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### **The Gender Bias in Fundamental Motor Skills Tests: A new Agenda Needed!**

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#### **Abstract**

A child's level of fundamental motor skill (FMS) proficiency has been suggested as a precursor to their level of participation in sports, games, and physical activity throughout life. With this in mind there is a need to ensure adequate skill development is taking place in our schools. Resources have been developed to aid educators in the assessment, planning, implementation, and evaluation of FMS programs, but there appears to be a gender bias towards boys in the selection of the tests currently receiving prominence in Australia. Most batteries are strongly related to the skills integral to traditional male sports but are less associated with those which are essential to female activities. From these tests it is incorrectly deduced that girls are poorly skilled, when in reality they may be no less skilled than boys, but rather skilled in different areas. Tests are needed that assess components integral to popular female activities, to ensure an accurate indication of their skill level can be accomplished. An example of some tests will be considered, in an attempt to improve educational practices and stress the need for new methodologies for new times to be implemented.

#### **Introduction**

Fundamental motor skills are defined as "Those functional skills that children use to enhance the quality of life and are the basic attributes that help children function in the environment" (Pangrazi & Dauer, 1995, p. 2). Development of these skills has been considered a key objective of physical education programs (Graham, 1987), as evidence suggests that a developmental sequence exists in motor skill behaviour, with mastery of fundamental motor skills a prerequisite to the successful introduction of specific sports, games, and activity skills (Gallahue, 1982; Gallahue & Ozmun, 1995; Holland, 1986; Turner & Martinek, 1992; Ulrich, 1985; Wickstrom, 1983). Children who do not master fundamental motor skills may encounter a sport and games proficiency barrier which may increase the difficulty of learning these more advanced skills (Gallahue & Ozmun, 1995; Seefeldt & Haubenstricker, 1982; Ulrich, 1985). As a corollary, it has been suggested that not experiencing mastery with these advanced skills may promote nonparticipation in physical activity which could carry over to adulthood (Commonwealth of Australia, 1992; Corbin, 1980; Department of Education Victoria, 1996; Kuh & Cooper, 1992; McKenzie, Alcaraz, Faucette, & Sallis, in press).

Recent Australian evidence has suggested that boys generally perform better on fundamental motor skill tests than girls (Booth et al., 1997;

Commonwealth of Australia, 1992; Pyke, 1987; Walkley, Holland, Treloar, & Probyn-Smith, 1993); however, an explanation of this difference is a contentious issue. It may well be that boys are more skilled than girls, but on the other hand, the tests and skills assessed may be more closely related to sport and activity forms preferred by males than females (Wright & Okely, 1997). Interestingly, research suggests these differences are not present in young children (Numminen, Saakslanti, & Valimaki, 1996). The purpose of this paper is to argue that the test batteries selected for the assessment of the fundamental motor skill levels of Australian children are biased towards the sports and games more popular for "hegemonic males" than females, and other forms of masculinity.

**Analysis of Popular Sports and Activities for Australian Children** In order to postulate that the most common fundamental motor skills assessment batteries are biased towards popular male sports, the most popular sports and activities for male and female Australian children must first be determined. When analysing the physical activity participation habits of Australian children, only those sports and activities in which advanced forms of fundamental motor skills can be clearly seen, can be analysed. For example, it is clear that tennis comprises an advanced combination of several fundamental motor skills such as the forehand strike, two-handed side-arm strike, overhand throw (for serving), and dodge. For other popular forms of sports and physical activities (for example swimming and cycling), it is more difficult to see a distinct relationship with specific fundamental motor skills; therefore, they have not been included in this analysis. Four recent studies on the sports participation levels of Australian children have been examined. A brief description of each study has been reported and the five most popular sports and activities for males and females in each study presented in Table 1. The Australian Health and Fitness Survey 1985 (Pyke, 1987) employed a representative sample of 2400 nine to fifteen year olds and collected self-reported data on sports participation in four contexts: representing the school, representing a club, both, and neither. The most frequently stated sports, overall (irrespective of context), were reported.

Clough and Traill, (1992) employed a stratified random sample of 1048 subjects between the ages of five and eighteen, resident in the ACT, and measured self-reported participation in sports in four different environments: in classtime at school, representing the school, with family and friends, and for a sporting club. A sport and game participation index has been calculated from these four environments by summing the percentages for each sport in each environment and reporting the five most popular sports in terms of percentages overall. Participation in Sport and Physical Activities, Australia, 1995/96 (Australian Bureau of Statistics, 1997) contains the most comprehensive data on the sports participation of our children. Sports participation was assessed in three environments: organised by the school, with family and friends, and representing a club. It was also assessed separately for three age groups: five to nine, ten to twelve, and thirteen to fourteen. An index of sports participation has been constructed by collapsing the three environmental categories into one, and reporting the five most popular sports in terms of numbers of participants overall for each age group.

In The NSW Schools Fitness and Physical Activity Survey (NSWSFPAS) Booth et al., (1997) employed a stratified random sample of 2026 thirteen to sixteen year olds resident in NSW and measured their self-reported participation in organised and nonorganised physical activities.

Table 1

Several Studies of the Five Most Popular Sports of Australian Children.

Study	Five most popular sports (in descending order)	
	Males	Females
Australian Health and Fitness Survey (Pyke, 1987)	Cricket, soccer, football (not specified), tennis, basketball.	Netball, softball, tennis, basketball, hockey, gymnastics.
Clough & Traill (1992)	Soccer, cricket, tennis, rugby league, and touch.	Netball, aerobics/calisthenics, tennis, softball, and volleyball.
Australian Bureau of Statistics (1997). (5-9 year olds)	Soccer, cricket, Australian rules, tennis, and basketball.	Dancing, netball, gymnastics, tennis, and aerobics/calisthenics.
Australian Bureau of Statistics (1997). (10-12 year-olds)	Cricket, Australian rules, basketball, soccer, and tennis.	Netball, tennis, dancing, softball, and basketball.
Australian Bureau of Statistics (1997). (13-14 year-olds)	Cricket, basketball, Australian rules, rugby league, tennis.	Netball, dancing, tennis, basketball, and softball.
NSWSFPAS (Booth et al., 1997)	Soccer, cricket, basketball, rugby league, and tennis.	Netball, dancing, tennis, basketball, and touch.

### Fundamental Motor Skills Associated with Popular Australian Sports and Activities

Each of these sports and games comprise several fundamental motor skills that are considered necessary for successful participation. Traditionally, these have been categorised into locomotor, nonlocomotor, and manipulative skills (Kirchner & Fishburne, 1995). The analysis of the most popular sports and games for Australian children (see Table 1) revealed they are comprised of the following fundamental motor skills.

#### Males

1. Soccer - run, kick, dodge.
2. Cricket - throw, catch, run, two-hand side-arm strike.
3. Tennis - throw, forehand strike, two-hand side-arm strike, run, dodge.

4. Basketball - catch, throw, ball bounce, dodge, run.
5. Australian Rules - punt, run, vertical jump, catch, ball bounce, dodge.
6. Rugby League - kick, punt, run, dodge, catch.
7. Touch - run, catch, dodge.

#### Females

1. Netball - throw, catch, run, vertical jump, leap.
2. Dancing - leap, rhythm, balance, vertical jump, gallop, skip
3. Tennis - throw, forehand strike, two-hand side-arm strike, run, dodge.
4. Softball - two-handed side-arm strike, run, catch, throw.
5. Basketball - catch, throw, ball bounce, dodge, run.
6. Gymnastics - balance, run, vertical jump, leap.
7. Aerobics/callisthenics - balance, rhythm, vertical jump, leap, gallop, skip.
8. Volleyball - throw, vertical jump.
9. Touch - run, catch, dodge.
10. Hockey - two-handed side-arm strike, run, dodge,

Although there is a reasonable degree of consistency between the fundamental motor skills required for popular male and female sports and games, the following two caveats are noticeable:

1. None of the sports favoured by girls involve foot-eye coordination

(kicking) skills.

2. Balance, rhythm, galloping, and skipping are more fundamental to

girls sports and activities compared with boys.

#### Analysis of Australian Fundamental Motor Skills Test Batteries

It would be wise, in view of the fundamental motor skills just listed, to examine the Australian test batteries that exist, and ascertain what fundamental motor skills are included in them. Unfortunately, very few Australian tests exist (Hands & Larkin, 1997). Assessments of fundamental motor skills are also variable, making it difficult to compare test batteries. Historically, children have been largely evaluated using quantitative tests that measure outcomes of a skill performance such as distance and speed (Holland, 1986). However, the last 20 years has witnessed an emergence of qualitative tests as researchers believed correct technique (that is, focusing on how the skill is performed) should prevail over quantitative development (Gallahue, 1982; Wickstrom, 1983). As a result, modern studies generally construct qualitative batteries that measure a range of locomotor, nonlocomotor, and manipulative skills, although few evaluate exactly the same skills. Variations also occur in number and description of performance criteria for each individual skill. A summary of Australian test batteries appears in Table 2.

Table 2

A Description of Australian Fundamental Motor Skills Test Batteries, and the Skills they Assess.

Test Battery	Method of Assessment	Fundamental Motor Skills Assessed
Queensland Motor Performance Screening Test (Calder, 1975)	Quantitative	Run, horizontal jump, hop, throw, catch, and agility.
Jeanes (1977)	Quantitative	Threading, rope jump, balance, clap & catch, broad jump, and distance throw.
Johnston et al., (1987)	Quantitative (qn) and Qualitative (ql).	Hopping(ql), balance(qn), heel-toe-walk (ql), bounce & catch(qn), jump(ql).
Larkin and Revie (1994)	Quantitative	Bounce & catch, balance, distance hop.
Fundamental Motor Skills: A Manual for Classroom Teachers. (Department. of Education, WA, in press).	Qualitative	Run, vertical jump, leap, dodge, throw, catch, kick, forehand strike, two-handed side-arm strike, punt, and ball bounce.
Fundamental Movement Skills Assessment Package (Department of Education, WA, in press).	Qualitative	Run, jump, hop, skip, balance, side gallop, throw, catch, kick, and strike.

What is apparent from these test batteries is the absence of fundamental motor skills such as rhythm, and the minimal representation of skipping, galloping, and qualitatively assessed balance. We have no argument that the skills that are in the current test batteries should be present, but believe there needs to be a wider and greater emphasis on other skills that are not represented, but are also fundamental to popular sports and activities played by Australian children. Unfortunately, the majority of these absences occur in popular female sports and activities. A description of two of these skills (balance and rhythm) and an example of test(s) that could be used to assess them will now be considered.

## Balance

Although balance is a part of many sports and activities, it is considered especially fundamental to dance, gymnastics, and aerobics or callisthenics because it greatly enhances the aesthetic appearance and appreciation of other fundamental movements. This is in line with motor development research which suggests that balance plays an important role in the performance of several fundamental motor skills (Ulrich & Ulrich, 1985; Wickstrom, 1983). Types of balance include static and dynamic (Kirby, 1991). Although four of the batteries in Table 2 contain balance tests, only one of them is qualitative, and therefore, in our opinions, appropriate for use in physical education programs. We recommend the qualitative balance test from the Western Australian Fundamental Movement Skills Assessment Package (Department of Education, Western Australia, 1997).

## Rhythm

Rhythm refers to the ability to initiate and respond to a pulse, pattern, accent, or phrase (Joyce, 1984). In the case of dancing, gymnastics, and aerobic or callisthenics, this generally refers to music. Rhythm is considered essential in these activities as individuals need to be able to first identify the pulse or beat, and then be able to keep their movements in time with the music, or maintain a constant tempo in the absence of music. The following developmental sequence and analysis could be used to assess rhythm:

### Developmental sequence

Stage 1: The individual claps in time with a beat.

Stage 2: The individual moves their body to the beat, on the spot (nonlocomotor).

Stage 3: The individual moves their body to the beat, while moving (locomotor).

Individuals could be assessed in these developmental stages according to chronological age or school year. This could be done with a standard piece of music, assessing on an individual basis over a 30 second period. Assessment criteria could include:

1. Initiates rhythm without teacher help (starts on the first beat).
2. Maintains rhythm for prescribed length of time (for example, 20 seconds).
3. Adapts to changes in rhythm as they occur.

## Summary

It is important to recognise that the skills selected in Australian fundamental motor skills test batteries may be biased toward traditional male team sports and not take into account those skills integral to popular female and nonhegemonic male physical activities. Four skills which warrant particular mention are balance, rhythm, skipping, and galloping. More research is needed into the development of tests and evaluation of skill proficiency of Australian children over a wider range of fundamental motor skills. We have presented a test for balance and rhythm that could be used in fundamental motor skill assessment batteries. However, it should be noted that the rhythm test has not been validated, although we have found one study that used clapping to a beat as an assessment of rhythm (Numminen, Saakslahi, & Valimaki, 1996). Considering several studies have consistently reported females perform better than males on skills such as balance, rhythm, and skipping (Hands & Larkin, 1997; Numminen et al., 1996; Ulrich & Ulrich, 1985), there is a need to include qualitative assessments of these skills in fundamental motor skills test batteries to provide a more accurate and gender-neutral assessment of the skill level of Australian children.

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