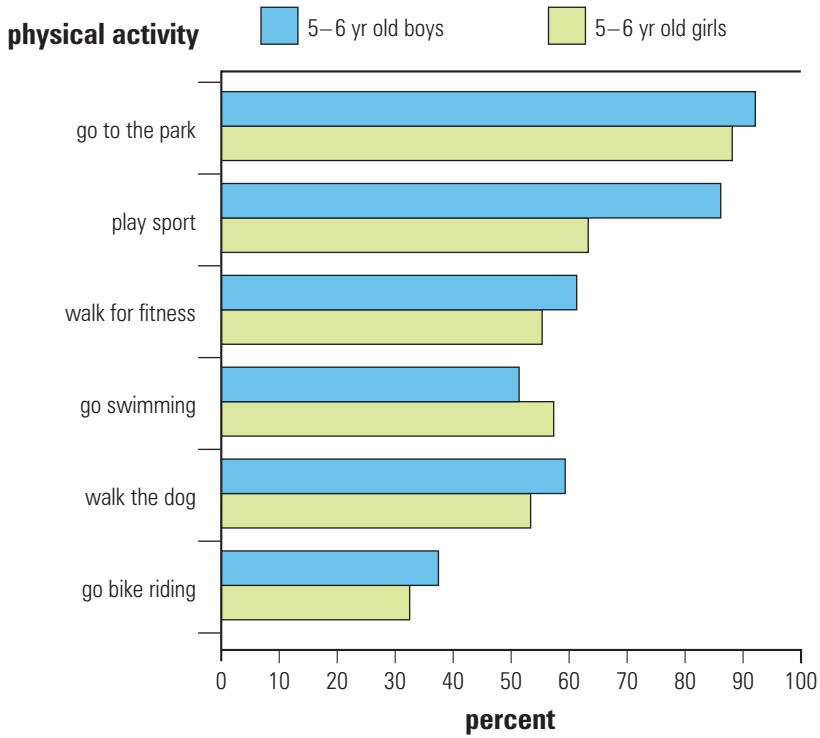
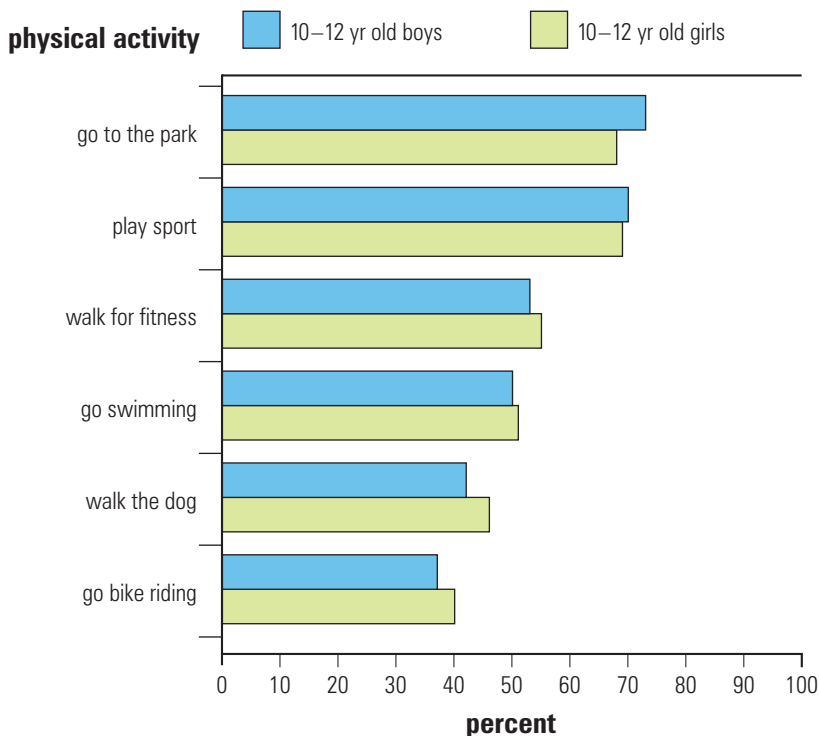


Figure 15 Proportion of families with 10 - 12 year old children who undertake physical activities together at least once per week



What activities are children doing in their local neighbourhood?

Children's walking or cycling to destinations in their local neighbourhood varied by age and by sex (Table 2). Not surprisingly, a higher proportion of older children accessed their local neighbourhood environment at least once in a typical week compared to younger children. Among the older children, more boys than girls accessed their local neighbourhood environment.

A higher proportion of 5-6 year old girls (36%) living in the western suburbs walked or cycled to a friend's house once or more per week compared to girls living in the eastern suburbs (25%). Although 18% of parents of young girls and 10% of parents of older girls in the eastern suburbs compared to 2% of parents in the western and eastern suburbs reported not living within walking distance to a park, a higher proportion of young girls from the west (55%) never or rarely walked or cycled to a park compared to young girls from the east (37%). More young girls (48%), older girls (49%) and older boys (66%) from the west walked or cycled to the shops once or more per week compared to young girls (22%), older girls (34%) and older boys (44%) living in the eastern suburbs respectively.

More older boys living in the west (26%) walked or cycled to sports venues compared to boys in the east (12%).

Table 2 Proportion of children walking or cycling to neighbourhood destinations in a typical week according to age and sex^a

Specific destinations	Proportion of children walking/cycling (%)			
	5–6 years		10–2 years	
	Boys (n=149)	Girls (n=138)	Boys (n=424)	Girls (n=495)
	%	%	%	%
Bike/walking tracks	33	26	31	27
Friends' houses	37	31	52	42
Parks, ovals, playgrounds	49	45	49	40
The postbox	13	14	18	15
Public transport	7	9	13	9
School	44	48	65	57
Shops	33	36	53	41
Sports venues	12	11	21	16
All destinations	91	84	92	91

^aAdapted from paper by: Timperio et al, 2004

Walking or cycling to school

Walking or cycling to school is potentially a very important physical activity opportunity for children. Unfortunately, children's walking or cycling to school has declined in the last 10 years (Morris et al, 2001). The Walking School Bus program, which involves children walking to school together in adult-supervised groups, is an exciting example of an initiative that is being trialled in many countries, including Australia (refer to www.vichealth.vic.gov.au). Understanding the barriers to children walking and cycling to school is important to inform the development of effective initiatives.

We found that 43% of older children do not usually walk to school on any day of the week, and just 16% of older children walk to or from school every day. Just 7% of older children rode their bicycles to or from school on one or more occasions per week. Among younger children, 55% do not walk to or from school on any day, and 14% walk to or from school every day. Very few of the younger children (6%) rode their bicycles to or from school once or more per week. Children who cycled to or from school were more likely to be in the most active group for overall physical activity. There were no differences in the proportions of older

boys and girls walking or cycling to or from school by eastern or western suburbs. However, a higher proportion of 5–6 year old girls living in the western suburbs walked to or from school (59%) compared to girls living in eastern suburbs (41%). Sixty-percent of non-overweight 10–12 year old girls walked to or from school at least once per week compared to 50% of overweight/obese girls. Conversely, 67% of young girls who were overweight/obese walked to school compared to 44% of girls who were not overweight.

Key findings

- The two most prevalent physical activities, sport class and physical education class, are performed at school.
- Among the 5–6 year-olds, 60% of the activities included play and non-organised sport.
- While many parents reported going to the park or playing sport with their child, the majority never went walking or bike riding as a family.
- Children living in the western suburbs walked or cycled to destinations in their local neighbourhood more frequently than did children living in the eastern suburbs.
- Two of the most common destinations that children walked or cycled to in their neighbourhood were parks or playgrounds and shops.
- Walking or cycling to school, particularly on a regular basis, was uncommon among the children.

Influences on Physical Activity

In order to develop strategies aimed at promoting or increasing children's physical activity levels it is important to understand why some children are active and others are inactive. Identifying those factors that influence children's activity levels is important in order to guide the development of physical activity initiatives.

What do parents see as the barriers to children's physical activity?

Figures 16 and 17 illustrate the proportion of parents who perceive factors such as 'stranger danger', 'road safety', and 'poor access' as barriers to children's physical activity. Parents of children from both age groups perceive stranger danger and road safety as barriers to children's physical activity. Surprisingly, 'lack of time to transport child to activities' was not reported by many parents as being a barrier to children's activity. Parents of younger children who reported having concerns about road safety were more likely to have children in the low physical activity category, and parents of older children who report that it's too hot in summer for their child to play outdoors were more likely to have children in the lowest physical activity category.

Based on the CLASS data, associations between perceptions of the local neighbourhood and walking and cycling among children found that perceptions of the local neighbourhood may be related to children's physical activity (Timperio et al., 2004). Children aged 5-6 years with parents who perceived there to be heavy traffic in the local neighbourhood and limited public transport in the local neighbourhood were less likely than other children to walk or cycle at least three times per week. Among the older children, parent's belief that there were no lights or crossings in the local neighbourhood was associated with walking or cycling for 10–12 year old boys. Among the 10–12 year old girls, parent's belief that their child needed to cross several roads to reach play areas and that there is limited public transport in the area was associated with a lower likelihood of walking or cycling. Children's belief that there were no parks or sports grounds near home was associated with a lower likelihood of walking or cycling (Timperio et al., 2004).

Differences in perceived barriers to children's physical activity were found between parents living in western suburbs compared to those living in eastern suburbs. A higher proportion of parents from western suburbs of Melbourne with older children reported that club fees were too expensive, it was too dark and cold in winter and too hot in summer for physical activity, that their child has to cross several roads to play, that there is no time for them to transport their child to sport, and that there are few sporting venues available in their neighbourhood. A higher proportion of parents from western suburbs of Melbourne with younger children reported that it was too dark and cold in winter and too hot in summer for physical activity, that there were no adults at home during daylight hours, that there is no time for them to transport their child to sport, and that there are few sporting venues available in their neighbourhood.

Figure 16 Proxy reported barriers to physical activity among 5–6 year olds

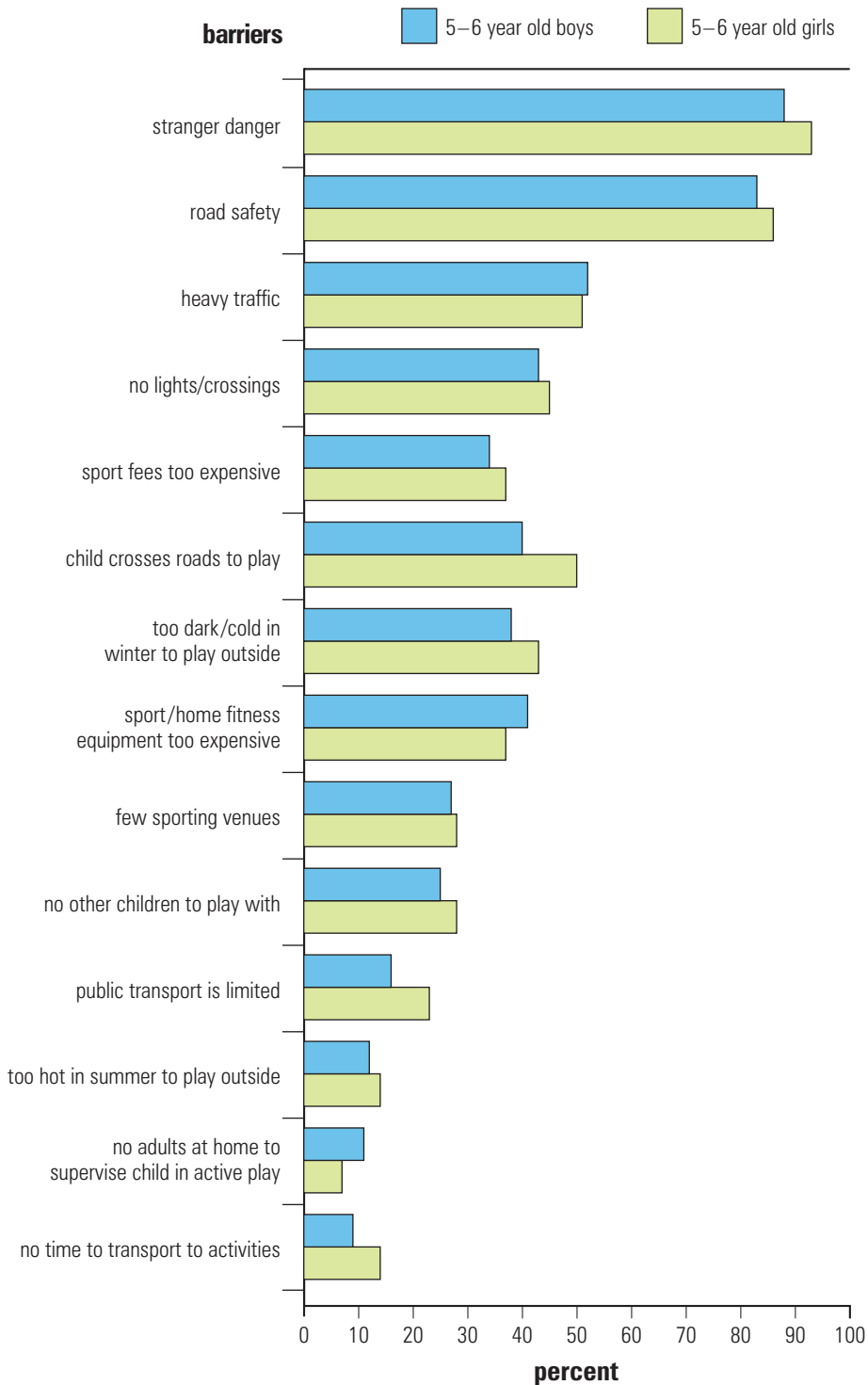
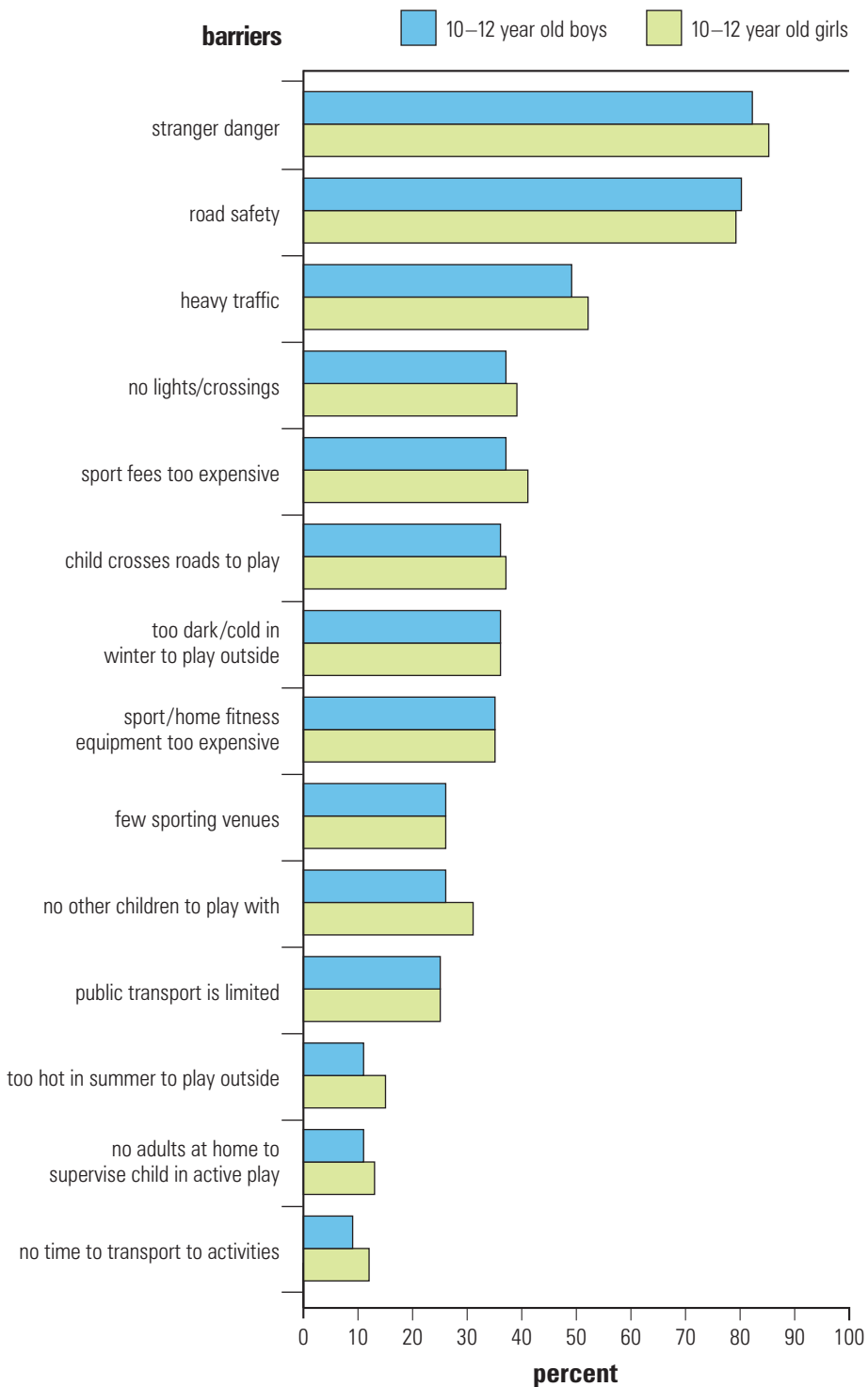


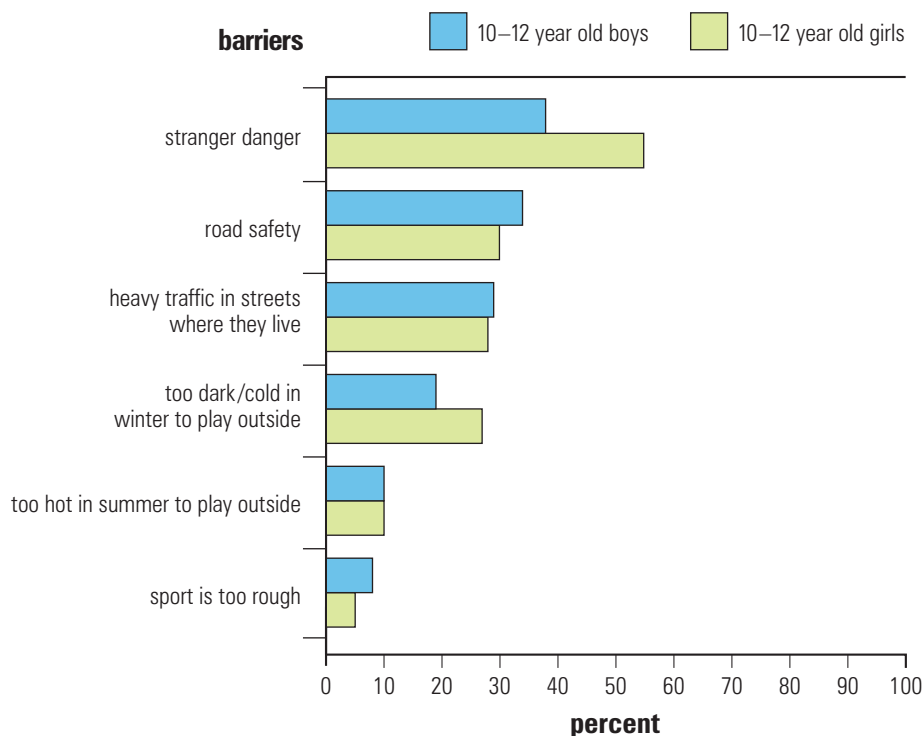
Figure 17 Proxy reported barriers to physical activity among 10–12 year olds



What do children see as the barriers to their physical activity?

Similar to their parents, most 10–12 year olds perceived stranger danger and road safety as the key barriers to physical activity (Figure 18). A higher proportion of girls compared to boys perceived stranger danger as a barrier to physical activity. Interestingly, a higher proportion of children living in western suburbs (55%) reported concerns about stranger danger as a barrier to physical activity compared to children living in eastern suburbs (47%).

Figure 18 Self-reported barriers to physical activity among 10-12 year olds

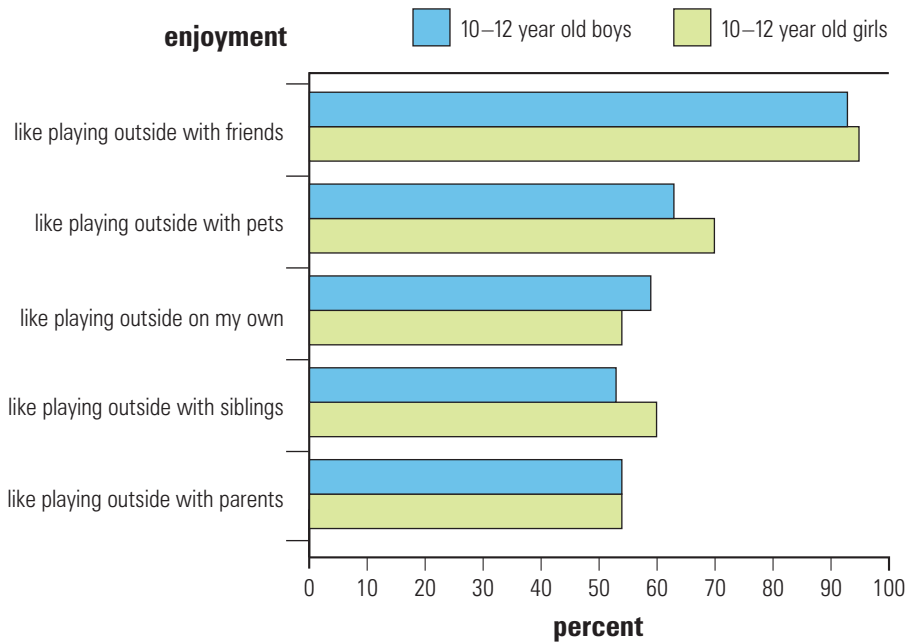


How much do children enjoy playing outside?

The older children were asked to report how much they enjoy playing outside and who they prefer playing outside with (Figure 19). Children who report enjoying playing outside on their own are significantly more likely to be in the high physical activity category. However, enjoyment of playing outside with friends, siblings, parents, and pets was not associated with overall physical activity levels among the 10–12 year old children. A higher proportion of 10–12 year old overweight/obese boys (30%) reported

they enjoyed playing outside on their own compared to non-overweight boys (17%). There were no differences in children's ratings of enjoying playing outside by geographic location.

Figure 19 Self-reported enjoyment of playing outside among 10-12 year olds



How conducive is the home environment to physical activity?

Table 3 shows that most parents reported their child as having a bicycle, balls, bats, and racquets. More than two-thirds reported having a medium-sized yard (i.e. a standard block of land). All children, regardless of their age, who had seven or more physical activity equipment items in the home were between two to four times more likely to be in the highest physical activity category, and older boys were 50% more likely. Older girls who owned a dog were 63% more likely to be in the highest physical activity category. Children with a large yard were more active than those with a smaller yard size.

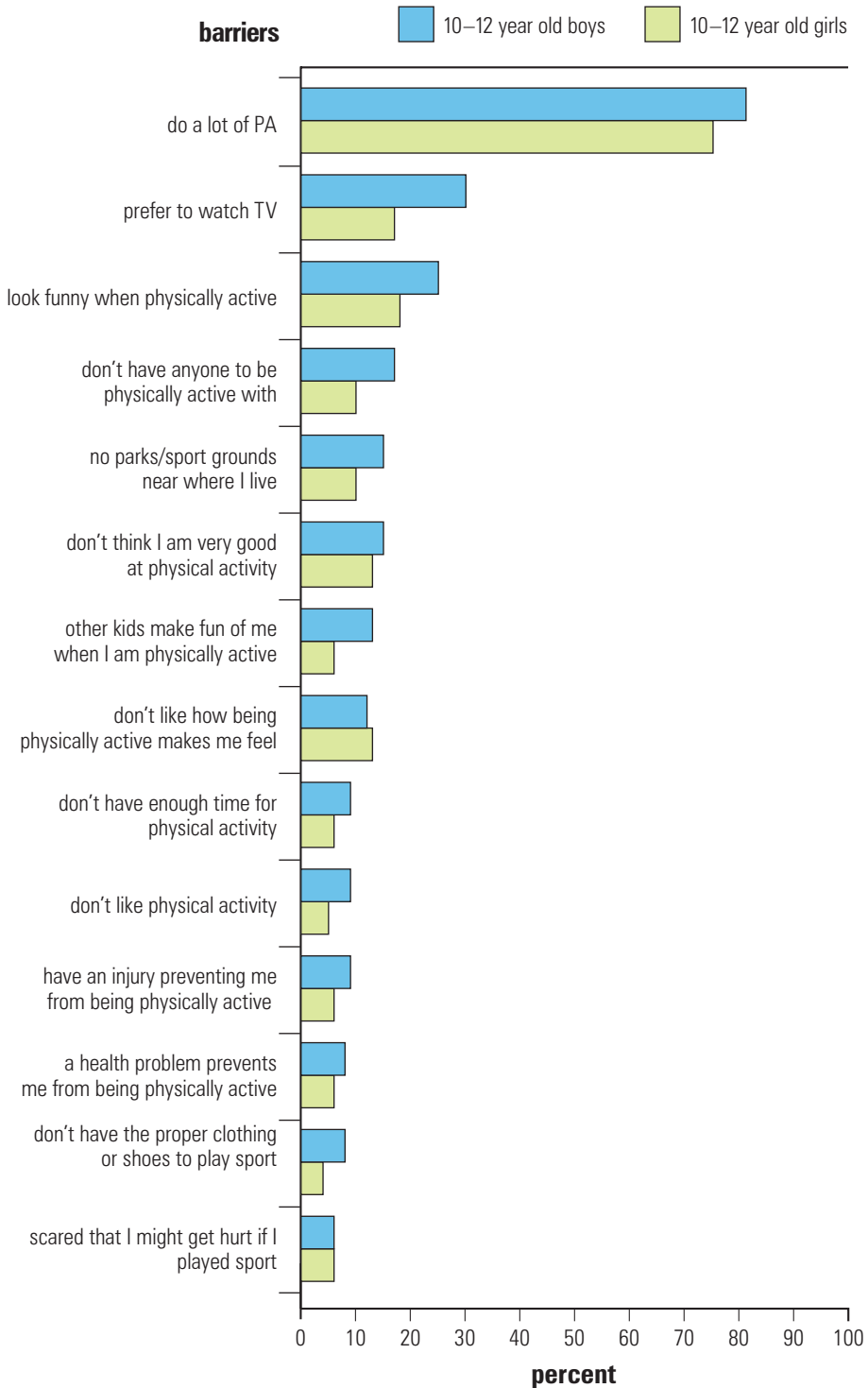
Table 3 Proportion of 5–6 year olds and 10–12 year olds with physical activity items in the home

	5–6 yr olds	10–12 yr olds
	%	%
Bicycle	99	95
Bats/racquets	92	95
Active toys (e.g., balls)	92	87
Skipping rope	75	73
Scooter	60	70
Rollerblades	42	77
Medium yard	68	70
Large yard	17	20
Front fence	55	44

What are children’s beliefs about physical activity?

Most children reported that they believe they already do a lot of physical activity (Figure 20), however, significantly more children living in eastern suburbs (82%) believed they already do a lot of physical activity compared to children living in the western suburbs (72%). Twice as many boys as girls reported that they prefer to watch television rather than be active, and a slightly higher proportion of children in the western suburbs reported that they would prefer to watch television (26%) compared to children in the eastern suburbs (20%).

Figure 20 Children’s beliefs about physical activity



How much do parents restrict children’s physical activity?

Parents reported on their physical activity rules and restrictions for their child. Figures 21 and 22 present the proportion of parents who agree with specific rules and restrictions statements (eg, ‘I don’t allow my child to play outside after dark’). Figures 23 and 24 present the proportion of parents who never impose restrictions on their child’s activity outside and going to friends’ houses. As expected, a higher proportion of parents with younger children reported needing to supervise their child while he or she plays outside. There were few differences in physical activity rules and restrictions for boys and girls.

Figure 21 Proportion of parents who agree with physical activity rules for 5–6 year olds

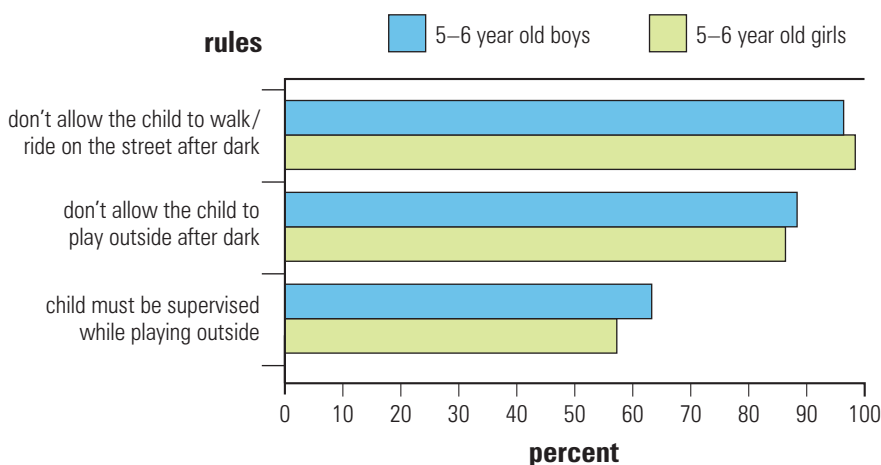


Figure 22 Proportion of parents who agree with physical activity rules for 10–12 year olds

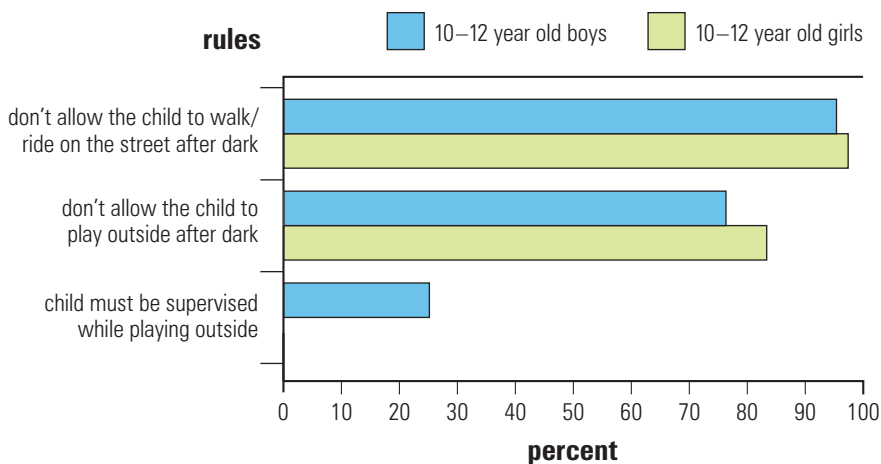


Figure 23 Proportion of parents who never impose physical activity restrictions for 5–6 year olds

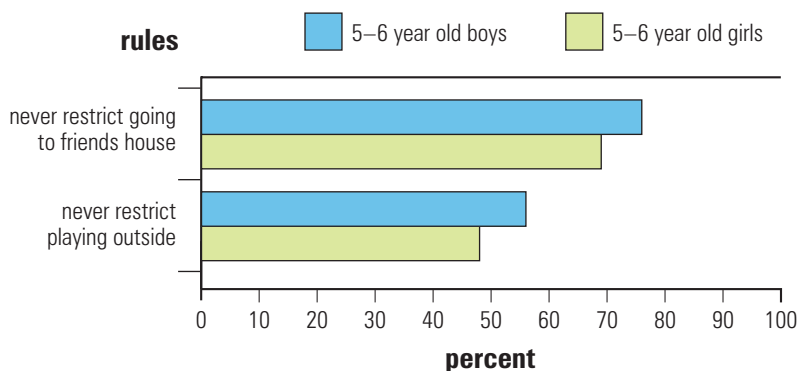
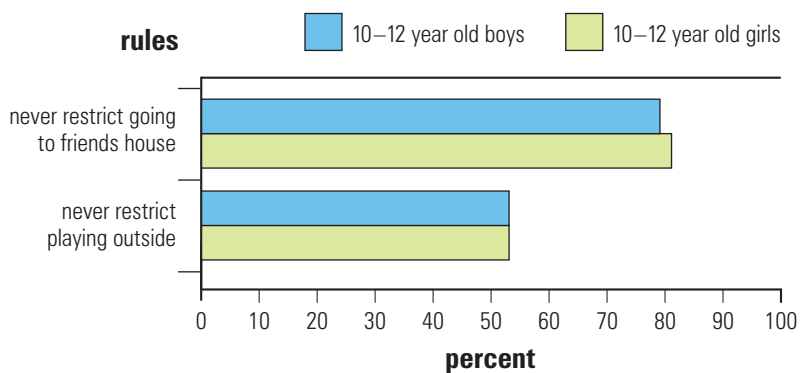


Figure 24 Proportion of parents who never impose physical activity restrictions for 10–12 year olds



What do parents perceive is an acceptable walking distance for their child?

For parents of older children, the average acceptable walking distance was 1.6 km for boys and 1.5 km for girls. For parents of younger children, the average acceptable walking distance was 1.5 km for boys and 1.4 km for girls. There were no differences in parents' reported acceptable walking distance for their child by geographic location, or by weight status.

Key Findings

- Stranger danger and road safety were the most significant barriers for parents of children in both age categories.
- Parents of children living in the western suburbs were more likely to see a range of factors as barriers to their child being physically active.
- The key barriers that influenced children's walking or cycling in their local neighbourhood were concerns about traffic and safety issues related to crossing roads.
- Children who reported not having a park near to their home were less likely to walk or cycle in their local neighbourhood.
- Children living in houses or flats on small blocks of land were less active than other children.
- Despite the finding that many children were engaged in only low levels of activity, most children in the study thought that they were highly active.
- It is a concern that nearly one-third of older boys would prefer to watch TV than be physically active.
- Half the parents of younger children and one-quarter of parents of older children saw a need to supervise their child whilst playing outside.

Preliminary Findings — Sedentary Behaviour

Time Spent in Sedentary Behaviour

In addition to concerns about children's levels of physical activity it is also important to consider children's sedentary pursuits. Television viewing, use of computers and other screen-based activities such as electronic games may also have an impact on children's health. There is evidence that television viewing is associated with increased risk of obesity among children. It is therefore not surprising that the Australian College of Paediatrics recommend that children spend no more than two hours per day in screen-based activities. At present, we have a poor understanding of children's participation in sedentary pursuits and the influences on them.

How sedentary are parents?

The average time spent watching television was less for fathers (1.60hrs/day) than for mothers (1.5 hrs/day). It was also less than the population average of 2.5 hrs/day (ACNielsen Media International, 2000) Neither fathers nor mothers spent much time playing electronic games. However, fathers spent approximately 30 mins/day using the computer for recreation, compared to mothers who spent half the amount of time using computers for recreation.

How sedentary are children?

Among both age groups there were significant differences between boys and girls and the time spent in sedentary pursuits each day (Tables 4 and 5). Older boys spent significantly more time playing electronic games, while older girls spent more time reading, listening to music, doing homework, doing art and craft, talking on the telephone, and playing a musical instrument. There were also significant differences among the older children living in the eastern suburbs compared to those living in the west. Children living in western suburbs spent more time watching television (145 mins/day) compared to children in eastern suburbs (133 mins/day); children in western suburbs spent more time sitting and talking (48 mins/day) compared to those in the east (37 mins/day); and children living in western suburbs spent more time listening to music (36 mins/day) compared to those in the east (29 mins/day).

Table 4 Time spent in sedentary pursuits (mins/day) for 5–6 year old boys, girls and overall

Children's sedentary pursuits (mins/day)	Boys	Girls	Overall
Watching TV	111	110	111
Playing indoors with toys	70	71	70
Sitting talking	35	40	37
Imaginary play	29	38	33
Reading	21	25	23
Art and craft	14	32	23
Electronic games	27	10	19
Listening to music	12	17	14
Homework	13	13	13
Travel by car/bus	13	11	12
Playing board games/cards	10	12	11
Computer	11	8	10
Talk on telephone	3	3	3
Playing a musical instrument	1	3	2

Table 5 Time spent in sedentary pursuits (mins/day) for 10–12 year old boys, girls and overall

Children's sedentary pursuits (mins/day)	Boys	Girls	Overall
Watching TV	140	134	137
Sitting talking	38	44	42
Reading	29	37	33
Listening to music	28	35	32
Electronic games	45	17	30
Homework	27	32	30
Computer	25	22	23
Playing indoors with toys	20	18	19
Travel by car/bus	12	13	12
Art and craft	9	14	12
Talk on telephone	7	12	9
Imaginary play	9	8	8
Playing board games/cards	7	9	8
Playing a musical instrument	5	7	6

Among the younger children, boys spent more time playing electronic games, and girls spent more time in imaginary play, art and craft, listening to music and playing a musical instrument (Table 5). There were also significant differences in time spent in sedentary pursuits and

where children live. Compared to children living in the eastern suburbs, children living in the western suburbs spent significantly more time doing homework (11 mins/day and 16 mins/day respectively) and spent more time watching television (102 mins/day and 121 mins/day respectively). 72% of all children exceeded the Australian College of Paediatrics (1994) recommendation that children watch no more than 2 hours of television per day.

Key Findings

- It is clear that older children spend more time in sedentary pursuits than younger children.
- On average children are spending a lot of time being sedentary, with most of this time spent in screen-based activities.
- Compared to girls, boys spend more than twice as much time playing electronic games, while girls spend more time in social activities.
- A significant majority of boys and girls of both ages exceeded the Australia Paediatric Association recommendations regarding time spent viewing electronic media.

Sedentary Behaviour Choices

Just as very little is known about children's physical activity our understanding of children's sedentary choices is limited. We don't know which sedentary pursuits children are doing, how much they like doing them, or what families are doing together. However, this kind of information is important if we wish to influence children's sedentary choices.

What are children's top ten sedentary choices?

Children's participation in sedentary pursuits during a typical week was reported by parents (Figures 25 and 26). Children's most common sedentary pursuit was watching television, followed by homework, reading, and playing electronic games for the older children. Among the younger children, television viewing, reading and playing indoors with toys were the most prevalent pursuits. For both age groups there were significant differences between boys and girls and the types of sedentary pursuits they participate in.

Figure 25 Sedentary choices of 5–6 year olds

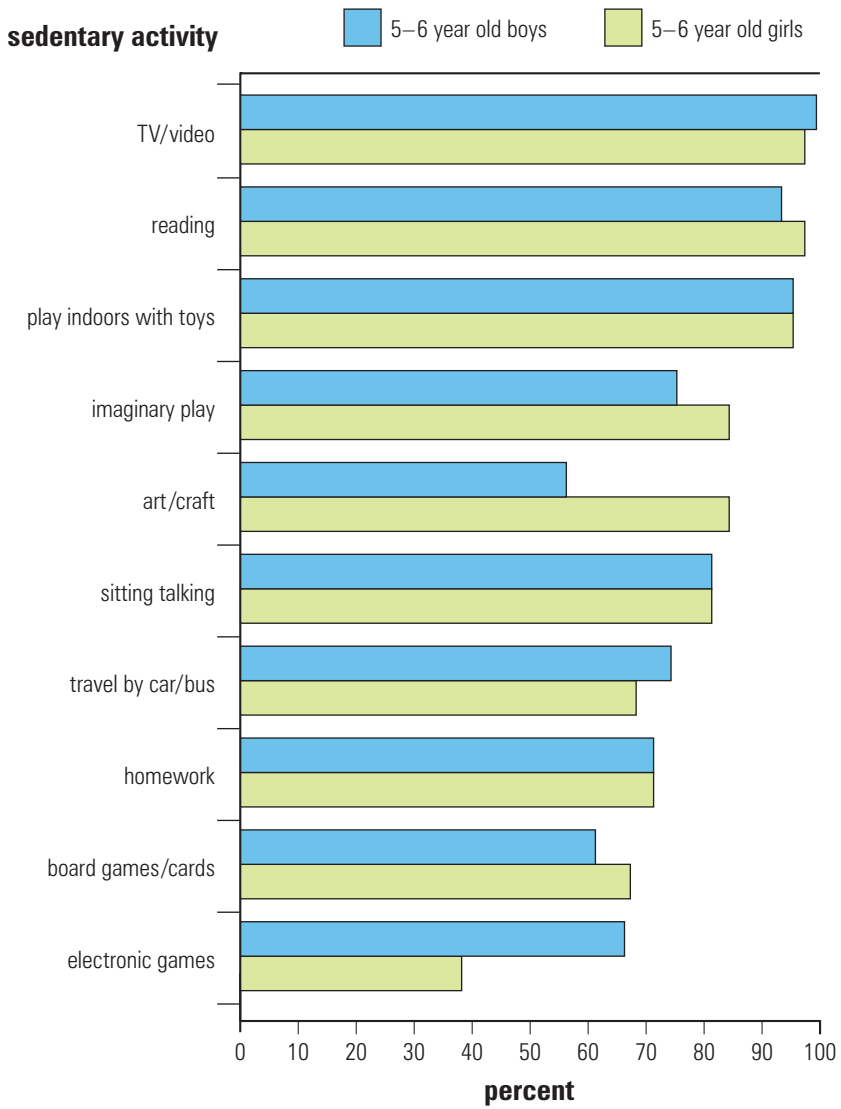
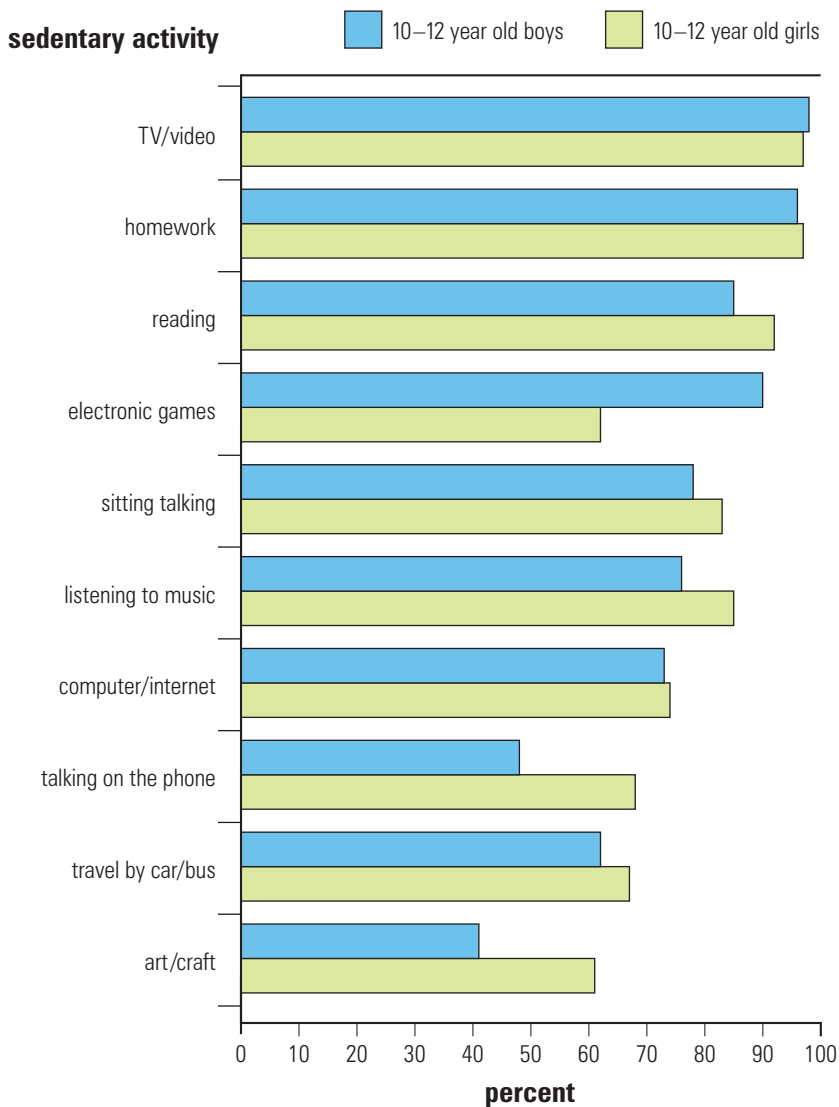


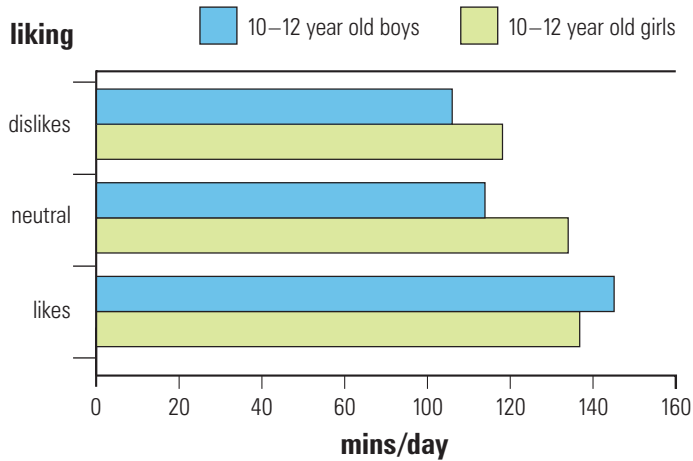
Figure 26 Sedentary choices of 10–12 year olds



How much do children enjoy watching television?

More than 80% of older children reported that they like watching TV on their own, with no differences between boys and girls. Boys who report liking watching TV watched significantly more TV each day compared with boys who did not like watching TV (Figure 27).

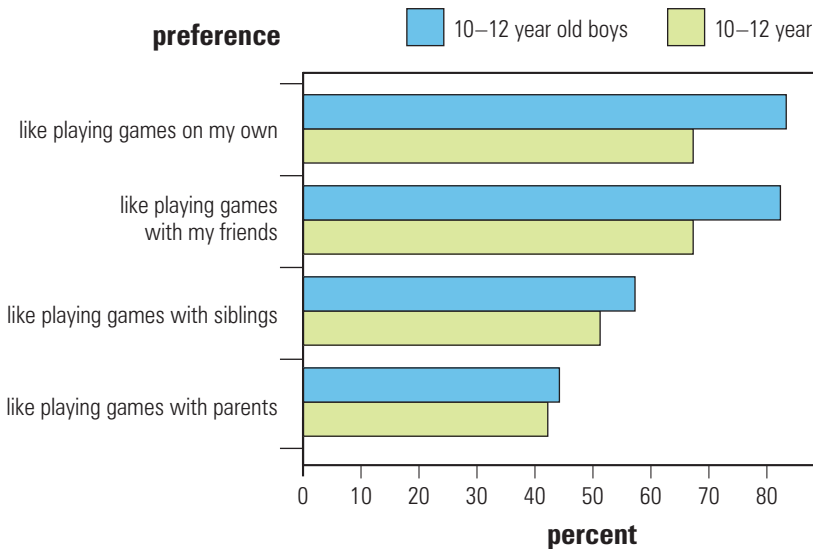
Figure 27 Time (mins/day) spent watching television by liking ratings among 10–12 year olds



How much do children enjoy playing electronic games?

More boys than girls reported enjoying playing electronic games (Figure 28). A high proportion of children reported liking playing on their own or with friends, however, fewer reported liking playing with their siblings or parents. As for TV viewing, children who reported they like playing electronic games spend significantly more time in this sedentary pursuit compared to those who reported disliking it.

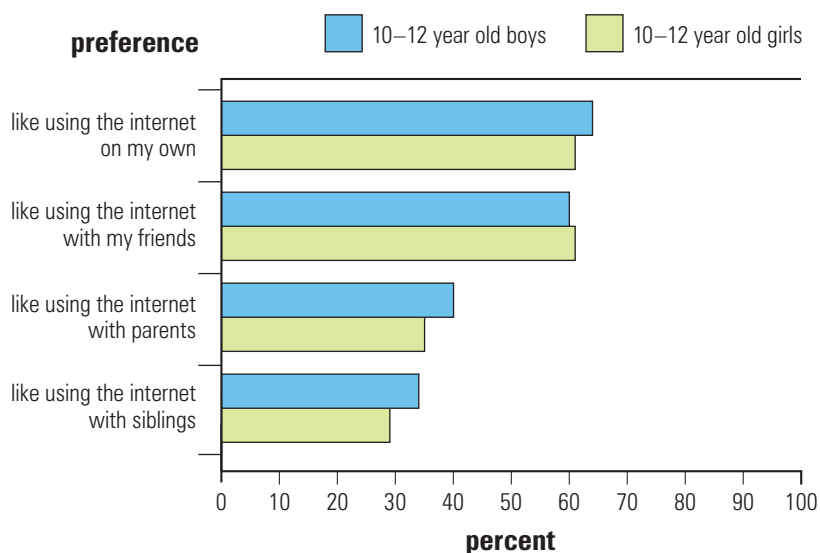
Figure 28 Proportion of 10–12 year old children who report liking electronic games



How much do children enjoy using computers and the internet?

As for TV viewing and electronic games, enjoyment was significantly associated with time spent in computer use (Figure 29). Children who reported liking using the internet spent more time in this sedentary pursuit compared to those who reported disliking it.

Figure 29 Proportion of 10–12 year old children who report liking the computer and internet



What sedentary pursuits do families undertake together?

Among families with younger children the most common family activity was eating meals (Figure 30). More than half (58%) of families with older children reported watching a family member play sport at least once per week (Figure 31). A higher proportion of families from western suburbs reported never watching a family member play sport (37%) compared to those in the eastern suburbs (23%); and a higher proportion of families with girls (62%) reported never watching a family member play sport compared to families with boys (56%).

Figure 30 Average number of times per week families spent in sedentary pursuits for 5–6 year olds

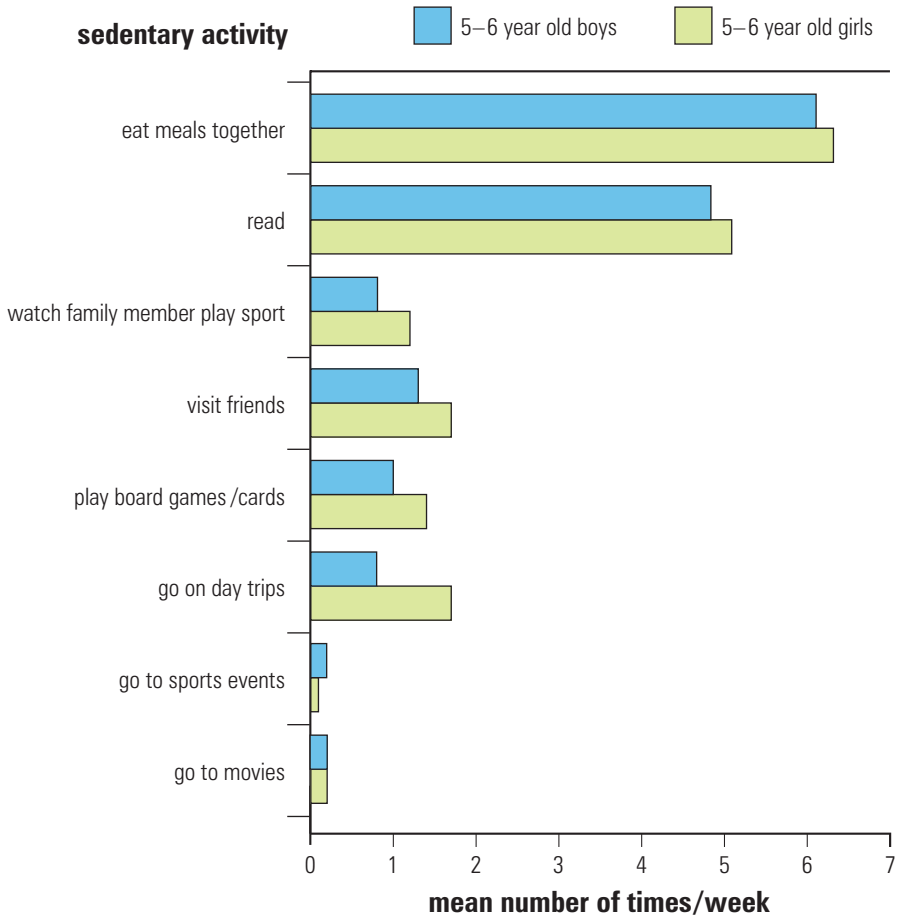
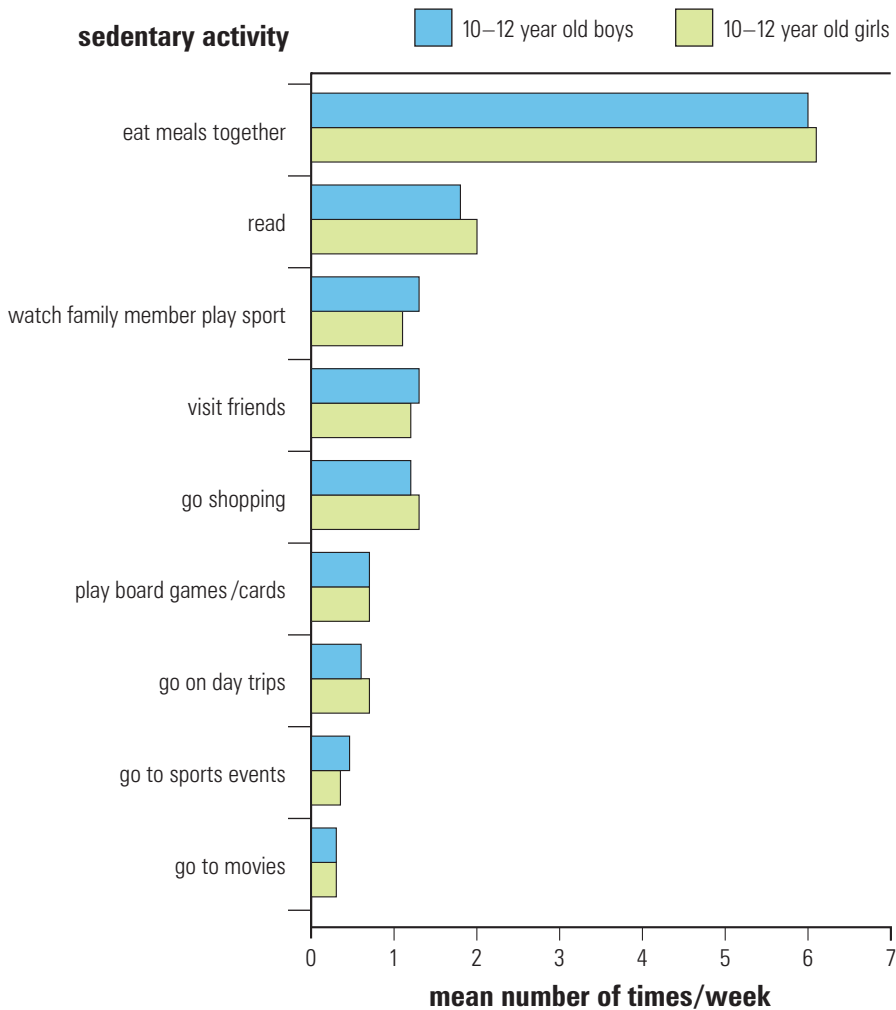


Figure 31 Average number of times per week families spent in sedentary pursuits for 10–12 year olds



How much do families watch television together?

Most parents reported watching television 1-2 times per week together as a family, with approximately 20% of families watching television together every day (Figures 32 and 33). Families from western suburbs watched television together more often (3.3 times/wk) than families from eastern suburbs (2.8 times/wk).

Figure 32 Proportion of families of 5–6 year old children who watch television together

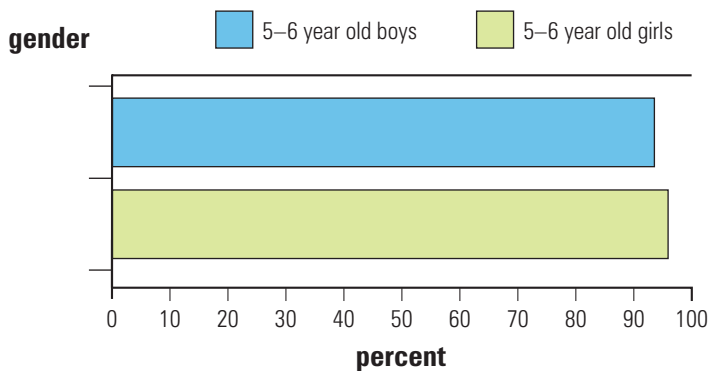
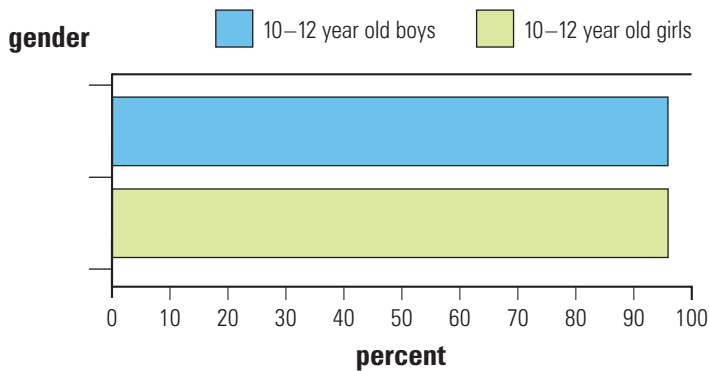


Figure 33 Proportion of families of 10–12 year old children who watch television together



Key findings

- Younger children spend more time playing indoors and in imaginary play, while older children spend more time playing electronic games, using computers, and doing homework.
- Even children who report disliking TV or who feel neutral about watching TV spent more than one-and-a-half hours per day watching it.
- One in five families report that they watch TV together every day.

Influences on Sedentary Behaviour Choices

Given that many children are spending more time in sedentary pursuits than is considered healthy, it is important to understand the influences on children's sedentary choices in order to develop strategies to reduce sedentariness.

How conducive is the family home environment to sedentary behaviour choices?

There were just two families in the sample who did not own a TV (Table 6). A high proportion of families owned one or more computers, and many had access to the internet at home. Nearly one-third of 10–12 year olds had a television set in their bedroom. Younger boys with two TVs or more in the home were three to five times more likely to watch TV for more than 100 mins/day. Younger girls living in the western suburbs were more than twice as likely to watch TV for more than 100 mins/day. Older girls with two TVs or more in the home were about twice as likely to watch TV for more than 150 mins/day. Among 10–12 year olds with a TV in their bedroom, boys were 70%, and girls 90% more likely to watch TV more than 150 mins/day.

Table 6 Proportion of 5–6 year olds and 10–12 year olds with sedentary recreation items in the home

	5–6 yr olds %	10–12 yr olds %
TV	99	99
VCR/DVD	98	98
Computer	80	92
Electronic games	60	84
Internet	60	71
3+ TVs	32	48
Pay TV	25	40
TV in bedroom	10	28

Children of families with greater access to TV's and other forms of electronic entertainment have higher levels of computer use and spend more time playing electronic games. Younger and older boys and girls with one or more computers, access to the internet, pay TV, and electronic games are up to four times more likely to use the computer for more than 10 mins/day, and younger boys were more than four times as likely to play electronic games for more than 20 mins/day.

Children and television viewing

How much is children's television viewing restricted?

Approximately half the younger children reported being allowed to watch television during meal times (Figure 34). Children whose parents restricted watching TV during meal times spent less time watching TV (120 mins/day), compared to those whose parents did not restrict (146 mins/day), and those whose parents sometimes restricted TV viewing during meal times (130 mins/day). Two-thirds of parents of older and younger children reported that their child was not allowed to watch TV until after their homework was complete (Figures 34 and 35). A higher proportion of parents of younger children reported needing to supervise their children's TV viewing.

Figure 34 Proportion of parents reporting television viewing restrictions for their 5–6 yr old child

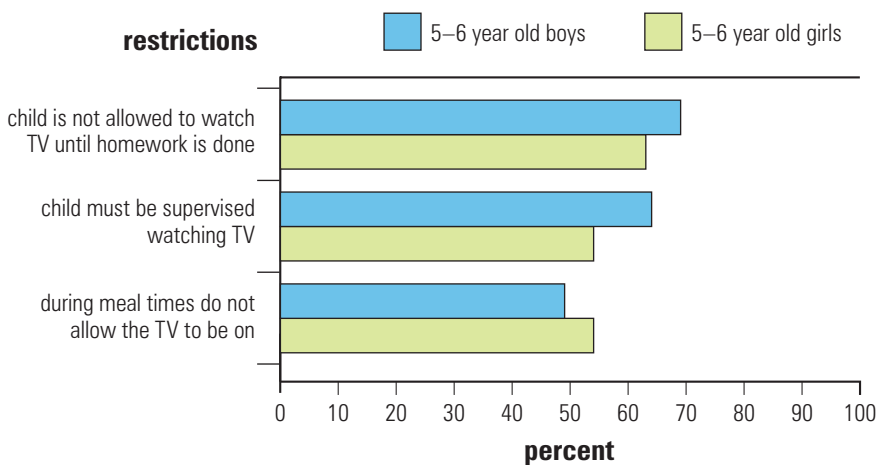
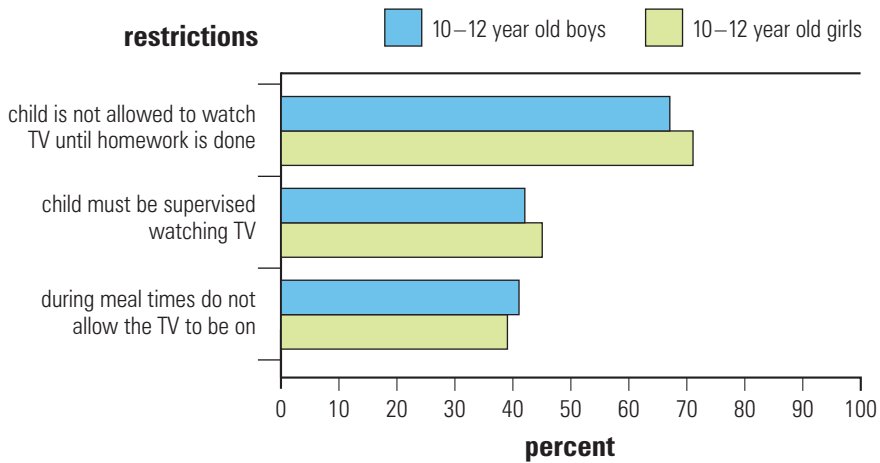


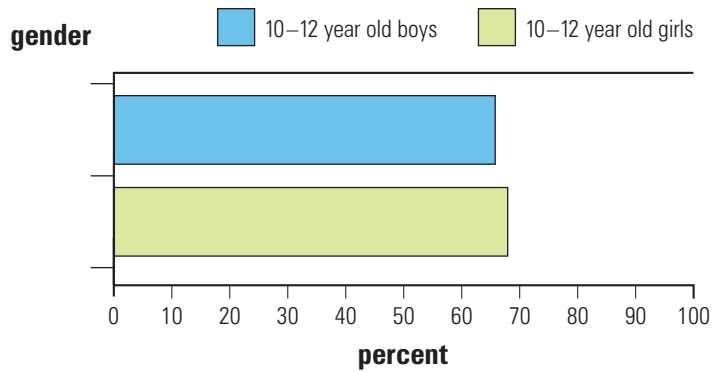
Figure 35 Proportion of parents reporting television viewing restrictions for their 10–12 yr old child



How much is children’s snacking in front of the television restricted?

Most 10-12 year old children reported being allowed to eat snacks whilst watching TV, (Figure 36).

Figure 36 Proportion of 10–12 yr old children who are allowed to eat snacks in front of the television



What do children snack on in front of the television?

Nearly half of the older children reported eating chips in front of the television (Table 7). Other popular snacks included biscuits, fruit, chocolate and lollies. The types of snacks reported by the children did not vary between boys and girls.

Table 7 Proportion of 10–12 year old children who eat different snacks in front of the television

Snack	%
Chips	48
Biscuits	34
Fruit	30
Chocolate	23
Lollies	20
Drinks	11
Ice-cream	9
Meals	7
Popcorn	6
Cake	5

Playing electronic games

As shown in Figure 26, playing electronic games is the third most common sedentary pursuit after TV viewing and homework among 10–12 year old boys.

How many homes have electronic games?

As described in Table 6, 60% of 5–6 year olds and 84% of 10–12 year olds had electronic games at home. Having a sedentary home environment was related to spending more time in sedentary pursuits. After adjusting for parental education, it was found that younger boys with one or more computers, access to the internet, pay TV, and electronic games were more than four times as likely to play electronic games for more than 20 mins/day. Among older boys and girls, and younger girls, having a highly sedentary home environment (more than nine sedentary recreation items in the home) was positively associated with having a higher body mass index.

How much is playing electronic games restricted?

Among 5-6 year old children, 46% of parents with boys and 70% of parents with girls reported never restricting their child playing electronic games (Figure 37). Among 10-12 year old children, 35% of parents with boys and 51% of parents with girls never restricted their child from playing electronic games (Figure 38). Younger boys whose parents reported 'rarely' or 'never' restricting electronic games use spent 13 mins/day playing electronic games, compared to those whose parents reported sometimes restricting use (37 mins/day), and those whose parents reported often restricting use (41 mins/day). Similar relationships were also found for young girls, and for older boys and girls. With the positive relationship between electronic games use and rules and restrictions, it seems that either having these rules does not result in less time spent playing electronic games, or that as the child already spends much time playing these games, parents attempted to enforce some rules.

Figure 37 Proportion of 5–6 year old children whose parents never restrict electronic games use

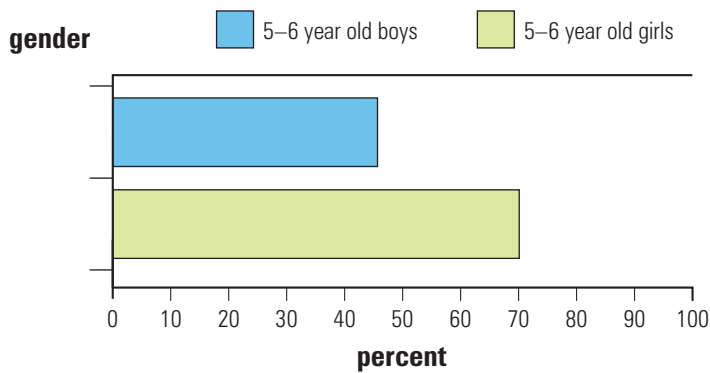
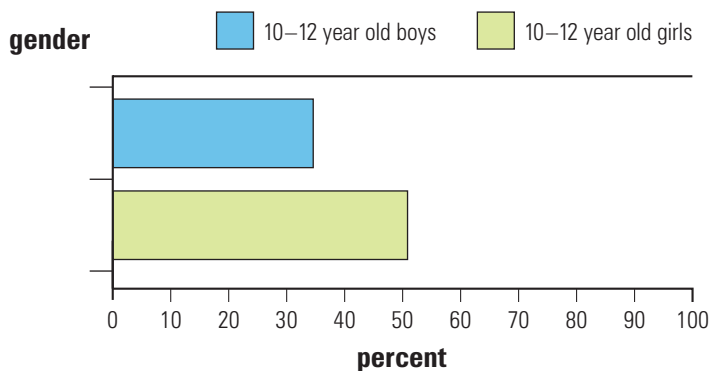


Figure 38 Proportion of 10-12 year old children whose parents never restrict electronic games use



Children and computer use

How much do children use computers?

Children aged 5–6 years spent 10 minutes/day using the computer, and children aged 10–12 years spent approximately double the amount of time using the computer. There were no differences between boys and girls.

How many homes have a computer?

Approximately 80% of homes of 5–6 year olds and 92% of homes of 10–12 year olds have at least one computer. Independent of parental education level, younger and older boys and girls with one or more computers, access to the internet, pay TV, and electronic games were at least twice as likely to use the computer for more than 10 mins/day.

How much do parents restrict the use of computers?

Forty six percent of parents with 5-6 year old boys and 57% of parents with 5-6 year old girls reported never restricting their child's computer use (Figure 39). Eighty-five percent of parents reported needing to supervise their child whilst he or she is using the internet. Thirty-eight percent of parents with 10–12 year old boys and 43% of parents with 10–12 year old girls reported never restricting their child's computer use (Figure 40). Children of parents who reported restricting their child's computer use spent more time in computer use compared to children whose parents do not restrict.

Figure 39 Proportion of 5–6 year old children whose parents never restrict computer use

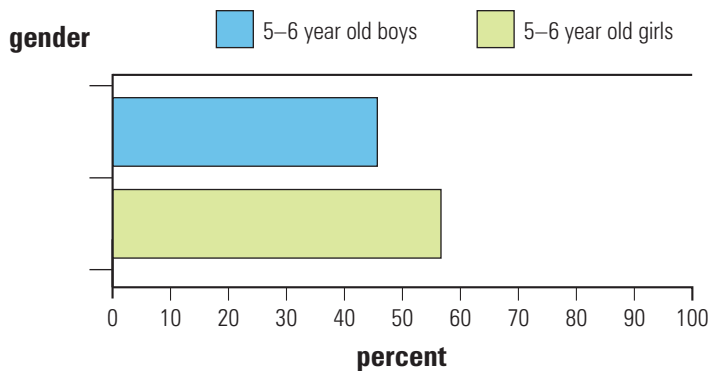
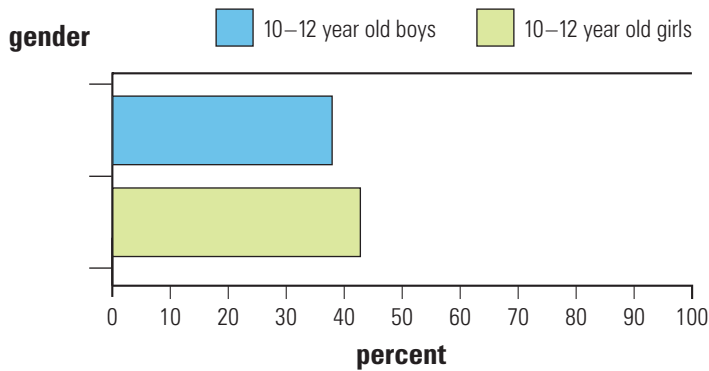


Figure 40 Proportion of 10–12 year old children whose parents never restrict computer use



Key findings

- Greater than one-third of households have more than three TVs and more than one-third of older children had a TV in their bedroom
- A majority (>60%) of households had access to computers and the internet in the home
- Children living in households with more sedentary options spend more time being sedentary and have higher average body mass index
- Many families don't see a need to supervise their child's TV viewing and many families are comfortable having the TV on during mealtimes and with children snacking in front of the television.
- More parents report supervising their child's use of the internet than supervising their child's TV viewing.

Summary and conclusions

The CLASS study is one of the first studies internationally to comprehensively examine the relationships between children's physical activity and sedentary behaviours and the family environment. The findings support the importance of the family environment as a setting for children's physical activity. The family environment has the potential to be highly supportive of physical activity or conversely to discourage children's physical activity through the promotion of sedentary behaviour. In the CLASS study the family physical activity and sedentary behaviour environments were found to differ widely from family to family.

Several important findings from the CLASS study are consistent with reports from international studies. Many children engaged in only low or moderate levels of physical activity. Although guidelines for children's physical activity do not currently exist in Australia the physical activity levels observed in the CLASS study support growing concern that many Australian children are not sufficiently active to confer positive health gains. Girls were consistently found to be more inactive than boys. Some evidence suggests that physical activity levels decline with age. Our findings support this belief, as the older children spent half as much time in moderate to vigorous physical activity compared to the younger children. These findings highlight the need to target girls and curb the decline in physical activity with age.

The CLASS study highlights a diverse range of determinants of children's physical activity pertaining to individual factors, the social environment and the physical environment. Self-efficacy, enjoyment of physical activity, time spent outdoors, seasonal variation, parental support and positive expectations and beliefs about the outcomes of physical activity were found to be important predictors of children's physical activity. Previous studies support these findings.

Specific barriers to physical activity were highlighted in the CLASS study. A commonly reported barrier to emerge from parental responses regarding children's physical activity was a lack of time. The physical environment was also identified as a barrier with lack of space associated with a lower likelihood of participation in physical activity. In the neighbourhood concern for children's safety and access to local facilities, such as parks, were also important determinants of children's physical activity.

An understanding of children's sedentary pursuits is a key dimension of children's activity. However, influences on children's sedentary pursuits are currently poorly understood. Results from the CLASS study support the widespread belief that children spend large amounts of time in sedentary pursuits. On average both boys and girls in the CLASS study exceeded the Australian College of Paediatrics recommendation of a maximum of two hours spent in screen based activities each day. A key finding to emerge

from the CLASS study is the children's time spent in sedentary pursuits was higher for the older children compared to the younger children. This is perhaps not surprising considering the older children were half as physically active as the younger children.

A challenge for future work in the area of children's physical activity is to better understand how family environments impact on changes in children's physical activity levels over time. In particular, to what extent and in what ways can the family environment protect against declines in physical activity and increases in sedentary choices as children move into adolescence. The interaction between the family environment and the influence of the local neighbourhood environment on children's physical activity will also be an important area for further research.

References:

- ACNielsen Media International. TV trends, 1999. Sydney: ACNielsen Company, 2000.
- ACNielsen Media International. Australian TV Trends 2001. Sydney: ACNielsen Company, 2001.
- Australian Bureau of Statistics. Children's participation in cultural and leisure activities. Canberra: Australian Bureau of Statistics, 2000.
- Australian College of Paediatrics. Policy statement, Childrens television viewing, *J Paed Child Health*, 1994; 30:6-8
- Baranowski T., Bouchard C., Bar-Or O., et al. Assessment, prevalence, and cardiovascular benefits of physical activity and fitness in youth. *Med Sci Sports Exerc* 1992; 24:S237-47.
- Bauman A, Bellew B, Vita P, Brown W, Owen N. Getting Australia active: towards better practice for the promotion of physical activity. Melbourne: National Public Health Partnership, 2002.
- Cole, T.J., Bellizzi, M.C., Flegal, K.M., Dietz, W.H. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ* 2000; 320:1240-1243
- Commonwealth Department of Health and Aged Care. National Physical Activity Guidelines for Australia: Active Australia. Canberra: Commonwealth Department of Health and Aged care, 1999.
- Cavill N, Biddle S, Sallis J. F Health enhancing physical activity for young people: Statement of the United Kingdom expert consensus conference. *Paediatric Exercise Science* 2001; 13:12-25.
- Department of Human Services. A Healty Balance, Victorians Respond to Obesity, 2002.
- Freedson P. S., Melanson E., Sirard J. Calibration of the Computer Science and Applications, Inc. accelerometer. *Med Sci Sports Exerc* 1998; 30:777-81.
- Magarey A. M., Daniels L. A., Boulton T. J. Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995 data against new standard international definitions. *Med J Aust* 2001; 174:561-4.
- Morris JM, Wang FS, L Lilja. School Childrens Travel Patterns - A Look Back and a Way Forward, 24th Australasian Transport Forum, Hobart, 2001.
- Rowland, T.W. Exercise and children's health, Human Kinetics, Champaign, Illinois, 1990.

Sallis J. E., Prochaska J. J., Taylor W. C. A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc* 2000; 32:963-75.

United States Department of Health and Human Services (USDHHS). Physical activity and health, a report to the surgeon general, Atlanta, GA

Publications from the CLASS study

Telford A, Salmon, Jolley D, Crawford D. Reliability and validity of a self-report and proxy-report physical activity questionnaire for children: The Children's Leisure Activities Study Survey. *Pediatric Exercise Science* 2004; 16:64-78

Timperio A., Crawford, D., Telford, A., Salmon, J. Perceptions about the local neighbourhood and walking and cycling among children. *Prev Med.* 2004; 38:39-47

Timperio A, Salmon J, Crawford D. Perceptions of local neighbourhood environments and their relationship to childhood obesity (abstract). *International Journal of Behavioural Medicine*. In press.

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Activities Study
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