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Discussion paper: Defining Sport and Exercise, a Conceptual Model

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Brian Pink
Australian Statistician

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CONTENTS

INTRODUCTION

This discussion paper presents a draft conceptual model defining key concepts commonly used in survey research on sport and exercise. The aim of developing a conceptual model for sport and exercise is to aid interpretation and future development of surveys in this field.

The model is presented in draft form in order to provide the opportunity for feedback and comment. The ABS would be particularly keen to hear feedback from specialists working in the field of sport and physical activity policy, research or measurement.

As a precursor to the development of this conceptual model, an analysis of sports and physical activity surveys was undertaken to review 30 surveys conducted at the national, state or territory level. This work informed the development of the conceptual model presented here.

Chapter 1 presents a definition of many terms commonly used in sport and physical activity research and policy, such as exercise, incidental exercise, physical recreation, and sport. A conceptual model has been developed to illustrate the similarities, differences and overlap of parameters that define sport and exercise.

Chapter 2 describes how different sport and physical activity surveys conducted by the Australian Bureau of Statistics correspond to the proposed conceptual model. This provides insights into how the differences in definitions and methodologies may impact on what is being measured as well as the results being achieved.

The paper has been prepared by the National Centre for Culture and Recreation Statistics (NCCRS) of the ABS. The work of NCCRS is supported by the Standing Committee on Recreation and Sport (SCORS) Research Group.

How to provide feedback

Feedback on the draft sport and exercise model can be directed to:

National Centre for Culture and Recreation Statistics (NCCRS)
Email: nccrs@abs.gov.au
Phone: +61 8 8237 7602
Postal address: GPO Box 2272, Adelaide, South Australia, 5001

Comments and feedback would be welcome before July 31 2008.

CHAPTER 1 OVERVIEW OF CONCEPTUAL MODEL

This model has been constructed from an analysis of varying concepts of 'physical activity' and 'sport', which are overlaid across four 'time domains' so that the context of the activity can be understood. The model outlines what activities may be considered in scope for research of varying concepts, such as exercise, physical recreation and sport. In this chapter, the physical activity definitions are first presented, followed by definitions relevant to sport and physical recreation. These definitions are then presented in an overall conceptual model, with a discussion of how particular activities fit within the model.

PHYSICAL ACTIVITY

The definition of physical activity presents an expansive scope which can include almost any kind of activity undertaken in many domains - leisure, work, transportation, personal care and household activities. For the purposes of this paper, the definition of physical activity has been adapted from Casperson, Powell and Christenson (1985). It is a broad definition that permits the development of concepts within it, including exercise and sedentary activity.

- Physical activity

  Any bodily movements performed by skeletal muscles that result in an increase in energy expenditure.

Based on a review of recent research and surveys in this area, the following definitions of physical activity have been recommended, and these are discussed in more detail below.

- Physical fitness

  A set of health (i.e. cardiorespiratory endurance, muscle strength, flexibility) and performance related (i.e. skill, speed, dexterity, mental concentration) attributes that people have in relation to their ability to perform physical activity.
- Sedentary activity

  Physical activity that results in almost no increase in energy expenditure, and usually involves sitting or lying down.
- Low intensity physical activity

  Physical activity that results in some increase in energy expenditure at a low intensity level, beyond sedentary, but not of sufficient intensity to provide a general fitness health benefit, even if undertaken for long durations and frequently.
- Exercise

  Any structured and/or repetitive physical activity performed or practiced where the main intention is to achieve improved physical fitness. This may include ineffective exercise, where individuals intend to achieve a fitness benefit, but do not.

PHYSICAL ACTIVITY continued

- Incidental health benefits from physical activity

  Any type of physical activity that may improve physical fitness, even though this was not an acknowledged purpose for undertaking the activity.

Physical fitness

Physical activity is a complex behaviour with numerous factors influencing its form and context. Different amounts of physical activity appear to be needed for specific health outcomes. A fundamental question for research is the extent to which physical activity provides a fitness health benefit, and what definitions and dimensions of physical activity are needed to support measurement of beneficial activity.

The health benefits of physical activity have been well documented. Evidence in the literature show that there are positive physiological, psychological and social changes associated with physical activity. The optimal combination of type, frequency, duration and intensity needed to achieve fitness health benefits for different populations remains debatable. Studies have not presented a uniform definition of what constitutes adequate physical activity, nor what kinds of activities provide adequate physical activity.

Sallis and Owen (1999) state that physical activity is "an entire class of behaviours that theoretically includes all bodily movement, ranging from fidgeting to participating in triathlons. The basic dimensions are commonly referred to by the acronym FITT: frequency, intensity, time, and type." The key concepts that have been used in self-report surveys for assessing 'physical activity' include:

- intensity - this is how much physical effort or energy is expended while undertaking an activity, and is usually described as 'moderate' or 'vigorous';
- frequency - how often a person undertakes physical activity;
- duration - this is how long people sustain a particularly activity, such as walking, or vigorous or moderate exercise (eg: for 10 minutes continuously);
- domain of the activity - whether the activity is for leisure, paid work, work around the home, etc; and
- sufficient 'physical activity' - this is the level of physical activity required to maintain or achieve certain health benefits.

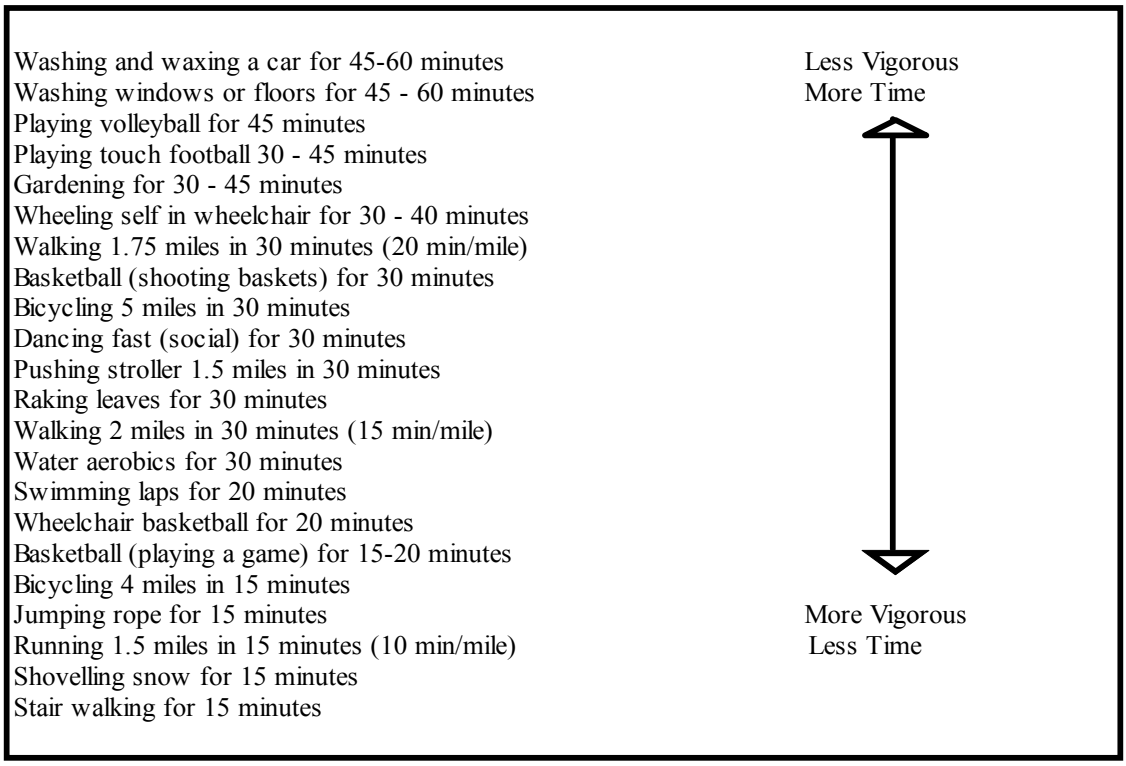
The intensity of physical activity has a major influence on health effects and benefits, and it is therefore important that an uniformed system of measurement be identified. Most studies quantify the level of physical activity according to metabolic equivalents (METS). METS are multiples of a person's resting oxygen uptake and can be applied to estimate the amount of oxygen used by the body during physical activity. One MET is equal to 3.5ml of oxygen consumed per minute per kilogram of adult body weight. Moderate physical activity is defined as an intensity of 3 - 6 METS (Bauman, Owen and Leslie 2000). The level of effort experienced by a person performing moderate intensity physical activity is akin to what one might expend during a brisk walk, while mowing the lawn or when bicycling on even terrain. Vigorous intensity physical activity refers to levels of effort expended in activities like bicycling uphill, carrying 10 kilograms up a flight of stairs or swimming continuous laps.

The Centers for Disease Control and Prevention (CDC) have developed a list of physical activities as defined by their level of intensity (US Department of Health and Human Services, 1996). The list shows a variety of activities that can be done to attain the desired level of intensity needed for health benefits. It also takes into account that

Physical fitness continued

frequency, duration and intensity all factor into the amount of physical activity needed. As such, the same level of benefit may be achieved by performing longer sessions of moderate intensity tasks (i.e. brisk walking) or in shorter sessions of more vigorous activities such as running. A sample list of these activities is shown in Figure 1.

Figure 1. Examples of moderate amounts of activity



Note: The suggested durations correspond to the expected intensity of effort. (US Department of Human Services).

The list provides a useful reference point to guide physical activity participation. A more comprehensive list describing various physical activities according to their MET levels, the Compendium of Physical Activities, was developed by Ainsworth et al. (1993, 2000). The compendium catalogues the MET levels of different daily activities ranging from sleeping to running and is useful in interpreting and understanding clinical and epidemiological studies in physical activities.

The intensity of an activity, as measured by METS levels, is used in the sport and exercise conceptual model presented later in this chapter, and is shown as a continuum from low intensity through moderate to high intensity activities. As already mentioned, more intense activities can be undertaken for shorter durations and still provide health fitness benefits. Lower intensity activities and sedentary activity are unlikely to achieve physical fitness benefits, no matter how often they are undertaken.

In regard to assessment of health benefits, there are a range of health related measures that can be used to assess health outcomes of physical activity (e.g. cardiovascular health, muscle strength, flexibility). In this paper, the definition of physical fitness encompasses a broad range of such measures. Casperson et. al. (1985), outline a number

Physical fitness continued

of components of health that may be associated with fitness. For the purpose of this paper, their work has been adapted to provide a broad definition of physical fitness as:

PHYSICAL FITNESS

A set of health (i.e. cardiorespiratory endurance, muscle strength, flexibility) and performance related (i.e. skill, speed, dexterity, mental concentration) attributes that people have in relation to their ability to perform physical activity.

In the definitions of physical activity that follow, the concepts of *intensity* (which can be measured by METS level energy expenditure) and *physical fitness* have been utilised as defining characteristics. Other dimensions of physical activity, such as frequency and duration of activity, may be captured as 'attributes' of the activity undertaken. Furthermore, in the model proposed later the 'domain' of physical activity (or context in which it occurs) can be accommodated by using the time domains of the model, which is explained towards the end of this chapter.

Sedentary activity

Many physical activity surveys classify people as 'sedentary' if they do not report undertaking moderate or vigorous physical activity or do not report any form of exercise. Many surveys do not specifically ask how much 'sedentary' activity or of what type (e.g. sitting at a desk) people do, but there is increasing interest in research in this area. The term 'sedentary' can be used generically to describe many physical activities that require sitting or lying down, given that these require the lowest increases in energy expenditure. There is general agreement that activities such as sitting or lying down while reading a book, sitting at a computer, or sitting and talking on a phone are sedentary activities. For this model, sedentary activity is defined as:

SEDENTARY ACTIVITY

Physical activity that results in almost no increase in energy expenditure, and usually involves sitting or lying down.

For the purpose of this discussion paper, this concept is broadly defined, without specifying what particular MET level intensities apply to particular activities to qualify them as 'sedentary', since research has not defined this.

Low intensity activity

As with 'sedentary' physical activity, the definition of low intensity activity is loosely positioned on a continuum of intensity, just above sedentary. Generally, these are low intensity activities that are unlikely to generate any health benefit, even if undertaken for long durations and frequently. Examples are playing croquet, washing dishes, or serving meals as a waiter or waitress. Some low intensity activities may generate some level of physical skill. For example, croquet or darts require good fine motor skills and hand eye coordination. While this skill is a component of physical fitness, having this skill on its own is unlikely to improve general fitness levels across a number of fitness outcome measures. While these low intensity activities are unlikely to generate fitness health benefits, they could not be described as 'sedentary'.

Low intensity activity continued

LOW INTENSITY ACTIVITY

Physical activity that results in some increase in energy expenditure at a low intensity level beyond sedentary, but are unlikely to provide a general fitness health benefit, even if undertaken for long durations and frequently.

It is important to note that there are some low intensity activities that may deliver some physical fitness benefits, such as yoga and stretching. These activities are often associated with exercise and may assist in achieving 'flexibility', which is a fitness criteria.

Exercise

The term 'physical activity' has been often used interchangeably with 'exercise' and in turn 'physical fitness'. Although exercise and physical activity share common elements, they are not equivalent. Exercise is in fact a sub-category of physical activity and has been defined as "any planned, structured and repetitive bodily movement performed to improve or maintain one or more components of physical fitness" (Corbin and Dowell, 1980).

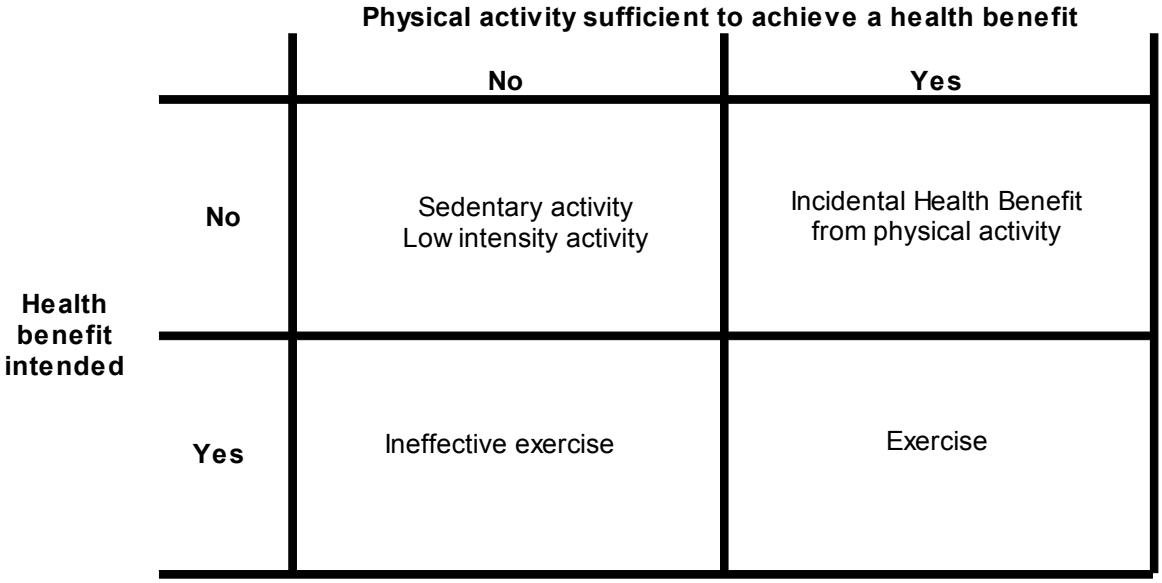
Corbin et al's (1980) definition of exercise implies that exercise includes the *intention* of the person to achieve physical fitness – it is activity that is 'planned' to improve fitness. Motivation to do 'exercise' is a fundamental factor in ensuring that *regular* physical activity is maintained at a level needed to provide physical fitness benefits (Dubbert, 2002 and Shilton, 2001). Exercise is not necessarily always an enjoyable recreational activity and may involve a demanding routine. However, it is possible for people to plan and do physical activity, which may be called exercise, without achieving actual fitness benefit (e.g. walking pace may be too slow or an activity undertaken for too short a period and not frequently enough). This relationship between a person's intention and the achievement of fitness benefits has been made more explicit in the definition used here.

EXERCISE

Any structured and/or repetitive physical activity performed or practised where the intention is to achieve improved physical fitness. This may include ineffective exercise where individuals intend to achieve a fitness benefit, but do not.

While objective measures of frequency, duration and intensity of activity are needed to assess potential fitness benefits, a person's intentions, as captured by the definition of exercise are also important to measure. These dimensions of the health benefit "intentions" of individuals and health benefit "outcomes" are illustrated in Figure 2.

Figure 2. Health benefit intentions and outcomes



Exercise continued

The types of activities that may constitute exercise would range from swimming laps and walking for exercise to playing regular sport. Many sport or physical recreation activities may be undertaken intentionally as exercise activities, as well as for enjoyment or competition. Whether or not these activities are motivated by an exercise intention, the achievement of health fitness benefits must be measured separately. Many surveys use an assessment of the intensity, duration and frequency of the activities reported by respondents in order to derive an estimate of the proportion of the population undertaking sufficient physical activity to achieve a health benefit. However, if a measure of 'exercise' is required, then it will be important that surveys capture the intention of a respondent to achieve a fitness benefit.

Incidental health benefits from physical activity

Some physical activities may provide physical fitness benefits, even though these activities are not undertaken with any intention to get fit. Incidental health benefits are usually associated with manual work or household chores. Activities such as gardening and household chores are common elements of healthy lifestyle campaigns in the United States (Kriska and Caspersen, 1997). Occupational physical activity has been examined with regards to its possible contribution to health and fitness. Some occupations demand a considerable amount of physical exertion in performing daily duties. People employed in the construction industry, for example, may need to carry loads of up to 20 kg repetitively during a day and process workers may perform repetitive reaching tasks for up to eight hours per shift. Other occupations may demand long periods of time spent standing or walking.

A report from the Centre for Disease Control indicated that up to half of adults in the United States who report no leisure-time physical activity also reported performing at least one hour of hard physical activity in the workplace (Morbidity and Mortality Weekly Report, 2000). In a study of three occupational categories, blue collar workers showed significantly higher levels of step-counts and self-reported energy expenditure (Steele and Mummery 2003). This study suggested that manual physical duties can have

Incidental health benefits from physical activity continued

correlations to improved physical fitness. The model of sport and exercise provided here includes the following definition of incidental health benefits:

INCIDENTAL HEALTH BENEFITS FROM PHYSICAL ACTIVITY

Any type of physical activity that may improve physical fitness, even though this was not an acknowledged purpose for undertaking the activity.

Given the inconclusive results of studies of the benefits of physical activity during work or housework, it is not possible to identify clearly what activities might provide incidental health benefits. However, some activities are more clear cut - such as professional dancers and professional sports persons. For these professionals the physical nature of their work is highly likely to be providing a fitness benefit, since high intensity physical performance is a requirement of the work.

SPORT AND PHYSICAL RECREATION

The scope and definition of sport is influenced by different contexts and individual disposition. Sport is not just a demonstration of physical prowess but also an avenue for employment, enjoyment or improving one's health and fitness. Sport can be undertaken within the formal arrangements of sporting clubs and competitions or as an informal recreational activity where formal rules may be adapted.

It is a difficult task to precisely define 'sport' for measurement purposes. It has been tackled here by providing several definitions of overlapping concepts that are relevant to data needs.

- Sport

  An activity involving physical exertion, skill and/or hand-eye coordination as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations.

- Physical recreation

  An activity or experience that involves varying levels of physical exertion, prowess and/or skill, which may not be the main focus of the activity, and is voluntarily engaged in by an individual in leisure time for the purpose of mental and/or physical satisfaction.

- Organised sport or physical recreation

  Sport or physical recreation activities may be organised by a club or association or other organisation, such as a sporting club, social club, church group, workplace, or gymnasium. An organised activity may vary from an organised one off fun run or bush walk, through to an organised sporting competition.

These concepts are explained in more detail below.

Sport

In formulating the definition of sport, consideration was given to its physical, competitive and institutional characteristics, as well as how sport is shaped by social and cultural influences. The idea of 'what is sport' will always vary over time and will reflect popular culture. Sport activities are constantly evolving, with new sports emerging and others receding and with considerable variation across countries. Emerging sports may begin with popular physical recreation activities, like skateboarding and rollerblading, now developing as a sport governing by rules and competition. Sport may also have a very local flavour, with different societies preferring different types of sports (e.g. various

Sport continued

forms of ice and snow sports are more prevalent in colder climates). This dynamic evolution echoes the close relationship of sport and society, as discussed by Coakley(2004) and Zingg (1986). Its scope and definition should then reflect the social and cultural setting of a particular group of people.

Although there are many different activities that might be considered a 'sport' and some definitions vary, there are common elements that can be identified. Many definitions have emphasised that sport is an institutionalised type of competitive physical activity, and that it involves physical exertion and use of complex physical skills. In addition some definitions discuss the motivation of participants for internal or external rewards (Coakley 2004, Luschen 1972).

The definition provided by this paper encompasses the inherent requirement for some physical skill as the focus of the activity, as well as competitive elements and rules for governing the activity.

PHYSICAL ASPECTS OF SPORT

All sport has a 'physical' element. The display of physical power and skill is an important component in sport. However, there are numerous activities thought of as sport that may use these components singly or mutually at different levels. Activities such as archery, darts, billiards or pool, or fishing do not involve rigorous physical exertion, yet they do require complex physical coordination skills.

It is difficult to specify the degree of rigour, complexity or physical exertion required to define a sport. Rather, the definition of sport presented here assumes that *some degree of physical skill or hand-eye coordination is the primary focus of the activity.* That is, the success of the activity is solely contingent upon the demonstration of a physical skill, and it is this skill that is the competitive element in a sport. Thus, playing darts requires the skill of hand-eye coordination to hit a bullseye. However, while playing a piano requires dexterity with the fingers to hit the right keys, it is more concerned with interpreting music rather than demonstrating physical prowess. Being able to read and interpret music and to communicate music to an audience is the main focus of the piano playing activity.

COMPETITIVE ASPECTS OF SPORT

Sport has an inherent competitive nature, even when played socially. The competitiveness in sport can be viewed as individualistic when one is competing against another individual or trying to surpass a previous personal effort. It can also be viewed as cooperative when one is part of a team challenging another team. Competitive sport also involves a test of physical or psychomotor skills undertaken within a framework of contest and rivalry with specific rules which establish the activity. Another factor that influences this competitive nature is the rewards associated with winning. These rewards can be satisfactions associated with exhibiting skills and winning the gold medal for your country or it can be a contract with a professional sporting club and possible lucrative endorsement deals with commercial companies.

Sport continued

Thus, sport is often dominated by a motivation to demonstrate performance (to show physical skill achieve a personal best or win an organised competition). However, people involved may have other motivations such as fitness, social status, enjoyment or even professional employment. The element of competition is only one motivation for sport and it is not always present for individuals. In the definition of sport provided here, the competitive element is defined by the way the sport activity itself inherently requires competition (whether or not individuals are motivated to win). A component of the definition of sport must be that it is an activity that has a competitive element.

RULES OF THE GAME

All sporting activities are governed by rules that define how the activity may be played. These rules may vary in different contexts, and participants may bend the rules for informal participation. Generally, sporting activities have a form of the game that exists in formal competition, where rules are clearly defined and strictly governed. Societies establish sporting competitions through varying types of sports organisations. That is, *all sport has established rules and patterns of behaviour governing the activity, enforced through organisations.* The rules and regulations established through organised sport may be adapted for more informal, social or recreation sporting activity.

The definition of sport combines the above elements, as follows:

SPORT

An activity involving physical exertion, skill and/or hand-eye coordination as the primary focus of the activity, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations.

Sport includes organised sport, but may also be undertaken outside a formal competition (e.g. recreationally) and/or using less formal rules which have been derived or adapted from organised sport. Sport may be undertaken as physical recreation (for enjoyment rather than performance). Sport may provide physical fitness benefits as exercise, but may also include low intensity physical activity (e.g. snooker, darts).

Naturally, there are many activities in society that have a competitive element (piano competitions, spelling bees) or have game rules (chess, bingo) or require an element of physical performance (dancing, circus aerobatics). Yet none of these are sport, because it is the combination of these elements that defines a sport. In addition, a further defining characteristic is that the game rules of sport are derived from organisations, known as sporting organisations, established within a particular society. Thus, all sport is derived from some form of organised sport, which is governed via social organisations that enforce rules and manage formal sporting competitions.

Physical recreation

Physical recreation is a concept often associated with fun and play. It may be physical activity that requires very little preparation and training, and the type of activity may vary from kite flying to playing hide and seek. The physical nature of the activity may involve varying degrees of physical skill or performance, including low intensity activity. Physical recreation therefore encompasses a range of physical intensity but excludes sedentary activity.

Physical recreation continued

People are motivated to participate in physical recreation activities because of the resulting physical, spiritual or social experience. This could either bring about an improvement in fitness level, an increased level of relaxation and freedom or the opportunity to be a part of the community. With physical recreation the main focus is on the quality of the experience. While satisfaction in competitive sporting games may be achieved through winning and the resulting rewards, physical recreation is engaged in the course of leisure time and driven by the physical and mental satisfaction of participation. Motivation for internal rewards (rather than external rewards such as awards or prize money) is a key defining characteristic of physical recreation. The motivation of physical recreation is for *individual mental or physical satisfaction.*

Many sports are played for enjoyment and recreation. However, some sports may have much less of a recreational element, such as professional and organised sports which may be considered 'work'. Children required to play sport as part of their school education are predominantly doing so for their education, and while some children may enjoy this, it is not defined here to be recreational activity.

In addition, while some people may enjoy exercise as a recreational activity (e.g. walking for recreation and exercise), there may be many who find exercise quite a chore (e.g. swimming laps, gym workouts). Thus, not all exercise is physical recreation. A key defining characteristic of physical recreation is that it is *voluntarily engaged* in by an individual in *leisure time*.

PHYSICAL RECREATION

An activity or experience that involves varying levels of physical exertion, prowess and/or skill, which may not be the main focus of the activity, and is voluntarily engaged in by an individual in leisure time for the purpose of mental and/or physical satisfaction.

Physical recreation activity may provide physical fitness benefits and be undertaken as exercise, but it also includes low intensity activities, such as playing mini putt putt golf, fishing or darts. Recreational swimming at the beach, such as a quick dip to cool off, is a physical recreation activity, but it is neither a sport nor likely to achieve fitness related health benefits.

Organised Sport or Physical Recreation

Most sport and physical recreation surveys classify sport participation as 'organised' or 'non-organised'. Organised activity requires the involvement of organisations to enable participation in the activity to occur and this may or may not be associated with formal competition and rule enforcement. The ABS sport participation surveys define organised activities as those arranged by a club, association or other organisation. The club or organisation need not be a sporting body - it may be a social club, church group, workplace or gymnasium. For example, a social club organises a social game of cricket, a local Council organises a fun run, a bushwalking club organises a bushwalk or a workplace organises a sport event for its staff. Both sports and physical recreation activities may be organised in this way. Organised sports are often organised by a sporting club or association, but sports or physical recreation activity may also be organised by other kinds of organisations.

Organised Sport or Physical Recreation continued

ORGANISED SPORT OR PHYSICAL RECREATION

Sport or physical recreation activities may be organised by a club or association or other organisation, such as a sporting club, social club, church group, workplace or gymnasium. An organised activity may vary from an organised one off fun run or bush walk through to an organised sporting competition.

Varying levels of competition and performance may be involved in organised sport, which are often linked to the specific organisations involved. A game of tennis that is organised by a social club is 'organised sport', but may not involve any team competition or strictly governed rules. A local tennis club that organises a regional competition is 'organised sport', where the competition is more formalised and performance may be more important for participants. The Australian Open is clearly a professional form of 'organised' sport, where performance is paramount.

Conversely, 'non-organised' activities may be undertaken alone or with others without the aid of organisations, although the facilities offered by such organisations may be used or hired. Examples of non-organised activities include: a social game of tennis organised by friends (not organised by a tennis club or social club) and walking, jogging or cycling alone or with friends (but not as part of a club activity). Non-organised physical recreation or casual sports games require fewer resources since rules, regulations and 'competitive' systems are not always needed or adhered to.

TIME DOMAINS

A key element to our understanding of sport and physical activity relates to the context in which the activity occurs. In particular, policy and research in this area often discusses the distinction between work and leisure related activities as well as how people allocate time to spend on physical activities. Most research and policy has been interested only in 'leisure time' physical activity as this has been thought to provide a more useful assessment of beneficial physical activity in the population. Activities such as manual labour, gardening and performing household chores are not commonly reported in physical activity surveys nor the subject of policies directed at promoting physical activity. However, there has been increasing interest in incidental physical fitness benefits that may be derived from walking or cycling to work, or while shopping or going about daily activities.

All of these activities are undertaken in different contexts. To assist in capturing these dimensions the conceptual model uses four time domains. The ABS Time Use Survey uses a typology of time use activities and behaviours proposed by Aas (1982). Four categories of time were identified and used to fit all activities of daily life. The categories are:

- Necessary time - includes activities which serve basic physiological needs, such as personal care;
- Contracted time - includes activities with explicit contracts which control the time spent on activities such as work or going to school;
- Committed time - activities to which a person has committed to because of previous acts or behaviours or community participation such as voluntary work, domestic duties and childcare; and

TIME DOMAINS continued

- Free time - amount of time left when the previous three types of time have been taken out of a person's day - activities that involve recreation or leisure as well as social and community interaction.

Though most sporting and exercise activities are undertaken during one's free time, these can also be undertaken during the other time domains. Incidental fitness benefits are, by definition, incidental to other activities, such as those conducted in committed time (gardening) or contracted time (work or school). Involvement in sport is not just limited to playing recreationally, as sport is also an industry. Regulatory agencies, officials, coaches, trainers, medical staff and the spectators are also involved. Sport officials such as coaches, administrators, medics or referees are also integral to any sport. Some people are contracted to and given remuneration for their participation during sporting events, others provide these services on a volunteer basis and do so at their convenience. Sport can also be contracted through education. Volunteers, employees and educational contexts are included as participants in contracted or committed time.

THE MODEL

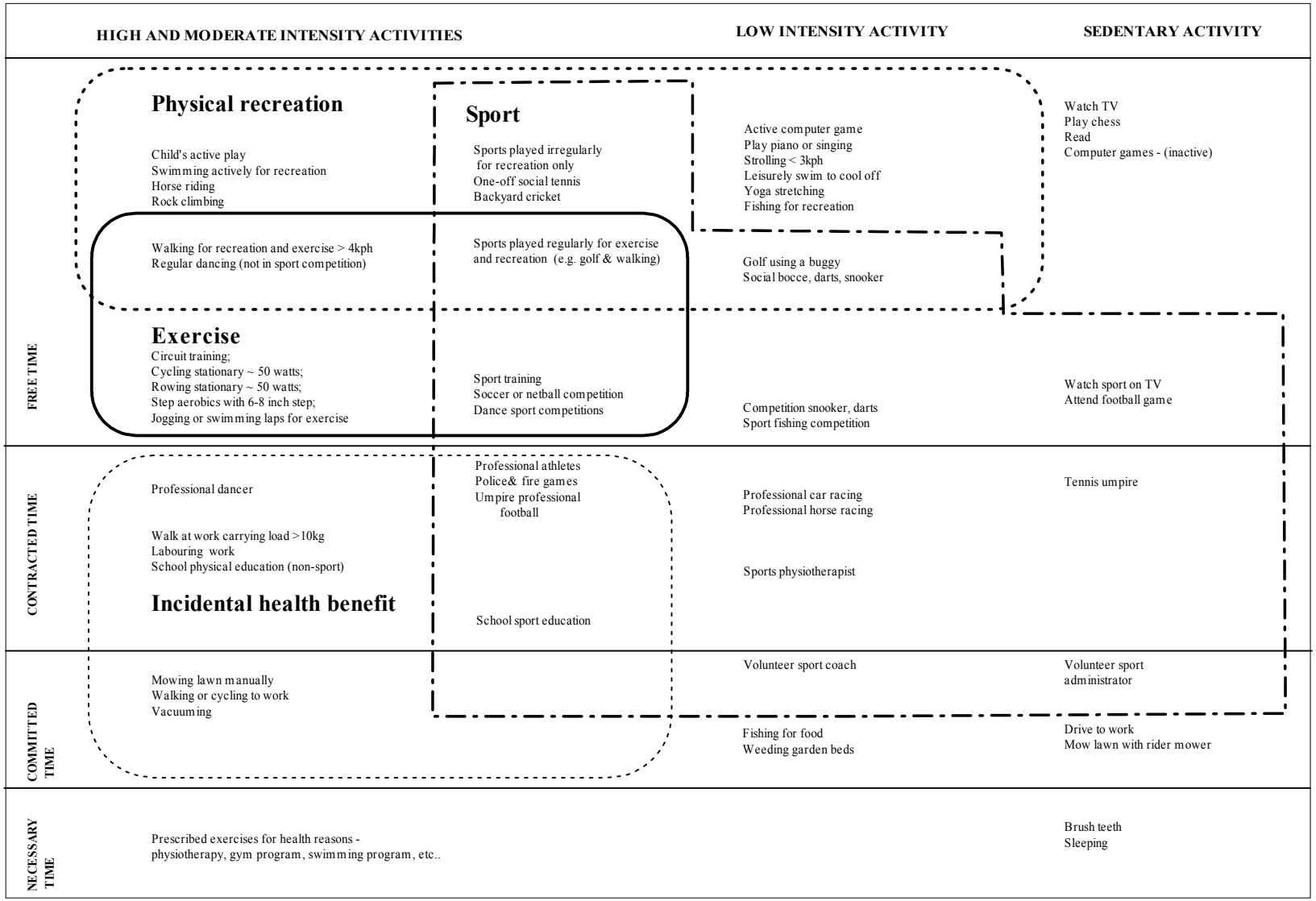
The core definitions of sport and physical activity have been shown together in the model presented in Figure 3, including:

- exercise;
- incidental health benefits;
- sport; and
- physical recreation.

These concepts are overlaid on the four time domains shown in Figure 3, from 'free time' (along the top row) down to 'necessary time' (at the bottom row). The model presents the intensity of physical activity as a continuum across the top, from higher intensity activity likely to deliver benefits as exercise (at left) through to low intensity and sedentary activity (at right). The concepts of exercise, sport and physical recreation are each shown with a box around them, all of which overlap. Within each box some examples of activities are given. Examples of activities which may provide incidental health benefits are also shown.

The conceptual model can be utilised to draw out what a particular survey measures and to evaluate the concepts used in exercise or sport surveys. The model also identifies areas where different concepts can overlap to aid in understanding the variance in the results of surveys measuring different concepts. The incorporation of the typology of time-use into the model affords valuable insights to understanding the different domains of physical activity and their associations. The conceptual model and definitions presented are proposed to be used as a guide for people working in the physical activity and sports area.

Figure 3. Conceptual Model of Sport and Exercise



Applying the model with activity examples

Figure 3 includes some examples of the kinds of activities which fit within each concept or each of the overlapping concepts. Some of these activity examples are discussed below in order to demonstrate how the model works in practice. The example activities chosen here can be viewed in many ways and provide an indication of the mix of issues which must be borne in mind when deciding what fits within the definition of 'sport','exercise' or 'physical recreation'. The issues raised in these examples apply equally to many other activities.

GOLF

Golf fits within the definition of sport, but may also be undertaken as a physical recreation activity in leisure time. Professional golfers may play in committed time – as work. Golf may be undertaken for exercise to varying degrees of intensity; and may or may not provide fitness benefits. Fitness benefits will depend on the intensity, duration and frequency of activity. These issues are discussed in turn below.

Golf is a competitive sport, which is governed by formal rules from sporting organisations and has physical performance as the primary focus of the activity. Some people who enter golf competitions in free time may do so for both recreation and performance reasons. Where there is a mix of goals the activity may be both a 'physical recreation' activity and a competitive sport undertaken in free time. For example, some junior golf competitions are training grounds to develop future golf professionals, and as such may be much more focused on performance than recreation even though undertaken in free time. When people begin to focus on earning an income through their golf competition, they become golfing professionals, operating in the 'committed time' domain. Most sports operate similarly, with amateur and junior competitions offering the opportunity for people to give a serious commitment to their performance.

Golf sporting rules have also been adapted to mini putt putt golf, but this is not undertaken as a serious competitive sport, and has no formalised rules governing the game through sporting organisations. Hence mini putt putt golf is not a sport, but a physical recreation activity.

Golf may provide some exercise benefit, but this is not necessarily always the case. The exercise element in golf comes not from the actual golf swing or putt but mostly from the walking involved from one hole to another. If a person uses a golf cart to navigate the course, the golf activity would not be sufficient enough to reach the levels required to improve health or fitness, and is therefore not exercise – it is low intensity activity.

WALKING

Walking can be done at many levels of physical intensity and for many reasons. Surveys of sport and physical recreation consistently report that walking is the most commonly reported exercise activity in Australia. Although the benefits of walking as a form of exercise are well recognised, evidence is still scarce for the benefits of walking while performing activities of daily living. Health and lifestyle campaigns encourage people to walk to work or the bus stop or go on walking holidays as a way of incorporating physical activity into daily life. The possible fitness health benefits have been empirically reported and walking is an activity that may be done as exercise, but which may also provide incidental fitness health benefits.

Applying the model with activity examples continued

Walking at a slow pace (< 3kph), or strolling, has *not* been shown to provide any fitness benefit, and therefore is shown as a low intensity activity in the model. Walking for exercise or recreation would need to be undertaken regularly, at a pace greater than 4kph, and for sufficient durations to provide health benefits. Many surveys of physical activity ask about walking for durations of 10 minutes or more. However, to accurately measure all the facets of walking is difficult and costly.

In addition, a walking race can be undertaken as a competitive sport, governed by rules and fitting the definition of sport. Also, orienteering is a sport that involves walking and/or running. Where walking is incorporated into sporting activity it is quite likely that fitness benefits accrue, due to the nature of these activities. However, most walking activities are not sports, but can be either physical recreation or exercise or incidental to other activity across the time domains; and fitness benefits are likely to be highly variable.

SWIMMING

Swimming can be undertaken as a competitive sport, but swimming can also be undertaken recreationally. Swimming at the beach often uses no sporting rules and is a 'physical recreation' activity and not a 'sport'. As with any other activity, the intensity, duration and frequency of the activity has an impact on whether swimming will provide fitness benefits. Swimming as a physical recreation activity may provide some fitness benefit – children swimming in the backyard pool or at the beach are usually fairly active. However, some people may swim simply to cool off, such as taking a quick dip at the beach. Even though this is commonly referred to as "going for a swim", a leisurely dip requires minimal physical exertion and may be low intensity activity and provides no fitness health benefit. Swimming may also be undertaken purely for exercise in free time, with many people swimming laps for exercise rather than for recreation. This would be exercise, but not sport or physical recreation and this form of exercise is likely to provide health benefits if undertaken regularly and for sufficient duration.

MOTOR CAR RACING

As a competitive sport, motor car racing drivers need to be fit and strong to be able to have the fine motor skills and concentration to control a car at high speeds. This is a sport that requires physical skill and is governed by sporting organisations. However, the fitness benefit that may be derived from this activity is debatable. Fitness and strength is gained from other forms of exercise and sports training rather than necessarily car racing alone. On its own car racing is probably not a sporting activity that improves general physical fitness. Archery, fishing and darts are also sporting activities which are unlikely to provide a general health fitness benefit on their own (although most professional sports persons in these fields are likely to be fit from various forms of training).

Applying the model with activity examples continued

PLAYING COMPUTER GAMES

Playing computer games is a almost always a sedentary recreation activity, which is not a sport. However, there are some interesting new possibilities emerging in regard to the use of computers which warrant some discussion. Interactive computer games allow people to play active games using hand and body movements in free space to interact with the computer. These games may provide some fitness benefit and therefore 'active computer games' are shown as low to moderate intensity activty, which may be included as physical recreation. These activities are included within the area of low intensity activity in our model, but it is not known whether regular participation in this activity of sufficient duration and intensity would provide a health benefit. It is not difficult to imagine a society where fun computer driven fitness programs, done in the lounge room perhaps with friends, are important for fitness.

Furthermore, if these computer games also adapt the rules of existing sporting games, then we might say that people are playing a virtual sport game. A virtual sport, such as soccer, may be played inactively (using a key board, mouse or joystick) or actively (in free space with body movements). However, using our definitions, a virtual game of soccer is not sport because the use of physical skill that is normally required to play soccer is not the main focus of the activity and rules do not exist to govern those movements. In order for an active computer game to develop as a sport, society would need to develop formal rules and competitions governing both the game and the use of the particular physical skills needed to perform it. There is a theoretical possibility for such active games to evolve into a sporting activity as technology and organisations develop to govern the competitions and physical performance required in using the technology.

PRESCRIBED EXERCISE

People may be prescribed exercise programs to recover from specific injury or to deal with obesity or other serious health issues. Medical specialists, such as physiotherapists, may prescribe very specific exercise programs. Growing numbers of fitness instructors have some medical training sufficient to assist people with obesity issues and they may prescribe a specific exercise program tailored to individual health needs. These tailored programs rarely, if ever, include a general instruction to play a particular 'sport' - hence there is no overlap between prescribed exercise and sport shown in this model. Prescribed exercise is required to maintain health and is therefore shown in 'necessary time' to distinguish it from a free time activity where people have choice. General medical practitioners may encourage their patients to do more exercise, rather than prescribing a specific exercise program and this is not seen as "prescribed exercise" in this model, as the patient must still choose to do an activity when and if it suits them, usually in free time.

DANCING

Dancing is not commonly thought of as a sport, but there are some competition 'dance sports' which can be called sport. They are governed by strict rules and competition guidelines, and are more about demonstrating physical skill than artistic expression (although that may be one component that is judged). Recently ballroom dancing has been proposed as an event in the Olympics, and such dance competitions could fulfil the

Applying the model with activity examples continued

definition for sport. Figure skating and synchronised swimming already have some elements of both physical skill and creative expression that is judged in a sport context. In a sport context accurate execution of physical skill while performing prescribed steps or moves is of primary importance. However, dance is more commonly undertaken as a form of artistic expression. Even though dancers and dance performances may be judged or assessed by teachers and critics, if this is done with artistic expression as a primary focus and not as rule bound as sporting competitions, then it is not to be called sport.

CHAPTER 2 SPORT AND PHYSICAL ACTIVITY SURVEYS

Ideally, in order to measure each of the concepts reflected in the model accurately, it would be important to know the type of activity, the context in which the activity was undertaken, the intent for undertaking the activity, and the level of 'fitness' benefit likely to be associated with that activity. In order to measure the fitness benefit likely to result, there is a need to know the intensity, duration and frequency of undertaking the activity as well as its type. However, while surveys collect some of this information, many are unable to collect such extensive data. Many surveys rely on respondents to decide whether to report their activity as 'exercise', 'sport' or 'physical recreation'. Following is a discussion of how the model applies to two ABS surveys – one with a focus on measuring sport and physical recreation participation (the Sport Participation Survey collected in the Multi-Purpose Household Survey) and one with a focus on measuring exercise (from the National Health Survey).

OVERVIEW

In order to accurately measure the concepts displayed in this model a range of information about physical activities are needed;

1. The type of activity;
2. The time domain for the activity;
3. The person's intent (for recreation, exercise, sporting competition or none of these); and
4. The fitness benefit likely to be incurred (assessed using data about intensity, frequency, duration, and type of activity).

These are the underlying factors that feature in the definitions of sport, physical recreation and exercise, which distinguish between the different concepts. Each of the concepts in the model requires varying levels of information about these factors. However, when collecting data on self-report surveys, it is often not possible to assess all of these underlying factors in detail. Most surveys rely on open-ended questions which ask about 'exercise', and/or 'physical activity', and/or 'physical recreation' and/or 'sport'. In reviewing surveys in this field it was found that most rely on the respondent to interpret what activities are relevant to the physical activity or sport participation question. So for example, a question that asks, "What exercise have you undertaken?" requires the respondent to interpret what exercise means and respond accordingly.

Purpose of Conducting Sport and Physical Activity Surveys

Sport participation surveys ask respondents about the frequency of participation in sport and physical recreation activities over a set period of time (normally the previous 12 months). These surveys are often referred to as 'sport participation' surveys as a shorthand, but in fact their scope is much broader than this. They seek to measure the percentage of the population involved in particular sports and physical recreation activities, but they also include 'exercise'. The surveys distinguish between participation as a player or in other roles (e.g. referee, coach, and administrator) and many also

Purpose of Conducting Sport and Physical Activity Surveys continued

identify 'organised' participation (e.g. participation that is organised by a club, association or other organisation).

Physical activity surveys usually ask respondents whether they have undertaken any physical activity in a given period, usually the previous one or two weeks, and about the amount of time spent doing physical activity. These surveys are interested in physical activity from a health standpoint, so the focus is on measuring varying levels of activity, including their intensity, duration and frequency, usually in a one or two week period. They generally do not collect data about participation in any particular individual activities (apart from walking). The surveys usually focus on physical activity or exercise during leisure time.

A key reason for undertaking surveys relating to participation in sport and physical activity is to provide government with statistics to inform policy and resource planning for sport and physical activity programs, infrastructure and administrative support. Surveys focusing on the measurement of physical activity may also form part of a broader health survey, including questions on a wide range of related health issues. These surveys generally aim to determine whether people are undertaking 'sufficient' physical activity to achieve a health benefit, and view low levels of physical activity as one 'health risk factor'.

The proportion of the population participating in sport and physical recreation, (i.e. the sport participation rate) has been identified by government as a performance indicator for services and resource allocation. The assumption has been that a successful government program in sport and physical recreation will increase overall participation, thus resulting in an increased participation rate. If the Government's investment is to be evaluated, at least in part, by overall participation rates, the measurement of reliable and valid participation rates is of vital importance.

In addition to overall participation rates, the surveys also provide information about organised participation rates and participation rates for individual sports and physical activities. Frequency and regularity of participation may also be measured and can provide useful data to evaluate government programs.

Government agencies also require detailed data about who participates in exercise, sport or physical recreation activities in respect of their demographic characteristics, as this can also inform the planning and development of relevant programs. For example, it may be important to understand which activities women, the elderly, migrants, or Indigenous communities participate in order to target particular programs for these groups.

Interest in participation statistics also extends to Local Government, non-Government agencies and the business sector involved in supporting exercise programs (e.g. walking or cycling to work) as well as sport and physical recreation. There is an increasing interest in recreation planning at the local level which may utilise similar measures of participation to identify 'local' geographic areas and to be able to plan and evaluate programs with sensitivity for regional differences. Using demographic characteristics of participation at the 'activity' level across a variety of sport and physical recreation activities, businesses and other organizations can utilize these participation statistics to be able to better understand their particular market.

NATIONAL HEALTH SURVEY

The National Health Survey (NHS) collects information on a number of lifestyle behaviours and related characteristics which are recognised as health risks. The risk factors covered were smoking, alcohol consumption, lack of exercise, being overweight and some dietary habits.

The NHS data on exercise has been used as a benchmark to assess physical activity levels in the Australian population and has also been useful in monitoring these levels over time. The NHS asked questions about physical activity undertaken in the last two weeks prior to interview. It also specifically asked questions on walking (whether for sport, recreation or fitness) as well as the intensity, frequency and duration of the physical activities. The NHS lead questions on exercise are open and do not provide any activity examples to assist respondents in deciding what activities are in scope, as follows:.

In the last two weeks have you walked for sport, recreation or fitness?

In the last two weeks did you do any exercise which caused a moderate increase in your heart rate or breathing?

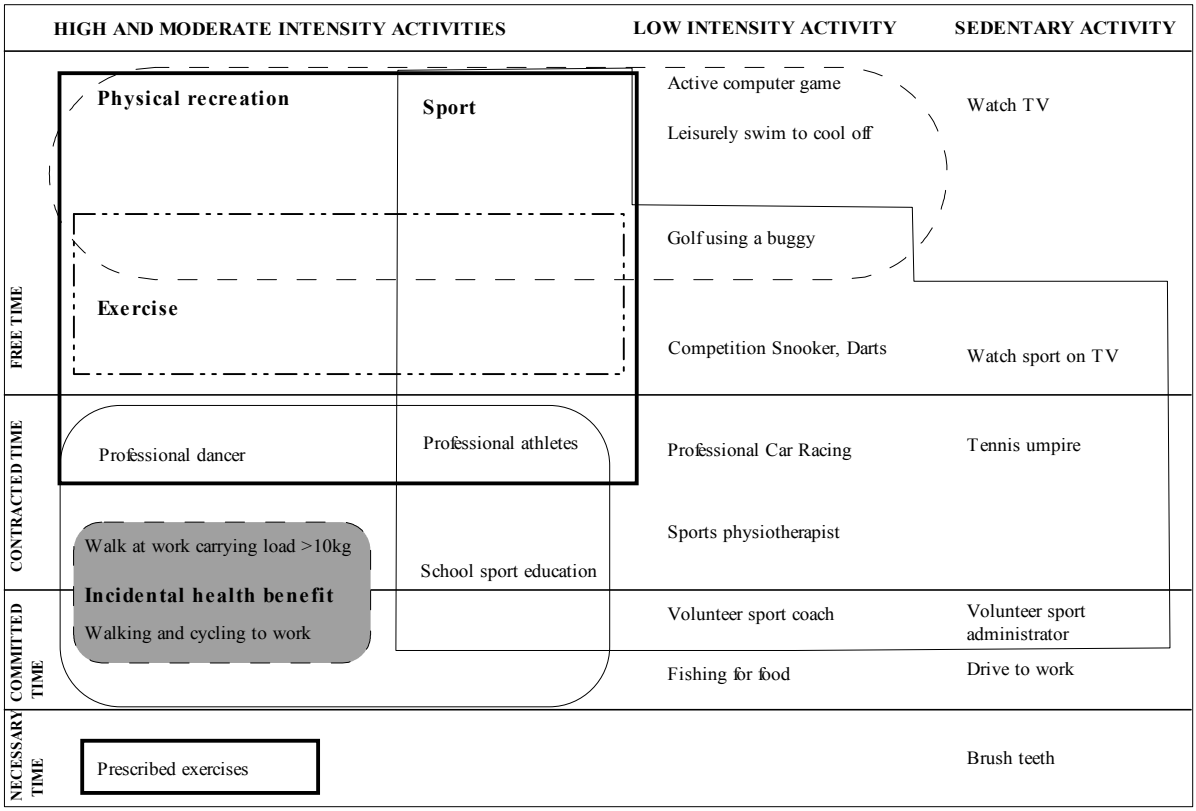
In the last two weeks did you do any (other) exercise which caused a large increase in your heart rate or breathing, that is, vigorous exercise?

The scope of the exercise questions of the NHS and its relationship with the conceptual model is shown in Figure 4. The key words used in the NHS question are 'exercise' and 'walking for sport, recreation or fitness' and the questions place emphasis on the concepts of "exercise" and "fitness" which are closely aligned concepts in our model. The mention of sport and recreation, even if only for the initial walking question, may also lead people to think of these kinds of sport or leisure related activities as relevant even for the later general exercise questions. Hence, people may not think to include work related physical activity or other physical activity which may have an incidental fitness benefit.

When responding to the exercise questions, respondents may decide themselves whether to include occupational physical activities. Some respondents may include their manual work activities if they believe that to be 'exercise'. This can be clear cut, as in the case of people who have active sporting roles (professional sports people and football referees) – they are likely to include their occupations as providing relevant 'exercise'. However, it is less clear cut for gardeners and labourers. It is likely that respondents would include medically prescribed exercise as being "exercise" in response to this question.

Given the wording of the question it is likely that all exercise in leisure time as well as prescribed exercise would be included. The likely scope of the survey is illustrated by the bold box outline shown in Figure 4, superimposed over the model presented earlier (Figure 3). However, there are some areas of physical activity where it might have been possible that the respondents would have answered affirmatively to the questions, such as for incidental health benefits, but this is less certain. This is illustrated as a *grey area* within the conceptual model.

Figure 4. The National Health Survey (2004–05) and the Conceptual Model



Note: The area with the bold lines represent the scope of activities the survey is likely to measure and the area with the grey ellipse represent the additional activities the survey could be measuring due to its methodology, depending on respondent interpretations.

NATIONAL HEALTH SURVEY *continued*

The 2007-08 National Health Survey will provide an improved capture of other forms of physical activity which might provide incidental health benefit, particularly physical activity at work – addressing some of the 'grey area' shown in Figure 4. In addition, it will assess the amount of sedentary activity people undertake at work (see Appendix A for details of the survey questions).

SPORT AND PHYSICAL RECREATION PARTICIPATION SURVEY

Questions about sport and physical recreation participation were asked as part of the Multi-Purpose Household Survey (MPHS) conducted throughout Australia from July 2005 - June 2006. The MPHS was conducted in both urban and rural areas in all states and territories among people aged 15 years and over. Apart from collecting data on the rates of participation in sport and physical recreation, the MPHS was expanded to include frequency and regularity of participation as well as barriers and motivators for participation (see Appendix A for details of the survey questions).

The lead survey question asked respondents the following questions:

The next few questions are about any physical activities or sports that you have participated in during the last 12 months.

In the last 12 months did you participate in any physical activities:

For sport?

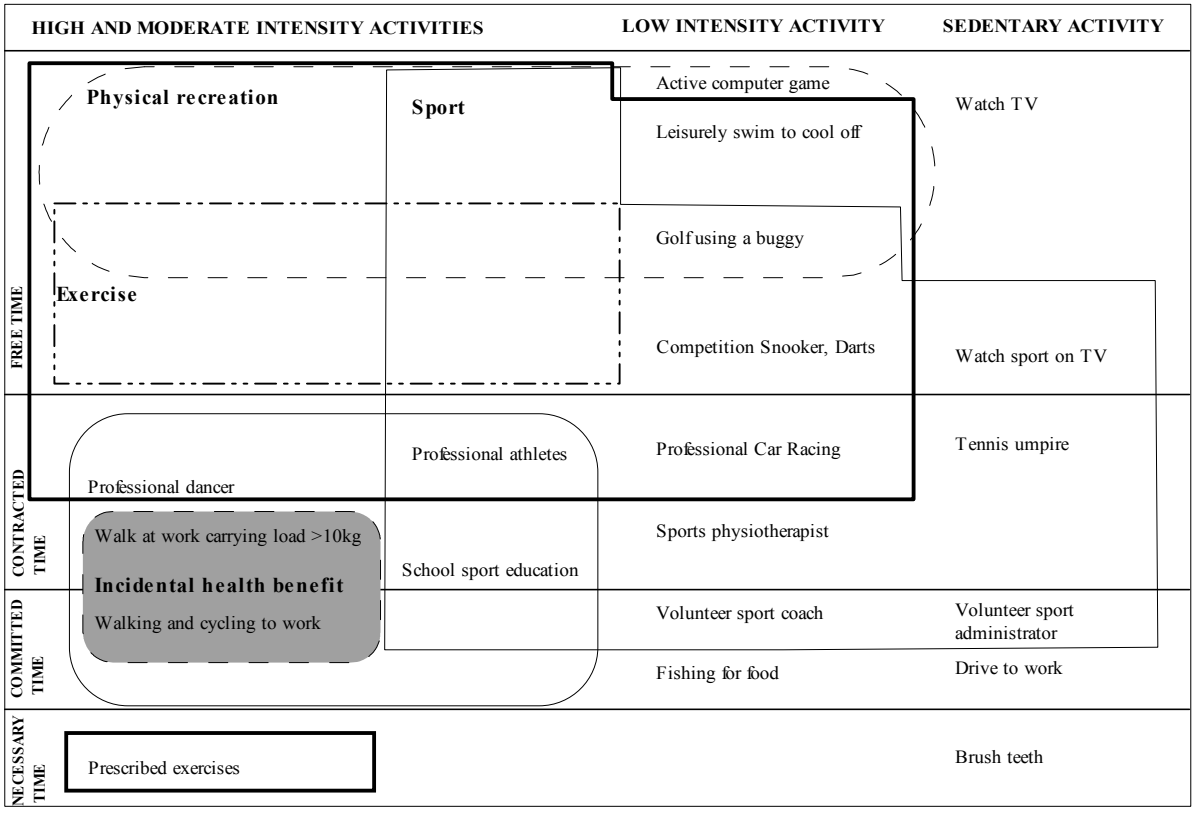
SPORT AND PHYSICAL RECREATION PARTICIPATION SURVEY *continued*

For exercise or recreation?

In the last 12 months, which activities did you participate in (for sport, exercise or recreation)? (up to six activities recorded)

The scope of the sport and physical recreation activities covered by the MPHS sport survey and its relation to the conceptual model is presented in Figure 5. As the survey is driven by sport and physical recreation policy, the aim of the MPHS was to measure participation in particular sport and physical recreation activities. With the growing evidence on the benefits of sport and physical recreation in health, the MPHS was expanded to look into the barriers and motivators for participation. This data can be used to further understand the 'intent' of individuals to undertake sport for fitness reasons (as exercise) or for enjoyment and satisfaction (as recreation).

Figure 5. Sport and Physical Recreation Participation Survey and the Conceptual Model



Note: The area with the bold lines represent the scope of activities the survey is likely to measure and the area with the grey ellipse represent the additional activities the survey could be measuring due to its methodology, depending on respondent interpretations.

As the sport participation survey collects data on the particular activities that people undertake, and the motivations for undertaking them, the scope of the survey can be fairly accurately mapped to the conceptual model. The question design allows interviewers to exclude activities that are not 'in scope' such as gardening or manual work. Evaluation reveals that these activities are rarely mentioned, which indicates that most people have an understanding of what the terms 'sport' and 'physical recreation' and 'exercise' mean and these concepts fit broadly with the model presented here.

SPORT AND PHYSICAL RECREATION PARTICIPATION SURVEY *continued*

However, it is not possible from this survey to separate out the 'sport' activity as distinct from 'physical recreation' and 'exercise'. For example, swimming is a commonly reported activity from this survey, but it is not known what proportion of the participants are swimming for recreation, or as sport, nor as exercise. There is no data collected on the duration or intensity of the activity undertaken and therefore it is not possible to estimate likely fitness benefits. Additional questions would be needed to determine whether the activities were undertaken as sport, physical recreation or exercise and to assess the likely fitness benefit.

CHAPTER 3 CONCLUSION

There are a number of surveys available which measure adult participation in sport, exercise and/or physical recreation activities. This report focused on two surveys conducted by the Australian Bureau of Statistics and sought to understand how the scope of the activities measured corresponds to the conceptual model of physical activity presented. In general, surveys of sport and physical recreation participation collect data about individual activities that permit a degree of certainty about what respondents have included - and this shows a reassuring alignment with the conceptual model. However, unlike physical activity surveys, the intensity of the activity is unknown and no estimate of likely fitness benefits can be derived.

As trends and priorities emerge through time, it is hardly surprising that different surveys have evolved to measure different aspects of physical activity. The associated differences in methodology of the surveys make it difficult to provide a single figure as a definitive measure of physical activity or sports participation levels at a particular point in time. The exclusion and inclusion of specific activities by respondents will affect the participation rate.

However, the activities that are most likely to impact on participation rates, are those in the 'grey areas' of measurement that are the most prevalent. Activities such as gardening, housework, and walking or cycling to or from work are likely to be quite prevalent. On the other hand prescribed physiotherapy programs may be less prevalent and have less impact on overall participation rates. For this reason, it is important to design surveys to either clearly include or exclude the most prevalent activities which are surrounded by some uncertainty.

The ABS sport surveys clearly exclude housework and gardening, but this may have been included as 'exercise' in the NHS data depending on how the respondents thought about exercise. For example, gardening and some home maintenance activities may be perceived to be 'exercise' by some people, particularly older people who take more time to tend to the home and gardens in retirement. These activities may also be perceived as 'recreation' activities, done for enjoyment, even though they fall within the 'necessary time' domain in the model, rather than the 'free time' domain. So gardening and home maintenance activities may be reported in surveys that ask people about exercise (depending on their interpretation), but are excluded form sport and physical recreation surveys. The older population group may be reported to be quite physically inactive in their free time, when in reality they may be doing extensive physical work (that they perceive as being physical recreation or exercise), but which the model classifies as physical activity in committed time.

continued

Similarly, occupational physical activities are often not considered in scope for exercise, sport or physical recreation surveys. As discussed earlier, some respondents might associate performing manual tasks at work as a substitute for physical recreation or exercise. From a health perspective, it is again possible that the physical tasks performed at work may be at a level sufficient enough to be beneficial. As such, surveys that exclude these activities may again overlook this aspect of physical activity.

Walking is a very common type of physical activity and whilst there can be little doubt that almost everyone in the population would 'walk' for some reason, the treatment of walking varies across surveys. Walking, provided it was undertaken for a recreation, exercise or fitness purposes, was considered in scope for the surveys, and was therefore included in the calculation of total participation rates. In all surveys the respondent determined whether their walking was a relevant recreation, exercise or fitness activity. Obviously there are numerous walking pursuits a respondent could undertake which would qualify, such as walking the dog, power walking, walking in the park, or walking to work (if the respondent thought of this as being exercise related). However these surveys generally do not collect specific data about the context within which the walking was undertaken. The most recent NHS (2007-08) will collect more detailed data on walking for exercise, and walking in other contexts. The perception of the respondent as to the relevance of their walking activity will have an impact on the estimates of measures of exercise or physical recreation activity.

The conceptual model presented in this report offers a broad scope of activities that can be measured in physical activity surveys. The model recognizes that the scope of activities covered by the surveys varies. Some sporting and physical recreation activities may be missed or undercounted in surveys that focus on physical activity or exercise, such as less active sports like - fishing, darts, snooker, or racing. Other surveys that focus on 'sport' may under-represent other types of physical activity such as walking or yoga.

The model presented a range of overlapping concepts (e.g. exercise, sport, physical recreation, low intensity physical activity and sedentary activities). The inclusion of the typology of time use into the model provides an opportunity to narrow down the context of the activity. It is hoped that this model can be used to inform decisions about the scope of activity that is desirable to measure, as well as the kind of data items and methodologies needed to measure these varying scopes accurately.

The operational definitions of sport and exercise are influenced by events in society and culture which are ever evolving. In order to use these definitions and the model for measurement, an activity classification could be useful to operationalise the definitions. The types of activities being measured would vary over time but the overall concept would not. The model illustrates the key concepts that define exercise and sport, but it is also recognised that the activities that may be included in these concepts are fluid and dynamic. It is hoped that the model will aid in understanding and developing studies in this emerging field.

APPENDIX A - QUESTION MODULES

National Health Survey (NHS) - Exercise Questions

The National Health Survey questions about physical activity have remained the same through the 1995, 2001, 2004/05 and 2007/08 surveys, providing valuable comparable data over time. These questions are:

The next few questions are about walking for fitness, recreation and sport. Please do not include any other walking that you may have done for other reasons. This will be recorded later.

In the last 2 weeks have you walked for fitness, recreation or sport?

The next few questions are about moderate and vigorous exercise. Please exclude walking that you may have done for fitness, recreation or sport, and household chores, gardening or yardwork.

In the last 2 weeks, did you do any exercise which caused a moderate increase in your heart rate or breathing, that is, moderate exercise?

In the last 2 weeks, did you do any (other) exercise which caused a large increase in you heart rate or breathing, that is, vigorous exercise?

Information on the frequency and duration of the above activities was also collected.

2007-08 NHS ADDITIONAL QUESTIONS

In 2007-08 the National Health Survey question includes some additional information but comparability will be maintained for the above questions, as follows:

Thinking about all the physical activity [you/proxy name] typically [do/does] now, would you say [you are/he is/she is] more active than this time last year, less active or stayed about the same as this time last year?

1. More active

2. Less active

3. Stayed about the same

4. Don't know

Excluding walking for fitness, recreation or sport already reported, in the last week, did you walk for at least 10 minutes continuously to get to and from places?

(Interviewer instruction for next question is that only one response is allowed, and they are to read all categories as a running prompt).

When you are at work, which of the following best describes what you do on a typical work day?

1. Mostly sitting

2. Mostly standing

3. Mostly walking

4. Mostly heavy labour or physically demanding work

5. Don't know

Multi-Purpose Household Survey (MPHS) - Sport, Physical Recreation and Exercise Questions (2005-06)

The 2005-06 MPHS questions on sport participation are shown below. Please note that due to complex sequencing, where the specific question asked is based on a respondent's answers to previous questions, this has been simplified in order to demonstrate basic wording.

WHETHER PARTICIPATED

The next few questions are about any physical activities or sports that you have participated in during the last 12 months.

In the last 12 months did you participate in any physical activities:

For sport?

For exercise or recreation?

In the last 12 months, which activities did you participate in (for sport, exercise or recreation)? (up to six activities recorded)

CAPACITY IN WHICH PARTICIPATED IN IDENTIFIED SPORT OR ACTIVITY

The next few questions are about your involvement in (specified activity) whether it was as a player or participant, coach, instructor, referee or some other role.

For each activity recorded:

In what capacity did you participate in (specified activity)?

Was it as a player or participant?

(Was it) as a coach, instructor or teacher?

(Was it) as a referee, umpire or official?

(Was it) as a committee member or administrator?

(Was it) in some other capacity?

ORGANISED SPORT AND PHYSICAL RECREATION

For each activity recorded:

Was any of (specified activity) organised by a club, association or other organisation?

If 'yes':

Was all of (specified activity) organised or was only some of it organised?

MONTH(S) OF PARTICIPATION AS A PLAYER IN IDENTIFIED SPORT OR ACTIVITY

For each activity recorded:

Including practise and training, since (current month last year), in which months did you participate in (specified activity)?

NUMBER OF TIMES PARTICIPATED

For each activity recorded, starting at the minimum number of times (given the number of months specified), respondents are stepped through the following questions until they answer 'no':

Including practise and training, approximately how many times in the last 12 months did you participate in (specified activity) as a (capacity)?

Was it more than twice?

(Was it) more than 6 times?

(Was it) more than 12 times?

(Was it) more than 26 times (, that is, more than once a fortnight)?*

(Was it) more than 52 times (, that is, more than once a week)?*

(Was it) more than 104 times (, that is, more than twice a week)?*

Multi-Purpose Household Survey (MPHS) - Sport, Physical Recreation and Exercise Questions (2005-06) continued

(*note: only included for those who had participated in all months)

Respondents who had participated as a player or participant in more than one activity are also asked these questions in relation to the *total number of times* they had participated across all activities. Starting at the minimum number of times (based on the sum of minimum of the range given for each specific activity), respondents are stepped through the following questions until they answer 'no':

The next question is about your involvement in all physical activities and sports (as a player/participant).

Including practise and training, approximately how many times in the last 12 months did you participate in all physical activities and sports (as a player/participant)?

Was it more than twice?

(Was it) more than 6 times?

(Was it) more than 12 times?

(Was it) more than 26 times?

(Was it) more than 52 times?

(Was it) more than 104 times?

Respondents who had participated as a coach, instructor, teacher, referee, umpire or official had either participated as a player or participant less than 13 times or had not participated as a player or participant are also asked these questions in relation to the total number of times they had participated as a coach, instructor, teacher, referee, umpire or official. Starting at the minimum number of times (based on the sum of minimum of the range given for each specific activity), respondents are stepped through the following questions until they answer 'no':

The next question is about your involvement in all physical activities and sports as a (capacity/capacities).

Including practise and training, approximately how many times in the last 12 months did you participate in all physical activities and sports as a (capacity/capacities)?

Was it more than twice?

(Was it) more than 6 times?

(Was it) more than 12 times?

(Was it) more than 26 times?

(Was it) more than 52 times?

(Was it) more than 104 times?

BARRIERS TO PARTICIPATION

Those who had not participated (or had participated less than 13 times in total) are then asked the following questions about barriers:

Thinking about the last 12 months, what are the reasons you haven't played (more) sport or done (more) physical activity?

If respondent says time, then ask:

What are the reasons for not having enough time?

If more than one reason given, then ask:

Of all the reasons you have just told me about, what is the main reason you haven't played (more) sport or done (more) physical activity in the last 12 months?

Multi-Purpose Household Survey (MPHS) - Sport, Physical Recreation and Exercise Questions (2005-06) *continued*

MOTIVATORS TO PARTICIPATION

Those who had participated more than 12 times are then asked the following questions about motivators:

Thinking about the last 12 months, what are the reasons you participated in physical activities and sports?

If more than one reason given, then ask:

Of all the reasons you have just told me about, what is the main reason you participated in physical activities and sports over the last 12 months?

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