

A review of the literature supporting the consistent messages of the education Department at Harbour Sport

At Harbour Sport we are dedicated to inspiring and enabling Harbour people to enjoy regular sport and physical activity throughout their lives. Within the Education Department, we are committed to increasing the physical activity (PA) levels of pre-school, primary, intermediate and secondary school students. In order to achieve this goal we promote 4 consistent messages that move with young people throughout their school lives, these are;

- 1. Positive, quality, student centred movement experiences**
 - **Age appropriate**
 - **The needs of the individual come before the needs of the organisation**
 - **“We’re going to try to win but it’s more than winning”**
- 2. Variety of sports and opportunities for all young people**
- 3. Movement, anytime, anywhere**
- 4. Your children, your community, their future (Project interACTIVE).**

The aim of this paper is to review the relevant literature that supports these statements. The literature details the PA habits of young people worldwide as well as here in New Zealand. Many also suggest interventions aimed at increasing the levels of PA amongst their sample populations. However before analysing this evidence, we must have an understanding of the current trends in PA participation during school years. This data is quite often presented relative to published recommendations for PA. Unfortunately, comparing PA data from different countries can be difficult because there are no standardised recommendations.

Recommendations:

The **American College of Sports Medicine’s (ACSM)** current recommendations come from a study by Strong *et al.*, (2005). They recommend:

- School age youth should participate every day in 60 minutes or more of moderate to vigorous physical activity (MVPA) that is enjoyable and developmentally appropriate
- The recommended 60 minutes or more of PA can be achieved in a single bout or cumulative manner during structured or unstructured activity

The **United Kingdom Department of Health’s (UKDH)** recommendations differ slightly from that of the ACSM. In response to the increasing prevalence of certain preventable diseases such as obesity and type II diabetes, the UK Chief Medical Officer (2004) produced ‘At least five a week’. This document recommends:

- Children and young people should achieve a minimum of 60mins of at least moderate intensity PA each day. At least twice a week this should include activities that enhance bone health ó activities that produce high physical stresses on the bone.

- Recommended levels can be achieved in a single bout of activity or doing activity in short bouts of 10mins or more, the activity can be lifestyle activity or structured exercise or sport, or a combination of these.

With the Sport and Recreation New Zealand Act in 2002, came the introduction of Sport and Recreation New Zealand (SPARC). SPARC published *Movement = Health* (2003) recommending adults too;

1. View movement as an opportunity, not an inconvenience
2. Be active every day in as many ways as possible
3. Put together at least 30 minutes of moderate-intensity physical activity on most if not all days of the week
4. If possible, add some vigorous exercise for extra health benefit and fitness.

Currently the official New Zealand guidelines for PA for children (Gillespie 2007) suggest children should:

- Throughout each day, do sixty minutes or more of moderate to vigorous PA
 - Be active in as many ways as possible
- Be active with friends, Whanau, at home, school and in their communities

Statistics:

It is difficult to understand how much PA children do because of vast the differences in measurement techniques and recommendations used. Measurement techniques can be either subjective or objective. Subjective measurements include self-reports, questionnaires and PA diaries amongst other things. Subjective methods are very popular because of their low cost, easy implementation and low participant burden, though they have a number of weaknesses, including issues with memory recall bias, social desirability and deliberate misrepresentation. Objective measurements include Doubly Labelled Water (DLW), calorimetry, heart rate monitoring, pedometry and accelerometry. Each of these processes has their own strengths and weaknesses, though DLW is considered the Gold Standard test of PA levels.

As stated previously, the value of PA research is limited due to the lack of standardised PA recommendations.

For example, using self-report questionnaires and recommendations from the UKDH (2004), Currie *et al.*, (2004) found just 27.9% of boys and 18.5% girls aged 15 achieved the recommended levels of PA. Interestingly, Riddoch *et al.*, (2004) used the same guidelines but measured PA levels using accelerometry. They found very different results, with PA levels in 15-year-old boys and girls to be much higher, 81.9% of boys and 62.0% of girls achieving sufficient levels. Troiano *et al.*, (2008) used accelerometry to measure PA levels, but instead referred to the ACSM recommendations. This produced very different results, finding just 42% of children, 7% adolescents and only 5% adults achieved the ACSM recommendations. Armstrong (2000) used heart rate monitoring, and the Simmons-Morton recommendations (20 minutes or longer, three or more times a week at a heart rate >140bpm ó roughly 70% maximum heart rate)) and found 76% of 11 year old boys accumulated 30 mins of daily activity with heart rate >139 bpm. By age 13 this figure had fallen to 44%. There was a similar trend in girls, with 74% achieving a heart rate >139 bpm for 30 mins at age 11, and just 32% achieving the threshold at age 13.

In New Zealand, SPARC conducted the Sport and Physical Activity Survey (SPAS) 3 times from 1997-2001 (Hohepa *et al.*, (2004)). Using face-to-face interviews and defining the physically active as participating in 150 minutes of PA during per week, SPARC found 63% of Kiwi adolescents were physically active. However, it appears the SPARC recommendations require less time and can involve any intensity compared with recommendations from other countries. This could increase the proportion of the population that achieved PA recommendations.

As is clear there are limitations to PA research due to the lack of no standardised PA recommendations. The lack of such a recommendation influences the ability to define an individual as active or inactive. In spite of this there are key trends across all of the evidence: Young people are not doing enough physical activity, and physical activity levels are decreasing with age (Currie *et al.*, (2004); Troiano *et al.*, (2008); Armstrong & Welsman (2006); Hohepa *et al.*, (2004)).

Consistent Messages

The Education Team at Harbour Sport have developed their consistent messages to ensure that all stakeholders have an understanding of the aims and philosophies of Harbour Sport. Each message may be interpreted differently particularly as there is a large age range (0-20) in the education setting.

1. Positive, quality, student centred movement experiences

- **Age appropriate**
- **The needs of the individual come before the needs of the organisation**
- **“We’re going to try to win but it’s more than winning”**

Strong *et al.*, (1990), like the Education Department, recognises the need for PA to be a positive and enjoyable experience. Strong *et al.*, (1990) state how important it is for children to learn, enjoy and understand PA and its benefits in order for them to maintain activity throughout their lifetimes. Smith & Smoll (1993) acknowledge that coaches and teachers can increase the level of satisfaction and enjoyment a child experiences through PA by using positive coaching techniques practiced in a positive motivational climate. Children who learn in these environments report decreased anxiety, increased self-esteem, increased intrinsic motivation and increased satisfaction, contributing to a positive movement experience. Also, it appears children who experienced a positive motivational climate display a lower drop out rate (5% compared with 26% in control). Frehlich (2007) describes a positive motivation climate, a mastery climate, as one where the teacher or coach emphasises effort and self-evaluated improvement. The Harbour Sport Education Team also encourages teachers and coaches to create an environment where the focus is on skill mastery and self-achievement, not winning. This is because pupils who are taught in a Mastery Climate developed more positive attitudes towards PE and engage in greater levels of PA, where as those who are taught in a climate promoting winning and competition display a less positive attitude to PE and lower levels of PA (Morgan *et al.*, (2005)).

A positive motivation climate can be enhanced further by a coach using a pupil-centred teaching style (Morgan *et al.*, 2005)). By promoting a pupil-centred PE

philosophy, SPARC (2007) encourages a shift from the successes of an organisation or school, instead focussing on the needs and achievements of each individual student. The Harbour Sport Education Team also sees a need for PE focus on the student. SPARC and Strong *et al.*, (1990) recognise the need for a child-centred teaching programme that encourage the teaching of appropriate skills at the appropriate age for every child. This allows every student to learn and develop new skills at appropriate times, encouraging every student to participate to the best of their ability. For example, a baby of 12 months should not be encouraged to run if they have not yet learned to walk.

SPARC (2005) recognises children can learn how to enjoy PA simple through spontaneous play. However schools and the PE curriculum can play a major role in influencing how much PA a child does. Students will learn through making mistakes, and being guided as to why they have gone wrong by PE teachers. In secondary school PE classes, Morgan *et al.*, (2005) found students who were exposed to guided discovery styles of teaching, as opposed to instructive styles, generally reported a greater focus on learning, more rapid improvement, increased variety, a more positive attitude towards PE and greater levels of enjoyment. These responses are essential to maintain a child's enjoyment, and increase the likelihood of a child establishing lifelong PA habits. These are responses the Harbour Sport Education Team aims to bring about.

Seefeldt *et al.*, (1993) emphasise that participation and personal accomplishment should be positively reinforced over winning. In their Overview of Youth Sport in the US, Seefeldt *et al.*, (1993) found that children (of all school ages) rated winning 8th out of 10 in a list of reasons for participating in school sports.

1. **Have fun**
2. **To improve my skills**
3. **For the excitement of competition**
4. **To do something I'm good at**
5. **To stay in shape**
6. **For the challenge of competition**
7. **To play as part of a team**
8. **To win**
9. **My Parents or close friends want me to play**
10. **To go to higher level of competition.**

However, the pressure of winning was not rated particularly highly (7th out of 10) in reasons why children drop out of school sport. This along with the fact that competitive opportunities enthused children to participate further indicates that there is a need for competition, though winning and losing is not the be all and end all, a message that the Harbour Sport Education Team looks to promote.

2. Variety of sports and opportunities for all young people

All of the recommendations for PA recognise the need for PA to take place in a variety of forms. The New Zealand Ministry of Education appreciate that PA should take place in a number of guises during a child's day. However many authors observe how PA not only provides opportunities for children to develop various movement

skills, but also to develop personal skills (SPARC (2007), Strong *et al.*, (1990) Cale (2000)).

In PE, Strong *et al.*, (1990) recognises that for children to reap the benefits of PA they must have opportunities to participate and learn through PA. Strong and colleagues (1990) identified the PE curriculum as having an important role in allowing children to do this. SPARC (2003) suggest that each schools PE programme should provide a variety of relevant and appropriate experiences for learning through and about movement; the Harbour Sport Education Team supports this message.

The Education Department encourages variety though extra curricular activities, or through links with sports clubs outside of the school environment. Cale (2000) identifies how links with clubs and centres benefits children by increasing knowledge and awareness of outside opportunities, enthusiasm and motivation. As a result of school-club links, some children may continue to participate increasing their overall PA levels. However school-club links or PE may lead to early sport specialisation. SPARC has noticed that those who are still active in secondary school (age 13-18) are more likely to have developed preferences towards some sports. Therefore, it is important that PE programmes enable students to reflect on their choices and explore further opportunities. Research by Bompa (1995) has found that early sport diversification rather than specialisation led to greater performance advances during adolescent years. In fact individuals who have specialised at an earlier age experience greater levels of anxiety, fewer meaningful social interactions and less diversified school sporting and educational lifestyle (Hill & Hansen (1987)), further highlighting the importance of providing a variety of PA opportunities for children.

Along with providing a range of opportunities for a variety of movement experiences, the Harbour Sport Education Team recognise how PA provides opportunities for the development of character. SPARC notes how PA participation facilitates the development of cognitive skills, goal setting abilities and relationship building, amongst other things. In his review of Physical Education and Sports in Schools, Bailey (2006) describes the òpositive and profoundö effect physical activity has on the physical, social, lifestyle, affective, and cognitive domains of children. Talbot (2001) claims that the impact of PA on a childö life lasts a lifetime. The personal skills they learn aid them in developing respect for their own and otherö bodies, improving their ability to integrate with other communities, understanding the role and importance of aerobic and anaerobic health and fitness, improving self-confidence and enhancing academic achievement. The opportunities for character building through PA are further supported by Svoboda (1994) who found a positive correlation between PA levels and general self-concept, self-esteem, mood, efficiency and well-being. Svoboda (1994) also found individuals who participated in higher levels of PA expressed generally lower levels of anxiety, depression, tension and stress further emphasising the importance of providing a variety of opportunities.

3. Movement, anytime, anywhere

The New Zealand guidelines for PA (Gillespie *et al.*, 2007) suggest that Kiwi children be active every day in as many ways as possible. In their òStrategy framework for developing young people through PAö SPARC (2003) state that PA opportunities can be planned or unplanned, structured or unstructured and take place in a variety of forms and settings. One issue relating to the low level of spontaneous PA

opportunities is the availability of open space in inner city New Zealand. The Canterbury West Coast Regional PA plan (Canterbury West Coast Sports Trust (2005)) are aware that there is a need for open spaces to facilitate spontaneous play and recognise more work needs to be done with territorial authorities to maintain regional parks and their role in PA promotion. The Harbour Sport Education Team plays a role in increasing and improving the availability and quality of public play areas.

Pate *et al.*, (1996) found PE lessons and break times represented the two main settings in which school children have an opportunity to be active more often. Break times have an advantage over PE, in that they provide opportunities for daily PA. Recent research leads us to believe that children are more likely to engage in moderate to vigorous PA (MVPA) during break times, an unstructured play environment. Pate *et al.*, (1996) used playground markings as an intervention and found an increase in the mean heart rates of those children in the treatment group compared with children in the control. The treatment group children also spent more time doing MVPA.

A child's PA levels can be increased simply by changes in lifestyle that favour PA promotion. The British Heart Foundation (2001) suggests introducing walking plans to encourage children to do more PA on their way to school. Other active transport interventions could include ensuring safe routes to schools, as well as establishing walking bus and walking buddy programmes. SPARC agrees with the ease with which PA levels can be increased through simple lifestyle changes like these. Authorities in New Zealand are also aware of the advantages of these active transport interventions. Gillespie *et al.*, (2007) see active transport as a regular way of increasing PA. They identify walking, cycling and skating to school as simple ways of increasing a child's daily PA. SPARC (2005) summarise our message very well, advising that any activity is better than none, and more activity is better than less.

4. Your children, your community, their future (Project interACTIVE).

There is obviously a need to maintain young peoples levels of PA. Project interACTIVE aims at implementing interventions in a chosen community, that work at engaging these children throughout primary and intermediate school through emphasising the 'your children, your community, your future' message. Cale (2000) notes the importance of involving the wider community in promoting PA in schools. Successful links with sports clubs and centres from the local community have benefits for students and teachers. They can assist in increasing knowledge and awareness of outside opportunities, enthusiasm and motivation, and for some increasing levels of PA outside of school (Cale 2000). Data from several European countries also highlights the importance of community-based sports clubs in school interventions as a predictor of adolescent PA (Strong *et al.*, 2005). Understandably, the New Zealand Ministry of Education (2007) recommends being active within the community and recognise how this creates opportunities for adolescents to be active with friends and family. Strong *et al.*, (2005) states the family unit are important contributors to encouraging active behaviours. In both his 1990 paper and 2005 paper Strong emphasises how parents must become advocates for the PA needs of their children, be this through walking with them to school or providing transportation to PA opportunities in the community. The Harbour Sport Education Team aims to engage parents and the community in providing opportunities for, and assisting children in participating in more PA.

Strong (1990) found that a child is more likely to be an active adult if he or she was active during their youth, an idea supported by Kristensen *et al.*, (2006). Kristensen *et al.*, (2006) proposes PA habits established in childhood tend to follow the individual into later stages of life; therefore PA interventions should be implemented during childhood in order to have the most profound effect. Puhl *et al.*, (1990) consolidates this message further.

Despite this, many authors observe a decrease in PA levels from childhood to adolescence (Caspersen *et al.*, (2000); van Mechelen *et al.*, (2000); Troiano *et al.*, (2007)). Kristensen *et al.*, (2006) specifically found a dramatic drop off in PA levels from the final year of primary to first year of secondary school (236.7 clicks per minute at age 11 to 176.1cpm at age 12). Troiano *et al.*, (2007) also noticed the tendency for PA levels to drop most significantly during the transition from elementary school (ages 6-11) to middle school (ages 12-15). Adherence to PA recommendations was mapped and fell from 41% at ages 6-11 to 7% at ages 12-15. Obviously there is a need to maintain the interest of adolescents in PA, during the transition through the school system. One aim of Project interACTIVE is to maintain PA levels by providing consistent messages about PA. These messages apply to all Project interACTIVE schools from primary through to college, reducing distortion in PA purposes and values from one institution to another.

References:

Armstrong, N., Balding, J., Gentle, P., & Kirby, B. (1990). Patterns of physical activity among 11 to 16 years old British children. *British Medical Journal*. 301. 203-205.

Armstrong, N., Welsman, J.R., & Kirby, B.J. (2000). Longitudinal changes in 11-13 year old children and their mothers. *Acta Paediatrica*. 89. 775-780.

Armstrong, N., & Welsman, J.R. (2006). The Physical Activity Patterns of European Youth with Reference to Methods of Assessment. *Sports Medicine*. 36. 1067-1086.

Bailey, R., (2006). Physical Education and Sport in Schools: A Review of Benefits and Outcomes. *Journal of School Health*. 76 (8). 397-401.

British Heart Foundation. (2001). Active Schools Resource Park ó Promoting Walking to School.

British Heart Foundation. (2001). Active Schools Resource Park óActive Playgrounds.

- Bompa, T. (1985). *Developing talent in young people*. NY: Ballantine.
- Cale, L. (2000). Physical activity promotion in secondary schools. *European Physical Education Review*. 6 (1). 71-90.
- Canterbury West Coast Sports Trust. (2005). Canterbury West Coast ó Regional Physical Activity Plan.
- Caspersen, C.J., Pereira, M.M., & Curran, K.M. (2000). Changes in Physical Activity patterns in the United States by sex and cross-sectional age. *Medicine and Science in Sports and Exercise*. 32. 1610-1616.
- Currie, C., Roberts, C., & Morgan, A et al., (2004). Young people's health in context. Copenhagen: World Health Organisation.
- Department of Health, Physical Activity, Health Improvement and Prevention. "At least five a week ó A report from the Chief Medical Officer" (2004).
- Fox, K. (2000). The effects of exercise on self-perceptions and self-esteem. In: Biddle, S., Fox, K., & Boutcher, S. *Physical Activity and Psychological Well-being*. 88-117.
- Frehlich, S.G. (2007). Achievement Motivation and the Motivational Climate. *Chronicle of Kinesiology and Physical Education in Higher Education*. 18 (2). 5-8.
- Gillespie, L., Thompson, K., Hinton, M., & McKay, A. (2007). Physical Activity for Healthy, Confident Kids ó Guidelines for sustainable physical activity in school communities. Wellington: Ministry of Education
- Hassmen, P., Koivula, N., & Uutela, A. (2000). Physical exercise and psychological well-being: a population study in Finland. *Preventive Medicine*. 30. 17-25.
- Hedstrom, R., & Gould, D. (2004). Research in Youth Sports: Critical Issues Status. *A White Paper for the Institute for the Study of Youth Sports Summarising the Existing Literature*.
- Hill, G.M., & Hansen, G.F. (1987) Sports Specialisation in High School: A complex issue. *The Physical Educator*. 44 (4). 422-426.
- Hohepa, M., Schofield, G., & Kolt, G. (2004). Adolescent obesity and physical inactivity. *Journal of the New Zealand Medical Association*. 117. 1207.
- Kristensen, P.L., Moller, N.C., Korsholm, L., Wedderkopp, N., Andersen, L.B., & Froberg, K. (2006). Tracking of objectively measured physical activity from childhood to adolescence: The European youth heart study.
- Morgan, K., Kingston, K., & Sproule, J. (2005). Effects of different teaching styles on the teacher behaviours that influence motivational climate and pupils' motivation in physical education. *European Physical Education Review*. 11. 257-285.

Pate, G.S., Baranowski, T., Dowda, M., & Trost, S.G. (1996). Tracking of physical activity in young children. *Medicine and Science in Sports and Exercise*. 28. 92-96.

Riddoch, C.J., Anderson, L.B., Wedderkopp, N., et al., (2004). Physical activity patterns of 9 and 15 year old European children. *Medicine and Science in Sports and Exercise*. 33. 591-6.

Sport and Recreation New Zealand (SPARC). (2003). Towards a Strategy Framework for developing Children and Young People through Physical Activity ó A discussion document for consultation.

Sport and Recreation New Zealand (SPARC). (2005). Movement = Health - Me Korikori ka ora. Wellington: SPARC.

Sports and Recreation New Zealand (SPARC). (2007). Movement = Health!

Strong, W.B., et al., (2005). Evidence Based Physical Activity for School Aged Youth. *Journal of Paediatrics*. 146. 732-7.

Strong, W. (1990). Physical activity and children. *Journal of the American Heart Association*. 81. 1697-1701.

Talbot, M. (2001). The case for Physical Education.

Troiano, R.P., Berrigan, D., Dodd, K.W et al., (2008). Physical Activity in the United States Measured by Accelerometer. *Medicine and Science in Sports and Exercise*. 40. 181-188.

Van Mechelen, W., Tisk, J.W., Post, G.B., Snel, J., & Kemper, H.C. (2000). Physical Activity of young people: the Amsterdam longitudinal Growth and Health Study. *Medicine and Science in Sports and Exercise*. 32. 1617-1622.

Whitehurst, M., Groo, D.R., & Brown, L.E. (1996). Prepubescent heart rate response to indoor play. *Paediatric Exercise Science*. 8. 245-250.