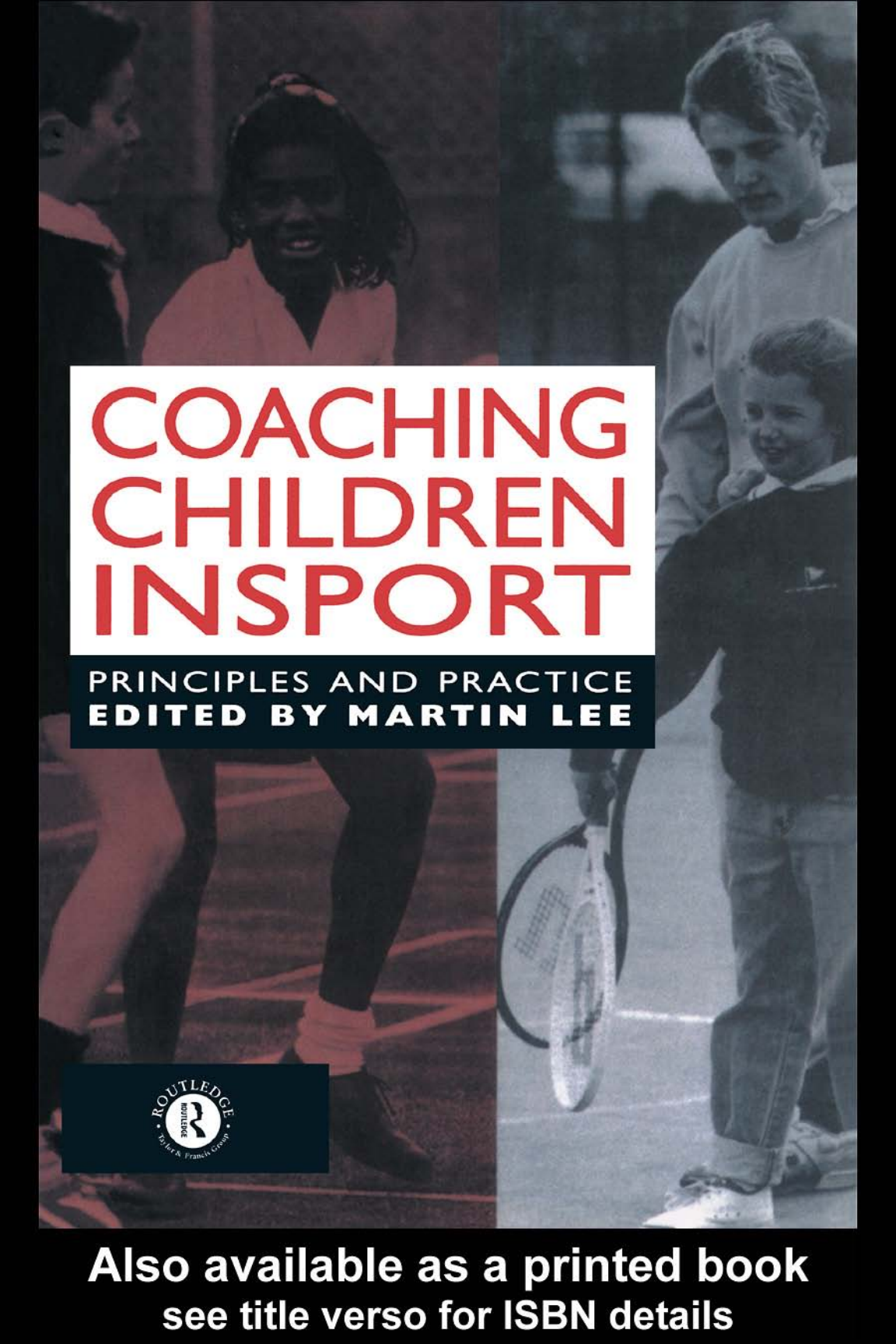




COACHING CHILDREN IN SPORT

PRINCIPLES AND PRACTICE
EDITED BY MARTIN LEE



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Coaching Children in Sport

Principles and practice

Edited by

Martin Lee

Institute for the Study of Children in Sport
Bedford College of Higher Education



London and New York

First published 1993 by E & FN Spon

Routledge is an imprint of the Taylor & Francis Group

This edition published in the Taylor & Francis e-Library, 2003.

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloguing in Publication Data

A catalogue record for this book is available from the Library of Congress

ISBN 0-203-47447-3 Master e-book ISBN

ISBN 0-203-78271-2 (Adobe eReader Format)

ISBN 0-419-18250-0 (Print Edition)

Contents

<i>List of contributors</i>	xi
<i>Preface</i>	xii
<i>Acknowledgements</i>	xv
Part One Children and Sport: An Introduction	
1 The importance of the study of children in sport: an overview	3
<i>Glyn Robert and Darren Treasure</i>	
Summary	3
1.1 Introduction	3
1.2 The importance of sport participation to children	4
1.3 Perception of stress in sport	6
1.4 Achievement goals in sport	8
1.5 The impact of the motivational climate	10
1.6 Conclusion	12
References	13
2 Whose sport is it anyway? Adults and children's sport	17
<i>Sarah Gilroy</i>	
Summary	17
2.1 The nature of sport in the 1990s	17
2.2 Physical education and sport	20
2.3 The effects on children's sport	22
2.4 The role of the family	22
2.5 <i>In loco parentis</i>	23
2.6 The regulation of children in sport	23
2.7 An alternative model for children	24
2.8 Conclusion	25
References	26

3	Why are you coaching children?	27
	<i>Martin Lee</i>	
	Summary	27
3.1	Introduction	27
3.2	Values	28
3.3	Reasons for coaching children	32
3.4	Who is sport for?	34
3.5	Children's values in sport	35
3.6	Why children first?	37
3.7	Conclusion	37
	References	38
4	Sport: it's a family affair	39
	<i>Tony Byrne</i>	
	Summary	39
4.1	Introduction	39
4.2	The sporting triangle	41
4.3	The parental involvement continuum	42
4.4	Curing the conflict and preventing the problems	46
	References	47
	Further reading	47
Part Two Developmental Changes in Children: Why the Child is not a Mini-adult		
5	Skeletal growth and development	51
	<i>John Aldridge</i>	
	Summary	51
5.1	Introduction	51
5.2	Anatomy of skeletal development	52
5.3	The effect of training and exercise on growth and development	60
5.4	Conclusion	63
	References	63
6	Children's physiological responses to exercise	64
	<i>Neil Armstrong and Joanne Welsman</i>	
	Summary	64
6.1	The energy systems	65
6.2	Conclusion	76
	References	77
	Further reading	77
7	Understanding the learner: guidelines for the coach	78
	<i>Rosemary Connell</i>	
	Summary	78

7.1	Introduction	78
7.2	History	79
7.3	Information processing	79
7.4	Selecting a coaching style	88
	References	90
8	Growing up in sport	91
	<i>Martin Lee</i>	
	Summary	91
8.1	Introduction	91
8.2	Psychosocial development	92
8.3	Conclusion	103
	References	104
	Further reading	105
 Part Three Important Psychological Aspects of Children's Participation in Sport		
9	Why children choose to do sport—or stop	109
	<i>Jean Whitehead</i>	
	Summary	109
9.1	Introduction	109
9.2	What success means to children	110
9.3	Why children may give up sport	115
9.4	Conclusion	120
	References	120
10	How children see success and failure	122
	<i>Stuart Biddle</i>	
	Summary	122
10.1	Introduction	122
10.2	Asking the 'Why?' question after success and failure	123
10.3	The meaning of success to children	128
10.4	How others see children's success and failure	130
10.5	Conclusions and recommendations	131
	References	132
	Further reading	133
11	Causes of children's anxiety in sport	134
	<i>Stephen Rowley</i>	
	Summary	134
11.1	Introduction	134
11.2	Anxiety in children and adolescents	135
11.3	Performance anxiety in youth sport	139
11.4	Coping with performance anxiety	141
	Conclusion	143
	References	143

12	Selecting the right targets	145
	<i>Rod Thorpe</i>	
	Summary	145
12.1	What is goal setting?	145
12.2	Goal setting and children	147
12.3	Sport—an achievement situation	151
12.4	How important is the goal?	154
12.5	Achievement management plans	157
12.6	Summary of the key points	158
	References	159
Part Four Applications to the Coaching Process		
13	Communicating effectively with children	163
	<i>Martin Lee</i>	
	Summary	163
13.1	Introduction	163
13.2	Social skills	164
13.3	Transactional analysis	168
13.4	Applications to coaching	174
	References	178
	Further reading	178
14	Counselling young athletes and how to avoid it	179
	<i>Lew Hardy</i>	
	Summary	179
14.1	Introduction	179
14.2	Coach—performer and parent—performer relationships	180
14.3	Coping with failure	183
14.4	Dealing with negative self-talk	183
14.5	Performance anxiety	186
14.6	Injury	188
14.7	Fear of physical harm	188
14.8	Conclusion and recommendations	189
	References	190
	Further reading	190
15	Training young athletes	191
	<i>Neil Armstrong and Joanne Welsman</i>	
	Summary	191
15.1	Introduction	191
15.2	Training principles	193
15.3	Aerobic training (cardiopulmonary fitness)	195
15.4	Anaerobic training	198
15.5	Muscular fitness training	198

15.6	Flexibility training	201
15.7	Detraining	201
15.8	Conclusion	202
	References	203
	Further reading	203
16	The effect of injuries on growth	204
	<i>John Aldridge</i>	
	Summary	204
16.1	Introduction	204
16.2	Acute injuries to the skeleton	205
16.3	Stress injuries to the skeleton	213
16.4	Tendon—bone attachment injury	216
16.5	Joint surface injuries	218
16.6	Epiphyseal growth plate injuries	220
16.7	Epiphyseal collapse	223
16.8	Conclusion	224
	References	224
17	Treating and managing injuries in children	225
	<i>Dennis Wright</i>	
	Summary	225
17.1	Introduction	225
17.2	The body's reaction to injury	225
17.3	Repair processes following injury	228
17.4	Treatment of specific injuries	229
17.5	Conclusion	234
	Further reading	235
18	Healthy eating for sport	236
	<i>Juliet Wiseman</i>	
	Summary	236
18.1	The energy providing nutrients	236
18.2	Dietary needs	241
18.3	What children eat	248
18.4	Nutrition education	249
18.5	Food for young athletes	249
18.6	Conclusion	254
	References	254
	Further reading	255
Part Five Good Practice in Coaching		
19	Making sport fit the children	259
	<i>Martin Lee and Ross Smith</i>	
	Summary	259

x Contents

19.1	Introduction	259
19.2	Areas to consider for modification	261
19.3	Recommendations	271
	References	272
	Further reading	272
20	Putting theory into practice—a sport example	273
	<i>Rod Thorpe</i>	
	Summary	273
20.1	Implications for those organizing and/or presenting sport for young people	273
20.2	Implications for the coaches	278
20.3	Psychological well-being of the child	280
20.4	Access to sport	281
20.5	Educating the parent	283
20.6	The adult model	284
20.7	Winning and losing	284
20.8	Conclusion	285
	References	285
	Further reading	285
	Appendices: Legal Matters	287
	Appendix A Coaching and the law	289
	<i>Valerie Collins</i>	
A.1	Introduction	289
A.2	Negligence	289
A.3	Defences	293
A.4	Damages	294
A.5	Community Law Directive	295
A.6	Conclusion	295
	Further reading	295
	Appendix B Ensure you are insured	296
	<i>Harry Towers</i>	
B.1	Introduction	296
B.2	The problems	296
B.3	The solutions	298
B.4	Conclusion	301
	<i>Glossary</i>	302
	<i>Index</i>	306

Contributors

Martin Lee, Institute for the Study of Children in Sport, Bedford College of Higher Education, Bedford

Glyn Roberts and **Darren Treasure**, Department of Kinesiology, University of Illinois, Champaign-Urbana

Sarah Gilroy, West Sussex Institute of Higher Education, Chichester

Tony Byrne, National Coaching Foundation, Leeds

John Aldridge, Orthopaedic Adviser, British Amateur Gymnastic Association

Neil Armstrong and **Joanne Welsman**, Physical Education Association Research Centre, University of Exeter

Rosemary Connell, Trinity and All Saints College, Leeds

Jean Whitehead, Bedford College of Higher Education, Bedford

Stuart Biddle, University of Exeter

Stephen Rowley, Sporting Bodymind, London

Rod Thorpe, Department of Physical Education, Sports Science and Recreation Management, Loughborough University.

Lew Hardy, Sport, Health and PE Department, University College of North Wales, Bangor

Dennis Wright, Physiotherapist, Wigan Rugby League Club

Juliet Wiseman, Massey University, New Zealand

Ross Smith, Australian Institute for Sport, Canberra

Valerie Collins, Nottingham Trent University

Harry Towers, Managing Director, Perkins Slade Ltd, Birmingham

Preface

During the last 25 years or so there has been an enormous increase in the provision of sport for children. It appears to be part of the more affluent society in which we live, the growth in television and televised sport, and a decline in the informal active play of children in the fields and streets. More formal sport for children has resulted in a growth in structured competitions with leagues, cups, medals, and selection for representative honours at district, county, regional, and international levels for even quite young children. Indeed, the age of full international athletes continues to fall and it has been estimated that about 30% of athletes participating in the Los Angeles Olympic Games were under the age of 20. Now, as I write, a 13 year old Chinese diver has just won a gold medal at the Barcelona Olympics and a 14 year old has won a gold medal for swimming. However, these are, by definition, exceptional cases. Most coaches work with children who aspire to nothing more than doing sport at club and perhaps county level; this is the vast majority of children.

Increasingly formalized sports structures which culminate in international competition have led to a greater commitment by adults in the care and preparation of young athletes. It is thought that there are now over 100 000 coaches contributing to the development of children in sport in Britain. They bear a great responsibility because they are dealing with young people at a time in their lives when they are very easily influenced and are subject both to the traumas associated with growing up, and to changing interests and demands upon their time. Many coaches have the advantage of being parents themselves or have trained as teachers. Parents learn about how children develop and cope with the world through experience, while teachers may have similar understanding through studying child development. Understanding adults are aware that '...the child is not a mini-adult...' though they may not be able fully to explain why this is so.

However, some coaches are neither parents nor teachers and are

involved in children's sport because they have had a lot of fun and satisfaction through their own participation and want to remain active in some capacity. Coaching allows them to do so and to help others gain similar satisfaction in something they love. But they may not have the advantage of knowing about children and how they differ from adults in their ability to meet the demands which sport places upon them. Whatever their background and motives coaches can only benefit, and so help their charges better, from understanding more completely the nature of children, their capabilities and limitations, their needs and desires, and the ways they change so rapidly.

Of course, the national governing bodies of sport provide coach education through a graduated series of coaching awards. These are designed to give coaches a fuller understanding of the technical and physical requirements of their sport and how to teach them; only rarely do they include elements which help coaches understand the people they are going to deal with. This situation has recently been addressed in England by the coach education programme provided by the National Coaching Foundation (NCF), which includes short courses about the particular nature and needs of children. Similar programmes are available in other parts of the world, for example the American Coach Effectiveness Programme (ACEP) which has provided a model for much of the NCF programme. However, some people are not able, or do not feel inclined, to attend formal courses but still want to improve their coaching. It is hoped that this book will both support the NCF courses and provide useful information for those who cannot attend.

The book has been written to provide information about children, and particularly young athletes, to practising or aspiring coaches in order that they may better understand the children's physical and psychological characteristics. It is intended as a source book that will enable coaches to know the child and not just the sport. A wide range of important topics is covered and care has been taken to present material which is scientifically sound in a way which can be readily understood by people who are not experts in the field. However, some of it requires specific scientific language; in cases where this is necessary a glossary is provided to help the reader. This book should also interest undergraduates in physical education and sports studies or sports science, hence the material presented is fully referenced.

The contributors to this book are all experts in their field and experienced in dealing with children, either as teachers, researchers or coaches, and in many cases as parents. They are distinguished by a common philosophy and approach to the material they have contributed. While most are, or have been, athletes in their own right and have devoted considerable effort to the pursuit of excellence and the promotion of their sport, they are concerned primarily with the welfare

of the children who follow them. Hence the principle of 'Children first, coaches second' underlies all the contributions.

The book is in five parts which represent types of valuable information to help coaches provide both a great deal of enjoyment and also a sense of achievement for their athletes. Part One introduces the reader to the topic by drawing attention to the child in the essentially adult world of sport. Part Two describes how children develop, physically, physiologically, and psychologically. Part Three is essentially psychological and is concerned with how children actually experience sport. Part Four deals more directly with coaching skills such as communication, setting goals and developing good training programmes. These are the bread and butter of good coaching. The main part of the text finishes in Part Five by drawing on the earlier material to suggest and give examples of putting theory into practice. Finally there are two important appendices which outline the legal responsibilities of coaches and the value of good insurance.

MJL

Acknowledgements

I consider it a privilege to have been able to assemble a list of distinguished academics and practitioners to produce a book that will inform coaches and teachers of sport. I wish, therefore, to take this opportunity to express my sincere appreciation to all the contributors who have made it possible, and to thank them for their patience over what became an extended period of gestation. They are all recognized experts in their fields (several have international reputations) who have all given generously of their time and expertise and I am most grateful. In particular I would like to thank Glyn Roberts for providing the link between Britain and North America, Ross Smith for keeping me informed of developments in Australia that have been incorporated into Chapter 19, Rod Thorpe who undertook to translate a variety of theoretical material into practical advice, and Neil Armstrong for his expertise and friendship. I would also like to give special mention to my colleague Jean Whitehead for her unfailing integrity and support throughout this and other endeavours.

I am grateful for permission to report results from *Ethical Issues in Sport III: Emergent values among youth football and tennis players*, research commissioned by the Sports Council Research Unit and carried out as part of a Council of Europe programme.

Thanks are also due to my wife, Rosemary, for producing the anatomical drawings in Chapters 5 and 16, to Sue Perkins for assisting with word processing and secretarial tasks, to Brian and Lynn Rees for their hospitality, and finally, to Amanda Killingback of E. & F.N.Spon for seeing value in the project and promoting it in a period of economic stringency.

PART ONE

Children and Sport: An Introduction

The first part of the book has been compiled to inform and challenge the reader. The information is contained in discussions of the importance of understanding children and the ways in which they fit into a world of sport which is essentially constructed by, and some might say for, adults. The reader is invited to see sport in a broad social context and examine his or her own role in introducing children to sport. The challenge is to be found in the questions that are posed by the authors, either implicitly or explicitly.

Glyn Roberts is a very experienced researcher who has worked primarily in children's sport for nearly two decades. He presents an overview of why it is necessary to study children in sport situations in order to provide better experiences for them. In reviewing the field he introduces the reader to some of the issues in paediatric sports psychology which have attracted attention in recent years. In particular he describes why sport is important to children and how it contributes to their psychological and social development, how they assess their ability and set goals, and finally deals with the importance of the motivational climate which coaches and teachers control and which has a significant effect on the enjoyment and participation of children in sport. Most of the research to which Dr Roberts refers is from North America. We recognize that it is not always directly applicable to British children, but as yet we are still in the process of building our own research base. Until we have it we can learn considerably from the work of others.

Sarah Gilroy is a sociologist who raises important questions about the role of sport in society and how sport is provided for children within the overall structure. She shows how sport can be differentiated into that in which the public takes part, a social model, and that which is public entertainment, a competitive model. Since the competitive, or

2 Children and Sport: An Introduction

professional, model receives considerable exposure children with sporting interests become influenced by prominent role models. Ms Gilroy goes on to describe the debate about the purpose and conduct of children's sport which has arisen as a result of the conflict of the two rather different value systems which underpin the two models and summarizes recent debates in physical education which have an impact upon the provision of sport for children. She points out the effects on the family and how parents inevitably become involved in structuring the child's progress. In this analysis children are caught up in a structure in which they may be the means to the achievement of other people's ends. The welfare of the child may become secondary to the desires of both the immediate family and society as a whole. Finally, Ms Gilroy draws attention to the changes in the conduct of children's sport which could be extended to the benefit of more young players.

In the next chapter, Martin Lee asks you directly about why you are coaching. The examination of motives which follows is based upon an explanation of the values which underpin our actions. Readers are invited to look at their own values both in life as a whole and in sport in particular. There is then a description of the reasons coaches commonly give for why they coach before another challenge is posed in the question 'Who is sport for, anyway?' in light of the values that young people express in relation to sport.

Coaching children differs fundamentally from coaching adults in that the whole family is necessarily involved in the process. Indeed it is extremely difficult for children to take part and develop in sport without the close support of their parents. Tony Byrne draws attention to the very important pattern of relationships between children, coaches and parents; what he calls the coaching triangle. Talking to coaches indicates that many consider parents to be the single biggest problem they have to face. Dr Byrne recognizes the different attitudes towards parents among coaches; those who welcome and use parents to help, and those who prefer parents to keep their distance. He then goes on to propose a continuum of parental involvement and describes ways in which different types of parents can be encouraged by coaches to help their children most effectively. He makes suggestions for the development of parental meetings in which the responsibilities and roles of parents and coaches are made clear. In this way both parties can work together more efficiently to help young athletes.

The importance of the study of children in sport: an overview

1

Glyn Roberts and Darren Treasure

SUMMARY

In this chapter, we focus on why the study of children in sport is important. We contend that sport is highly valued by children and plays a key role in their psychosocial development. We argue that a child's perception of ability is one of the most important elements to study in order to understand children within the competitive sport experience. We conclude by suggesting ways in which adults can structure the sports context to make the competitive sport experience more enjoyable and beneficial for *all* children.

1.1 INTRODUCTION

It is generally believed that children's games and sport play an important role in socializing children to the values and beliefs of society. This is because children are brought into contact with rules, social values and other children, and need to develop the skills to survive and enjoy the competitive sport experience. Thus, games and sport are considered to be anticipatory models of society in which children learn important lessons which benefit them later in life.

That involvement in sport can lead to such valuable lessons and contribute to positive personality development has long been a coveted ideal for the supporters of competitive sport for children. Beyond question, sport can provide a forum for teaching responsibility, conformity, subordination of self to the greater good, and the shaping of desirable achievement and social behaviours. But the notion that sport builds character does not sit well with critics of the current structure of competitive sports for children who view the consequences of sport

4 The importance of the study of children in sport

participation as mostly negative. The critics accuse participation of increasing aggression, retarding moral development and fostering an undesirable social climate for children.

The supportive evidence for either position is largely anecdotal, however. There are studies that give some insight into these issues, but systematic research which specifically focuses upon the impact of competitive sport on children's psychosocial development needs to be undertaken.

1.2 THE IMPORTANCE OF SPORT PARTICIPATION TO CHILDREN

There are many reasons why we need to be concerned with conducting research on children who are engaged in competitive sport. First, organized sport for children has expanded dramatically in many countries and in many sports in the last few decades. In the United States, there is even organized competitive sport for three year old boys (Martens, 1986). Second, no reason is more compelling than the simple fact that children would often rather engage in competitive sports than any other endeavour of their experience. There is evidence to support this. Joan Duda (1981) assessed the preferred achievement domain of high school (14–18 years of age) males and females in North America. She found that males preferred to succeed on the sport field rather than in the classroom. This confirms other research which has shown that sport is an important achievement context for males (Coleman, 1961). Interestingly, females also preferred to succeed in sport contexts than classroom contexts! The only context females wished to avoid in sports was individual head-to-head competition with other females. This finding is consistent with other research (e.g. Kleiber and Hemmer, 1981) which has found that females prefer not to compete directly with other females. However, it is revealing that females consider sport contexts, especially team sports, as appropriate contexts in which to succeed against others.

Failure preferences were revealing also. Males indicated that failing in sports was the *most* aversive context in which to experience failure. Given the choice, males would rather do poorly in the classroom than in sports. Females were different to males in their failure preferences as they preferred to fail in sport than in the classroom. This interesting gender difference in failure preference underscores the differing social expectations males and females have, and how we socialize males and females toward different achievement goals.

Third, sport is very important for psychosocial development and is an important context in which peer status and peer acceptance is established and developed. Indeed, Veroff (1969) argues that games and

sport are the domain in which young boys compare themselves in order to demonstrate their standing relative to their peers. In terms of peer acceptance, it has been suggested that many characteristics, e.g. early onset of pubescence, normalcy of a given name, birth position, gender, ethnicity, social class, physical attractiveness and academic achievement (Evans and Roberts, 1987), contribute. However, one way a child can gain acceptance is to be good at activities valued by other children. Because the sport experience is highly valued by children, being good at sports is consequently a strong social asset for children (Evans and Roberts, 1987; Kupersmidt *et al.*, 1990; Weiss and Duncan, 1992).

When one looks at children interacting in free play settings the importance of being physically able in the eyes of other children is clear. Evans (1985) examined children aged eight to 12 and found that team captains, group leaders, were almost always the most competent players and the selection of teams followed a strict hierarchical structure based upon ability. Not only were the better boys the captains, but they also assumed dominant roles in the game and decided who could and could not play. For those boys with poor physical skills, life on the playground was beset with a number of social problems (Evans and Roberts, 1987). They were chosen last, or not at all. When chosen, they were relegated to minor roles, and often prevented from entering games in progress.

The inferior status of such children was most evident when they attempted to enter games already in progress. Children made concerted efforts to accommodate skilled performers, but low ability players were frequently 'locked' out of games (Evans and Roberts, 1987). Research also indicates that popular children are better able to determine the social norms of situations and act upon them (Putallaz and Wasserman, 1990). Thus, it appears that high ability children are better able to act according to the prevailing behavioural norms which, in turn, affords them more opportunity to interact with other children and develop their social skills. Children with low physical skills are particularly at risk.

It is clear that children with above average physical skills are accepted more, and have more status than do under-achieving youngsters. Children with better motor skills are likely to have positive peer relations, while children with low motor skills are disadvantaged when trying to establish friendships with peers (Evans and Roberts, 1987).

As is obvious from the above, the sport experience is important for children. It can affect their peer relationships, their self-esteem and their self-worth (Roberts, 1984). It is no wonder that sport is a domain in which children can experience stress and anxiety.

1.3 PERCEPTION OF STRESS IN SPORT

Learning more about competitive stress and helping children cope with stress have been top priorities for researchers interested in children's sport. Today, with children's sport participation at an all-time high, interest in competitive stress and enhancing the general emotional quality of the sport experience is strong (e.g. Martens *et al.*, 1990; Passer, 1988; Smoll and Smith, 1988).

The most basic demands of sport focus on the demonstration, comparison and evaluation of ability. Children actively seek out competitive situations in order to gain information about their physical ability. Not to demonstrate ability in such a highly valued activity is therefore likely to be extremely stressful for less able children. Demonstration of ability, however, is not the only aspect of children's sport that participants perceive as important. For example, children concerned with learning new skills and improving their performance may find the sport experience stressful if the environment involves excessive amounts of interpersonal competition and evaluation based on normative standards (Roberts, 1986). Conflict, low popularity and the inability to be with friends may cause stress, even to the point that a child may choose to drop out of sport altogether (e.g. Gould *et al.*, 1982).

Recent research has highlighted fear of failure and concerns about adequacy of performance as the main sources of anxiety. Studies of 13–19 year old elite wrestlers (Gould *et al.*, 1983a and b) and 9–15 year old elite runners (Feltz and Albrecht, 1986) found that out of about 30 potential sources of anxiety, participants' concerns about fear of failure and adequacy of performance dominated.

Social evaluation from others is a significant but more minor source of anxiety to most young athletes (Feltz and Albrecht, 1986; Gould *et al.*, 1983a and b; Passer, 1982). Studies of male junior wrestlers (Scanlan and Lewthwaite, 1984) and male and female youth soccer players (Scanlan and Passer, 1979) indicate that before competition, children with low expectations for success had higher state anxiety than children with more positive performance expectations.

It is clear that stress and anxiety are important elements in the experience of children in competitive sport. Anxiety scores increase over the age span and are at their highest in adolescence (Brustad, 1993). This increase in anxiety occurs as children increase their use of social comparison processes (Horn and Hasbrook, 1986, 1987) and increase their focus upon relative ability (Nicholls, 1978). It is the contention of Roberts (1986) that as the impact of the competitive experience increases, in terms of assessing relative ability, some children increasingly perceive stress.

Evident in all of the above is the realization that one factor above all

assumes importance in the understanding of children within the competitive sport experience—the child's perception of ability. As we have documented, perceived ability is important in peer relationships, anxiety and self-esteem of children. While other factors obviously play a role, the self-perception of ability is one of the most important elements to study in order to understand children within the competitive sport experience.

1.3.1 PERCEPTION OF ABILITY

Most of the research on children's perceived ability has assumed a unidimensional perspective of the concept of ability (e.g. Harter, 1978, 1981, 1985). This research has, in the most part, assumed that the self-perception of ability refers to how much ability an individual has relative to others. The fact that individuals, when given ample information, can figure out where they stand relative to others is not necessarily all that interesting or informative. However, recent work in academic and sport contexts has revealed that ability, and thereby the behaviour of children, is better understood if we assume a multidimensional understanding of ability and concentrate our efforts on understanding what individuals think ability is (e.g. Nicholls, 1989; Roberts, 1992). This research has emerged out of the achievement goal approach.

1.3.2 THE ACHIEVEMENT GOAL APPROACH

Nicholls (1984, 1989, 1992) contends that two conceptions of ability manifest themselves in achievement contexts, namely a task involved conception of ability and an ego involved conception of ability. Nicholls contends that the two conceptions of ability are embedded within two independent achievement goal orientations. Within sport contexts, these goals are termed mastery and competitiveness (Roberts and Balague, 1989, 1991).

When a child has a mastery goal perspective, that child is concerned with demonstrating mastery of the task (Ames, 1984; Dweck, 1986; Maehr and Braskamp, 1986; Nicholls, 1984). This goal drives achievement behaviour when mastery is determined to be important. The child employs a task involved conception of ability (Nicholls, 1984, 1989) where perceptions of ability are self-referenced and dependent upon learning or improvement at the task.

When a child has a competitive goal perspective, that child is concerned with demonstrating ability compared to others (Ames, 1984; Dweck, 1986; Maehr and Braskamp, 1986; Nicholls, 1984). This goal drives achievement behaviour in circumstances where social comparison is extant. The child employs an ego involved conception of ability

8 The importance of the study of children in sport

(Nicholls, 1984, 1989) where perceptions of ability are other referenced and dependent upon subjective comparison of one's ability with that of others.

There is considerable data to show that the goals exist and are relevant to the ongoing stream of behaviour of the child. If one has the goal of mastery, then the individual is likely to engage in adaptive patterns of behaviour such as choosing moderately challenging tasks, focusing upon effort within the context, trying hard in the face of difficulty or failure, being interested in the task, and persisting in the task over time. The same pattern of adaptive achievement behaviour is also assumed to hold for competitive goal oriented people when their perception of ability is high. That is, when a child is competitive oriented and has the perception that his or her ability is high, then he or she focuses upon effort, tries hard in the face of failure and persists in the task over time. Dweck (1986) has argued, however, that adaptive behaviours of individuals who are competitive oriented are very fragile in the face of failure or difficulty. The perception of ability may weaken and in such instances maladaptive patterns of behaviour manifest themselves. Maladaptive behaviours are choosing easy or hard tasks in order to avoid challenge, not exerting effort in the achievement context, having deteriorating performance over time and lacking persistence (Ames, 1984, 1992; Dweck, 1986; Duda, 1989, 1992; Nicholls, 1984, 1989; Roberts, 1984, 1992, 1993).

Within the academic context, evidence in support of behaviours consistent with the achievement goal held is now considerable. Children manifest adaptive achievement striving when mastery oriented and manifest maladaptive achievement striving when competitive oriented (Dweck, 1986; Ames, 1987, 1992; Nicholls, 1992).

1.4 ACHIEVEMENT GOALS IN SPORT

There is now ample evidence to illustrate that achievement goals function in the context of sport (see Chapter 9). Measures to assess the goals have been developed (Duda, 1989, 1992; Roberts and Balague, 1989, 1991) and ongoing research is assessing the relationship of the goals to achievement behaviours in sport. For example, when holding a mastery goal perspective individuals have self-referenced performance attributions consistent with adaptive achievement behaviours, whereas when holding a competitive goal perspective individuals who are low in perceived relative ability make attributions more consistent with maladaptive achievement striving (Duda, 1992; Jackson and Roberts, 1992; Hall, 1990; Roberts, 1992). For example, Jackson and Roberts found that competitive goal oriented individuals are less likely to experience positive performance states, such as experience of peak performance, than mastery goal individuals.

Roberts *et al.* (1991) looked at achievement behaviours of adolescent athletes in practice and competition in sport. They found that competitive goals were related to being bored in practice, to focusing upon winning in competition, and to believing that sport should enhance one's status. A mastery goal, on the other hand, was found to be related to satisfaction in sport, to learning and obtaining social approval in practice, and believing that sport should enhance social responsibility. Thus, with adolescents, the achievement goal perspective to understanding achievement behaviours of individuals within sport has had strong support. When we consider younger persons within sport, however, the issue does become a little more complex.

1.4.1 ACHIEVEMENT GOALS OF CHILDREN

It was Ewing (1981) who provided the first evidence that goal perspectives are important motivational correlates to behaviour. In her research with 12 to 15 year old children, Ewing found that the younger children in her study demonstrated goal perspectives of mastery and competitiveness (along with a social approval goal perspective). Ewing also found that individuals who are high in competitiveness were the ones most likely to drop out of sport; that is, competitive goal oriented children were most likely to exhibit the maladaptive behaviour of giving up.

In a follow-up study, Ewing *et al.* (1985) used factor analytic procedures to investigate the development of the goals in nine to 14 year old children and found developmental differences. Young children (9–11 years of age) had somewhat mixed goals; mastery and social approval elements were very clear but the competitive goal perspective was not fully developed. Children were approximately 11 to 12 years of age before the competitive goal perspective emerged.

More recently, Buchan and Roberts (1991) assessed the perception of success of children at two different ages (9–10 years of age and 13–14 years of age) and confirmed this hypothesis. Buchan and Roberts were interested in determining the achievement goals held by the children. They found that the older age children were clearly more competitive goal oriented than the younger age group. The younger age group had mixed interpretations pertaining to goal perspectives, but predominantly focused upon a mastery goal. In addition, Buchan and Roberts found gender differences. Boys were more competitive goal oriented than girls.

This increase in competitive orientation may have significant negative consequences for children around the age of 12, particularly for those who begin to have reservations about their relative ability. It is at this age that Nicholls and Miller (1984) found that children were able to

differentiate skill, luck and effort from ability. After the age of 12, therefore, it should not be surprising that when children expect to look incompetent, greater impairment of performance will occur when competitive goals are salient (Miller, 1985). As Roberts (1984) argues, the culmination of this developmental process of differentiation, combined with increased emphasis on competitive goals, may be the reason why drop-out from competitive sport becomes such a large problem at age 12.

It is not inevitable, however, that children will develop a competitive goal orientation in the sport context. The cues and feedback given by significant adults is critical in determining the achievement goal children will hold (Ames, 1987), particularly for children under the age of 12 for whom social approval is very important (Ewing, 1981; Buchan and Roberts, 1991). Specifically, do the situational constraints have an impact upon the development of one goal versus the other? It is to that aspect we now turn; what is the impact of the perception of the sports context?

1.5 THE IMPACT OF THE MOTIVATIONAL CLIMATE

In an education setting, Carol Ames has looked at how achievement situations influence the adoption of competitive or mastery goal orientations. Ames' research suggests that the achievement context, whether the classroom or the sports field, can be considered more or less competitive or mastery involving depending on the demands of the situation. This research has indicated that in situations that are characterized by interpersonal competition, public evaluation and normative feedback, competitive involved goals are more likely to emerge. In situations which place an emphasis on the learning process and participation, mastery goals are more likely to emerge.

By giving certain cues and rewards, and making explicit expectations, significant adults structure the sport context so that task or ego involved conceptions of ability are the criteria by which performance is evaluated. The adults' goal preferences become manifest and children perceive the goal structure and act accordingly. In this way, the goal structure created by the adult establishes a *motivational climate* that makes one conception of ability or the other manifest. Children are exposed to the explicit criteria that impinge upon their own assessment within the context. The motivational climate created by parents, teachers and coaches therefore has the effect of developing one goal perspective over the other (Nicholls, 1989; Roberts, 1992).

Roberts *et al.* (1992) found evidence consistent with this hypothesis in a study that demonstrated that parents view the competitive sport experience for their children differently depending on their goal orientation. Parents endorsing a high competitive goal orientation

emphasized normative standards when defining success, focusing on winning and being better than other children in assessing the success of their child in sport. In contrast, parents endorsing less competitive orientated goals placed greater emphasis on their child's success in developing positive peer relations through the sport experience, focusing on getting on with others and being accepted as part of the team. It would appear that by valuing how well their child gets on with others and is accepted as part of the team, less competitive oriented parents are providing a far better framework for the development of successful peer relationships.

1.5.1 CREATING A MASTERY CLIMATE

Research has demonstrated that students who perceive the motivational climate of the classroom to be mastery oriented are more likely to display adaptive behaviour than those students who perceive the climate to be competitive oriented (Ames and Archer, 1988; Ames and Maehr, 1988; Powell, 1990). Mastery related cues are conveyed by many aspects of the learning environment, from how tasks are defined to how children are grouped, to how they are recognized and evaluated by others. The premise of Ames' research is that the nature of children's experiences can influence the degree to which a mastery goal orientation is salient. Consequently, a child will develop adaptive patterns of behaviour in mastery climates.

Although research in sport is only just beginning to address the issue of motivational climate (e.g. Roberts *et al.*, 1992; Walling and Duda, 1992), many characteristics of the classroom are clearly shared by organized sport—where the authority structure is adult-defined and the reward structure is adult-imposed (Ames, 1992). Classroom and organized sport settings, for example, involve children in achievement related ventures where the outcomes are seen as important and valued, and formal evaluation is externally imposed. Individual performance is public, and children are often stratified or grouped by ability. In these settings, achievement behaviour can be evaluated in terms of improvement and progress toward individual goals, or in relation to normative standards. Children, therefore, can either focus on developing their abilities and learning new skills or on demonstrating or protecting their abilities. Extrinsic rewards, recognition and adult coercion can become the reasons for engaging in the activity, or personal satisfaction can come from participation, a sense of social activity or a belief that one's effort brings improvement. In these ways, sport and academic settings share similar structural features (Ames, 1992).

Ames is currently conducting a comprehensive classroom based intervention that is directed at changing the teacher's role and the

teacher's behaviour so that a mastery orientation characterizes the totality of the classroom experience (Ames, 1992). Preliminary findings indicate that the psychological climate in the intervention classrooms is significantly impacted by changes in the teachers' strategies. Within the classroom, Ames and her colleagues have been able to identify those strategies that make a mastery orientation salient to individual students. They have found that the teachers who created the mastery climate enhanced children's involvement in learning as well as their quality of learning. In short, mastery climates enhanced adaptive strategies of children.

There is currently no work in sport involving children in which adults have specifically changed the motivational climate to the sport context. However, it would appear that the role of the parent, teacher and/or coach in the active construction of an individual's perception of the motivational climate is vital. How do they design practice sessions? How do they group players? How do they give recognition? How do they evaluate performance? What behaviour do they consider desirable? Do they congratulate players on ability or good effort? How do they react when the team loses? Persuasive evidence exists to suggest that by making certain cues, rewards and expectations salient a coach can encourage a particular goal orientation and in so doing significantly affect the way a child perceives the sport experience.

Practitioners should therefore work hard to establish a mastery climate by emphasizing short term goals and learning and skill development. To enhance motivation, children need to be evaluated for their improvement and effort, not their performance and ability (Ames, 1987, 1992; Roberts, 1984, 1992).

1.6 CONCLUSION

In this chapter, we have tried to illustrate the importance of the study of children in sport, and how practitioners, researchers and parents need to assess the way they behave when dealing with children in the competitive sport experience. The uppermost thought in our minds should be that we are trying to make the competitive sport experience more enjoyable and beneficial for *all* children. We must be cognizant of the fact that when success in sport is defined as winning in competition, children are given few opportunities to define their experiences positively. If children perceive they have little opportunity of developing the necessary skills or feeling they are valued, then they adopt maladaptive behaviours and are inclined to leave such unpleasant environments. But sport does not have to be like this for children. By adopting mastery concepts in competitive environments, children are

more satisfied, enjoy the experience, and adopt adaptive achievement strategies.

We are not suggesting removing competition from sport. Competition is one of the most enjoyed aspects of sport; ask any child! Rather, we want to encourage coaches and parents to focus on criteria that emphasize a mastery goal orientation and de-emphasize a competitive goal orientation for children while competing (Roberts and Treasure, in press).

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Whose sport is it anyway? Adults and children's sport

2

Sarah Gilroy

SUMMARY

This chapter focuses on the social context of children's sport and identifies some problem areas that coaches, adults and parents need to address if they are to help children get the most out of sport.

It is tempting when you are a coach or a parent, dedicated to developing your child's sporting talent, to be concerned with the very real problems that either you or the child might encounter, e.g. those of over-arousal, types of training and injury. It must be remembered, though, that there are broader concerns which are just as important, if not more so. These are to do with the way in which children's sport is organized, who organizes it, and who benefits from it. Just as adults' sport has changed in recent years, for example in equipment, facilities and sponsorship, so has children's sport, and to understand what is happening to children we must first look more closely at what sport in general looks like. It is only by doing this that we can have a better understanding of why children's sport has developed in the way it has and why some of the negative aspects of adult sport have crept into it. Too often there is the tendency to assume that sport is somehow set apart from the rest of society and as such it will not be infected by the ills of society. If we want to ensure that our children find their involvement in sport fulfilling and rewarding then we need to retain a critical stance, and keep a 'weather eye' on sport in general and children's sport in particular.

2.1 THE NATURE OF SPORT IN THE 1990s

So what does sport in general look like? This may seem to be a redundant

question, but if we are to take the process of reassessing sport seriously, particularly when it has undergone so much change, we must start with the basics. The general picture of sporting involvement, that is participating rather than watching, in this country is pretty bleak since only an estimated 37% of women (aged 16 and over) and 57% of men (aged 16 and over) are taking part in at least one outdoor or indoor sport (Sports Council, 1991). It is bleak because the breakdown shows that the highest participation in outdoor sports is in walking, with figures of 18% for women and 21% for men. For indoor sports the most popular activity for men is snooker (17%) and for women swimming (10%).

There is, of course, a problem in getting accurate figures for participation mainly because definitions of sport vary and also much of sport is 'informal' and therefore is impossible to quantify due to its often casual nature. So we are left with figures produced by the General Household Survey and the National Countryside Recreation Survey which ask people what they have done in a particular period prior to the survey. At best these figures give us a broad outline of participation patterns, and at worst they misrepresent actual participation.

The general picture is one of men participating more than women, and of participation by both dropping rapidly as they get older. The involvement of ethnic minority groups in sport is hard to gauge although there is evidence to suggest that minority groups are under-represented and are often subject to racial discrimination when they do participate (Jarvie, 1991). Ethnic minority women can suffer from the constraints of ethnicity and gender which limit their involvement, particularly when participation goes against cultural values and religious beliefs. A visit to any sports ground at a weekend provides further evidence that these are common trends.

2.1.1 THE TWO MODELS OF SPORT

It is clear that 'sport' means different things to different people. For a professional it means work; for an elite amateur it can be worklike and very competitive; for someone else it could just be a good way to meet people and get out. Despite these meanings we can still identify two dominant models. The first is predominantly a competitive form of sport. The word 'predominantly' is important here, because all forms of sport have some element of competition in them. Although for some people competition is the very essence of sport, for others it is the social element that is crucial. The second model of sport is therefore one where the social aspects of participation are more important than the competitive aspects. The difference between the models becomes clear when we look at the way sports are organized, the participants and their experiences.

2.1.2 THE SOCIAL MODEL OF SPORT

The social model is more concerned with sport which is done primarily for social reasons, i.e. it is enjoyable and has little pressure attached to it, it is a good way to meet people, it makes you feel good. The competitive element, although present, is only of secondary importance. Examples of this would be having a game of squash or badminton with friends or playing in a local soccer team. The second place given to competition would be supported by the fact that serious training would be unlikely and rewards for winning would be few, beyond the intrinsic satisfaction of doing well. It would just be playing for playing's sake. Just as in the wider scheme of things, men are more involved, in actual performance terms, than women (see Deem, 1986 and Green *et al.*, 1990 for reasons as to why this is the case). This is particularly true when comparing outdoor to indoor sports, with more men than women being involved in outdoor sports (Sports Council, 1991).

2.1.3 THE COMPETITIVE MODEL OF SPORT

The competitive model echoes the same social divisions seen in the social model, i.e. with women and ethnic minorities being under-represented. The major differences between the models concern the organization and the role that sport plays in an individual's life. Unlike the previous model competitive sport is highly structured and ultra-competitive. The stakes are high, and large sums of money can be earned by those who have turned professional. For the top class amateurs prestige and status and, increasingly, money to put into a trust fund are the main rewards. The intensive training that top class sports people undergo sets them apart from lesser mortals. They are, or become, highly motivated, disciplined and determined people and this enables them to spend hours training when others might be socializing. For many people our only knowledge of this kind of sport is what we gain from watching television or reading the papers and magazines. Sports people are fast becoming television personalities, who are presented as leading exciting, healthy and rewarding lives. In effect they are not only promoting a particular product but also a way of life. The cost of sustaining this kind of sport is high and much of it now comes from corporate sponsorship. As sport has begun to assume such importance it puts pressure on the participants, who need to continue performing at their best to retain their bargaining power. Frequently we see news reports of sports people competing despite serious injuries and at risk of causing permanent damage to themselves. We are also increasingly being presented with evidence that athletes are using illegal performance enhancing drugs. The cases of Ben Johnson and Katrin Krabbe are those that we are most

familiar with, but as evidence presented to a Canadian inquiry into steroids in amateur sports suggested, steroid use is the rule not the exception in amateur sport.

What is it, then, that drives people to these lengths despite the damage it can do to their bodies? Some perhaps have come to rely on the 'star' status they have gained and are afraid to lose it, and others are driven by a desire to be the best, regardless of the means or personal cost.

Sport in this model is therefore often experienced as being highly structured and controlled, and very rewarding, both emotionally and financially. There are drawbacks, though, for sport of this kind can bring with it many pressures, it can be socially isolating and, even for amateurs, it can become like work.

2.2 PHYSICAL EDUCATION AND SPORT

With such models of adult sport it is hardly surprising that children begin to emulate the adults around them. Are there any other models that present an alternative type of sports involvement for children? The social model is the one to which children are introduced primarily through their families and school. It is in these environments that children move along the path from play to sport. The emphasis, particularly in schools, is on creating the 'right' kind of learning environment. Of course, who determines what is 'right' has been at the centre of the debates about competition in schools and the National Curriculum. It is perhaps worth spending some time looking at the issue of competition, because in many ways it encapsulates some of the problems currently being faced in the two adult sport models already described.

Recently opinion has been growing, in some schools and teacher training institutions, that much of what had been regarded as unquestionably good about physical education (and inter-school competition in particular) was, in fact, problematic. The common belief that competition within the physical education environment was inevitably wholesome, character building and a form of preparation for life has been questioned. How many children actually found it wholesome and character building? Even with hindsight adults were beginning to ask whether physical education should be offering something more. The continued drop-off in participation in the post-school years did not, and does not, give much evidence that physical education was succeeding in educating people to stay fit for life.

For some, physical education was about teachers gaining prestige and status through producing good school teams. In some schools the pursuit of success in the extracurricular activities led to a 'neglect' of the curricular activities. Also, within inter-school competition there was increasing evidence of children adopting the competitive adult model.

As a result a 'do or die', 'win at all costs' attitude was creeping in. Doctors warned that children could not be expected to appreciate that such attitudes are inappropriate and that schools should recognize this and take action to prevent it. The response from physical educators was to reconsider who benefited from competition (particularly inter-school competition). If it was to be of benefit to the few at the expense of the many then clearly it was not suitable. Many schools, particularly in the former ILEA, restricted or 'banned' competition. The reaction that this brought from some members of the public and the media often revealed a misunderstanding of what was happening in schools. It was assumed that all competition was thought to be bad, and that the 'new' Physical Education (PE) contained no element of competition.

Politicians came forward in defence of the status quo:

I think the whole thing was very un-British. We all enjoy the competitive element of sport; indeed in all things. Life is competitive and as long as these sports are fun I think they should be encouraged.

(N.Lyell, MP for Mid Beds., *Bedfordshire Times* 23.10.86)

What is being forgotten here, of course, is the fact that competition comes in a variety of forms, e.g. competition versus yourself, versus the elements, versus another, and competition where one group competes against another. The comments also revealed a rather traditional and old fashioned view of physical education, that is one which saw the role of PE as that of producing test cricketers:

There is a massive void to be filled before we can dream once again of succeeding generations of super kids on their way to reinforce the Test cricket team.

(*Sunday Times*, 1986)

These 'new' ideas, however, were perceived as threatening. Some sections of the media sought to strike a chord with traditionally conservative sports enthusiasts by aligning the 'new' ideas to the political left and thereby trying to discredit and dismiss the ideas:

And from the left wing has come the demand that the competitive element should be phased out in school sport and again cricket suffers. You can even get a booklet from something called the National Coaching Foundation and Play Board which entreats us to chuck out words like winners and losers in favour of 'free expression' and 'self worth'.

(*Sunday Times*, 17.8.86)

The words used in the above quotation are calculated to ridicule the aims of the National Coaching Foundation (NCF) and Playboard, e.g. 'something called' and 'to chuck out words', but perhaps more serious is that in doing so the author misrepresents the aims of the NCF and Playboard (Playboard, 1986).

Times have changed. Gone are the days when there were just a handful of activities for people to do; leisure and sport have changed dramatically. Sport itself now competes for participants with a plethora of exciting computerized entertainment. Games which need fewer people have become much more popular than the large team games of cricket, hockey, rugby and soccer. In fact most of these games have developed smaller, sometimes indoor versions to widen the appeal, e.g. indoor cricket has become particularly popular, with specialist facilities now well established.

2.3 THE EFFECTS ON CHILDREN'S SPORT

The question that we must now ask is how far have the models of adult sport permeated into children's sport? The other consideration is the effect that the debates over the 'new' ideas are having on adults, for, after all, children's sport is largely organized by them either as parents and/or coaches. Children's experience of sport varies from going to relatively low key activities such as swimming classes, gym club or soccer practices on a Sunday morning to the more highly pressured activities such as going to the pool every morning before school for swimming training. The variety of activities open to children today is extensive, but only if the parents are able to support them with transport, equipment, and entry fees.

2.4 THE ROLE OF THE FAMILY

The family is undoubtedly one of the key elements in the child's involvement in sport (Rowley, 1986). Often family arrangements will have to be made around the child's commitments. Few children participate in sport without the financial and emotional support of their families. The more involved the child becomes and the better she/he gets, the more pressure grows, not only on them but also on their parents. This nebulous thing called 'pressure' has a lot to answer for. It can lead to parents and coaches becoming obsessive about the child succeeding; it can lead to the child seeing winning as being the 'be all and end all'; it can lead to unfair means being employed to ensure success; it can lead to physical injury as the child competes when she/he should not, just because winning is so important (Hellstedt, 1990; Lindner *et al.*, 1991). Pressure can lead to stress, which can often,

although not always, be harmful and although sport psychologists are able to help us with techniques to reduce stress the problem still remains. It remains because the pressure comes largely from outside the individual, from the way in which sport and competition are valued in society. Competitive sport as we know it in Britain is not inherent; anthropologists have shown that not all societies are based on competition as we are in the industrialized West. Accepting this fact can take us some way in appreciating that it is theoretically possible for us to modify the way in which sport is structured and, therefore, experienced.

2.5 *IN LOCO PARENTIS*

The concern over the nature of children's sport and whether it is harmful or beneficial to them is a very real one. The excesses of children's sport are being revealed as just that, excesses; but they are also revealed as being the excesses of adults expressed through children. The question this comes back to is that of our responsibility as adults to raise children in the 'correct' way and to realize that what might be for the apparent good of the child in the short term might be detrimental to him/her in the long term. Also on a broader scale what some might regard as being good for the country and our society might not always be what is best for each child. Recent moves to make education more vocationally orientated and therefore more instrumental have concerned some educationalists who fear that the general education of the child is being sacrificed on the altar of technological and industrial growth. Who is to decide what is best for the child?

2.6 THE REGULATION OF CHILDREN IN SPORT

Unlike education and employment, children's sport is as yet relatively untouched by direct legislation. There has been legislation which has the potential to have a major impact on children and sport, but it is unclear as yet just how much effect it has had. For example, health and safety regulations have been implemented to improve the standards of child care in terms of facilities, equipment and staff training at nurseries, but it is unclear how this will impact on voluntary work with children.

The Children Act 1989 is concerned with getting the best for children, by promoting and safeguarding their welfare (Brayne and Martin, 1991). Whilst no specific mention is made of sport, those of us working with children in sport need to make ourselves aware of what the Act seeks to do. The Act puts the child first and considers what is in the best interests of the child. If a child is likely to, or is, suffering from significant harm then action can be taken. This could mean that when the health or

development of a child is put at risk this could be defined as 'significant harm'. 'Development' is not just physical but also intellectual, emotional, social and behavioural.

It is clear, then, that the excesses in children's sport that the NCF (Lloyd and Campbell, 1990) and the Sports Council have documented may fall within the scope of the Act if young sports people are suffering 'significant harm'.

Rowley's (1986) early study points to potential problems concerning the drive for excellence and international success which pushes people (coaches, parents and children) into believing that routine and specialized training needs to start even earlier. Such action could lead to significant harm to the child's development. The problem is that because children are thought to be taking part because they want to, their participation is not seen as being problematic, despite the harm it may cause later. Also, sport is not regarded as being a danger area as child abuse or children working in dangerous environments might be.

In reality, training, for some children, is worklike and potentially could lead to significant harm by adversely affecting the child's development. For example, one girl took up swimming when she was five and quit when she was 14 having done an estimated 10 000 hours of training in the pool. Such a commitment of time and energy would not have been tolerated had the child been at work in a shop, but because sport is seen to be 'play' it escapes our critical eye. Children are particularly vulnerable to a variety of injuries, some caused by overuse, e.g. epiphyseal injuries, and others caused by specific training, e.g. back injuries in young gymnasts due to training to develop spinal mobility. The problem is not only that the children do not know when to say no to what their coach or parent wants them to do, but also that many of us do not know enough about the dangers they can be exposed to.

The NCF echoes the Children Act by putting children's needs first. Children's sport is for the children, not for coaches to gain glory or make a name for themselves, and not for parents to relive their lost sporting past through the lives of their children.

2.7 AN ALTERNATIVE MODEL FOR CHILDREN

There is a problem, then, with children's sport following the adult models. Firstly, the children themselves are not mature enough (physically, socially or mentally) to cope with the stress that is associated with the competitive model, nor are they able to make decisions which necessitate long term as opposed to short term plans. Secondly, the adults who help organize children's sport often try to fulfil their own sporting ambitions through the children; thus it often becomes too serious and worklike. This has been cited by researchers in both Britain

and North America as being one of the reasons that children give for opting out of sport in search of something which is more enjoyable. The problem comes in trying to strike a balance between the social and competitive approaches to sport. If it is too social the children may become frustrated at the lack of challenge, and also may want to emulate their sporting models. If it is too competitive the drop-out rate and dissatisfaction rate may be higher.

Almost in response to this problem has been the development of the modified game approach, which tries to retain the basic nature of the game whilst modifying the equipment, the playing area and the rules to match the physical and mental development of the children. Sports such as rugby and tennis have led the way in this area by developing mini-rugby and short tennis. Although some of the problems children once encountered while playing the full version of the game have been addressed, many of the developments, far from creating a more wholesome environment for children, have done little except reproduce, on a smaller scale, the same problems of a highly structured, competitive and adult-dominated sport. There is a tension here between what the children seem to enjoy, what the sports and clubs, i.e. adults, think is best for the sport and club, and finally what adults think is best for the children in the long term. For example, adults might think that mini-rugby is good for children because there is less physical contact allowed, and the sport and clubs might see it as being a very useful way of recruiting members and identifying talent early, but others might see it as reproducing an adult, ultra-competitive approach to sport too early.

2.8 CONCLUSION

On its own the modified game approach does not guarantee an answer to our problems; what is needed is greater sensitivity towards children's experiences in sport. To develop this we need to understand how sport is changed by, and can have an impact on, the rest of society. As adults, we need to reflect on whether any of our actions are directly or indirectly leading to children not getting the best out of sport for themselves. We need to reflect on what kind of model of sport we are promoting, consciously or unconsciously, and what kind of example we set when playing or coaching or indeed just watching sport. We need therefore to look critically at what is happening in children's sport. Sport can be harmful; we need to guard children's sport from the excesses so often seen in adult sport. Children need our support, and we need to make sure that we strive to give them the best that we can. We need to give children a sporting chance.

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Why are you coaching children?

3

Martin Lee

SUMMARY

In this chapter I argue that people who coach children have a responsibility to educate them which cannot be avoided and has effects which may extend beyond the playing field. The basis of why people coach lies in their value system and hence it is important to understand your values. I will describe a model for looking at values and invite you to examine your own value system. Then I will discuss some commonly expressed reasons for coaching and pose questions about who coaches are really doing it for, the children, themselves or others. Finally I will describe values which children express in sport and suggest that coaches should try to match them to their own values.

3.1 INTRODUCTION

When people do anything their reasons for doing it affect both what they do and the ways in which they do it; they influence their targets and their actions. When their activities involve others it is clear that their motives will be important in relationships established between those involved and the experiences they have. Glyn Roberts and Darren Treasure (Chapter 1) and Jean Whitehead (Chapter 9) explain the motivations of children in some detail. In this chapter I want to discuss motives which coaches have for coaching and, more importantly, the values which they bring to the sport situation.

Coaching children differs from coaching adults in that the athletes are more easily influenced and constantly faced with new situations and experiences. At the time when they are most involved in sport, say

between the ages of six and 16, children undergo rapid changes in which they are greatly affected by what happens to them and around them. So coaches have the added responsibility of taking on an educational function which has an effect beyond the sport itself. That means that they must be aware of the impact that their priorities and actions have on the children they coach.

Against this background it is important for coaches to establish those priorities and be clear about their philosophy of coaching. This is a process which is often neglected or ignored when coaches meet to further their own education or simply talk about coaching their sport. Yet without it their efforts may be misunderstood or even lack direction altogether. Commenting upon youth sport coaches in America, Dr Rainer Martens, founder of the American Coaching Effectiveness Program (ACEP), has pointed out that without a clear philosophy coaches '...tend to adopt the most prevalent philosophy..., the professional or elite sports model which emphasises winning' (Martens, 1988, p. 103). It is this attachment to winning which frequently places young athletes at the centre of the hopes and aspirations of others so that their own wants and needs may be forgotten.

Clearly, then, it is most important that coaches clarify their values and motives and understand the part they play in the lives of the children they coach. It is essential to recognize that, like it or not, coaching children is an educational activity, not just concerned with encouraging competitive success but, inevitably, with the effect of developing values in the athletes. Perhaps, above all, coaches must come to grips with who they are doing it for: themselves, the club, the sport itself, the country, the parents or the children.

3.2 VALUES

3.2.1 THE IMPORTANCE OF VALUES

Let us look at the influence of human values on coaching. The ideas presented here are drawn from the work of an eminent American psychologist, Milton Rokeach, who has spent much of his life studying the ways in which people organize their beliefs about what they think is important in life—their values (Rokeach, 1973).

The ways in which we coach, or do anything else for that matter, reflect our values. Briefly, values are those things which we believe to be important in our lives; they express what we believe to be preferable between competing goals and actions. Values may be either things which we strive to achieve (terminal values) or ways in which we behave (instrumental values), both of which can be limited to those things which are (a) essentially personal and do not involve other people, or (b) social

and, hence, have interpersonal effects. We tend to organize our values into systems; that is to say that different values take on an order of priority in our thinking which guides the choices we make in our behaviour.

In an extensive discussion of values in physical education, Jim Parry from Leeds University points out that 'Games are laboratories for value experiments' (Parry, 1985). We might extend that and say that sport is an arena for values testing. For example, coaches may often be faced with the choice of insisting that children play fairly, even when they are likely to lose a contest, or showing them how to cheat in order to win it. This is a conflict between personal values of success at whatever cost and social values of moral responsibility. Each coach's value system affects the way he or she decides; and those decisions tend to be consistent.

3.2.2 THE NATURE OF VALUES

Values can be said to have certain characteristics. Firstly a value is a form of belief, something that exists in our minds rather than in the objective world. Like other beliefs it has three aspects to it: (a) what we know, or believe to be true, (b) how we feel about it—good or bad, and (c) how we behave as a consequence. So, for example, if we believe that learning new skills contributes to self-knowledge then we will probably think that it is good, value skill teaching and try to emphasize it in our coaching. Or if we believe that children learn about themselves and grow from being challenged we will always try to set difficult, but attainable, targets for them.

Secondly values appear to be rather enduring; when we believe that something is worth pursuing or a particular way of behaving is important it is not easy for us to be persuaded otherwise. This may be because we tend to learn values in childhood in a rather isolated, all or none fashion. As we mature we encounter more complex situations where we are forced to choose between competing values and, eventually, we develop a mature value system which is difficult to change. Thirdly, they are thought to operate consistently across different situations. Therefore we would expect that people would hold the same values in sport as they do in other walks of life; the system would not change in different settings.

Because value systems can be thought of as a combination of both terminal and instrumental values which are either personal or interpersonal it is possible to put them into a simple framework (Table 3.1).

Attainment values

Attainment values are thought of as those goals that we have for ourselves and are not concerned with the welfare of other people or

Table 3.1 Classification of human values according to dimension and focus

Focus	Value dimension	
	Terminal	Instrumental
Intrapersonal	Attainment	Competence
Interpersonal	Social	Moral

society at large. So we might think in terms of accomplishment, of gaining social recognition or of self-respect. Thus striving to win a particularly important event or achieve a level of performance in sport represents the behavioural manifestation of values associated with attainment.

Social values

Social values are goals that we have for society as a whole, or the small part of it with which we are concerned, like the club or team. They will include such things as providing justice (being fair), freedom (allowing people to have control), and equality of opportunity (treating everybody the same). Social values may be demonstrated in, for example, club policies which facilitate access to minority groups, or ensure that all members have equal playing time in a basketball team.

Competence values

Competence values represent the extent to which we consider it important to show how good we are at whatever we are doing. They are personal and concerned with how we behave and with demonstrating our abilities. So we might think about being ambitious, disciplined or capable. In sporting terms they might be represented by setting high goals, being dedicated and skilful. Failure to achieve these standards results in feelings of disappointment or even shame. Coaches who emphasize competence values will concentrate on maintaining high levels of performance at all times; this may contribute to the experience of anxiety among young competitors (as explained by Stephen Rowley in Chapter 11).

Moral values

Moral values are interpersonal and instrumental. That is, they are concerned with how we behave in situations which involve others. They

might include such things as being honest, accepting and forgiving. In the field of sport moral values form the basis of that which we call sportsmanship. Failure to adhere to them results in feelings of guilt since we violate a set of guidelines for behaviour towards others which we feel is important. A good example of the impact of moral values occurred in the Winter Olympics of 1956 when the Italian bobsleigh pairs team lent a critical piece of equipment to the British pair who went on to win the gold medal (BBC TV, 1992). The Italians were the only threat to the British at the time. For them the values of fairness and altruism were more important than the attainment value of winning the championship.

Perhaps what is important about this breakdown is to recognize that while values guide our actions, they do not all refer to moral or social values and that personal values to do with attainment and competence are perfectly valid and desirable. Indeed, no judgements are made about the relative desirability of any values, they are all 'good' and the priorities are the province of each coach. However, they are important in our understanding of not only why we coach children but also how we go about it.

3.2.3 EXAMINING YOUR VALUES

In recent years I have asked coaches and students about their values in sport and in life. Using the same technique as Milton Rokeach (1973) and adapting his value labels for sport, I have produced a short questionnaire (Table 3.2) to help coaches explore their value systems. You may like to try it yourself.

Instructions

Rank each of the values listed in order of importance to you both in column (a) and in column (b). In (a) rank them on how important they are in your life in general; in (b) rank them on how important they are to you in sport. Identify which values in each list you think are intrapersonal and interpersonal.

Now ask yourself three questions:

- (a) Are you consistent in sport and life in general?
- (b) How do your values affect your coaching?
- (c) Which values are strongest in your system:
 - (i) Attainment or social?
 - (ii) Competence or moral?

You may find, as have many of my students, that there are differences between what they value, and consequently how they behave, in life generally and in sports. As a result many of them have begun to look

32 Why are you coaching children?

Table 3.2 Sports Value Survey (adapted from Rokeach, 1973)

Terminal values			Instrumental values		
	(a)	(b)		(a)	(b)
Accomplishment	—	—	Accepting	—	—
Equality	—	—	Ambitious	—	—
Freedom	—	—	Capable	—	—
Friendship	—	—	Considerate	—	—
Justice	—	—	Disciplined	—	—
Pleasure	—	—	Forgiving	—	—
Self-respect	—	—	Honest	—	—
Social recognition	—	—	Independent	—	—

again at what they believe to be most important. However, among coaches I have found that there is more agreement between their instrumental values in life and sport; they set their priorities about conduct in much the same way in both situations. But their goals, terminal values, in sport tend to be personal while in life they valued social goals more strongly.

3.2.4 COACHING VALUES

The values that coaches hold are reflected in their motives for coaching; hence the importance of the question ‘Why are you coaching?’. They are also readily transmitted to the children who frequently look upon their coaches in awe and take them as significant role models: they think as the coaches think, their attitudes are the coaches’ attitudes, their values are the coaches’ values. It is important, therefore, not to underestimate the impact you have on your young athletes.

3.3 REASONS FOR COACHING CHILDREN

Let us turn to the reasons which people give for coaching children. Not only do those reasons determine in many ways, both explicitly and implicitly, what coaches do and how they do it but they are also important in shaping their success in coaching different children. This is because they should, ideally, fit the reasons the children have for being there.

3.3.1 COACHING CHAMPIONS

Some coaches are very keen to coach champion performers, elite athletes; they get great satisfaction from helping them to reach both the pinnacle

of their performance and public competitive success. This means focusing on children who have unusual ability, emphasizing skill and fitness, and training them in a limited range of activities, often from a very early age. This approach may be good, even necessary, for those children who have a similar commitment and the ability to achieve; but, of course, others may be passed over and, perhaps, miss the opportunity to develop in the sport. The values involved here are personal and competence; the focus is on accomplishment, and on being ambitious and disciplined. Above all else it is important to succeed and success is frequently seen primarily as winning. While winning is an integral part of sport Frank Smoll and Ron Smith, two American researchers, have shown that it can sometimes become more important to coaches than to the children (Smoll and Smith, 1979). They have pointed out that children can learn both from winning and from losing. As a result of their research they emphasize that firstly *winning is not everything, nor is it the only thing*, and secondly *failure is not the same as losing* (Smoll and Smith, 1979, p. 4). This last comment draws attention to the personal definition of success and failure which has a significant influence upon children's interpretation of their experiences in sport. This is explored in more detail by Stuart Biddle in Chapter 10.

3.3.2 KEEPING IN THE SPORT

Many coaches become involved with coaching children as a way of keeping contact with their sport and making a contribution to it. Indeed, in a small study of coaches which I have carried out this is given as the most common motive. While this finding may be influenced by the self-selection of those who returned the questionnaire it is clearly a very widespread motive and was considered by them to be more important than coaching champions. The terminal values reflected here may again be personal, focusing on pleasure and friendship.

3.3.3 INTEREST IN CHILDREN

Some coaches like to coach children rather than adults because they are interested in the welfare of children, either in general or, in particular, of their own children. Many coaches may be teachers and so already be aware of the educational impact of what they do. But this motive suggests a general concern for interpersonal values and the benefits of the sport for others.

Coaches whose main interest is in children's welfare may consider sport to be a means to either personal development or social development. The former will mean developing ability at all levels for its own sake and the ability to cope with success and failure is as important

34 Why are you coaching children?

as the outcomes themselves. The latter will result in placing a priority on such things as co-operation with others, the development of sportsmanship, accepting rules, and creating opportunities for leadership.

3.3.4 ENJOYMENT

Some coaches simply enjoy the contact with children and like to help them to enjoy sport. Research has shown consistently that coaches and parents are very important in determining how much enjoyment children get in their sport. However, it is often very difficult for people to say what it is that they enjoy about an activity and, of course, different people will enjoy different things in the same event. Frank Smoll and Ron Smith (1979) have found, in America, that coaches for whom players most enjoyed playing were those who made them feel good. I have found that a most important feature of what children like in their coaches is a sense of humour so that they can relax and have fun (Lee and Austin, 1988). This may be a reflection of the enjoyment that coaches get from being involved with children; the greater the enjoyment the more fun the children can have.

3.4 WHO IS SPORT FOR?

Throughout our lives we are all subject to the needs and wishes of other people. This may be specially true for children, who have less control over their own lives than adults. Children who get involved in sport often find that there are pressures on them from many different sources. This happens particularly to very able children who find that many different groups want their services and they often have to make difficult choices. They may have to meet the needs of a school team; they may be a coach's pathway to higher things; they may represent their parents' hopes for achievement; or they may be considered as future international stars to represent their country. With these demands being made upon them it is not surprising if their own wishes sometimes get lost, and if they sometimes wonder who they are doing it for.

So, to conclude this short discussion let us ask: Who is children's sport for? People who conduct children's sport have a variety of reasons for doing so. The outcomes of good sports provision for children may enhance the prospects of the clubs, the national teams, the reputation of the coach, or the pride of the parents. While these may all be valuable outcomes they should not become the primary reasons for doing it. If they do the welfare of the children becomes secondary.

3.4.1 COACHES' NEEDS AND CHILDREN'S NEEDS

Naturally people who devote their time to coaching children must satisfy their own needs or they will cease to do it. At the same time there should be a recognition of the children's needs and a desire to meet them. Jean Whitehead, whose work is fully explained in Chapter 9, has found that children like sport for a number of different reasons. They fall into three main categories: being able to do something well, being involved with or recognized by others, and demonstrating superiority. Coaches who recognize these benefits will also see that they affect the way in which children approach sport. Most importantly, a balance between coaches' needs and children's needs will help to ensure that coaches work with children whose goals are the same.

3.5 CHILDREN'S VALUES IN SPORT

So far I have been considering values from a coach's point of view. This is because it is not unreasonable to suggest that coaches can and do transmit their values to young athletes. Let us now turn briefly to values which are expressed by young athletes themselves.

I have recently carried out research commissioned by the Sports Council to identify values which are important to young football and tennis players (Lee and Cockman, 1991). We interviewed players between 12 and 16 years old and discussed how they would respond in critical situations in their sport which presented a moral dilemma. Table 3.3 presents the values which were identified from an analysis of the transcripts of the interviews. We also recorded the frequency with which each value was expressed; this revealed information about children's awareness of different aspects of the sport experience.

There are some interesting aspects of the findings. Firstly, we found that young athletes appeared to express values which are specific to sport, or at least particularly important in sport settings. This is in contrast to the assumptions made by Rokeach and other researchers in the field of values who conclude that values are universal, that is, they apply in all areas of life. However, it vindicates the view of others who recommend identifying values specific to the groups in which the researcher is interested.

Secondly, an analysis of the frequency of occurrence showed differences between sexes and players in different sports. Enjoyment was more commonly mentioned among tennis players than footballers; footballers were more concerned with collective values such as conformity, obedience and team spirit. This suggests that there is a value culture which is associated with different sports which may be transmitted by coaches.

Table 3.3 Spontaneously expressed values identified from football and tennis players aged 12–16 years

Value	Descriptor
Accepting	Being able to get along with others despite apparent differences
Achievement	Being personally or collectively successful in a contest
Caring	Showing concern for other people
Conformity	Conforming to the expectations of others
Companionship	Being with friends who have a similar interest in the sport
Conscientious	Doing one's best at all times and not letting others down
Contract maintenance	Supporting an implicit agreement to play the game; playing in the spirit of the game
Enjoyment	Experiencing feelings of satisfaction and pleasure
Fairness	Not allowing or taking any unfair advantage
Good game	Enjoying the contest regardless of the outcome, usually embodying a balance between contestants
Health and fitness	Becoming healthy as a result of participation and becoming fit to compete
Obedience	Carrying out instructions to avoid punishment
Public image	Gaining the approval of others
Sportsmanship	Being of good disposition, accepting bad luck with good humour, showing positive behaviour towards opponents, and accepting defeat with grace
Self-actualization	Simply getting a thrill from the activity
Showing skill	Being able to perform the skills of the activity well
Team spirit	Doing something for somebody else and the team
Winning	Demonstrating superiority in the contest

Thirdly, the most frequently mentioned values were winning, enjoyment and sportsmanship. However, it is not possible to describe the relative importance of these values at this time. It is sufficient to say that it is consistent with the bulk of available research that young people are primarily concerned with enjoyment and satisfaction in their sport. The problem is that children enjoy different things about sport and cannot always articulate their feelings very well (see Wankel and Kreisel, 1985).

It is interesting that all the values presented were found during the analysis of the first 20 interviews; thereafter nothing new was added. In support of these findings the study was replicated in Spain using junior football players only and gave very similar results. This indicates that the values identified may be common to sports in different national cultures.

Again the values were all identified within 20 interviews (Cruz *et al.*, 1992).

This research highlights the importance of coaches understanding children's values, both about their goals and their modes of behaviour in sport, and the influence they themselves have upon those values.

Motives and values are closely related though not identical. Motives may be considered to be reasons why we do things; values, however, may refer to a variety of outcomes which may or may not constitute primary motives. A coach's motives may be explicit and clearly understood but coaches are not always aware of the values which underpin their behaviour and may be transmitted to children. A greater understanding of their own and their children's values will enable coaches to meet the needs of the children they work with more closely.

3.6 WHY CHILDREN FIRST?

The ACEP programme in America has the motto 'Children first; winning second'. It could, as with Jim Parry's comment (see above), be restated as 'Children first; coaches second'! You may ask how this can always be justified and the answer lies in a principle stated by the philosopher Immanuel Kant. He suggested that certain actions were necessary regardless of the outcomes. So coaching children should be thought of as a worthwhile thing to do regardless of the result. It has also been interpreted to mean that nobody should be the means to another's ambitions. If the coach and athlete agree about their goals then the relationship is equal, but if coaches have goals which can only be realized through children, whose real needs are not met, then it is unbalanced and wrong.

3.7 CONCLUSION

In this chapter I have tried to present some food for thought about why you are coaching children. I have argued that coaching children is inevitably an educational process, the effects of which reach beyond the confines of the playing field, gymnasium or swimming pool. Because of this it is important to understand your own values and that these values are transmitted to the children in your care in ways that may affect them throughout their lives. The goals we hold reflect our values but coaches should recognize the motives and needs of children, putting their welfare above all else. Let us recognize that good coaching increases the performance potential of children, gives enjoyment, and contributes to their development as people. It is not always easy to do all three and demands a great deal of understanding and commitment.

38 Why are you coaching children?

In order to be most effective it is important to:

- (a) be clear about why you are coaching;
- (b) examine your own value system, both terminal and instrumental;
- (c) examine the relationship between your motives, values and behaviour;
- (d) be aware of the values you transmit to the athletes in your care;
- (e) understand the athlete's motives and values.

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Sport: it's a family affair

4

Tony Byrne

SUMMARY

When children engage in sport it is inevitable that their families are drawn in to providing support. For children who aspire to excellence as much as ten years of the family's life can be organized around the demands of training and competing. This chapter explores the relationships between athletes, coaches and parents. A 'circle of influence' model identifies the variety of people who have an effect upon children's participation in sport, but particular attention is paid to the triangular pattern of interaction between children, coaches and parents which is critical to the children's experience. It is important to promote harmony and minimize conflict if children are to benefit fully and the advantages of open communication between parents and coaches are discussed. A model of parental involvement proposed by Jon Hellstadt (1987) forms the basis of a description of different types of parental involvement. Those who are under-involved may simply lack interest or may lack information, and those who are over-involved may be merely excitable or quite fanatical in their commitment. Finally, I (a) suggest a strategy for resolving conflicts that requires that coaches to keep parents informed, listen to their concerns and invite them to participate fully in supporting their children, and (b) provide guidance to parents on how best to support their children.

4.1 INTRODUCTION

In recent years children's sport has become a very controversial area. Proponents and opponents continually voice their opinions and beliefs about the benefits to be reaped or costs to be incurred from sports

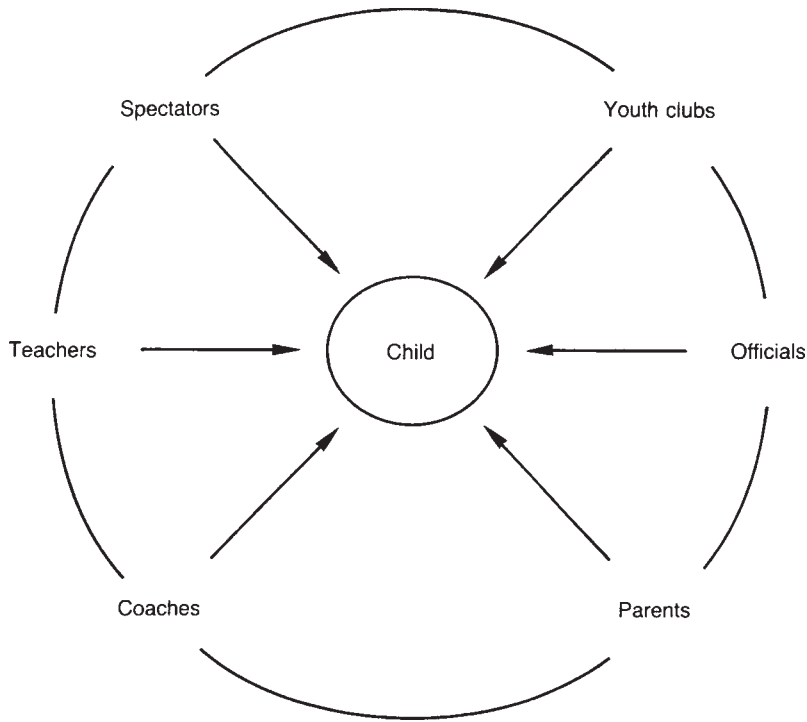


Fig. 4.1 Circle of influence

participation. Those in favour of children's sport see it as a land of promise where participants develop future skills, sportsmanship, self-esteem, independence, loyalty and a commitment to excellence. Those against view sport as a den of iniquity arguing that the 'win at all cost' attitude fosters violence, cheating, drug abuse and dissent.

It is evident that both those for and those against sports participation for children assume that these positive and negative effects are automatic. This clearly is not the case. Sport is inherently neither good nor bad. The positive and negative effects associated with sport do not result from participation per se but from the nature of the sport's experience. It has frequently been shown that an important feature in determining the nature of the experience is the quality of adult leadership. In fact it has been suggested that sport should be thought of as a two-edged sword, capable of cutting in opposite directions, the direction the sword cuts being dependent upon those who swing it, not on the sword itself.

There are a number of different adult groups actively involved in sport who can have an influence upon the athlete (Figure 4.1). Teachers,

officials, spectators, coaches and parents all affect the nature of the sports experience and to a large extent determine whether this experience is a positive one. However, of all the adults involved in this 'circle of influence', the coach and the parents are perhaps the most important. It is their attitudes, beliefs and behaviour which undoubtedly affect the child's experiences in sport.

Although much has been written and said about the roles and responsibilities of the coach there is little to be found with regard to parents. The purpose of this chapter is to redress the balance and tackle the important but often ignored question of parental involvement. I will argue that, in order to meet the objectives of youth sport (physical, social and psychological development, fun and family unity) and thereby reap the benefits of sports participation, the coach must develop excellent working relations with the parents of his or her athletes. Suggestions for involving and dealing with parents will be made and behavioural guidelines offered. I believe these guidelines, if adopted, will help swing the sword in the right direction.

4.2 THE SPORTING TRIANGLE

The sporting triangle (Figure 4.2) is an inherent part of children's sport. The inter-relationships between the coach and the child, the coach and the parent and the parent and the child are inevitable. Few could disagree that coaches, in order to be effective, must have excellent working relationships with their athletes. However, when discussing parental involvement in youth sport views differ greatly and emotions run high. 'The kids are great, it's parents that cause the problems. If I had my way I'd ban 'em all.' Such comments are commonly expressed and reflect the views of many sport coaches. Discussions with numerous coaches from a wide variety of sports indicate that three distinct points of view exist when it comes to parents and their involvement in sport.

First, there are those who welcome and encourage parental involvement. Parents are accepted as a vital element in the coaching

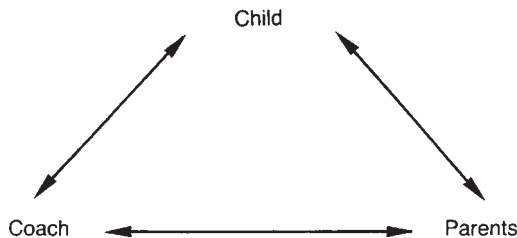


Fig. 4.2 Sporting triangle

process. They are seen as an important human resource capable of reinforcing the views of the coach. Second, there are those who view parental involvement as an inevitable yet at times unnecessary aspect of working with children. Parents are at best an inconvenience, something to be tolerated but certainly not encouraged. Finally, and by no means a minority, there are those coaches who believe parents should be excluded from the sporting arena altogether. For these coaches, parents are more trouble than they are worth.

Horrific stories of parental behaviour recalled by some coaches lead one to appreciate their opinions. The pressure parents exert on their children, and the abuse they give coaches, officials and other parents allow one to share coaches' concerns. However, the solutions offered by many coaches are not acceptable. Neglecting or, worse still, rejecting parental involvement is tantamount to burying one's head in the sand. Like the ostrich you might not see the problems coming but you will certainly feel them when they arrive.

It is clear that if misunderstanding or conflict occurs between any two of the members in the sporting triangle, relationships with the third will be affected. Careful cultivation of the relationships between the coach, the child and the parent is essential if the sports experience is to be enjoyable and successful. Parents need to be made aware of their roles and responsibilities within sport. This awareness can only be achieved through effective two-way communication.

Those coaches who communicate with parents can avoid conflict within the confines of the sporting triangle. Talking and listening to the parents of their athletes will enable coaches to achieve greater understanding, establish respect and increase the chances of meeting their objectives. Coaches who choose to ignore parents do so at their peril. They will without doubt be faced with numerous problems. At the very least these problems will result in the child receiving inconsistent messages from two very important people, causing them confusion and uncertainty. At worst these problems could result in conflict between all three parties making the sporting experience a thoroughly unhappy one for *all* concerned.

The remainder of this chapter will address some of the problems that commonly occur in the sporting triangle and offer guidance to help the coach avoid and overcome them.

4.3 THE PARENTAL INVOLVEMENT CONTINUUM

Jon Hellstad (1987) has suggested that the involvement of parents in their children's sporting career falls on a continuum ranging from underinvolvement through moderate involvement to overinvolvement. This continuum offers a convenient means of considering parents and

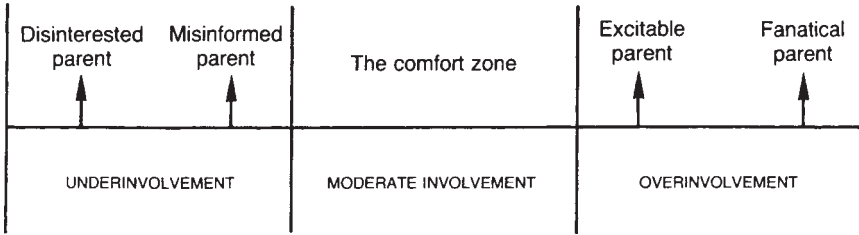


Fig. 4.3 The parental involvement continuum

the problems that sometimes arise (Figure 4.3). To help in the discussion of the relevant issues four types of parents will be described. Names and places have been changed to protect the innocent. However, any resemblance to parents past or present is *not* coincidental.

4.3.1 UNDERINVOLVEMENT

Disinterested parents

Some parents are heavily involved in the social activities of the local community. They frequently attend civic events, cocktail parties, gala evenings and the like. In such situations children may be members of every sport club in town. The child's sporting involvement is clearly beneficial for the parents as they don't require a babysitter. They just drop the children off at the leisure centre/sport club and leave the rest to the coaches. While the idea of leaving everything to the 'coach' may appeal to many, it is all too obvious that children placed in such a situation will not reap the full benefits of sport participation.

A recent study revealed that of the children interviewed, 32% participated because their parents wanted them to. If children are forced to take part in sport there is a very good chance that the experience will be both unenjoyable and stressful. Children should take part because they want to, not because they have to. We will return to this point again when we discuss overinvolved parents.

Misinformed parents

There are those parents who allow their children to join local clubs, having first spoken to them about involvement, yet who decide not to attend practice or competitions. In such cases the reason seems to be a lack of understanding with regard to parental roles rather than disinterest. The media and to a certain degree coaches often quote

examples of parents who spoil their children's involvement in sport by placing too much stress upon them. In an attempt to ensure they don't detract from their children's enjoyment of sport, some parents decide not to get involved.

Children want to please their parents and show them what they can do. Sport offers a wonderful environment for this. It allows the children to display the new skills they have learnt, to demonstrate effort and show commitment. The smiling face of a parent to share in the successes and a hug to console in defeat go a long way toward making sport an enjoyable experience. It also brings the family closer together in an area which the child values.

Coaches must therefore get parents involved but they need to be careful. First, it is important that the coach ensures parents are aware of their roles and responsibilities with regard to children's sport. Second, financial constraints or family pressures, such as shift work and other children, may make attendance difficult. Tactful discussions with the athletes will provide all the information a coach needs to approach and encourage parents to take up their roles in the sporting triangle.

4.3.2 OVERINVOLVEMENT

Although underinvolvement may present coaches with some difficulties it is overinvolvement which causes the most headaches. The most noticeable problem with regard to parental overinvolvement is misbehaviour during competitive events. The reasons for this problem differ and to highlight this it is helpful to classify overinvolved parents into two categories: excitable and fanatical.

Excitable parents

Initially parents who fall into the excitable category seem to be a coach's dream. They tend to be very supportive of the coach and attend practices and games without interfering in the coaching process. Unfortunately, they often get caught up in the heat of the moment. The sheer excitement of a goalmouth scramble or a game point rally turns them into screaming spectators who hurl abuse at all and sundry. Those most likely to incur the wrath of such parents are the officials. 'Are you blind?', 'Get your eyes tested' and other such comments stream from their ever-open mouths. Excitable parents are often as tired as their children, having lived every moment of the game. Parents in this category are not bad people, they just do not realize what they are doing. They don't recognize that their behaviour is embarrassing their children and setting a very poor example. They have forgotten, or never knew, that as far as children are concerned actions speak louder than words.

In situations like this where parents get caught up in the exciting world of children's sport the coach must be able to communicate on a personal level with parents. It will be necessary to take parents to one side and reinforce the idea that they must set a good example if they want their children to benefit and enjoy sport. Parents should be seen but seldom heard and when they do speak it must be positive.

Fanatical parents

Without doubt the most problematic parent a coach has to deal with is the fanatic. This type of parent comes in all shapes and sizes. He or she may have been either extremely successful or unsuccessful in sport. The one thing all fanatical parents have in common, however, is the desire for their child to be a sporting hero or heroine. A successful performance on the part of the child leads to celebrations for the parents. These celebrations are accompanied by minute analysis and suggestions for improvement. Fanatical parents are never quite satisfied.

Poor performances or, worse still, a loss result in a long flow of criticism aimed at everyone but especially the child whose performance is a clear reflection of his or her parent's worth. The coach also receives advice/criticism irrespective of whether he or she wants it. Coach—parent conflict often occurs over the position or amount of time a child is allowed to play. The intense pressure placed on the children shows up on their faces and in their performance. They often argue with the officials because they know their parents expect it. They work hard in practice but don't enjoy it. Quite often children whose parents fall into this category have trouble sleeping and eating prior to competition.

Clearly, when attempts are made to experience success which is missing in their adult lives or that eluded them during their own sporting careers, parents are imposing on their child's participation in sport. When parents push their children to achieve the same, or greater, success in sport as they did, they are imposing their motives on them. Children are not mini-adults and they should not participate for the entertainment and gratification of adults.

External pressure from adults for children to take part in sport, to win at all costs, to be number one, will undermine their motivation and turn play into work. The stress of having to perform to adult expectations and achieve adult set goals will take a heavy toll on a child. Undoubtedly, the fear will lead to dissatisfaction and ultimately attrition.

Identification with one's child is natural. It is overidentification, the taking control and manipulation of the child that lead to problems in sport. Youth sports participation can provide parents and their children with common interests. It can also lead to tension between them. A coach can explain that excessive emphasis upon outcome and consistent

criticism cause stress. By encouraging the more officious parents to praise children and to focus their attention on performance rather than outcome, many of the problems can be overcome.

4.4 CURING THE CONFLICT AND PREVENTING THE PROBLEMS

As with medicine, prevention is better than cure. Martens *et al.* (1981) have suggested that many of the problems that arise between parents and coaches can be avoided if a parent orientation meeting is held before the season begins. Martens and his colleagues outline seven objectives for such a meeting, the most important of which are:

- 1. to inform the parents about the coach's philosophy and objectives;
- 2. to inform the parents what is expected of their child and of them;
- 3. to listen to the parents' concerns and objectives;
- 4. to establish clear lines of communication between the parents and the coach.

By holding a parent orientation meeting prior to the start of the season, coaches will avoid many of the problems discussed in this chapter and get parental involvement into the comfort zone (Figure 4.3). They will also have the ability to refer back to the discussions at that meeting should any problems arise.

The parental guidelines in Table 4.1 are given to enable you, the coach, to state clearly your expectations of parents. They will allow you to talk through some of the thorny issues such as parental pressures and

Table 4.1 Parental guidelines

Should	Should not
Attend games	Force children to participate
Encourage their child to play by the rules	Question officials
Set an example by being friendly to the parents of the opponents	Shout derogatory comments at players, other parents or officials
Emphasize fun and enjoyment	Interfere with their child's coach
Praise and reinforce effort and improvement	Criticize their child's performance
Applaud all good play irrespective of who it's from	

misbehaviour. Effective communication will develop the links you want and need with parents. Remember, when it comes to children's sport, we must all be on the same side if the experience is to be a positive one.

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PART TWO

Developmental Changes in Children: Why the Child is not a Mini-adult

It is almost becoming a cliché to say that the child is not a miniature adult. This part of the book explains some of the ways in which they differ from adults and describes how they change physically, physiologically and psychologically during their development from young children into young adults. The changes which are described here are most important for an understanding of the limitations of what coaches can expect children to be able to do in sports.

John Aldridge is an orthopaedic surgeon and medical officer to the British Amateur Gymnastic Association. Consequently he is very well qualified to write about growth and development in relation to athletic performance. His chapter describes the development of the skeleton and how it is affected by hormonal changes, diet and sex differences. He also discusses the effect of training on skeletal growth and on menstrual patterns in girls.

A particularly important part of the duties of coaching is to organize suitable training programmes for children. While the topic is addressed specifically later in the book, the next chapter, by Neil Armstrong and Joanne Welsman, lays the foundations by describing the ways in which energy is generated within the body. Most importantly, they draw the reader's attention specifically to differences between children and adults in the ways in which they generate energy and hence differ in their capacity to undertake different forms of training and competition. This has very strong implications for the structure of both training and competitive programmes for boys and girls as opposed to adolescents.

Understanding how children learn skills in sport is of fundamental value to teachers and coaches. Part of the developmental process is that of the ability to learn motor, cognitive and social skills. This ability is partly limited by the maturational state of the nervous system and the capacity of children to process information. Rosemary Connell explains the psychological mechanisms of learning and controlling movements and the difficulties which face children as they attempt the complex skills required in sports.

The final chapter in Part Two deals with how children develop personally and socially in a sporting environment. A major element in the progression from childhood to adulthood is the gradual recognition of a sense of self. Martin Lee shows how children develop a sense of self and how, for some, the experience of sport is an essential part of the process. He then describes the importance of the group in social development and explains how children change in the ways they are able to work with others in teams. This leads to advice to coaches about what they can expect children in teams, or other groups, to achieve and how they can help children by structuring their sport to make it easier for children to understand their own roles and the rules.

Skeletal growth and development

5

John Aldridge

SUMMARY

This chapter describes the patterns, mechanisms and processes of skeletal growth and development. The changes in size and shape from childhood to adolescence are outlined, and the anatomical mechanisms are described in more detail. Bone length is governed by the activity of growth plates and the maturation of bone is a result of ossification in primary and secondary centres within the bone. The effect of factors which affect bone growth, such as nutrition, hormones and mechanical stress, are described prior to a discussion of the effect of training on skeletal growth, body build and composition, and sexual maturity.

5.1 INTRODUCTION

A basic knowledge of skeletal growth and development is important in understanding many aspects of performance and ability in sporting activities at different ages. It is also the key to appreciating many types of injuries that occur in children (see Chapter 16).

Children grow at different rates at different ages and different children also develop at different rates, so there are early and late developers. Not only do children grow at different rates but there are also changes in body proportions that can put limitations on their ability to perform. During foetal life the head is relatively large and at birth accounts for 25% of body length. From birth to one year the trunk is the fastest growing part, whereas from then until puberty the lower limbs account for 66% of the total increase in height (Figure 5.1).

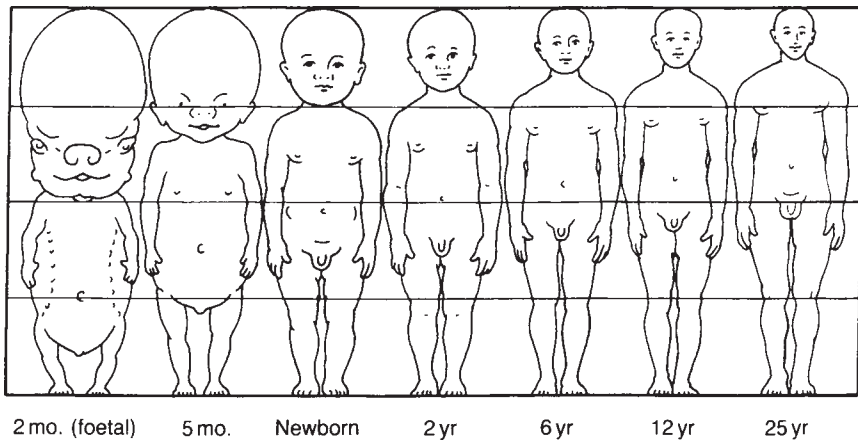


Fig. 5.2 Changing body proportions from conception to adulthood (from Whipple, D. (1966) *Dynamics of Development: Euthenic Paediatrics*, McGraw-Hill, New York; by kind permission of the publishers)

We are all aware of long-legged gangling youngsters at puberty who are rather clumsy and apparently lack co-ordination because of the disproportionate trunk and limb length. After puberty increase in trunk length accounts for 60% of further growth. Figure 5.2 illustrates this change in proportion.

At puberty, differences in body shape and proportions become apparent between the sexes and these changes can create difficulties in certain activities. In females total body fat increases, the pelvis widens and breasts develop; these are all very awkward changes to accommodate and make some sports extremely difficult.

As the pelvis broadens the hips move further apart and away from the midline. This is associated with increased angulation of the thigh and necessitates greater muscle strength to stabilize the pelvis in walking. The hip abductor muscles are used to fix the pelvis to the weightbearing leg when the other is raised from the ground.

In women the increased width of the pelvis requires greater muscle action during locomotion. Hence there is a tendency for them to tilt from side to side when they walk (Figure 5.3).

5.2 ANATOMY OF SKELETAL DEVELOPMENT

The body grows by the formation of new cells. As cells divide, they then differentiate into specific types of cell and tissue. Cellular division, differentiation and the migration of cells in the foetus lead to the skeleton being laid down mostly as a scaffolding of a substance called cartilage. Cartilage consists of cells called chondrocytes in a bed of formless tissue.

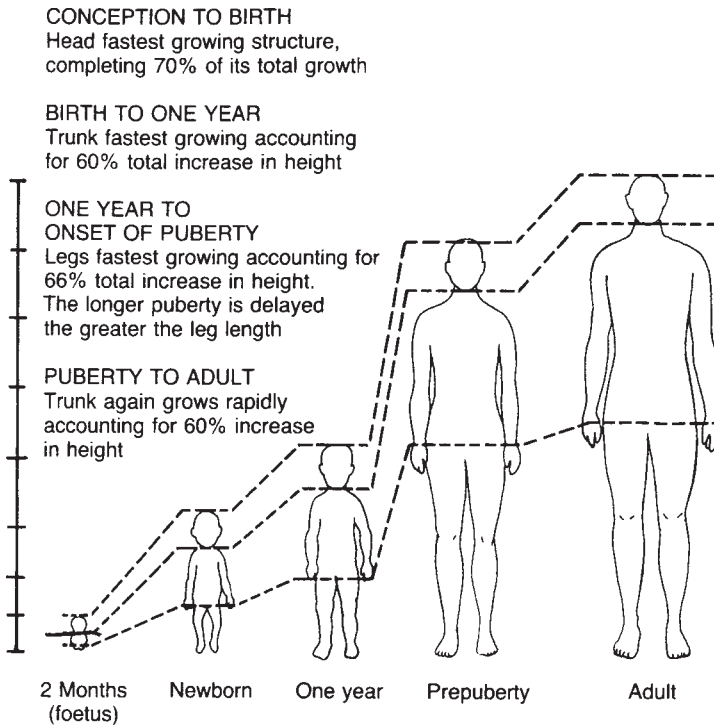


Fig. 5.2 Changing body proportions from conception to adulthood (from Whipple, D. (1966) *Dynamics of Development: Euthenic Paediatrics*, McGraw-Hill, New York; by kind permission of the publishers)

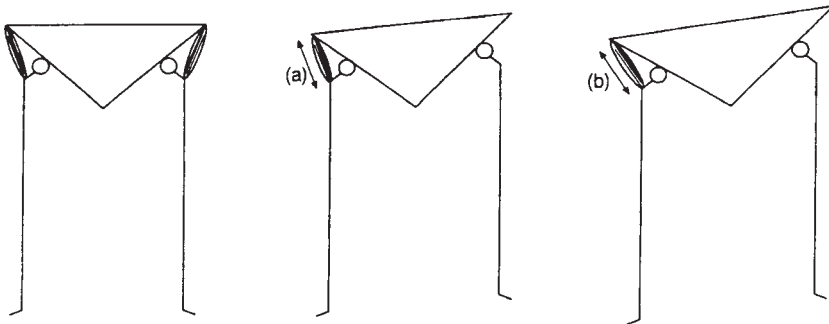


Fig. 5.3 Contraction of the abductor muscle requires less power (a) when the pelvis is narrower than (b) when it is wider

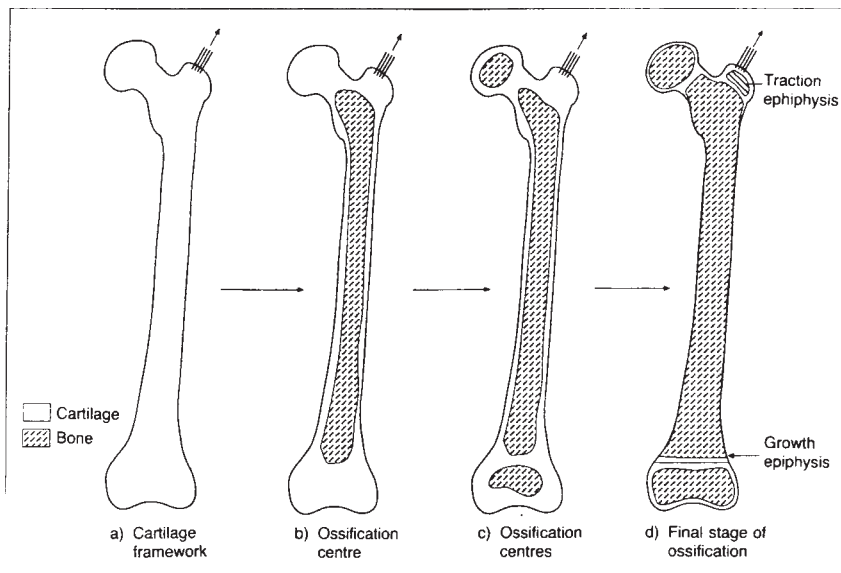


Fig. 5.4 Conversion of the cartilaginous scaffold into bone (adapted from Aldridge, J. (1987) in Lee, M.J. *et al.*, *Coaching Children: A Level 2 Course*, National Coaching Foundation, Leeds)

It is the substance we see in the end of a chicken drumstick that is rather hard and gristly. In a few places in the skeleton, the clavicles and parts of the skull for example, bone develops without this cartilaginous stage.

The cartilaginous framework is converted into bone by a process called endochondral ossification. Different areas of the scaffold called ossification centres develop and progressively replace the cartilage with bone. Using the long bone of the thigh, the femur, as an example, a single primary area of ossification develops within the shaft. Subsequently separate secondary areas of ossification develop at either end of the bone (Figure 5.4). Additionally other centres can arise at the site of attachment of major tendons and are called traction epiphyses.

Eventually the whole of the cartilaginous framework is converted into bone. The secondary centres of ossification at both ends increase in size but remain separated from the primary ossification centres of the shaft by a plate of cartilaginous cells. These cells are capable of division and are known as epiphyseal growth plates (Figure 5.4). The cells in these plates divide continually during growth and result in the bone increasing in length. Bone growth also occurs outwardly so the bones become thicker. Because bone is a living tissue it is continually being removed

and replaced. Remodelling can therefore take place during growth and this is important when fractures occur. More will be said about this in Chapter 16.

5.2.1 COMPONENTS OF SKELETAL GROWTH

There are two important components of skeletal growth: longitudinal linear growth and skeletal maturation.

Linear growth

Increase in bone length occurs by the division of cells in the growth plates at either end of the long bones. Similar growth in the vertebral bodies in the back occurs at both the upper and lower surfaces. Usually the growth epiphysis at one end will grow more than the epiphysis at the other so that most growth in the lower limb, for example, occurs about the knee, because the lower femoral and the upper tibial epiphyses grow more than the growth plates at the upper and lower ends of the limb. In the upper limb, however, most linear growth occurs at the wrist and at the shoulders.

From birth the rate of growth in length slows with age and is represented in Figure 5.5 as an exponential fall. This fall is interrupted between the ages of five and seven by the so called mid-growth spurt and more importantly later by the adolescent growth spurt.

Boys grow slightly faster than girls in the first year of life, but between the ages of one and nine they grow at the same rate. This is known as the asexual phase of growth. Girls begin their adolescent spurt on average two years earlier than boys. Boys grow more in the first year of life and have a longer adolescent growth spurt than girls and so tend to be taller.

Skeletal maturation

Maturation of the skeleton depends on the rate of ossification, which can be determined by X-ray examination. Different parts of the skeleton begin to ossify at different ages and the growth plates in different bones also stop growing and ossify at different ages.

In the hand and wrist the ossification centres of the carpal bones appear at different times and their size and shape change at a regular rate. An X-ray of a hand and wrist can be used to estimate the bone age of an individual by comparing it with an atlas of wrist X-rays taken at different ages. In most people the bone age will correspond with their chronological age.

The balance between linear growth and skeletal maturation governs final stature. Skeletal maturity is reached when all the growth plate

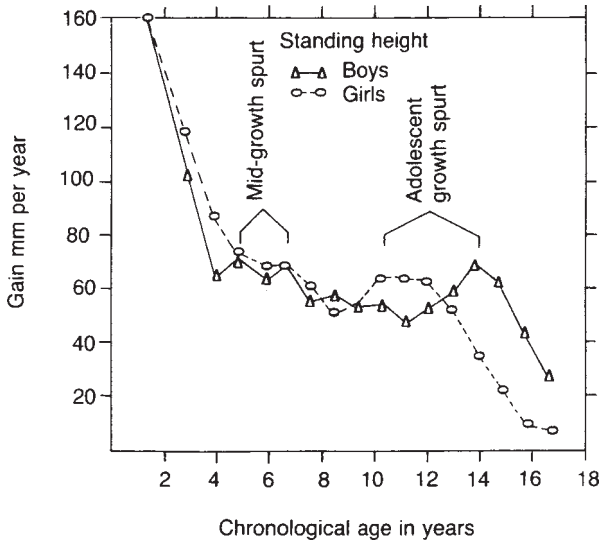


Fig. 5.5 Longitudinal growth curves of a boy and a girl which are halted at the 'mid-growth' and 'adolescent' growth spurt periods (from Duthie, R.B. (1959) The significance of growth in orthopaedic surgery. *Clinical Orthopaedics*, **14**, 7–18)

epiphyses have fused the shafts and ends of the bones (Figure 5.6). Once this has happened then no further linear growth can occur.

5.2.3 FACTORS AFFECTING SKELETAL GROWTH

Patterns of growth are closely linked to genetic make-up and environmental factors. Genetic potential, known as the genotype, determines the limits of growth. Whether this potential is realized in final physical appearance, known as the phenotype, depends upon environmental influences. In general linear growth is affected by the environment whilst skeletal maturation is much more closely controlled genetically.

Environmental factors can affect growth both prenatally and postnatally. Those factors which will be considered here are nutrition, disease, hormones and mechanical stress.

Nutrition

Nutrition is important in physical growth and development. Diets which are deficient in minerals and vitamins adversely affect both. Prolonged periods of poor nutrition limit both linear growth and bone maturation, and result in a reduction in expected bone length. So where there is a shortage of food children tend to be rather short. Similarly an adequate

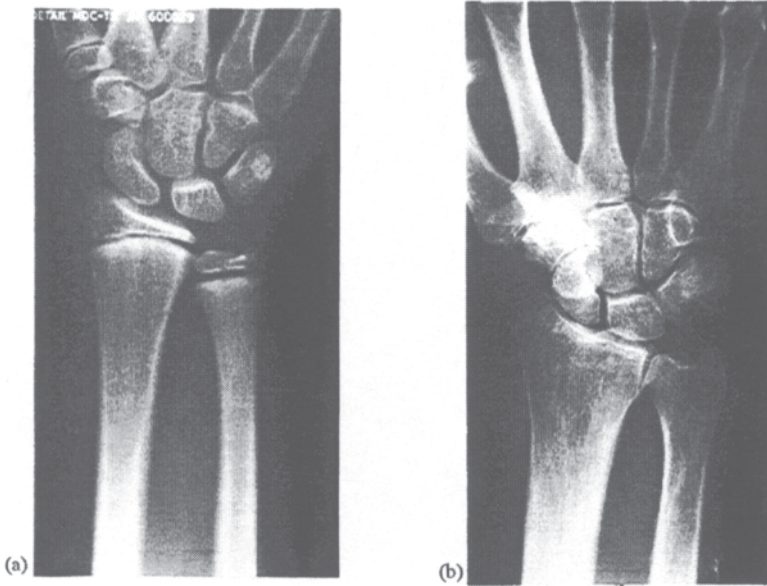


Fig. 5.6 X-ray photographs of growth epiphyses showing growth plates (a) open and (b) fused

intake of protein is essential for growth and if affected by diseases which cause protein deficiency, children will also be shorter. It is very important to recognize that dietary requirements differ at different ages but high metabolic rates, which result from physical activity, must be satisfied, particularly during periods of increased growth.

Debilitating disease

Any serious illness can retard bone growth. X-ray examinations of children who have been ill often show some evidence of arrested growth by a series of dense lines across the shaft of the bone (Figure 5.7). When children recover, catch-up or compensatory growth occurs so that they still attain normal stature.

Hormones

Hormones are closely involved with the control of normal skeletal development. The correct balance between the growth hormones, insulin and thyroxine is important in influencing the asexual phase of growth. During the sexual phase sex hormones have a more important effect.

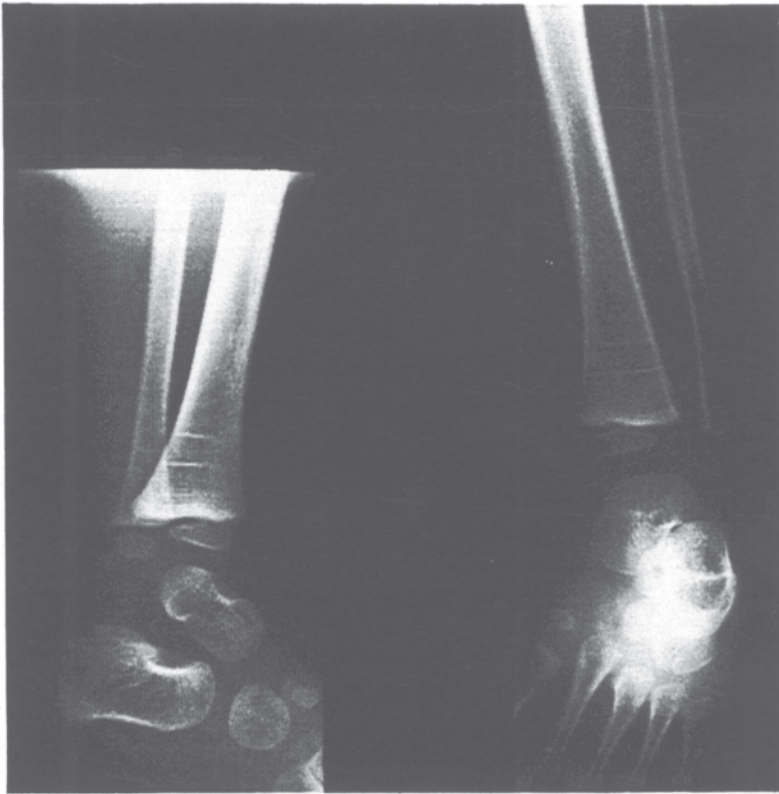


Fig. 5.7 X-ray photograph showing arrested bone growth lines

Growth hormone

Growth hormone is produced by the pituitary gland and acts on growing epiphyses by stimulating cellular division and the production of the intercellular matrix. A lack of growth hormone results in dwarfism whilst overproduction leads to gigantism. In the latter condition the length and thickness of bone are increased, the jaw becomes protuberant and mental retardation can occur. After the growth epiphyses have fused an excess of growth hormone causes thickening of bone so that the chin, the cheeks and the forehead become very prominent.

Thyroxine

The thyroid hormone, thyroxine, maintains the metabolic rate necessary for normal growth. Increased production accelerates skeletal maturation

and premature closure of growth epiphyses; deficiency in childhood leads to failure of expected linear growth, retardation of maturation and dwarfism.

Insulin

Insulin, produced by the pancreas, controls normal blood sugar levels and is essential for normal growth hormone activity.

Steroid hormones

Adrenal steroids

The adrenal gland produces two groups of hormones both related to cortisone. One group, the mineralocorticoids, regulate fluid and mineral balances in the body. The other group, the glucocorticoids, are concerned with metabolism in general.

Sex hormones

Sex hormones, androgens in males and oestrogen in females, are concerned with the development of secondary sexual characteristics and with fertility. They stimulate longitudinal bone growth but also cause growth to cease by causing fusion of the epiphyseal plates. In excess they cause retardation of growth and short stature. They have an anabolic effect and stimulate growth in most cases.

Administered hormones

Hormones are administered as drugs in the treatment of conditions caused by their deficiency in the body. For example, in diabetes insulin administration is used to control blood sugar levels.

Steroids, which are related to the male sex hormone testosterone and have anabolic properties, have been misused in sport in an attempt to increase muscle bulk and strength. If they are administered artificially before maturity then adolescents may suffer from premature ossification and fusion of the growth plates and not reach their full stature. They can also have adverse psychological effects, cause liver damage, and upset the cardiovascular system. In males they can reduce sperm production and cause infertility. In females their use causes masculinization, acne, clitoral hypertrophy and suppression of ovarian function and menstruation.

It is not surprising, therefore, that this group of substances is banned in sport as an aid to performance, not only for the unfair advantages they

give to the users but also for the serious side effects that may result from using them.

Mechanical stress

Normal bone growth requires a certain amount of stimulation by mechanical strain being applied to it by normal muscle action. The limbs of children who have paralysed muscles, as a result of poliomyelitis for example, do not develop normally and remain small.

Prolonged periods of non-weightbearing on a limb, as may happen when children have a limb splinted in plaster for any length of time, will cause its growth to be retarded. This can cause an inequality of limb length until catch-up growth occurs. However, it should also be recognized that excessive strain applied across an epiphyseal plate can cause retarded growth.

5.3 THE EFFECT OF TRAINING AND EXERCISE ON GROWTH AND DEVELOPMENT

I shall consider the effects of training on three aspects of development: (a) skeletal growth and maturation, (b) body build and composition, (c) sexual maturation.

5.3.1 SKELETAL DEVELOPMENT

A great deal has been written on this subject but the findings are rather inconclusive. The results of research are confusing because of the difficulties of standardizing the methods, samples and variables selected for observation. Some studies have shown a slowing of the normal growth curve whilst others have shown no effect of exercise on growth rate.

Since it is very easy to measure, many studies have concentrated on whether the skeletal age is advanced or retarded in athletes when compared with their chronological age. However, it is difficult to draw conclusions about the causal effects of exercise on growth because of the simultaneous effects of normal growth.

However, the relationship between sports activity and growth does appear to differ at different stages in the growth pattern and with different sports. A very large growth study in Medford, Oregon undertaken by Harrison Clarke and graduate students at the University of Oregon during the 1960s (Clarke, 1971) showed that outstanding football players were advanced in skeletal maturity between the ages of ten and 15 years when compared with non-participants. However, between the ages of 15 and 18 years there appeared to be no differences.

Among track and field athletes this pattern was noticeable between 12 and 15 years. Similar results have been found in Little League baseball and among young basketball players. Compensatory growth would therefore apparently have occurred in the late developers so that they had caught up.

Different patterns have been found among swimmers and gymnasts. A study of young swimmers indicated no differences between skeletal and chronological age but showed that in the 8–10 age group those who produced the best performances were skeletally advanced. The effect was most noticeable among breast-strokers. Among gymnasts, however, the tendency is to have delayed skeletal maturity. Studies at various major championships have confirmed this finding. Clearly late development and short stature give a considerable advantage in this sport (see Malina, 1982, for review).

While it is difficult to separate maturation and training effects on performance there is one facet of skeletal growth which clearly can be affected by training. Bone density increases with activity and decreases with inactivity. The effects can be seen, for example, in tennis players where the bone of the dominant arm is of higher density than that of the non-dominant arm.

In summary there appears to be a sports specific relationship between skeletal development and maturation, and success. This relationship is probably not produced by the different training required for different sports but is more probably an inherited characteristic in the individual. Thus naturally late developers are most suited to sports such as gymnastics whilst the more skeletally advanced are more suited, say, to rugby football. Of particular interest are the observations that children with advanced skeletal development are at an advantage during the early teens but the advantage is lost as others mature. This makes it difficult to predict ultimate attainment in sports where strength and speed are advantageous.

5.3.2 BODY COMPOSITION AND SHAPE

The body is composed of three different tissues: fat, muscle and bone. In this section we shall consider lean body mass, the muscular part, and total body fat which consists of subcutaneous fat, depot fat and essential fat.

Physical activity is important in maintaining body weight; it increases lean body mass and reduces total body fat. It is, however, very difficult, especially in children, to separate training effects from normal growth and other effects such as diet.

Differences in body composition can be seen in different sports. Swimmers are much heavier and have more body fat than athletes in

most sports. In other sports lower total body fat measurements range from more than 20% as in tennis and basketball players to about 15% in long distance runners and gymnasts.

There is little doubt that diet plays a large part in this. However, training is also an important factor and in one series of studies it was shown clearly that adolescent boys who trained longest had more muscle and less fat than boys who trained less. Nevertheless, although training can modify the shape of the body by increasing muscle bulk and reducing fat, in general body build is much more genetically controlled.

5.3.3 MENSTRUAL DYSFUNCTION

Studies on twins and family units have shown that the onset of menstruation is primarily genetically controlled. However, environmental factors such as nutritional status, socio-economic class and family size can all affect it. For athletes intensive training has become an accepted cause of a delayed menarche among adolescent girls or the arrest of a normal menstrual cycle in older athletes (Malina, 1983; see Wells and Plowman, 1988, for review).

Swimmers are perhaps the only sporting group where early menarche is common. Since the age of onset of menstruation is significantly related to the skeletal maturity, this fits well with the observation that swimmers tend to have advanced skeletal age. In sports when skeletal maturation is delayed then so is the onset of menstruation.

There also appears to be a relationship between the age of the menarche and body composition. It is suggested that a minimum level of 17% total body fat is necessary for the onset and maintenance of a normal menstrual cycle (Frisch and McArthur, 1974). So it can be argued that training affects menstruation by reducing body fat.

We have noted earlier that physical activity can increase bone density. Bone density is also affected by female sex hormones, principally oestrogens. Post-menopausal osteoporosis, or thinning of the bone, is well known to occur as oestrogen levels fall at the time of the menopause. There is therefore a risk that non-menstruating athletes, whose oestrogen levels will be low, are also at risk of developing a reduced bone density and so may be more likely to develop stress fractures. Certainly Drinkwater *et al.* (1984), who compared 14 normally menstruating women with 14 amenorrhoeic women in training, showed that bone mineral content of the spine was reduced in the latter group. This indicates that amenorrhoeic athletes in intensive training did not increase their bone density as normal but rather suffered a reduction in it.

5.4 CONCLUSION

Physical development is a complex process that is affected by many factors. Although it is essentially genetically controlled it is also affected by environmental conditions. The effect of training on this process is not clear and more investigation has to be done before firm conclusions can be drawn. However, a knowledge of the processes of growth and development will enable coaches to make more informed decisions about training procedures and programmes for children which may be more beneficial to them.

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Children's physiological responses to exercise

6

Neil Armstrong and Joanne Welsman

SUMMARY

This chapter is concerned with the physiological responses of the child to physical activity. Changes with growth and maturation are central to the discussion and differences between children and adults are highlighted. The chapter opens with an explanation of the three processes by which energy for muscular contraction is generated: the ATP-CP and lactic acid anaerobic systems and the aerobic system. The relationship between energy systems and muscle fibre type is discussed. The aerobic and anaerobic energy systems are then described in greater detail with consideration of the means by which these may be measured. Changes in maximal oxygen uptake during development are discussed before a more detailed consideration of the cardiovascular and pulmonary components of the oxygen transport system which serves to illustrate more clearly child—adult differences. The measurement of blood lactate responses to exercise provides an important additional assessment of aerobic capabilities. The necessity for child-specific reference values when interpreting children's blood lactate responses is emphasized, as is the need to consider carefully the impact of methodological factors upon the blood lactate measures obtained. The measurement and interpretation of children's anaerobic power and capacity are then examined. Children's clear inferior ability to perform intense anaerobic exercise compared with adults is described but as highlighted, the methodology used to attempt to explain and quantify these differences has serious limitations.

An understanding of the physiology of the exercising child is vital

if coaches hope to optimize the performance of young athletes. This chapter should be read in advance of Chapter 15 where the physiological principles are applied in the development of training programmes for children.

6.1 THE ENERGY SYSTEMS

Exercise requires energy and the energy to support muscular contraction is produced during the breakdown of adenosine triphosphate (ATP) to adenosine diphosphate (ADP) and phosphate (P) (Figure 6.1). ATP is a complex chemical compound formed during the breakdown of food and the quantity of ATP stored in the muscles is very small, perhaps sufficient to sustain a sprinter for about one second of maximal running. ATP must therefore be regenerated very quickly if activity is to continue beyond this time. Initially it is resynthesized from the breakdown of another high energy phosphate, creatine phosphate (CP) (Figure 6.2).

Unfortunately, maximal exercise can only be supported in this manner for a further 4–5 seconds because muscular stores of creatine phosphate are also limited. However, well before the high energy phosphate stores (phosphagens) are used up, more ATP is provided from the breakdown of carbohydrate to pyruvic acid (Figure 6.3). Carbohydrate (glucose) is stored in both the muscles and the liver in the form of glycogen. Liver glycogen is primarily used to maintain blood glucose concentration. Muscle glycogen is used to provide energy (ATP) for muscular exercise, a process called glycogenolysis. Blood glucose can also be used as an energy source, although to a lesser extent than muscle glycogen, and the breakdown of glucose to pyruvic acid is known as glycolysis.

The generation of energy through the breakdown of glycogen or glucose is often called the lactic acid energy system and it is most important at the beginning of exercise, when oxygen consumption is low, and during very intensive exercise when pyruvic acid production exceeds the capacity of the aerobic system to oxidize it. A build-up of pyruvic acid results in the formation of lactic acid which accumulates in the muscle and eventually brings muscular contraction to a halt. Both the phosphagen system and the lactic acid system can operate in the absence of oxygen and they are therefore known as anaerobic energy systems. On pages 71–74 we will explain the production of lactic acid in the muscle and its subsequent accumulation in the muscle and the blood.

The oxygen transport system is relatively slow to adapt to the demands of exercise and the rate at which ATP can be generated anaerobically greatly exceeds that of the aerobic system (Figure 6.4). The aerobic system is, however, the most efficient in terms of ATP production and because of its ability to use fat, in the form of fatty acids, as an energy

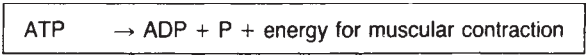


Fig. 6.1 The generation of energy from adenosine triphosphate

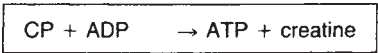


Fig. 6.2 The resynthesis of ATP from creatine phosphate

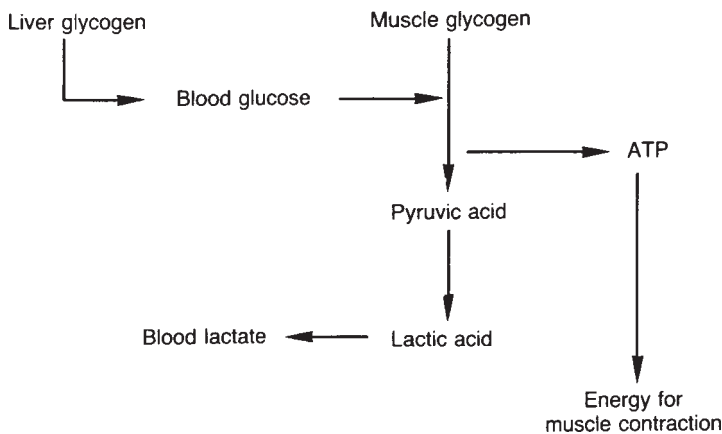


Fig. 6.3 The lactacid energy system

source it has a much greater capacity for energy generation than the anaerobic systems. During prolonged exercise the child’s performance capacity therefore depends largely upon his or her ability to deliver oxygen to the working muscles.

Genetically determined muscle fibres possessing different properties have been identified and it seems that preferential recruitment of specific fibre types is dependent upon the precise demands of the exercise. Sprinters tend to have a predominance of type II (anaerobic) fibres whereas marathon runners may have as many as 80–90% of their muscle fibres in the type I (aerobic) form. The distribution of muscle fibre type in children and adolescents is the same as in adults and is not fundamentally altered even by prolonged training. Consequently, children and adolescents who are capable of high anaerobic performance may not have a similar aerobic potential. Young children may well have less specialized energy responses during exercise than adolescents and

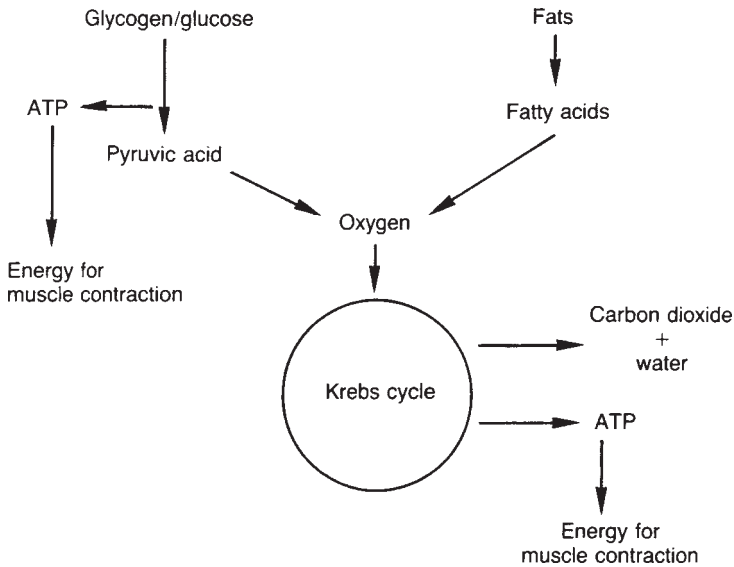


Fig. 6.4 The aerobic energy system

adults, but if we are interested in improving children's performance we need to consider each of the energy generating systems in relation to growth and development.

6.1.1 THE AEROBIC ENERGY SYSTEM

Maximal oxygen uptake

The maximum energy output of the aerobic system is best described by measuring the maximal oxygen uptake ($\dot{V}O_2 \text{ max}$). For reasons discussed elsewhere (Armstrong *et al.*, 1991) the correct term to use with children is peak oxygen uptake but for ease of exposition we will use the more common term $\dot{V}O_2 \text{ max}$ in this chapter. $\dot{V}O_2 \text{ max}$ is widely recognized as the best single measure of cardiopulmonary fitness.

Some investigators have been reluctant to carry out direct measurements of $\dot{V}O_2 \text{ max}$ with children and have predicted the parameter from submaximal laboratory tests (e.g. Astrand nomogram) or field tests (e.g. multi-shuttle run). We have demonstrated that the standard error of prediction is 10–12% with young boys which indicates that there is no substitute for a direct determination of $\dot{V}O_2 \text{ max}$. Maximal (or peak) oxygen uptake can be successfully achieved on a treadmill with children of five years and older. When determining the $\dot{V}O_{2 \text{ max}}$ of child athletes, however, it is important to simulate their

competitive performance as closely as possible. Very little valid feedback can be given to a coach if his swimmers are tested on a cycle ergometer or a treadmill. Testing must be specific to be of value.

When expressed in litres per minute (l/min), $\dot{V}O_2$ max increases with age in both boys and girls. There is little difference² between boys and girls until puberty, although there is some evidence to suggest that boys attain higher values from the age of five years. At puberty, boys exhibit a spurt in $\dot{V}O_2$ max which often occurs just after the time of the greatest increase in height and corresponds with the increase in male hormone secretion. The steep rise in the $\dot{V}O_2$ max of boys continues until about 16 years after which there is a slower² rise which may continue until about 18 years. In girls $\dot{V}O_2$ max reaches its maximum at about 14 years and from 16 years it may fall with increasing age.

At first glance it seems that maximal aerobic power is less well developed in children who are therefore placed at a disadvantage in comparison with older subjects. However, for tasks that involve moving the body, the child, whose body mass is much smaller, may not require as high a $\dot{V}O_2$ max as the heavier adult and when $\dot{V}O_2$ max is related to body mass² a different picture emerges. In boys, values are remarkably consistent throughout childhood and adolescence since the gains in $\dot{V}O_2$ max are closely matched by parallel increases in body mass. Girls reach² their maximum between ten and 12 years and thereafter a progressive decline sets in with increasing age. The deterioration of the girls' mass related $\dot{V}O_2$ max is partially due to an increase in body fat and levelling off of haemoglobin concentration but a substantial component of the sexual discrepancy may well be sociocultural.

Although the mass related $\dot{V}O_2$ max of children is at least as good as that of adults, their movements² are less efficient, they have lower reserves of power and smaller stores of muscle glycogen. During prolonged activity (e.g. long distance running) children are therefore at a disadvantage when compared to adults. A further consideration when contemplating entering children for long distance events is the environmental conditions. Young children have immature temperature regulatory systems which limit their ability to sweat. They also have large body surface areas compared to their muscle mass which makes them particularly vulnerable at extremes of temperature. When these observations are coupled with the possible skeletal damage and psychological trauma, one can understand the recommendation of the American Academy of Pediatrics that under no circumstances should a full marathon be attempted by immature children.

The cardiopulmonary system

In order to obtain a more complete picture of child—adult differences it

is necessary to consider the components of the oxygen transport system, in particular the pulmonary and cardiovascular responses to exercise.

The pulmonary response to exercise

Minute volume is a function of respiratory frequency and tidal volume (Figure 6.5).

Children respond to exercise with shallower respirations and higher respiratory frequencies than adolescents and adults. During maximal exercise children may reach over 75 breaths/min compared with a normal adult response of about 45 breaths/min.

Maximal minute volume increases with age and body size. A five year old child may be able to breathe up to 35l/min, whereas a young adult may reach values in excess of 150l/min. Nevertheless, when ventilation is expressed in relation to body size, maximal values are much the same in children, adolescents and adults. Similarly, the lung volumes of children and adults are as expected on the basis of body dimensions. During exercise the pulmonary ventilation is initially matched to the oxygen consumption, but both children and adults experience a ventilatory threshold beyond which ventilation rises in a more accelerated manner.

Some physiologists relate the ventilatory threshold to the so-called 'anaerobic threshold' but the issue is controversial and only limited data are available for children (see the section on blood lactate responses to exercise).

In terms of oxygen uptake, children have a less efficient ventilation system and during both submaximal and maximal exercise, the younger the child the higher the pulmonary ventilation per unit of oxygen consumption. On the other hand it is the alveolar ventilation rather than the pulmonary ventilation that determines gas exchange, and alveolar ventilation accounts for a larger proportion of the total ventilation in children than in adults. The alveolar ventilation is the portion of air that reaches the tiny terminal air sacs in the lungs where gaseous exchange with the blood in the pulmonary capillaries occurs. The pulmonary capillary blood volume and the diffusing capacity of the lung increase in parallel with growth and the maximum diffusing capacity of the child's lung is at least as great as in the adult, whether related to body mass or oxygen consumption.

The cardiovascular response to exercise

The principal factors limiting oxygen uptake are the maximum cardiac output and the maximum arteriovenous oxygen difference (Figure 6.6).

$$\text{Minute volume} = \text{Respiratory frequency} \times \text{Tidal volume}$$

Fig. 6.5 Pulmonary ventilation

$$\text{Maximal oxygen uptake} = \text{Maximal cardiac output} \times \text{Maximal arteriovenous oxygen difference}$$

Fig. 6.6 The determinants of maximal aerobic power

The cardiac output of children is significantly less than adults at any given level of oxygen consumption. This indicates that children have a more favourable peripheral distribution of blood during exercise which facilitates the transport of oxygen to the working muscles. The cardiac output of children may be as much as 1–2l/min lower at the same oxygen uptake compared to adults so the child must rely on a higher peripheral oxygen extraction (i.e. a greater arteriovenous oxygen difference). As long as the child works at a submaximal level the increased oxygen extraction from the blood can compensate for the low cardiac output, but maximal arteriovenous oxygen difference is limited by the haemoglobin content of the blood.

Young children have a low blood haemoglobin concentration and therefore a limited ability to transport oxygen in the blood. There are no gender differences during the first few years of life but boys demonstrate a steady increase in blood haemoglobin concentration up to puberty with a subsequent spurt in their late teens. Haemoglobin concentration in girls is similar to that of boys until the time of menarche but their haemoglobin concentration remains relatively constant from that point. Despite their lower haemoglobin concentration and red blood cell count, the maximal arteriovenous oxygen difference of children is comparable to that of adults. Children seem to be able to extract almost all of the oxygen circulating through the working muscles. Blood haemoglobin concentration is very useful to measure, particularly with girls, as it may help to account for fluctuations in performance and it therefore should be included in any monitoring programme.

The components of cardiac output are heart rate and stroke volume (Figure 6.7). The maximal heart rate of children is higher than that of adults, and the younger the child, the higher the heart rate at any given level of oxygen consumption. This partially compensates for the child’s small stroke volume compared with adults during both maximal and

$$\text{Cardiac output} = \text{Heart rate} \times \text{Stroke volume}$$

Fig. 6.7 The components of cardiac output

submaximal work. When taking differences in body size into account, however, the child's stroke volume is comparable to that of adults.

Stroke volume, cardiac output and arteriovenous oxygen difference are very difficult to measure in the exercising child and as a result heart rate has become the most commonly used measure. The heart rate response to exercise (and to a lesser extent during recovery) has proved to be very valuable in the analysis of exercise response and its sensitivity to changes in conditioning has provided a useful means of monitoring training programmes. The maximal heart rate of children and adolescents ranges, on average, between 195 and 215 beats/min, although it is not unusual to observe rates in excess of 220 during maximal exercise. After maturity maximal heart rate declines with age and with adults the formula $220 - \text{age}$ provides a useful indication of maximal rates. Submaximal heart rates recorded at any given exercise level decline with age and although girls follow the same trend their heart rates are significantly higher than similarly aged boys at any intensity of exercise. The reasons for the sex differences are unknown. Although a lower haemoglobin concentration, a smaller stroke volume and lower levels of habitual physical activity may account for adult differences, they cannot explain the differences which have been demonstrated between boys and girls as young as six years. It may be that there are sex related differences in the regulation of the heart which may help to explain why boys also have faster recovery rates following exercise.

The blood lactate response to exercise

In addition to the determination of $\dot{V}O_2$ max, the measurement of the blood lactate response to a series of ²submaximal exercise bouts of increasing intensity provides a reliable assessment of aerobic fitness.

As illustrated in Figure 6.3, lactic acid is formed when pyruvic acid is broken down anaerobically (without oxygen) to provide ATP for muscular contraction. At low exercise intensities energy requirements can be met almost entirely from aerobic metabolism. With increases in intensity the aerobic system is unable to meet the energy needs and the contribution from anaerobic sources progressively increases, lactic acid is produced in the muscle and blood lactate levels rise accordingly. Figure 6.8 illustrates the typical pattern of blood lactate increase which is observed during an incremental treadmill test. It is clear from this

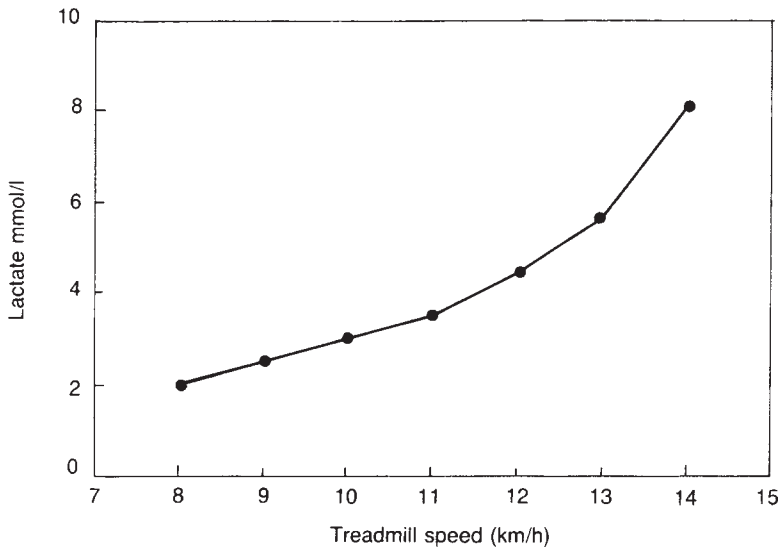


Fig. 6.8 The blood lactate response to incremental exercise

diagram that, unlike oxygen uptake and heart rate, blood lactate does not increase linearly with exercise intensity. The explanation for this is that the lactate level measured in blood does not simply reflect increased lactate production but represents the balance between the processes which both add lactate to and remove lactate from the blood. These include the rate of lactate production in the muscles, muscle fibre type, the rate of lactate release from the muscles and the rate of lactate use as an energy source by the muscles, the liver and the heart. Therefore at moderate exercise intensities, lactate production may be increased but as this is matched by a corresponding increase in the removal of lactate from the blood the result is that blood lactate levels remain low or only slightly elevated.

The point at which the rapid increase in blood lactate occurs (the lactate threshold) has been termed the 'anaerobic threshold'. This has been considered to represent the onset of anaerobic metabolism due to insufficient oxygen supply to the muscle. This assumption has been extensively challenged and in the light of the above discussion it is clear that the lactate threshold reflects the point at which production of lactic acid and its release into the blood outstrips its removal, with the net result of an increase in blood lactate.

Under normal circumstances ventilation increases in a similar fashion to changes in blood lactate during incremental exercise, i.e. an initial slow rate of increase followed by a rapid increase. Because of this the

blood lactate 'anaerobic threshold' has frequently been estimated from changes in ventilation. In children, whose breathing patterns during exercise tend to be erratic, the identification of a threshold is particularly difficult. Furthermore, the precise identification of clear 'thresholds' from either blood lactate or ventilatory data is fraught with difficulties and the underlying physiological significance of the 'anaerobic threshold' remains an area of contention.

For coaches with access to a method of blood analysis, submaximal aerobic fitness is best determined through the measurement of performance (e.g. % $\dot{V}O_2$ max or heart rate) at a fixed level of blood lactate. For the assessment of adults a level of 4.0 mmol of lactate per litre of blood (4.0 mmol/l) has been recommended as a reference value. Originally this level was chosen because it was assumed to represent the maximal lactate steady state. It is now recognized that lactate metabolism during exercise and consequently the maximal lactate steady state does, in fact, vary widely between individuals. Nevertheless performance at the 4 mmol/l level is highly related to aerobic endurance ability and is sensitive to improvements in submaximal aerobic capacity following training. This concept is developed further in Chapter 15.

Clear differences in lactate responses to exercise exist between children and adults. Both the muscle lactate and blood lactate concentrations of children are lower than adults at all submaximal exercise intensities. The maximal post-exercise blood lactate levels of children rise with age and the maximal muscle lactate concentration is much lower in the child than the adult.

The reasons behind these child—adult differences have still not been fully explained. It has been suggested that the ability to derive energy from anaerobic sources is related to hormonal changes during sexual maturation. However, there is clear evidence that even mid to late adolescents who are sexually mature respond to exercise with lower blood lactate levels than adults. Some evidence from studies which have examined children's muscle tissue (using muscle biopsies) suggests that children have lower concentrations of the enzyme phosphofructokinase (PFK) than adults. As this enzyme regulates the rate at which glycogen is broken down this would explain children's lower blood lactate levels during exercise. Other studies have not, however, confirmed this although there is consistent evidence to suggest that the enzyme profile of children's muscle is geared towards providing energy from oxidative (aerobic) rather than glycolytic (anaerobic) sources.

Because of children's lower blood lactate response to exercise many children will not reach a 4.0 mmol/l lactate level during an exercise test to determine $\dot{V}O_2$ max. Therefore this adult reference level for submaximal aerobic performance assessment is not appropriate. A blood lactate level of 2.5 mmol/l represents approximately 80% $\dot{V}O_{2\max}$ in

adolescents and so is more suitable for use in this age range. The use of this lower level is supported by the finding that, although lactate metabolism during exercise in children varies considerably between individuals (as in adults), their maximal lactate steady state occurs close to a value of 2.5 mmol/l.

The pattern of blood lactate increase with exercise will be influenced by the testing conditions and the methods used to analyse the blood. Interpretation of test results must therefore consider the following points:

1. Blood lactate responses are specific to the test protocol used, for example, the duration of each exercise stage, and whether the test is continuous or includes rest periods between stages. The type of exercise (i.e. running or cycling) will also have an influence on the blood lactate levels obtained so results from a treadmill test cannot be used to monitor swimming performance.
2. Various sites are available for blood sampling including artery, vein or capillary. Capillary sampling from the fingertip is most likely to be used (and is recommended) with children. It is important to realize that the blood lactate levels obtained may vary according to the site of sampling. For example, during cycle ergometry, blood lactate levels in venous blood are lower than in arterial or capillary blood. The difference increases as exercise intensity increases. These differences also exist during treadmill running but are less pronounced.
3. The actual lactate value obtained will depend upon the preparation of the blood prior to assay. For example, lactate levels differ between whole blood, lysed blood, plasma or serum due to the presence or absence of red blood cells in the assay sample. Most of the semi-automatic and portable analysers favoured by coaches for field use are whole blood assays.

Because of these factors it is not possible to compare test results from different laboratories unless the testing conditions are identical. This is an important consideration for coaches using lactate testing to monitor training. In Chapter 15 the practical applications of blood lactate measures to training are discussed in more detail.

6.1.2 THE ANAEROBIC ENERGY SYSTEMS

The phosphagen energy system

Much less attention has been paid to the measurement and interpretation of children's anaerobic power and capacity than to their aerobic

characteristics despite the predominance of anaerobic metabolism in activities involving supramaximal efforts of short duration (e.g. sprinting).

The muscular concentration of high energy phosphates (ATP and CP) is very similar in adults and children and they are used at much the same rate during intensive exercise. Children should therefore be as well equipped as adults to compete in events of very short duration. The Margaria Step Test is an established test of anaerobic power. The speed at which the child can run up a staircase of known height is measured, and from this information power output is calculated. The short duration of the test means that the high energy phosphate stores are maximally stressed with minimal involvement of the glycolytic process. The phosphagen system can also be assessed from the Wingate Anaerobic Test. Here the subject pedals a cycle ergometer at maximum effort against a known, constant resistance for 30 seconds. The peak power obtained in any five-second period (usually within the first five seconds) reflects energy provision from the ATP—CP system. However, this test has its limitations when used with children. Cycling engages a smaller muscle mass than running, with a high proportion of the total power output produced by the quadriceps muscle. Prepubertal children and older girls often lack sufficient strength in these muscles to pedal against a heavy resistance and so their performance on the test is compromised.

Laboratory estimates of peak anaerobic power using the Margaria Step Test and the Wingate Anaerobic Test have consistently demonstrated that the peak power output of males increases with age, whether the results are expressed in absolute power units (watts), or normalized for body mass (w/kg). The peak power output of females attains a maximal value during the teen years and then stabilizes with a few minor variations.

It seems that the results of laboratory tests are in conflict with the known underlying biochemical characteristics of children. The reasons for this lack of agreement are probably a function of the performance nature of the laboratory tests and the reluctance of investigators to use invasive techniques (e.g. muscle biopsies) on children. Perhaps the recently developed technique of nuclear magnetic resonance spectroscopy which is completely non-invasive may clarify the situation in the near future. Coaches need to be aware of the limitations of currently available laboratory tests of anaerobic performance.

The lactacid energy system (glycolysis/glycogenolysis)

Although the question of whether or not children have an inferior phosphagen system may be debatable, the evidence concerning the generation of energy via the lactacid system is conclusive, regardless of

the method of analysis. Although, as previously described, blood lactate is a reflection of many factors it is usually assumed to be an indication of the rate of glycogenolysis and therefore the rate of anaerobic energy generation.

The most popular tests of the lactacid energy system are the Wingate Test (described above) and the Cunningham Speed Test. This latter test involves running on a treadmill at a speed of 3.56 m/s at a gradient of 20%. The subject's time to exhaustion and post-exercise blood lactate level are recorded. Obviously this test relies heavily on the child's motivation to do well and performance will alter with growth, particularly with improvements in running efficiency and co-ordination. For these reasons and as exercise intensity is not standardized according to body mass it is difficult to compare children or monitor individual changes year by year.

The Wingate Test provides perhaps the most reliable estimation of anaerobic capacity although interpretation of the results must take into consideration the limitations described above. The mean power output over the 30 second period and the fatigue index (the difference between the peak power and the minimum power as a percentage of the peak power) reflect the capacity of the lactacid system especially when supported by post-exercise blood lactate measures.

The results of laboratory tests have consistently demonstrated that the lactacid anaerobic performance of males increases with age from childhood to adulthood. Several studies have indicated that females attain their maximal performance during their teens. This hypothesis has yet to be proven but it is consistent with the observation that male and female differences in anaerobic performance are minimal during the pre-adolescent period, yet during adolescence boys become significantly better anaerobic performers and retain this advantage in adult life.

6.2 CONCLUSION

Some of the important differences between children and adults in their responses to physical activity have been noted and it has been shown that children are not mature working machines. In the vast majority of sports, lack of maturity is a severe handicap and children cannot hope to compete on an equal basis with adolescents or young adults. Age and maturational differences are more pronounced in activities demanding the generation of energy anaerobically and children are at a severe functional disadvantage compared with adults when performing strenuous (supramaximal) activities of between 10s and 60s duration. Boys and girls are fairly evenly matched before maturation, but during adolescence boys develop major functional advantages which generally facilitate superior sporting performance.

If laboratory tests of children's performance are repeated at regular intervals the results may enhance the information available to the coach and facilitate the development of optimum training programmes (see Chapter 15). Coaches must, however, be aware of the limitations of laboratory testing of children.

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Understanding the learner: guidelines for the coach

7

Rosemary Connell

SUMMARY

Coaching is no easy task. Not only must coaches have expert knowledge of their sport, they must understand the individuals they are coaching. This means more than knowing how confident they are or what motivates them. It requires knowing how children think and learn, how they attend, perceive, remember, and make decisions. This knowledge can then be used by the coach to determine which learning tasks are set, the way they are set, the style(s) of practice to adopt, the way feedback is used. In this way the coach matches the coaching style to the child.

A recurring theme has been that the coach should engage learners to a greater extent in their own learning. This is not only effective in terms of performance outcomes but also in learning outcomes. The coach has done more than teach a sport, but has developed children's learning strategies so that, whatever sport they engage in, they will be able to tackle it with confidence. They know how to learn.

7.1 INTRODUCTION

Understanding how children think and learn is critical for the coach. While the physical characteristics of children are relatively easy to judge from observation and measurement, their thinking or cognitive abilities are less obvious. If coaches are to maximize children's learning, they will need to ask themselves such questions as, 'Will the child understand what I say?', 'How many coaching points will he be able to take in?' and 'How well will she cope with difficult decisions?'. Clearly, knowing the answer to such questions will help coaches in planning practice sessions, and thus optimize learning.

This chapter briefly outlines a historical approach to motor learning and then presents a model known as the information processing model which is helpful in understanding the learning of skills. Each component of the model, attention, perception, memory, decision making and motor control, is described and guidelines for coaches working with children of varying ages are suggested.

7.2 HISTORY

In the 1950s and 1960s most motor skills research did not focus on the learner, but rather on the method or structure of practice. For example, it was found that spacing coaching sessions (distributed practice) was more beneficial than fewer larger sessions (massed practice), especially for physically and mentally demanding skills. Another finding was that breaking the skill into parts rather than teaching the whole skill was best if the skill was complex and could easily be broken down without destroying the continuity of performance, e.g. swimming the front crawl. On the other hand, teaching the whole skill was better for simple or tightly integrated skills, e.g. a tennis forehand drive. While these research studies told the coach something about the relative effectiveness of various practice methods they did not explain the processes underlying learning, or whether these changed with age. The last 20 years have produced information which helps the coach to understand how an individual performs and learns skills. Researchers such as Connell (1984) and Keogh and Sugden (1985) have taken a process rather than a product approach in their examination of children's motor performance and learning, i.e. they have focused on *what happens during learning* rather than on what is learned.

7.3 INFORMATION PROCESSING

Borrowing terminology from the computer world, a number of models of skill performance and learning have explained how people process information. Figure 7.1 is a simplified information processing model.

Just as a computer receives information, codes, stores and performs various operations on it before producing a response, so the human central nervous system receives information via its senses, interprets it, and then produces some sort of motor response. For example, the child sees the ball travelling towards him, feels where his body is and recognizes that if he is to catch the ball he must move in a particular way. He has to decide when, where and how quickly to move, and how to place his hands to trap the ball. Throughout the action he continues to receive information about his body and the ball via feedback, and if there is time, adjusts his initial plan. The results of his efforts are checked and

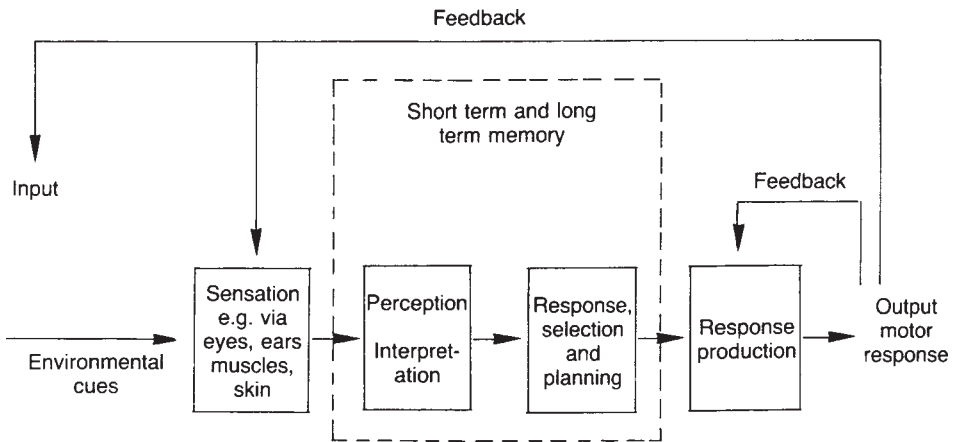


Fig. 7.1 A simple information processing model applied to motor performance

stored in memory and can be used the next time a catching action is planned. Although the model gives the appearance of sequential processing of information, more than one mechanism may operate at the same time; for example, a child can organize the jumping movements of skipping while watching and listening to the turning rope. The model is particularly helpful to the coach in his analysis of task demands, and in his search for sources of performance error.

Humans, like computers, have finite limits to the amount of information they can process, and the speed with which they can deal with information. This is known as information processing capacity. It is helpful to think of processing capacity as a pool of attention which can be allocated at will by the individual (Kahneman, 1973). If more attention is needed than is available the person becomes overloaded. As children develop, they learn more sophisticated ways of dealing with information so that they can cope with more information at once, and more quickly. It is important for coaches to make sure that they do not overload children, for example by giving only one coaching point at a time. They should also help children to develop more mature processing strategies. Examples of such strategies will be detailed in the following sections.

7.3.1 ATTENTIONAL CHARACTERISTICS OF CHILDREN

Learning sports skills does not simply involve learning movement patterns, it also involves learning which cues to pay attention to. For example, in swimming and gymnastics, attention to the feel of the movement is important, while in games playing, cues in the

environment are far more critical. When there are large numbers of cues competing for attention some selection must be made. Imagine children in a team game where there are numerous cues competing for their attention: team-mates, opponents, pitch markings, audience, coach, their own thoughts and feelings. To play effectively they must selectively attend to those cues which are relevant and block out those which are not. Because the cues in the display change frequently, attention needs to be directed to the most important ones quickly.

Research has shown that children scan their environment in an exploratory, disorganized way, in which both relevant and irrelevant cues are sampled. Adults on the other hand show organized search strategies in which they focus on relevant cues only. This developmental change in attentional allocation may involve a progression from over-exclusive attention at up to age six, to over-inclusive attention between six and 11, before becoming selective at age 12 onwards. This could explain the young child's narrow focus on the ball followed by his distractibility in the face of other players, audience, coach, etc., and then finally his ability to focus on relevant cues only. While these types of behaviour appear to be age-related, with careful structuring of the practice situation and with guidance, even young children can be taught to attend selectively. One way to do this would be to reduce the information to relevant cues only, for example by restricting such things as number and space, and then gradually to introduce the irrelevant cues.

Most sports demand that more than one thing is done at once, e.g. dribble the ball and look for a team-mate. It must be recognized that the child will experience difficulty doing both tasks together until the performance of one of them demands less attention. To cater for this coaches should allow their pupils time to practise dribbling alone, then past static players or cones before introducing moving players. This allows the dribbling action to become automated, i.e. less attention demanding, and frees attention for perception or decision making.

7.3.2 PERCEPTUAL CHARACTERISTICS OF CHILDREN

Perception means interpretation or recognition of the information detected by the sense organs. It involves the interplay of information from the senses and from memory. Because young children have fewer past experiences they will be naive perceivers. It is possible to recognize something which has not been experienced before if other similar perceptions have been stored in memory, for example, young children's perceptions of a ball travelling towards them will be directly influenced by past experiences of all objects moving towards them. This suggests that a wide range of perceptual experiences will best equip the child to

make accurate judgements. Recognizing spaces, judging direction and speed of movement of other players and balls needs practice, and with that practice will come faster, more precise judgements which demand less attention.

Many sporting situations involve picking out items of interest from a background. This is known as figure-ground differentiation and individuals differ in how easily they can do this. Herman Witkin (1954) described people who find difficulty with this as field dependent, while people who deal with such a problem quickly are field independent. Children progressively become more field independent until approximately 18 years of age. Coaches, therefore, should help children to pick out objects from their backgrounds by making the object distinctive, such as using multicoloured balls and/or by making the background as plain as possible and of a contrasting colour.

Teaching children to look for patterns is another way of reducing attentional effort. For example, when dribbling down the basketball court the player looks for a pattern of defensive players rather than focusing on each individual player in turn. Similarly, teaching children to anticipate the rest of an action from early cues, for example, the type of tennis serve from body position, helps them respond more quickly.

Accurate perception of fast moving objects, such as balls or shuttlecocks, is common in sport. The child must learn to judge the significance of the object, predict its future position and plan and initiate a counter move. The sharpness with which moving objects can be perceived is known as dynamic visual acuity. As this ability improves between ages five to 12 (Cratty *et al.*, 1973), coaches should ensure that young children have plenty of time to make accurate perceptions.

Children also show an increasing ability to integrate information from several senses. Connolly and Jones (1970) conducted an interesting experiment in which they presented wooden rods of varying lengths to adults and children of five, eight and 11 years of age. They were allowed either to see the rod or feel it when blindfolded, and then were asked to identify the same length but using the other sense, for example, feel a six inch rod and then judge the same length visually. Accuracy in such judgements was found to increase with age. This would suggest that a child who may see a demonstration, perhaps a gymnastics vault, and then attempt to copy it will not find it easy to match the feel of the performance against the visual image stored in memory. It may be helpful if the coach encourages the child to try to feel the movement while watching the demonstration.

Sometimes, if children experience difficulty in getting the idea of the movement coaches use a method known as manual guidance when they guide the child through the correct movement pattern. Research suggests

that this is not an especially useful type of practice because movements which are planned and actively made by the child are remembered such more clearly than movements which are passive and are constrained by the coach.

7.3.3 MEMORY CHARACTERISTICS OF CHILDREN

Without memory it would be impossible to learn anything. A popular view of memory holds that there are three separate forms of memory: a short term sensory store (STSS), a short term store (STS) and a long term store (LTS). Each sense is thought to have its own STSS although research work has been limited to the visual system. Some research has indicated that all information is initially registered for up to approximately one second and that a small fraction passes into STS whilst the rest is lost. This shows how important it is for children to be taught to anticipate likely cues as these may be the ones more likely to be passed on for further processing. The good coach will tell children what to look for in a demonstration, for example.

It is thought that the short term store can only hold between five and nine items for a period of about 30 seconds. These items will be displaced by incoming ones unless they are maintained in STS by repetition (rehearsal). Sugden (1980) has found that young children do not spontaneously use rehearsal strategies, so simply encouraging pupils to repeat the coach's instructions before going off to practise will help ensure that they do not forget what to do.

In order to increase the storage space in STS, information can be organized so as to take up less room; for example, remembering the details of a tennis serving action as 'scratching the back' and 'throwing the racket'. This strategy is known as chunking. Strategies are also important for transferring items from STS to LTS. While the number of items or experiences and the length of time that they can be kept in LTS are thought to be unlimited it is often difficult to recall them. Retrieval can be improved if new experiences can be linked to those already in store, e.g. relating a badminton overhead clear to throwing a ball. Another useful strategy is to store the new memory in an especially meaningful code, e.g. using a rhyme to remember shot put technique:

Chin knee toe
Make a bow
See it go

or using a familiar visual image like the clock to remember hand entry position as 'five to one' in backstroke.

The way in which actions are stored in LTS is not really known. One

view is that each action has its own detailed representation in memory, while another suggests that classes of actions are stored, for example, the overarm throwing class of actions. For this to work two rules or schema are also stored which control the use of each specific class of actions, rather like a recipe must be present as well as the ingredients. The latter theory was proposed by Richard Schmidt in 1976 and is known as the schema theory of motor learning. The attractiveness of his view is two-fold. Firstly, it reduces the amount of storage space needed, and secondly, it allows for the production of novel actions, i.e. actions never made before. Since virtually all our actions are to some extent novel, especially those which take place in changing environments, for example team games, a theory which allows for actions to be performed in slightly different ways is critical. The development of the rules or schema for each class of actions can be fostered by variable practice.

At first, the value of variable practice was tested by comparing practice of a single instance of a skill like shooting basketballs from the free throw line against several variations, i.e. from different positions around the basket. Surprisingly, varied practice proved to be equally effective and sometimes superior, even if the test was to shoot from the free throw line from which the varied group had not practised at all. This effect has been especially strong with children (Kerr and Booth, 1978; Shapiro and Schmidt, 1982).

Schmidt has explained the results by suggesting that varied practice enables a stronger schema to be developed, and this schema can be used to accurately plan movements never experienced before. Of course, another explanation might be that varied practice is simply more interesting.

Having recognized the value of variable practice, motor learning researchers have recently turned their attention to the structure of the practice. Let us imagine that four variations of a football pass are to be practised. The coach could organize four blocks of practice in which one type of pass is concentrated on in turn, or he could randomly organize the practice so that all four passes are worked on throughout the session.

A coach may feel that it is better to 'block' practice in order to 'groove' the skill, and while there is some research which does suggest that complete beginners may benefit from a small amount of blocked practice (Shea *et al.*, 1990), research has found that in general, giving learners a range of experiences in a random order is more effective (Lee, 1988).

Another rather surprising research finding about practice is that learning can be optimized if several quite different skills are practised in each session. For example, Goode and Magill (1986) have shown that three different badminton serves, a high serve, a short serve and a flick

serve, are remembered best if they have been practised in a random order in the same session rather than blocked in separate sessions. During the practice sessions themselves improvement was greater if single skills were experienced; however, when tested some time after practice, those who learnt the three skills together performed best. What can explain these unexpected findings? The most obvious answer would be that varying practice is more motivating. Yet if this were the case, performance during practice should also be better with random practice. Two other explanations have been suggested, each based on the premise that the learner will remember and thus learn more if he is forced to process information more deeply.

One suggestion is that when learners change from one skill to another they forget the solution to the first skill and thus have to regenerate the solution when they return to it. Thus a considerable amount of problem solving is involved during practice.

A second explanation is that changing the task on every trial enables the learner to distinguish between the skills more clearly so that they will be stored in memory in a more meaningful way.

These findings suggest that coaches might need to reconsider some of their habitual practice methods. It would call into question such practices as taking successive netball or basketball shots from the same spot, or serving a bucket of balls to a target, or performing a single cricket stroke against a ball machine. During the practice session the learner is likely to be seen to improve, which will give both learner and coach satisfaction. However, once in a performance situation the performer seems to have lost the new-found skill. If we consider what is needed in many sports it quickly becomes clear that repetition of the same skill or even the same variation of a skill is rarely needed. Rather, the particular skill may be used only once and thus an important task for the learner is to select the appropriate response. The most effective coach will be the one who can find ways of involving the learner in response selection rather than mindless repetition of skill execution.

Of course, there are some sports which require only the perfect execution of a movement pattern such as a gymnastic vault or a highboard dive, and such highly specific programmes could be effectively learnt with repetitious practice.

7.3.4 DECISION MAKING CHARACTERISTICS OF CHILDREN

A variety of decisions must be made during the performance and learning of skills. Children have been shown to be slower than adults in making simple decisions like which button to press when one of several lights is illuminated (Fairweather and Hutt, 1978) or which playing card to put into which pile (Connolly and Jones, 1970).

The decisions which are required in sporting situations are usually much more complex, for example, which pass shall I use, with how much force, in which direction, when shall I start it?

Furthermore, in many sports, decisions have to be made quickly, so it is important for coaches to help learners to recognize which response is best in each situation. For example, squash players learn that a boast shot (stimulus) should be met with a drop shot (response). If these stimulus—response pairs are stored in LTS, decision making time can be cut and attention can be focused on the execution of the response, which will be especially necessary for the beginner. Of course, the coach needs to help the learner to link a narrow range of appropriate responses with each stimulus to prevent their performance becoming too predictable. Children also need to be taught to plan ahead. McPherson (1989) studied young tennis players and found that a significant difference between the better and weaker players was the ability to plan ahead between points.

A criticism which is often levelled at coaches of games is an over-emphasis on technique and practice of isolated skills at the expense of tactical awareness. If a coaching session consists of isolated skills practice for 50 minutes with a game for ten minutes at the end, not only is children's enthusiasm likely to wane but their awareness of 'what to do when' will not develop. Starting the practice session with a game and then working on a skill which is causing the game to break down will show children the value of practising and provide a specific game context to the practice. They are learning to link certain responses with particular situations.

The importance of the game has been behind the Teaching for Understanding approach, an initiative which fosters discovery and comprehension of the principles of games playing rather than the development of isolated skills. An example of this approach with racket games would be to set children the task of playing a game which uses short and deep shots. The intention is that they should develop an awareness of the tactical value of such shots. As they play they will experiment with methods of achieving a drop shot and a length ball. The coach can then work on the execution of these skills in a more closed or predictable practice situation before returning to the open, less predictable situation of the game.

7.3.5 RESPONSE CHARACTERISTICS OF CHILDREN

Once a response has been selected it must be organized and carried out. The extent to which individuals use feedback to control ongoing movements depends on the speed of the movements and the capability and choice of the performer. Feedback is information fed back from the

eyes, ears, muscles, joints and skin, which tells the performer about the movements which have just occurred. Feedback can only be used during the action if the action itself is slow. In 1979 Hay, a psychologist, studied the way movements were controlled by children between five and seven years old when reaching to point at a target when they could not see their arms. Five year old children tended to use a ballistic movement, i.e. a fast movement with very sudden braking near the end of the movement. Seven year olds started a braking movement very early on, or began the movement quickly and then used a smoother two-stage braking strategy. The older children predominantly used the latter strategy. This shows that feedback was used more efficiently by the older children. At first feedback was hardly used at all, and then it was used too much for a smooth performance, with finally the older children showing the ability to integrate kinesthetic feedback from the muscles and joints of the arm with visual information of the target position.

Children need help in paying attention to the relevant feedback. They tend to rely heavily on visual information and are often far more interested in the end result, for example, how far the javelin goes rather than what the angle of release was like. Some research by Jerry and Kathy Thomas in 1988 has shown that children are much less accurate than adults at detecting errors in their movements. In learning the correct technique, it is valuable for the learner to note what the action feels like as this can become the basis for detecting errors in performance later on. An example of a performer going through the error detection and correction process can be seen when a racket player makes a poorly executed stroke, loses the point, and then immediately shadows or rehearses the correct movement pattern.

As far as possible coaches should encourage learners to evaluate their own performances with the coach adding necessary refinements only. This encourages learners not to become too reliant on their coaches, who often will not be present during competition. Knowledge of results (KR) can also motivate learners to continue to strive for goals although special care must be taken with the child whose performance is poor. After successful attempts KR can act as reinforcement, i.e. it will encourage repetition of good performance. If KR is to be effective in terms of error correction it must be given sufficiently often for the child to continue to modify his developing response, but not so often that he cannot work on previously received feedback. In the same vein it has been found that KR which is too precise can overload the child. Coaches should be careful as they may be tempted to give too much detail if they use video playback. They must be prepared to use the video interspersed with practice, concentrating on one point at a time only.

It was previously noted that children are slower in making decisions. This applies equally to making decisions about KR. If the child is slow at

processing information, more time will be needed after the presentation of KR and before the next attempt. Teaching young children how to deal with KR is particularly important as there is evidence that given freedom of choice, the younger the child, the less time he gives to processing KR. This is probably because he does not know how to use it. Therefore, coaches may need to help children to think about what the KR after each attempt means. They need to ask themselves such questions as, 'Did I do what I intended?', 'Did I succeed?', and 'Shall I change my next response and if so how?'.

7.4 SELECTING A COACHING STYLE

The style which the coach adopts must take into account children's thinking and learning abilities. As outlined in this chapter, the ways in which children attend, perceive, remember, make decisions and control movements are very different. Jack Keogh and David Sugden have summarized this very well in their book *Movement Skill Development*:

As they grow older, children develop more proficient processing abilities. This proficiency encompasses skills in memory, attention, and general processing abilities together with better performance when speed is required. Children also develop strategies that aid in attaining, retaining or transferring information. These strategies and their appropriate use become part of children's knowledge base and allow them to approach tasks differently and to process more quickly and efficiently.

(1985, p. 344)

Coaches develop preferred ways of coaching their sport and there is a danger that they may focus on the activity and forget that they are coaching children who need to learn how to learn, as well as to learn the particular activity.

The aim of the coach should really be to make herself redundant; in other words, as a result of coaching, children should learn how to learn so that they can become increasingly self-reliant.

One way in which a coach can fulfil this aim is to engage learners to a greater extent in their own learning. For guidance on how to do this the coach might consider Muska Mosston's spectrum of teaching styles. Mosston and Ashworth (1986) describe a range of coaching styles which differ according to the role played by the learner and the coach in decision making.

At one extreme the coach is autocratic and makes the decisions, for example, decides what the goals of the session are, plans the practice,

evaluates the performance and provides the feedback to the learner. At the opposite extreme, the learner self-programmes, that is, she makes decisions about her goals, her method of practice and her performance independent of the coach. In between are a range of coaching styles where the learner and coach share and often negotiate over what, when and how to practise.

Let us compare two teaching styles, one which is frequently used by coaches, the practice style, and one which is less often used but has much to offer, the reciprocal style.

The practice style involves the coach determining the aims, selecting the method of practice and, having set the task to the group, moving around providing individual and group feedback. This can be a highly effective method of coaching. The reciprocal style involves the coach determining the aims, planning a series of practice work cards and organizing the children into pairs. Each pair then works at the practice, one member using a coach-prepared checklist to evaluate their partner's performance, and then reversing roles. The coach's job is not to provide feedback directly to the performers but to help the observers in their evaluation and provision of feedback. In this way the children are learning to analyse critically and to decide on methods of improving performance. This style will not work with all children and may be most profitably employed with those who are at intermediate stages of learning. As all coaches know, observation is a skill which takes time to develop and even carefully detailed observation and feedback cards will not guarantee that optimal feedback is given. However, a reciprocal style does demand more attention and effort on behalf of the learners and it has the potential to increase the amount of feedback each child receives.

For a number of reasons, coaches are often more comfortable with styles where they are in control. They see it as their job to make the decisions, and fear that time and effort will be wasted as well as a greater likelihood of discipline problems resulting if children are given more power. Whilst these are valid concerns, giving children a greater role could actually increase their learning. There are several reasons for this. Firstly, youngsters have a chance to learn what they see as important, resulting in high motivation. Secondly, they can set goals which are congruent with their confidence levels, and thirdly, they will engage in their practice with more thought and learn to evaluate and correct errors in their performance. Through taking a more active role in learning they have the opportunity to become self learners. Since the coach will not always be present during practice or competition this is a highly desirable outcome.

Of course coaches need to help learners to take more responsibility for themselves and each other in a gradual way and their selection of

coaching styles will depend upon the physical and intellectual ability of the individuals, their levels of motivation and confidence, the aim of the session and the time available.

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Growing up in sport

8

Martin Lee

SUMMARY

This chapter deals with psychosocial development of children and how it affects their perceptions of and participation in sport. Personal and social development are identified as two important elements of the process of children's progress to adulthood. The idea of how people see themselves, self-concept, is the central focus of the chapter and the way in which children use different sorts of information to describe and evaluate themselves in a sport situation is explained. The development of mature social behaviour is a critical part of being able to take part in many sports, especially games, and the way in which children learn the rules and roles of groups is explained in order to help coaches understand the difficulties faced by children when they first begin to play games. Finally I make a few suggestions for how coaches can reduce the demands on children in group situations.

8.1 INTRODUCTION

Earlier chapters in this section have dealt with ways in which children change in their physical characteristics, their response to exercise, and learn to control movements. This chapter will show how they come to understand themselves and relate to others in social situations. This is known as psychosocial development.

An understanding of psychosocial development is important for a number of reasons. Firstly, it provides the basis for understanding how and why children are likely to react in different situations. Secondly, it helps the understanding of the psychological demands that sport places

on participants, adults or children, and its powerful psychological effects on them. Thirdly, it helps coaches to become more aware of the effects of their own behaviour on the children they coach.

Sport plays a big part in the lives of many children, particularly between about ten and 15 years of age in Britain, and a study in Australia indicates that 64% of young people between 13 and 18 take part in sport (Australian Sports Commission, 1991). It is also prominent in society and for individuals it is made more or less important by the interest shown by their families. To the extent that it is important to them it provides children with personal challenges and opportunities to assess their capabilities; their success affects their self-esteem, and a variety of attitudes, values and beliefs. For those children for whom sport plays a significant role, it can have a profound effect on how they view themselves. Conversely, the way in which children perceive themselves may have a significant effect upon their participation in sport (Australian Sports Commission, 1991; Weiss *et al.*, 1990). The Australian study revealed clearly that low perceived ability, or physical self-esteem, is a major contributor to non-participation. This was frequently brought about by the comments and judgements of coaches, which caused children to drop out. Children's sports experiences are affected very much by the expectations and reactions of those around them: parents, teachers, coaches and other children. What coaches do and say has powerful effects upon children's self-perceptions and their psychological responses (Horn, 1987; Smith *et al.*, 1979).

8.2 PSYCHOSOCIAL DEVELOPMENT

The course of development from childhood to adulthood is long and arduous, particularly so for parents perhaps! The process is of primary interest to psychologists and is known as psychosocial development. It involves learning to integrate in a social world in which individuals are able to establish productive relationships with others. The eminent child psychologist Jean Piaget considered that a crucial phase of the process occurs in middle childhood, a time when children are likely to be introduced to sport (Smith and Cowie, 1988).

There are two elements of psychosocial development to consider: that concerned with individuals learning to understand themselves and that concerned with interpersonal relationships, though this separation is probably more a matter of convenience than anything else. The first describes how children come to see themselves, their self-concept, and, perhaps more importantly, to evaluate themselves, their self-esteem. The second shows how children learn to respond appropriately to the demands of others, deal with increasingly complex social situations, and become independent while being able to co-operate effectively.

8.2.1 PERSONAL DEVELOPMENT

One of the special attributes of being human is the ability to reflect upon ourselves as we would think about another person; we are able to become the objects of our own thoughts. In effect there is an 'I' which thinks about a 'me' which can be referred to as the self-concept. Essentially the self-concept is a set of attitudes towards a particular object, oneself. Therefore it has the usual components of attitudes. First, there is a cognitive component, what we know or believe about ourselves; second, there is an affective component, how we evaluate and feel about that knowledge, usually referred to as self-esteem; and finally a behavioural component, how we are likely to act as a consequence. The peculiar quality of the self attitude (self-concept) is that it is about an object which only one person knows. While others know and can have feelings about us as another person, only we can know and have feelings about our own selves. An important process in psychosocial development may be the progressive differentiation of self, in which sports experiences may play an important role.

The development of the self-concept is important because it provides a framework by which children interpret their experiences, structure their behaviour, and create expectations about what they expect to happen to them. The way in which people look at the world depends upon their background and their past experience (Berger and Luckmann, 1963). This means that we all live in different worlds which we construct for ourselves. Although the events we see may be common, the way in which we interpret them differs. For example, the way in which we see decisions made by officials may depend upon how the contest is going at the time; sometimes we feel very hard done by, at others the same decision might be considered quite just. Moreover, our perceptions will be affected by the relationship we have to the players or teams. Identification with sports teams can result in biased interpretation of events on the field in favour of one's own team (e.g. Hastorf and Cantril, 1954).

The self-concept also acts as an inner filter which lets through certain sorts of information and shuts out, or rationalizes, others. We frequently accept the good things about ourselves and ignore the bad things and consequently maintain a desirable self-image. This is known as a self-serving bias. As children gradually create a more clearly defined picture of themselves they may filter out information which doesn't fit it. If they have a good self-image they may ignore or deny negative comments about themselves and, just as important, the reverse may be true. This can have profound effects on their experiences and expectations of success and failure; they may see themselves habitually as 'winners' or 'losers' (see Chapter 10 for further discussion).

Structure of self-concept

That part of the self which we call 'I' is the subject, or doer, which thinks about the object, the 'me' (William James's discriminated aspects). Children begin to learn from birth the distinction between themselves and the world around them and then they become aware of their own peculiar qualities; the 'I' gradually comes to know more about 'me'. The relationships between the different parts of the self are shown in Figure 8.1.

The model shows that 'me' can be thought to have two parts: each person has a picture of themselves, a self-image, to which he or she attributes more or less value, self-esteem. Of course, pictures have different parts, some of which may be good, others less so. The self-image is the same. So children can think well of themselves in some things they do and not so well in others. Research has shown that children assess their competence both in general and in physical, social and cognitive skills in particular (Harter, 1978, 1981). Hence, they might feel very good in sport but inadequate in school or with other children. Further, the model also draws attention to the distinction between what we think we are, what we would like to be, and what we think other people think we are. Differences between these perspectives can result in changes in behaviour or perceptions which bring them closer together. For example, a child whose ideal is to be a national champion but who sees himself as merely competent may be motivated to practise and train hard to bring the two aspects of self together. Conversely, if he makes little progress or finds that the competition is greater than he thought it would be, he may change the ideal and drop out of the sport.

Recent research in motivation and self-concept has focused on competence. Hence children's self-evaluations could be expected to vary according to fluctuations in performance. What is not well known is the degree to which adequacy in sport generalizes to other areas of children's experience. In contrast to the focus of self-esteem another aspect of self, self-acceptance, is considered to be independent of competence. Hence it is less susceptible to the inevitable fluctuations of sports performance and may provide the basis for a more stable self-concept (Waite *et al.*, 1990). It may be important for coaches and others to encourage children to realize their potential but also to accept themselves as they are rather than as they would like to be. Making realistic assessments of ability is an important skill for coaches and one which is frequently set aside!

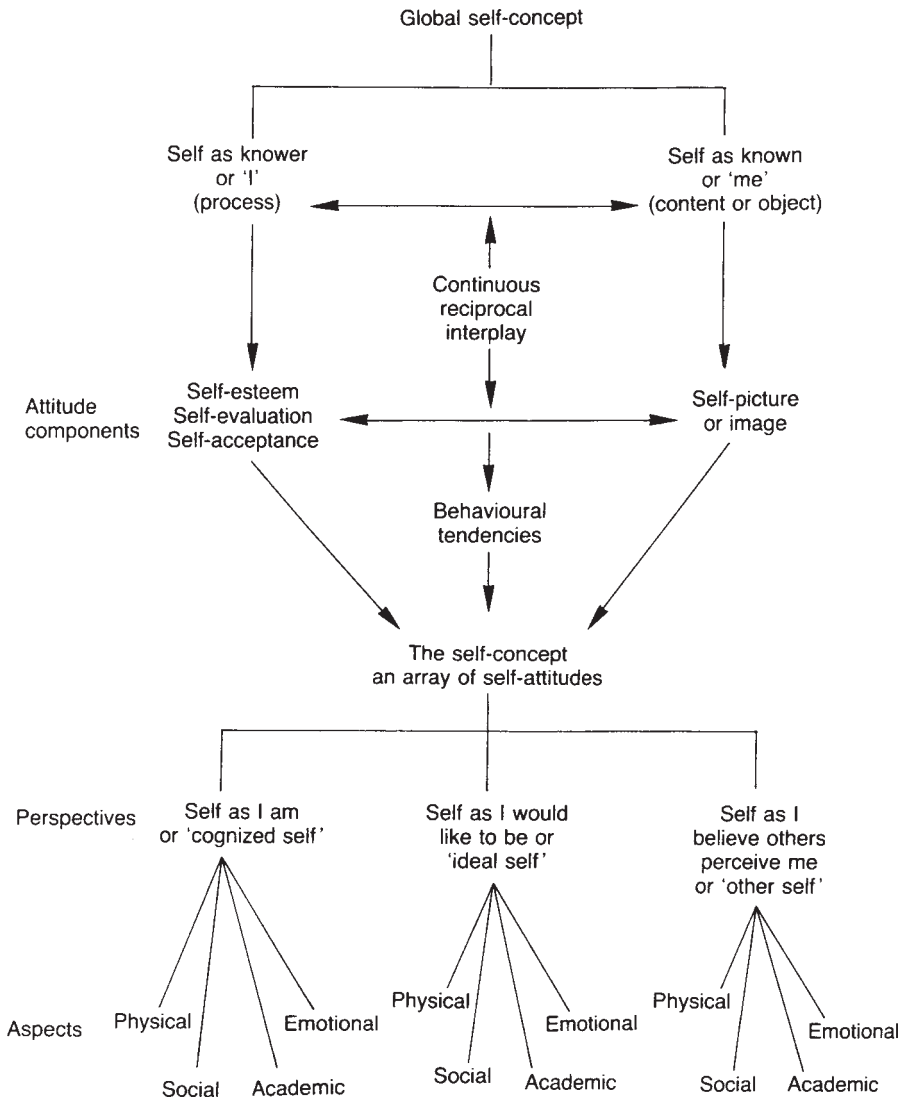


Fig. 8.1 The structure of self-concept (reproduced from Burns (1982) by kind permission of the publishers)

Development of self-concept

Children develop a self-image initially through their physical characteristics, then through what they can do and what other people say about them. When they become aware of themselves as distinct from others they tend to describe themselves by simple external features and

physical characteristics but as they get older they use their achievements and more sophisticated non-objective features such as psychological characteristics, personal attributes and relationships (Burns, 1982).

Body image

The picture children have of their bodies and evaluations of them is their body image. Unfortunately these are often equated to stereotypical body builds and the personality associated with them. Children who are muscular may be thought of as active, aggressive, outgoing and being leaders; tall, thin children as quiet, nervous and shy; fat children as lazy, jovial, non-athletic. Naturally, such ideas are often inaccurate and cause both embarrassment and frustration, but they still influence children's feelings about themselves.

Performance

When children learn skills they are able to describe themselves in terms of their competence. Initially they are concerned with simply being able to do certain things; kick a ball, do a cartwheel and so on. During the primary school years, say six to ten, abilities in particular activities become more important elements of self-description. Children begin to learn sports-related skills, they become more aware of other children and they start to evaluate their ability by comparison with them. In our society being 'good at games' is highly valued and may provide children with status and influence among peers. It has been shown that among children aged eight to 13 who took part a summer sports camp those who perceived themselves as being good at sport were more successful in social relations and better accepted by others (Weiss and Duncan, 1992). Perhaps more importantly, success in sport has been shown to be an important determinant of status in adolescent subcultures in general (Coleman, 1961; Eitzen, 1979).

Significant others

Quite clearly information from other people is important in fashioning the way in which children see themselves. The comments of those who are most important in their lives, significant others, have most effect on children's feelings about themselves and even casual remarks can have a great impact. Significant others include the family, teachers, coaches, and other children.

(a) *The family* The family is initially the most important influence on children. Parents, brothers and sisters are all closely concerned with each

other and continually give messages about the competence and worth of growing children. The more accepting, warm and interested parents are towards their children the more confident and positive they will become.

(b) *Coaches* Coaches and teachers become influential as children move away from home and develop outside interests. If children are interested in sport then coaches assume a very important role and at times they can become just as important in children's lives as parents.

Remember that coaches are both instructors and judges and hence affect both self-image and self-esteem. It is sometimes difficult to distinguish between teaching and evaluating and it is important to give information, or instruction, in a non-judgemental way. Yet children respond better to being taught in a way which does not 'put them down' or suggest that they are fools because they have made a mistake.

(c) *Peers* The role of other children in influencing self-perceptions comes about through comparison and through direct evaluation. In addition to comparing the outcomes of what they do children also listen to the comments made about them by other children. These comments can have great impact and observant adults know that children can be very cruel.

Comparing self with others

The comparison of one's own performance with that of others is a major process in the assessment of self-worth. Research indicates that children begin spontaneously to compare themselves to others by about six or seven and that the tendency to do so grows to a peak at about 11 or 12 (Toda *et al.*, 1978; Weiss, 1987). The comparison process gives rise to a pecking order of competence which becomes more clearly differentiated into distinct areas of achievement as the children grow older.

Quite clearly the selection of appropriate people to compare oneself with affects the outcomes of the comparison. Children who compare themselves with others who are less able may get an inflated sense of ability; those who compare themselves too soon with others who are much better may become so deflated that they may feel like giving up their sport. Helping children to select the most appropriate reference group is an important coaching function which enables children to assess themselves realistically while maintaining motivation.

How children use different sources of information

Adults can assess their competence at a task not only by comparing themselves with others but also by using other criteria and sorts of information. Children are limited in their ability to do this and, consequently, may become unduly depressed or elated about their

Table 8.1 Sources of evaluation used in assessing competence

Internal	External
Effort exerted	Match outcome
Skill improvement	Feedback from others
Ease of learning	(a) Adults
	(b) Peers
	Peer comparison

Derived from Horn and Hasbrook, 1987

performance. The sources of information which children use to assess their own competence are presented in Table 8.1.

In essence the sort of information that children use changes according to their age and how independent they are. The information can come from within themselves (effort exerted, improving skill, and ease of learning new skills) or from external sources such as the outcome of the contest and feedback from others. Pre-school children mostly use achievement and parental approval. When they go to school they like to maximize the differences between themselves and others and do this by trying to get more rewards, an external criterion. As they progress they use information from a wider variety of sources, tending to depend mostly on external results and approval, though these may be applied inconsistently. It is not until late childhood at about 11 or 12 that they see that they have more control over their own destiny and shift to standards that they set for themselves. This becomes more normal during adolescence, but it is not until late adolescence that they are able to balance external and internal sources to evaluate themselves realistically (Horn and Hasbrook, 1987).

At Bedford we have begun to look at the sorts of information used by children to evaluate themselves in relation to self-esteem. In a preliminary study one of my students measured the perceived competence of a group of club swimmers between eight and 15 years of age. Swimmers who scored high or low were asked to complete a questionnaire which elicited information about what information they used to assess themselves. The major finding was that all the swimmers used more internal sources than external, but those with high levels of self-esteem were significantly less reliant on external sources than those of low self-esteem (Christensen, 1991). This suggests that less confident children rely on coaches to give feedback about their competence, while those who are more confident are more able to make their own

assessment. However, all the swimmers involved could be described as high flyers, yet they still use all the information available. It may be that children who perceive themselves as less competent by virtue of experience and attainment may be more reliant on information given by the results of a contest and comments from coaches, parents and peers than was the case with these swimmers.

So what should coaches do? They can help young athletes to develop a more realistic view of their progress and abilities. Some children may over- or under-rate their efforts because they concentrate on results and do not look at their performance. If they over-rate their ability they may suffer a later setback because they have used limited sources of evaluation, e.g. comparing with less able children, and have not listened to the comments of experienced observers. They are not necessarily being obtuse, they may simply be at that particular stage. They need patient help to get to a more mature assessment of their own competence. This means learning to accept and integrate information from different sources; to keep results in perspective; to focus on performance; and to use the comments of others constructively.

8.2.2 SOCIAL DEVELOPMENT

The development of social behaviour, the way in which children relate to others around them, is a long and complex process which can become particularly difficult during adolescence. It is important to coaches because they work with groups of children. Although some concern has been expressed that the demands of intensive training may cause young athletes to become rather isolated (Rowley, 1988), a study of elite young athletes in England showed that most of those involved described themselves as having good friends and being popular (The Sports Council, 1992). However, it may be that friendships are restricted to those who share the sport involvement.

Problems of working in groups

Most sports, whether team sports or not, demand the co-operation of individuals in groups. This means that they must be capable of mutual assistance and support and coaches are faced with three tasks. First, they must keep the group moving towards a common goal. Second, they must use the abilities and personalities of the individual members most productively. Third, they must look after the welfare and progress of individuals. Sometimes these requirements conflict and cause strains within the group. For example, team members may have different goals and want to go their own way; they may have to work, or play, with others they don't like, or have to play out of position; and helping

individuals may mean encouraging them to leave the club and go to another, thereby weakening the team. We know that children have different motives for doing sport (see Chapter 9); some do like to compete and win, others participate for the companionship that sports provides. In order for children to realize their different motives it may be necessary to accommodate the needs of other children. Thus a rugby player who is committed to excellence may need to accommodate the needs and attitudes of others in the team who have different ambitions; it is hard to play rugby alone. Different goals such as those among group members inevitably demand a degree of negotiation and accommodation if the group is to be successful in meeting both individual and communal goals.

Self-concept and group affiliation

I have already described how children's self-concept grows from their interaction with other people and, not unnaturally, the groups and teams to which they belong are part of that process. Groups become a part of our identity and when the group's activities are important to us then it becomes a more important part of that identity (Hogg and Abrams, 1988). So if children are very interested in, say, football then being a member of the local football team is likely to be an important ambition and they will be proud to describe themselves as members of the team or club. A good example of social identity is the habit that many children have of expressing their loyalty to particular sports teams by wearing their colours. As children enter adolescence they may enter a gang culture which has a strong influence on their identity. Membership of sports teams may perform a similar function, particularly if the sport is important to them. This is not necessarily restricted to competent performers. You may know cases of children for whom the sport is important but who are not very good yet they still come to practice and, perhaps, play a role in helping run the club. They are establishing a social identity as club members and can be very helpful, and encouraging their input can be valuable both to them and to the club.

Pattern of social development

During early childhood, until about five years old, children are self-centred; they do not readily distinguish self and others and they expect other people to adapt to their needs. It is not easy for them to play co-operatively and, typically, they play alongside rather than with each other. Because of this it is very difficult for them to enter into team activities because they do not understand co-operative behaviour.

Between six and nine, children form small friendship groups which gradually become more enduring. They may play in a world of make-believe and act out different parts, taking a role. Thus they learn what is expected of those roles without having to create them. Peers also become more influential and they make more comparisons with each other; in short, they compete. It is a period of 'Let's see who is best'. The competition is immediate in that it happens in a particular event and time; it takes the form of pursuing rewards at the expense of others, a sort of 'one-upmanship' in which it is important to have more than other children. At this time you may find it difficult, and inappropriate, to channel children toward the more long term goals normally associated with sport.

During late childhood, between ten and 12 or 13, friends play a bigger part in children's lives and they may do sport because their friends do. They are better able to understand the demands of teamwork and become a part of the team, rather than merely acting out a role. They are more sophisticated in their reasoning but are only able to assimilate fully the causes of competitive results towards the end of this period (Passer, 1986).

As children move into adolescence they form strong ties with peer groups which have a strong influence on their values, attitudes and behaviour which may conflict with adult expectations. They also provide a major source of information by which adolescents evaluate themselves. On the positive side adolescents can learn to work together very effectively, creating roles for themselves, and real teamwork is possible. They are now mature enough to make more realistic assessments of performance and results and more able to enter fully into the adult competitive world.

Sports teams as working groups

Members of sports teams have to work together in the same ways as members of other groups, such as working groups and families! They need to agree about what they are trying to achieve, how to best use the resources (e.g. abilities) available to them, to understand their place in the team, and to understand the social patterns within the team. It is also important that their contribution to the team is recognized by the coach and other members.

Understanding the ways in which people in the team interact means that the players must know both the rules of the game and the job that everyone else is required to do. This puts quite sophisticated demands on children as they learn to play games and their ability to meet them depends upon their cognitive and social development. Various observers of child development (e.g. Erikson, Piaget, Smilansky) have concluded

that children move gradually towards games with established, public rules which are accommodated by about the age of seven (Smith and Cowie, 1988). This observation means that those who organize sport for children should understand the psychological demands of sport, as opposed to games, on those children and not expect them to play as adults. This applies particularly to understanding the demands of the rules of the sports and the roles which different participants are required to play in them.

Rules

The rules of a sport are important because they not only prescribe the framework within which the game is played, they also determine the skills of the sport. In most cases the rules are laid down to accommodate adults and depend upon mature levels of cognitive development. The more complex the rules the less likely it is that children will be able to follow them. Take for example the game of rugby. Here the object is to get the ball forward while being allowed only to throw it backward. Children who have started playing informal invasion games not unnaturally assume that to move a ball forward it is OK to throw or kick it in that direction. Yet in rugby this is not allowed, it can only go backward and, what is more, while you are in front of the ball you cannot take any further part in the game! Small wonder that some children become a little confused as to what to do and don't always stay behind the ball! Fortunately recent changes in the way rugby is introduced to children have helped overcome this problem (see Chapter 19).

Roles

When children do sports, particularly team games, they have to take different roles in those teams, each of which contributes to the team effort. These roles are determined by the accepted structure of the team and tactical demands of the game, not necessarily by the formal rules. For example, there is a variety of formations used in football and the evolution of positions in rugby has occurred over a long time and can still change. The formation of the team means that players in each position have specific jobs to do. While this may seem obvious it may not be so readily recognized that in order to carry out their own job properly every player must have a good understanding of the job associated with every other position and what everyone else is likely to do in a given situation; they must be able to take the role of the others (Mead, 1934). The more involved the demands of the sport and the more players there are, the more difficult this is. It is not surprising that

early efforts at team sports result in children clustering around the ball, like a beehive. To reduce the psychological demands of the game the number of players should be reduced to the extent that children can understand the roles required and the likely outcomes of their, and others', actions. It also helps if children play in a variety of positions in a team so that they have to develop an understanding of different roles. Many sports have already produced mini versions of the adult game, but coaches should be personally aware of the difficulties faced by children, through no fault of their own, and be able to modify their practices accordingly.

Making team play easier

To overcome the problems that beginners face it helps to adapt the activity to the level of cognitive and social development of the children. Here are some simple guidelines:

1. Modify the rules to make the game easier and so that they are easily understood and applied.
2. Keep the numbers as small as possible; it is easier for children to see what they and everybody else should do.
3. Children learn best by doing, so put them in different positions, giving different roles, to help them to understand their job in relation to others.
4. Start by using simple small-sided situations which only give one or two options, then gradually increase the demands on players by giving opportunities for more complicated decision making and integration as they become more able to cope.

8.3 CONCLUSION

This account of psychosocial development may have given some insights as to why young children can excel in individual sports such as gymnastics, iceskating, swimming and why success in team games comes later. Team games demand a degree of social maturity that is not required for individual sports. Furthermore, children are only ready for competitive sport when they are able to cope with the demands of the situation. Before placing children in formal competitions coaches and parents should recognize the pressures on psychological as well as physical capacities. While there can be no hard or fast rules the results of extensive experience in examining children's sport have led Jay Coakley, of the University of Colorado, to conclude that formal sport competition is not appropriate for children before they are eight years old because of

their limited ability to assume different roles and understand what competition is really about. Until this age the emphasis should be on skill development and until about 12 it should be balanced with the *gradual* introduction of rules, more complicated roles, and strategies. When children reach their teens it is more realistic to introduce formal competition because they are more fully able to absorb the complex relationships involved (Coakley, 1986). Of course there are, increasingly, examples of precocious child athletes but there are also notable examples of those who have suffered because of it, and most coaches deal with those children for whom membership of the sporting elite is not a possibility and for whom youthful sporting experiences are meaningful in themselves, not as a passport to a career.

The psychological development of children has many facets. The ability to reason, the ability to control movements, the dawning of self-knowledge, the ability to establish and maintain relationships, and learning to control emotions are all part of growing up. They also contribute to children's achievement and satisfaction in sports. Hence an understanding of them, however brief, can only increase coaches' capacity for providing satisfying sports experiences for those in their care. This chapter provides the basis for coaches to get to know the personal and social characteristics of their athletes and not to restrict themselves to assessing their physical features and skill when advising them either in the short term or the long term.

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PART THREE

Important Psychological Aspects of Children's Participation in Sport

In Part Three some important topics in the psychology of sports participation for children are discussed. These topics have been selected to give coaches a more complete picture of the ways in which children actually experience taking part. They are concerned with the motives which children have for taking part in the first place, perceptions of the processes of success and failure, causes and manifestations of anxiety, and with helping children set suitable goals for themselves. The reason for selecting these topics is to alert coaches to individual differences in children's experience of sport which may provide insights into how to promote, maintain and deal with problems of interest and motivation which may arise.

One of the major difficulties faced by coaches, and one which may not be immediately evident, is that their motives and goals may be very different from those of the children they coach. Jean Whitehead has made an extensive study of what children in Britain want to achieve in sport. In Chapter 9 she discusses what success means to different children and outlines the main types of goals that they set for themselves. In distinguishing between different types of goals Dr Whitehead shows how coaches and parents can affect children's perceptions of their success by the ways in which they direct their judgements. The importance of coaches in guiding children to set appropriate goals is made very clear. Finally Dr Whitehead shows the relationship between why children drop out and the goals they set for themselves.

Stuart Biddle has made a special study of the reasons people give for the success or failure of their attempts to achieve their targets. In his

chapter he applies his expertise to explaining children's reaction to winning and losing. After an event, particularly after losing, it is common to ask 'Why did I win/lose?'. Dr Biddle explains how children change in their ability to assess the causes and goes on to discuss the important idea that they may actually learn to become 'helpless' when they find that whatever they do doesn't appear to affect their success. Finally he offers advice to coaches on helping children to become realistic in their assessments and so make it easier for them to accept both their successes and failures.

Probably the most frequently discussed issue in children's sport is the distress which children may experience in sport. While this concern should not get out of proportion (it may well be no worse than in other areas of children's lives such as music or doing examinations), it does demand the attention of coaches and parents. Stephen Rowley, of the Sports Council's Training of Young Athletes project, first explains the different types of anxiety which children may suffer and how children differ in their susceptibility to anxiety provoking situations. He goes on to outline causes of performance anxiety and then suggests how coaches can help children cope with anxiety caused by the pressures of competition.

In Chapter 9 Jean Whitehead draws attention to the different explanations of children's sense of achievement in sport and includes reference to the importance of goal setting. Rod Thorpe develops this and gives both a rational basis and practical advice on how to help children set realistic and challenging targets for themselves. He explains the principles of goal setting as a motivational strategy and shows how coaches can incorporate it into a teaching and training strategy in a way which recognizes the individual characteristics of different children.

Why children choose to do sport—or stop

9

Jean Whitehead

SUMMARY

This chapter is about children's motivation in sport. It summarizes their reasons for participating or stopping, then focuses on their achievement goals. The first part is about what children think success is. It outlines the great variety in their views, then examines the most common goals in more detail and considers how they can be met. It shows how some kinds of goals make it easier to feel successful than others, and it explains how goals change with age, and how boys and girls tend to choose different kinds of goals. The second part is about why children leave sport. It describes how dropping out is linked with different types of goal, then explains how children's judgements about their ability change, how goals have different time scales, and how sport becomes less attractive than other activities. A general recommendation is that coaches encourage children to set task mastery or process goals, to improve their feelings of success.

9.1 INTRODUCTION

Research generally shows that children participate in sport in order to have fun, improve skills, belong to a group, be successful and gain recognition, get fitter, and find excitement. Reasons for withdrawing from sport include having other things to do, boredom, lack of success, too much pressure, loss of interest, friends leaving, expense, injury, work, and problems with facilities or support.

These results suggest that it isn't a simple matter to understand children's motivation in sport. Children have many different reasons for the things

they do, and some of their reasons change from day to day. Most importantly, children don't think like adults. For example, their capacity to judge their own ability develops very slowly, so they cannot have clear expectations about how successful they may be in competition. Sometimes children drop out of sport because they do not feel successful in just the way they would like to, and they do not see any way to change the situation. If we are to help, we must first know what success means to them.

9.2 WHAT SUCCESS MEANS TO CHILDREN

9.2.1 A GREAT VARIETY OF VIEWS

I have asked over 3000 children aged nine to 16 years to describe a time when they felt successful in sport. Here are some replies from primary school children.

I did my first back dive ever in front of my brother and my dad.
We were practising and I was the only one who could do it.
I raised £59 for the British Heart Foundation and swam 50 lengths.
I passed my gymnastics badge.
When I scored my first goal for cubs because it was a good goal.
I moved out of the little pool into the big pool.
I scored 2 goals for my team and we won things for my school.
I swam a length with nobody helping me.
I practised and practised then one day I did it.
I swam underwater for nearly a width and I was happy because the instructor said 'You went miles!'

These answers show that children don't see winning as the only kind of success. Indeed, they can even be unhappy winners if they don't think they played well, or happy losers if they know their opponent was very strong. One girl described a successful moment like this: 'It was a competition and I came second and the girl who won was brilliant'.

I found that children had about 16 major views of success that didn't overlap with each other. These views varied somewhat in different age groups, but the 13 most general ones are shown in Table 9.1. This table shows that children have a diversity of reasons for taking part in sport. If coaches understand the wide variety in children's motives and have time to get to know their athletes, it can help them to select a suitable approach for coaching a particular child in a one-to-one situation. For example, a child who is keen to improve can be set some specific goals and asked to keep a training diary to record progress towards each one.

When a coach is working with large groups for short periods it is not possible to adapt to what each child needs. It is then more useful to know

Table 9.1 Children's major reasons for feeling successful

Showing superior ability
Feeling pride in performance
Pleasing other people
Surpassing own limits
Being needed by others
Defeating others
Achieving something independently
Having fun
A feeling of adventure
Improving
Understanding something important
Being noticed
Competing fairly

which goals are most common, so that programmes can be planned to suit the majority of children.

9.2.2 SIX COMMON GOALS

I shall focus on six main goals found in my research (Whitehead, 1990a): demonstrating ability, task mastery, social approval, victory, breakthrough, and teamwork. The first three goals apply to all situations in life when it is important to perform well, for example in examinations and auditions as well as in sport. They were suggested in 1980 by two psychologists in the United States, Martin Maehr and John Nicholls, who had studied the contrasting views of success held by people in different countries and who thought that these three goals might be common worldwide. Glyn Roberts has written about two of these goals in Chapter 1. Martha Ewing (1981), one of his students, was the first to find these goals in school sport.

Demonstrating ability

The aim here is to demonstrate high ability and avoid exposing low ability. Children who have this goal may take part in events when they expect to do well, but try to avoid events in which they expect to do poorly, and drop out when things begin to go wrong. They judge their ability by comparison with other children but not necessarily by direct competition with them.

Task mastery

Children with this goal do not think about other people. Success for them is in mastering the skills for their own sake. They may become so involved in what they are doing that they lose track of time. They don't

avoid tough competition because they have no worry about comparison with others. This goal is particularly important in young children who are learning to master their environment.

Social approval

With this goal, children will try to do whatever they think will please people. They usually put out great effort because they think praise is earned simply by trying hard. Strictly speaking, social approval is not an achievement goal because it may not be given for good performance. For example, children can earn praise by helping with kit. However, it is common in competitive conditions. Children who work to win because they think winning is what pleases their coach or parents have different motives from those who want to win to show their ability.

The second three goals are linked in some ways to the first three, but are more specific to sport or children. They came out clearly in the reasons that children gave me for feeling successful in sport.

Victory

The focus here is on doing better than others in direct competition with them, either by winning or by defeating an important rival or capable opponent. It differs from simply showing ability and is generally stronger in boys than girls.

Breakthrough

Success here is the feeling of breaking frontiers to do something that seemed impossible or is quite new in itself, or finding unexpected inner qualities. It is like task mastery because no one else is involved, but the experience is quite different in quality from anything that has gone before. It is important in children and can link with a feeling of adventure.

Teamwork

Children with this goal emphasize working well in a team, in contrast to achieving something alone. There is a link with the approval motive but the focus is on helping others, not simply impressing them. The teamwork goal fits sport achievement more than school examinations, and it is more important in team sports than individual sports.

9.2.3 HELPING TO MEET THE GOALS

Coaches who understand these goals can help children in at least two ways. First they can include different activities in their programmes to meet the contrasting goals. Here are some examples:

Ability Ask children to demonstrate their skills to others.

Mastery Give attention to improving specific skills.

Approval Praise different aspects of performance and attitude.

Victory Provide graded or handicapped competition to enable all to win.

Breakthrough Introduce exciting new activities, and encourage children not to give up.

Teamwork Help players to co-operate both on and off the field.

A second way for coaches to help is to recognize how the type of goal can restrict children's experience of success, and to help them change to a different type in order to be more successful. This is explained below.

9.2.4 HOW GOAL TYPES LIMIT CHILDREN'S SUCCESS

Table 9.2 shows how the six goals fall into three pairs with contrasting characteristics. These three types of goal actually control how easily children can feel successful.

Outcome goals focus on the results of a competition (e.g. winning) so success depends partly on the opponents. With these goals a child might give maximum effort, exceed previous performances and still fail—because the opposition is better. In contrast, *process goals* focus on what children actually do when performing their own activities (e.g. becoming more consistent in one aspect of their technique) so success is largely under their own control. If process goals are well set by coaches, children can feel some success even when they lose. For example, hockey

Table 9.2 Types of goals

Individual goals	Common features	Type of goal
Demonstrating ability Victory	Superiority over others	OUTCOME GOAL
Task mastery Breakthrough	Personal progress	PROCESS GOAL
Social approval Teamwork	Pleasing others	APPROVAL GOAL

defenders can improve their ability to reposition quickly when possession of the ball is lost. Lastly, *approval goals* are like outcome goals because they place success partly in the hands of other people. For example, even if a child wins, he or she may feel no success if a coach or parent has unrealistically high goals and wanted a better result.

In effect, when children try to beat others or please others, success is out of their control. This makes it important for coaches to include some process goals in their sessions so that everyone can feel some success if they try hard. Process goals are targets for improving the way in which an activity is performed. They can be achieved by individual effort and don't depend on the performance of anyone else. In interactive team sports, however, process goals can also be set to improve team co-operation.

Most children have elements of all these goals, although their importance varies on different occasions. A sensitive coach can use this knowledge, not only to provide realistic praise to meet children's social approval goals, but to choose which behaviour he or she praises or rewards in order to help children set the most appropriate goals. For example, a coach who praises children for trying hard or improving the quality of their performance, not only for good results, will encourage them to set process goals rather than outcome goals.

9.2.5 HOW GOALS CHANGE WITH AGE

In a study of the most common achievement goals, I found that task mastery was most important in primary schools, but the demonstration of ability became most important in secondary schools. This is consistent with the studies that Glyn Roberts and Darren Treasure report in Chapter 1. Young children are more concerned with mastering their own environment and developing their own skills than with beating others—at least until someone tells them that it is important to win!

When I looked at some of the additional goals, I found that fun and breakthrough were important in primary school children, and motives for independence and perfection developed later. Teamwork was important by adolescence. Teenagers had clearer ideas than younger children about which actions would earn approval, and were more concerned with the views of their friends than with the views of adults.

Young children need realistic praise from others, not only to satisfy their social approval goals but also to indicate how well they are doing in meeting their other goals. For example, children are not good at judging their own ability so they rely on other people to tell them how well they are doing in mastering skills, and how they compare with other children.

This places a great responsibility on coaches and parents not to set standards which are too high for a child's ability and will lead to disappointment if they cannot be met.

9.2.6 HOW GOALS DIFFER IN BOYS AND GIRLS

Some research shows that boys and girls tend to prefer different kinds of achievement goals, but the differences are not consistent in all conditions. More frequently boys are concerned with the outcomes of their performance, and girls with its quality. Martha Ewing (1981) found that teenage boys tended to expect that success would lead to external rewards, like fame and popularity, but girls viewed it more in terms of bringing self-satisfaction. Boys were generally more depressed than girls by failure. I found that victory was clearly more important to boys, and social approval to girls.

In a nutshell, this indicates that boys will generally be more attracted by competition than girls will. It suggests that some girls will even avoid sports programmes that are very competitive, although they may like the sporting activities themselves. Coaches of competitive teams will naturally have met the many girls who are exceptions to this overall tendency, but if more of the average adolescent girls are to remain in sport and experience its benefits, coaches may need to give opportunities for them to enjoy the sporting activities for their own sake without competitive pressure.

Although motives for recreational and leisure sport participation are somewhat outside the scope of this chapter, it is worth noting here that Leo Hendry (1992) at the University of Aberdeen has shown a consistent trend for adolescents to move away from organized sporting activities to casual and commercial leisure activities.

9.3 WHY CHILDREN MAY GIVE UP SPORT

In general, sport participation increases in primary and middle school years and decreases in upper school years, and boys do more sport than girls (Whitehead, 1988). This may be partly because more teams are run for boys than girls, so they have more opportunities. The lack of suitable opportunities and support to develop their talents may sometimes cause children to withdraw from sport, but their achievement goals generally have more to do with it.

9.3.1 HOW SPORT GOALS INFLUENCE SPORT PERSISTENCE

The type of goal that children have affects the length of time they may stay in sport. Martha Ewing's (1981) pioneering work showed that the

continuing competitors in an American high school were more oriented towards gaining social approval than the drop-outs who were more oriented to demonstrate their ability. Other researchers, for example Joan Duda (1992), report that ability-oriented motivation is generally linked with dropping out rather than continuing in sport, although it depends also on the situation and on children's views of their ability. It is initially surprising that children who most want to do better than others would drop out of sport, but it is understandable when one recalls that most participants cannot be winners. Hence if the *only* goal that children have is to show superiority and they aren't able to do this, they may drop out. The same thing would probably happen if children had any other single goal that was not being met in sport, and this indicates the desirability of helping children to develop multiple goals.

Of course, other factors could also influence Dr Ewing's finding. In some sports it may be quicker and easier to gain approval than to show ability. In many American sports, for example, a boy who sits on the bench hoping to play can more easily gain approval for loyalty than he can show his ability! So children who seek praise may stay in sport while those who want to show ability drop out if they get little chance to play.

This suggests that dropping out is partly influenced by perceived *opportunities* to meet different kinds of goals, and that sometimes there may appear to be more opportunities in sport to meet social approval or task mastery goals than to demonstrate ability. If ability-oriented children are to stay in sport, coaches must therefore give them many opportunities to show their ability. Also children like to be part of the action, so they prefer to play and lose rather than sit out while their team wins.

However, different goals can influence withdrawal in different situations. I followed up some young sports club competitors for two years (Whitehead, 1990b) and found that the drop-outs from athletics had higher motivation to show superiority than did those who persisted, but the drop-outs from rugby had lower motivation for teamwork.

This suggests that coaches need to think what opportunities there are for different goals to be satisfied in their particular sport. Stella Wilson (1989) compared the achievement goals of international synchronized swimmers and squash players and found the teamwork goal to be relatively higher in synchronized swimmers and the victory goal to be higher in the squash players. It further suggests that the motivational climate, which Glyn Roberts wrote about in Chapter 1, varies with the sport. It also varies with the context. I found differences in the goals that led children to leave school sport and club sport—and in the middle school age group and the upper school age group. One reason

for this is because children's judgement of their ability changes with age.

9.3.2 HOW CHILDREN CHANGE IN JUDGING THEIR ABILITY

John Nicholls (1989) has reported a comprehensive series of studies in which he and others have shown how children go through four stages in learning to distinguish between effort and ability as causes of their performance. In primary schools, they generally think that success comes simply from trying hard, but by secondary school they can see that effort by itself is not enough, because their ability puts a limit on their possible performance.

When they see the great importance of ability, several things may happen. If they like to show ability but don't think they have enough of it, they may drop out because they don't want others to know this or to see them fail. On the other hand, if they are keen for social approval but think that ability is the only thing that is approved of by their coaches, I suspect they may also drop out. Certainly teenagers think that coaches value ability very highly. One group who answered questionnaires for me thought that their coaches valued (1) winning or showing ability, (2) effort or trying hard, and (3) having fun. They ranked these things in the opposite order for themselves!

This withdrawal from sport because of a perceived lack of ability can restrict the potential development of an individual child, and is particularly likely to affect late developers who temporarily lack speed, power or other physical attributes when compared to their peers, but who could eventually become very good. It is therefore particularly important for coaches and parents to show that they value things other than ability.

9.3.3 HOW GOALS HAVE DIFFERENT TIME SCALES

All goals can lead to children dropping out if they are not met, but children also leave sport when their goals *are* met and some goals have shorter time scales than others. For example, if a child participates in a new sport because of curiosity about what it is like, this goal will be quickly met. If curiosity goals bring youngsters into sport they will rapidly take them out again as they seek novelty elsewhere. However, a good coach can keep curious children coming by 'keeping them guessing' about what is coming next, and including amusing new activities. In this way the children may remain long enough to develop other goals which will be more enduring.

Children's approval goals are met as long as people seem pleased with what they are doing, particularly if these people are important to

them. Such goals could keep young people in sport for a life time because praise can be given by so many people for so many things—even when skills are no longer improving or if ability is low. However, children who aim to please may leave sport when important people want them to.

Mastery goals can keep youngsters in sport for years because skill learning takes time and there are always more complex skills to learn. However, mastery-oriented youngsters may lose interest if everything is too easy for them. Because they enjoy challenge they may not be happy with a very easy win, whereas a child who is oriented to demonstrate superior ability may revel in an easy win.

Outcome goals may be effective only as long as youngsters get good results, and the same thing may apply to extrinsic rewards, like prizes or badges. Deci's (1975) theory of intrinsic motivation explains that, depending on how they are used, rewards can actually reduce teenagers' own intrinsic motivation. Then when the rewards are no longer available, the activity is no longer attractive. In contrast, children who take part for the physical thrill of the activity itself may be the most persistent participants because they can't be turned off by the sport, only frustrated by deprivation of it! Mastery goals, which are associated with the process of performance, are linked with longer participation in sport than competitive outcome goals (Duda, 1985).

9.3.4 HOW SPORT BECOMES LESS ATTRACTIVE THAN OTHER ACTIVITIES

So far it may have seemed that children enter or leave sport because of what they think about success in sport. But they are more likely to leave because other things in their lives are becoming more important. The commonest reason given for leaving is simply having other things to do (Gould, 1988). Sometimes this may cover up a more sensitive reason such as worry about a lack of ability, but children's priorities do change in adolescence.

Glyn Roberts in Chapter 1 reports Joan Duda's (1981) finding that success in sport was more important to North American teenagers than success in schoolwork. This is not the case in Britain, where the examination system, school leaving age and routes to success in sport and higher education differ from the USA. I found that success in schoolwork was consistently more important than success in sport in teenagers aged 13 to 16, particularly in girls (Whitehead, 1987). Moreover, with increasing age the relative importance of both of these activities declined in comparison with other things in the youngsters' lives, like music, going out with friends, TV, reading and computers. Interviews with the competitors who had withdrawn from the rugby or

athletics teams suggested that long term objectives, perhaps to do with a future career or family, were becoming important. Anita White and Jay Coakley (1986, p. 21) found that young people reached a participation turning point when they thought their skills were at a peak in a particular activity and that further improvement would demand more time and energy than they were willing to commit, given their expanding interests.

One theory of behaviour explains this by arguing that people participate in an activity when its 'benefits' or attractions exceed its 'costs' or disadvantages. When children have been in sport for some time they will have experienced most of its benefits. Its relative costs then increase because more time, money or effort may be needed, and schoolwork or friendships may suffer. These rising costs are accepted only by those who hope for increasing benefits such as selection for higher level competition. Withdrawal may also occur because activities with lower costs and more benefits are available. For example, two boys may see equal benefits in sport but one may stop before the other because he has more attractive alternatives such as a part-time job or a girl friend.

Lastly, some young people may develop a dislike for sport because of bad experiences, such as injury, exhaustion, embarrassment, ridicule, or rejection by coach, team-mates or others. Physical and emotional stress, whether within the sport or related in some way to it, can cause withdrawal. However, if coaches understand children's needs and do not make unreasonable demands on them, nor allow others to do so, such experiences should be relatively rare. Coaches can also actively show a sense of humour and encourage fun, because children experience less stress when they have more fun.

In summary, children may *choose* to leave sport because they have reached their original goals or decided they cannot reach them, or because they have developed a liking for other activities or a dislike for sport. Alternatively they may be *forced* to leave because they become injured, move house, have problems with money or transport, are dropped from a team, or their club closes. Some of these reasons are outside the coaches' control, but others are not. A better understanding of children's motives can help coaches to adapt practices to improve the satisfaction that children gain from their experience in sport. Most importantly it should not be assumed that there is a fault in the child or the sport programme if a child withdraws. There could be much benefit in replacing the term 'drop out', which implies some kind of deficiency, with the notion of 'drop in'. Then it may be realized that children drop in to sport for a period of their lives, in order to further their personal development, then 'drop in' to other activities to continue this process on a firmer foundation.

9.4 CONCLUSION

This chapter has emphasized that children have contrasting views of what success is, and that these views differ with age, gender and type of sport. Children's interpretations of success will influence their enjoyment and behaviour, how hard they try in different situations and how long they continue in sport. In particular, if children are keen to do better than others, but don't think they have enough ability or opportunity to do this, they may drop out.

Coaches can improve children's feelings of satisfaction by recognizing the differences in their views, including activities to satisfy different goals, encouraging children to set process or mastery goals, giving them plenty of opportunities to play, and showing that winning is not the only important thing in sport. Then when children leave sport for other activities in life, they will carry with them the fruits of a positive experience.

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How children see success and failure

10

Stuart Biddle

SUMMARY

It is important to understand how children view the reasons associated with success and failure in sport. This chapter summarizes reasons often given by children and what consequences these may have for the way they feel and act in sport. Practical applications centre on the best ways of using this information for making sport a positive experience for all children.

10.1 INTRODUCTION

A friend of mine told me with great pride that he had recently completed a marathon. However, in response to my somewhat insensitive question of 'What was your time?' he simply threw up his arms in frustration and said 'Oh, don't ask me that! I just wanted to finish!'

I appeared to have fallen victim to the obsession that we have in sport of relying almost exclusively on the result rather than the process of participation. We often forget that simply taking part is what spurs many people on. My friend had the goal of completing a marathon. He succeeded, yet my definition of success appeared to centre only on the time it took. Nevertheless, sport must involve some recognition of competition and consequently the result cannot be ignored. Indeed, to many people the result is all-important, while to others the process of competition is just one way of taking exercise, meeting a personal challenge or enjoying the company of friends.

For many children who play sport, success and failure, and winning and losing are likely to be important considerations. Sport is an environment where one's competence is on display, and for certain age

groups (e.g. adolescents), it is very important to demonstrate competence in front of friends.

This chapter, therefore, will address the issue of how children view success and failure in sport. The kinds of reactions to success and failure will be discussed first, then the consequences of these reactions will be considered from the viewpoint of the child and the coach—child relationship. Practical considerations and recommendations will be given throughout.

10.2 ASKING THE 'WHY?' QUESTION AFTER SUCCESS AND FAILURE

In the 1960s and 1970s, psychologists working in education were interested in how children and college students evaluated the results of examinations. After numerous studies a pattern emerged. First, people gave reasons associated with themselves if they passed the exam, so they would make replies such as 'I passed because I studied hard', or 'I passed because I'm good at this subject'. Second, those who failed the exam often made statements referring to outside influences or things outside of their control, such as 'I failed because the teacher set the exam at the wrong level', or 'I failed because I was unlucky with the choice of questions on the paper'. What these researchers found, therefore, were four main reasons people gave for their exam result. These reasons—referred to as 'attributions'—were labelled effort, ability, difficulty of the task and luck. Other factors were also thought to be important, of course, but these were identified as the main attributions for examination success or failure (see Weiner, 1986).

During the 1970s, sport psychologists started to ask similar questions about winning and losing in sport. For example, competitors were requested to rate the extent to which winning or losing a game was the result of effort, ability, task difficulty or luck. Similar results to those in the classroom also emerged in sport with winners reporting factors associated with their own ability and effort more than losers. This came to be known as the 'self-serving bias' whereby successful participants tended to attribute success to themselves but failure to a mixture of factors, some of which were unrelated to themselves. This bias is thought to be a conscious effort by the participant to 'feel good' after success and not so bad after failure. Similarly, in team sports it has often been reported that players take credit for team successes and do not take the blame for team failures. This was once referred to as the 'I'm OK but the team's so-so' phenomenon! [See Biddle, 1993].

10.2.1 LITTLE BOXES: CLASSIFYING ATTRIBUTIONS

In order to make better sense of these reasons, one of the main

		Source of Attribution	
		Internal	External
Stability	Stable	Ability	Task difficulty
	Unstable	Effort	Luck

Fig. 10.1 An early classification model of attributions in the classroom

researchers studying this field, Dr Bernard Weiner, drew up a model to classify attributions (see Weiner, 1986, 1992). He suggested that attributions could be placed along two continua or dimensions: locus of causality and stability. The locus dimension referred to attributions that were associated with the person ('internal') or not associated with the person ('external'). For example, effort and ability were considered internal whereas luck and the task were considered to be external attributions.

The stability dimension classified attributions according to whether they were stable and unchanging over time, such as ability or the task, or whether they were unstable and variable over time, such as luck and effort. This classification allowed for a simple model to be drawn up, as shown in Figure 10.1. More complex models have also been developed, but this one should be sufficient to understand the main points.

The same model was also suggested for sport situations, although the number of attributions made in sport was thought to be higher than in examination situations and the placement of the task attribution was moved. A sport-related model, therefore, is shown in Figure 10.2 (Roberts and Pascuzzi, 1979). The consequences of making attributions along these dimensions will be discussed later.

10.2.2 DO CHILDREN REALLY MAKE ATTRIBUTIONS, EXCEPT WHEN ASKED?

Although children will make attributions, young children (i.e. below about 10–11 years of age) probably find it difficult to distinguish between

		Source of attribution	
		Internal	External
Stability	Stable	Stable ability	Coaching
	Unstable	Unstable ability (form) Practice Effort	Luck Task ease

Fig. 10.2 A model of sport-related attributions (adapted from Roberts, G.C. and Pascuzzi, D. (1979) Causal attributions in children's sport; some theoretical implications. *Journal of Sport Psychology*, 1(3), 203–11)

some factors. For example, children aged 5–7 years appear not to be able to differentiate too easily between effort, ability and outcome. They tend to report that those who try hard are successful and if you are successful you must have tried hard. Children at five or six years tend to think of success and failure from a personal, rather than comparative, orientation. Finishing the race is a success, regardless of place. Slightly older children—at about 6–7 years—start to adopt a more normative comparative perspective. Now they start to think whether others can do the task or not. Tasks that are 'hard' are those few others can do. Children at 7–9 years are strongly focused on effort as the cause of outcomes, whereas from 9–10 years, ability and effort become differentiated as ability is seen as 'capacity' and that this will limit the effect of effort on the outcome (Duda, 1987).

Researchers into attributions have often questioned whether people actually do make attributions, except when asked by an attribution researcher! A review of studies that looked at 'spontaneous' attributions (those made without prompting) concluded that attributions are made during everyday life, and particularly when a goal has not been achieved or when the outcome is unexpected (Weiner, 1985). This suggests that losers, or those thinking they have failed, will engage in more attributional thinking than winners or those seeing themselves as successful.

Just to show that attributions really are made, a report on a recent American football game said that 'the coach has eliminated bad luck, biorhythms, and sun-spots as the reasons why his football team has lost 9 of its last 10 games. Now he's considering the unthinkable possibilities of

(a) he has lousy players or (b) they aren't really trying'. One of the most famous sports quotes of all time is based on attributions. Gary Player, the South African golfer, on hearing that his successful putt was labelled 'lucky', retorted, 'Yes, the more I practise, the luckier I get!'. Of course, his somewhat ironic remark was aimed at highlighting the link between practice (effort, not luck) and outcome. This reminds me of the comment made by a 14 year old after I had asked a group of children to see if they could touch their fingers behind their back with one hand going up the back and the other down. On concluding that he had 'failed', the boy, in response to my question 'What does this test tell us about flexibility?', replied 'I've got really short fingers!' Misattribution at its best!

Another example of 'real life' attributions was given by Mike Gatting, captain of the England cricket team at the time, when he said after his dismissal at the hands of Allan Border in a World Cup match, 'Perhaps as it was Allan's first ball, I must accept limited responsibility'. By attributing a 'failure' like this to himself it is likely to affect the way he feels and acts. This will now be considered.

10.2.3 MAKING ATTRIBUTIONS: DOES IT REALLY MATTER?

The attributions given by children can have important consequences for the way they feel about the sport in question and their future motivation towards it. Using the models illustrated in Figures 10.1 and 10.2, it is possible to trace the likely consequences of making attributions.

Self-confidence

One of the predictions from the early research on classroom attributions was that expectations about future successes and failures could be made from knowing the stability of the attribution (Weiner, 1986). For example, attributing success to a stable factor, such as personal ability, predicts future success. Similarly, stable attributions for failure will predict future failure. Unstable attributions, however, do not allow clear predictions since, by definition, the attribution is changeable. For example, attributing success to your own effort does not predict success since next time you may decide not to try so hard. Hopefully, success can be attributed to stable factors as this sets up a positive confidence cycle, as shown in Figure 10.3.

Children's feelings

The attributions we give for sport performance can help determine how we feel about the performance. For example, children who attribute a

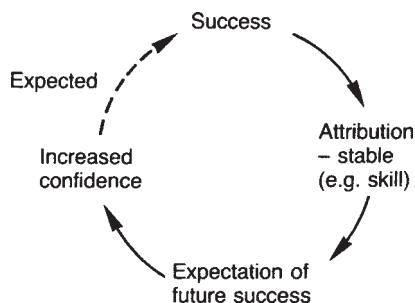


Fig. 10.3 A confidence cycle associated with stable attributions for success

win in a race to having tried hard are likely to feel more pleasure and pride than if they thought it was due to luck or weak opposition. The type and intensity of emotional feeling, therefore, is thought to be related to the attributions given.

My own research has focused on this issue and found support for three main propositions:

- (i) emotions are more likely to be related to internal rather than external attributions;
- (ii) emotions associated with self-esteem, such as pride, are more likely to be felt after internal attributions given for success in *important* events;
- (iii) in addition to attributions, emotions felt after sport are strongly associated with how we think we played, rather than the result of the game (Biddle and Hill, 1988, 1992a, 1992b).

Feeling helpless

There has been a great deal of research on how children react to failure in the classroom (Dweck, 1989). Why is it that some children are spurred on to greater effort, while others slide down the spiral to despondency and apathy?

A series of experiments by Dr Carol Dweck at the Universities of Illinois and Harvard showed that the reactions of children to failure were related to the attributions the children gave for such failures. In particular, children who felt that their failure was due to their own lack of ability were most likely to give up. Such apathy was termed 'learned helplessness' since these children believed that no matter how hard they tried, they would not succeed. Such children tended to dwell on negative thoughts whereas other children who did not display such reactions to

failure tended to think more positively after failure, rarely doubted their own ability, and sought out solutions to problems. Dweck called these children 'mastery-oriented' (Dweck, 1980).

If their attributions predicted a helpless or positive response to failure, Dweck summarised, then changing children's attributions for failure should change their reaction to failure. This led to Dr Dweck conducting a study on the 'retraining' of attributions (Diener and Dweck, 1978). She caused two group of young children to fail at a task and then gave one group periodic success while the other were taught to think that their failure was due to their own lack of effort. This was the attribution retraining group. After future failure, the attribution retraining group showed a positive response and improved their performance. However, the 'success' group did not improve as their attributions remained the same. By allowing the attribution retraining group to think that failure was due to lack of effort, they were shown that there was an escape from failure—more effort. A possible attribution retraining sequence is illustrated in Figure 10.4.

Although attribution retraining has been shown to be successful (Forsterling, 1988), a word of caution is called for. Effort has been referred to as the 'double-edged sword' of achievement because if children fail after thinking that they tried hard, it is likely that they will make attributions to low ability. This is to be avoided as it could lead to learned helplessness. For this reason, while the principles demonstrated by Dr Dweck are probably correct, it may be better to reattribute failure to something like 'wrong playing strategy' rather than low effort. Whatever the new attribution is, it should be a factor open to personal control and influence.

10.3 THE MEANING OF SUCCESS TO CHILDREN

In addition to understanding the attributions children make in sport, parents and coaches might also find it interesting to consider the question 'What is the meaning of success to children?'. This is more than just an academic question. To understand how children define success in sport should help us promote motivation and enjoyment.

It has been suggested that children have at least two ways of defining success in sport:

1. Ability or ego orientation: children supporting this orientation have as their main goal the demonstration of superior ability relative to others. This is called an *ego goal* as it is 'other person' referenced. Such children will tend to focus on ability, believe that sports success is related to ability, and hence make ability attributions.
2. Mastery or task orientation: children supporting this orientation have as their main goal the successful completion or mastery of a

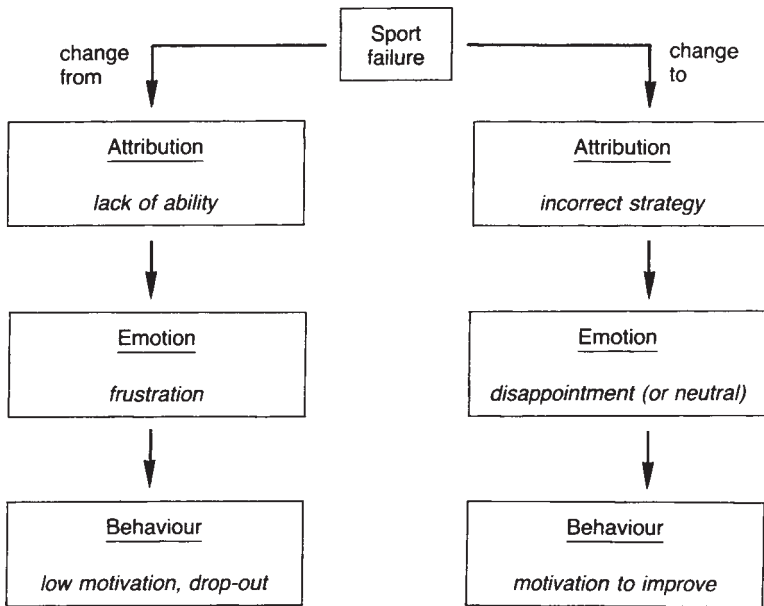


Fig. 10.4 A possible attribution retraining sequence task, or self-improvement. This is called a *task goal* as it is self-referenced. A task goal has been associated with effort attributions since these children believe that high effort brings success (Duda, 1987; Duda, Fox, Biddle and Armstrong, 1992).

As suggested, the type of goal adopted by the child will affect the type of attribution used. We have already said that attributing failure to lack of ability may have particularly negative consequences. As a result, one might cast some doubt on the wisdom of encouraging an ego goal. It is likely to force children into defining success as winning rather than self-improvement. Not all children can win regularly whereas many children, if not all, can improve on their own performance. The ego goal is likely to be most damaging when the individual lacks self-confidence. This is shown in Figure 10.5.

A recent study of ours at Exeter (Duda *et al.*, 1992) has shown that higher levels of enjoyment in sport reported by 11–12 year olds are associated with having a task goal rather than an ego goal. In fact, boredom was more associated with the ego goal. In short, it appears that the promotion of a task orientation is to be recommended for enjoyment and motivation in children's sport.

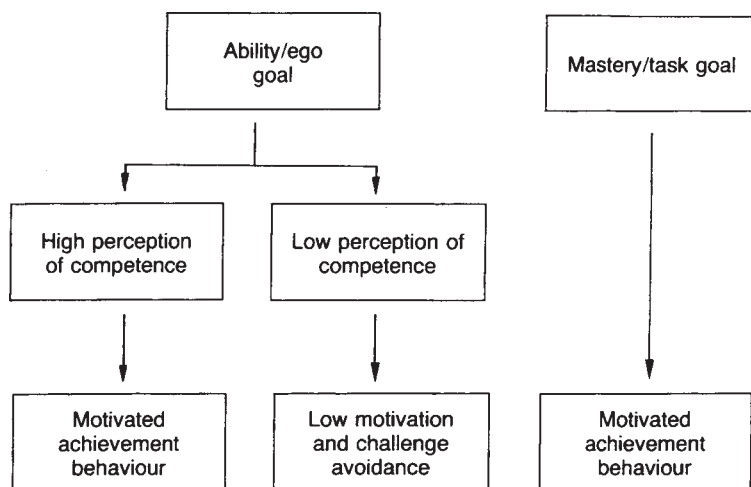


Fig. 10.5 Possible consequences of different goal orientations in sport

10.4 HOW OTHERS SEE CHILDREN'S SUCCESS AND FAILURE

While concentrating on how children see success and failure, this chapter would be incomplete without considering how other people, such as parents and coaches, see this process too. It is common for other people to make their own judgements about why they think the child succeeds or fails. For example, let us consider the girl who has just finished a tennis match in a local tournament. She has lost the match and has the following thoughts:

'I tried hard, but...'

'I tried to keep her on the baseline, but she was too strong with her ground strokes.'

'I guess I did all I could, but she was a good player...I should be OK with more work on my second serve.'

Now along comes her coach. The first thing she says is 'Come on Steffi, you were really lazy today!' Immediately an attributional conflict has been created. The child believes she tried hard, but the coach says she didn't. Fortunately, the child believes that she can make progress in the future, with practice. However, if the coach gives an attribution that future success is unlikely ('you've got a tremendous amount of work to do if you're going to make it!'), then self-doubt can creep in.

Coaches, and others working with children, should allow children to make their own attributions first. They should then give their own thoughts in a constructive manner without causing unnecessary conflict.

After 'failure' or defeat, try to look towards positive factors which can be controlled in the future.

10.5 CONCLUSIONS AND RECOMMENDATIONS

By studying attributions made by children in sport, as well as understanding the goals adopted by children, we move closer to the situation of seeing sport from the point of view of the child. Dr Charles Corbin, a leading American physical educator, in his book on primary school physical education (Corbin, 1976), recalls an article published in 1952. In this article the author speaks of the 'Principle of priority of man' ('man' here is used to refer to all humans—it was 1952!). This principle states that the interests and needs of people must take priority over activity; and the worth of every activity is measured in terms of its contribution to the advancement of people. Dr Corbin then applied this principle to children in sport. He said:

Too often we ask 'What's wrong with sport for children?' This is the wrong question! The child's involvement in sport is for the benefit of the child. The question should be 'what does the sport do for the child'?

He goes on to question the motives of those who put the activity first and the child second and violate the principle of priority of man. Dr Corbin gives four examples of ways in which sport is done for sport's sake:

1. not adapting sport to meet the needs of all children;
2. using full-size courts and equipment instead of adaptations more suitable for children;
3. excluding girls;
4. copying 'big time' sports.

He says

if we *really* were designing play experiences for *children*, I suspect that the activities we provided would be much different than what we currently offer...Sport, including winning in sport, should never be more important than the benefits of the sport for sportspeople.

These general comments are made so that we can put sport into its proper perspective for children. This should include an understanding of the way children think about sport and the attributions they make.

In conclusion, therefore, the following points are made from the information presented in the chapter.

1. Children will make attributions in sport, particularly after failing or losing.
2. Self-confidence could be related to the attributions made, particularly whether the attributions are stable or unstable.
3. Children are likely to experience emotion that is a consequence of the way they thought they played. However, in addition, emotions will be related to their attributions.
4. The nature and extent of negative feelings after failure will be a function of the attributions made and the importance attached to winning. Coaches can reduce the importance of winning by highlighting personal performance instead.
5. Avoid children feeling helpless by helping them reattribute failure to controllable factors rather than just providing 'instant' and 'easy' success.
6. Avoid attributional conflict by asking for the child's attributions first.
7. Try to understand the meaning of success to the individual child. An ego goal may be dysfunctional for some children, particularly if they lack self-confidence. A task goal may be more appropriate.
8. Children are not miniature adults. They will not always think and act in the same way as adults and they should not be expected to handle success and failure in the same way. Children learn the process of competition from the people around them. Let's help them learn in the best possible way by providing an environment rich in personal challenge. Let's put into practice the 'principle of priority of *children* in sport'!

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Causes of children's anxiety in sport

11

Stephen Rowley

SUMMARY

Over the past few years concern has been expressed about the cumulative effect which repeated stress and anxiety, caused by taking part in youth sport, may have upon the emotional development of the child. However, research has so far failed to provide any data to establish the number of young athletes suffering from sports related anxiety, or to indicate why some appear more resilient and cope with the anxieties caused by sports participation better than others.

The aim of this chapter is twofold. Firstly to provide a general guide to the different causes of anxiety in childhood and adolescence with specific reference to sport; and secondly to describe ways in which the coach and parent can identify and help the anxious child.

11.1 INTRODUCTION

Perhaps the most universal and potentially most disruptive emotion found amongst children and adolescents taking part in competitive youth sport is anxiety. The effect it has upon a child's behaviour and performance varies considerably, as do the things which make children anxious; much depends upon the youngster's ability to cope with the threat and uncertainty posed by particular situations within sport. Yet despite numerous attempts by researchers to describe reasons for individual differences in its cause and effect, for the coach, parent or athlete involved with the practicalities of coping with anxiety, the emotion remains ill-defined and poorly understood.

Until recently, most coaches were mainly interested in understanding

how anxiety affects performance: the experience of anxiety is often associated with poor performance. Lately, however, concern has been expressed by coaches, parents and educationalists about the cumulative effect which repeated stress and anxiety, caused by taking part in youth sport, may have upon the emotional development and well-being of the child. Such has been the worry that some are now questioning whether young children should be involved in organized training and competition at all. The reason given is that children are not old enough to cope with the anxieties generated by the sports environment. Yet although potential sources of stress have been identified by sports psychologists, they have failed to provide any data to establish the numbers of young athletes suffering from anxiety or why some cope with the anxieties caused by sports participation better than others. Little attention has been given to evaluate ways in which youngsters can learn to cope with the effects of sports related anxiety. Moreover, it is wrong to assume that there is a tidy relationship between a stressful event, anxiety, age and coping. Studies monitoring the effect on children of such stressful life events as divorce or death of a parent do not suggest that vulnerability to emotional problems such as anxiety increases or decreases at any particular age. Furthermore, it has been suggested by Albert Bandura (1977), an American social psychologist, that avoidance of stressful or anxiety provoking situations will hinder the development of coping skills. Preventing children from taking part in sport will not therefore stop anxiety but may only delay the age at which it might occur.

Part of the problem lies in the fact that anxiety, like stress, is a concept understood by all, as long as it is used in a sufficiently vague and general way. A more comprehensive understanding of the cause and also the role of anxiety in youth sports has proved elusive mainly because of the failure of many researchers to take account of the child's emotional development—in children the cause of anxiety changes as the child progresses from infancy through childhood to adolescence. But also too much emphasis has been placed upon the competitive situation itself as the main cause of anxiety rather than the personality and motivation of the performers, their families and coaches.

11.2 ANXIETY IN CHILDREN AND ADOLESCENTS

Normal anxiety is usually described as an unpleasant state of psychological tension, often accompanied by physical symptoms, caused by anticipation of a threatening event or situation. The onset, severity and duration of anxiety vary. It may come on gradually over a period of minutes or hours, or it may strike without warning. It may last for only a few seconds or for hours or even days. In children the number of

situations or events which cause anxiety increase as they grow older. Typically, anxiety in childhood and adolescence takes five main forms: generalized anxiety, separation anxiety, social anxiety, performance anxiety and fears and phobias. The main features of each type of anxiety are described below.

Generalized anxiety describes worries or fears which are not isolated to any one situation or event but which are generalized by the youngster to cover a wide range of future events.

Separation anxiety is caused by worries about real or imagined separation from a parent because of illness, injury or death.

Social anxiety is caused by fears or worries about loss of friends, attractiveness or meeting new people.

Performance anxiety can occur when the child is called upon to take a test, speak in front of others in the classroom, or compete against someone in sport.

Fears and phobias are extreme states of anxiety linked to particular objects, persons or situations. For example, visiting the dentist or having an injection are common childhood fears. In some cases, though, extreme fear can result in the child avoiding certain situations (phobias).

Each of these different types of anxiety has a part to play in the normal child's emotional development although their importance alters as the child grows older. Dangerous or unfamiliar situations or separation anxiety from parents are characteristic anxieties of the very young child. The older child is more threatened by social anxieties such as loss of friendship, whereas the adolescent is more concerned with fear of failure, ridicule or any situation which involves evaluation by peers or significant other people such as a parent, coach or friend. These sorts of worries are the ones most often expressed by youngsters taking part in sport, and are good examples of performance anxiety. However, it is important that coaches who deal with very young children should not discount the effect which separation anxiety, caused by real or threatened separation from parents, may have upon performance.

Characteristically the sensations of anxiety include psychological, physiological and behavioural components such as loss of concentration, worry, rapid heart rate, nausea, stomach ache, fidgeting, restlessness and fatigue. There are some effects, however, which deserve particular mention because of their importance for young performers.

11.2.1 PHYSIOLOGICAL EFFECTS OF ANXIETY

The physiological effects of anxiety are many and varied. They include, for example, increased heart rate and blood pressure, sweating and stimulation of metabolism. One important effect involves a change in muscle tension. Anxiety increases muscular tension in the body which

may reduce the effectiveness of certain muscle groups, particularly in sports which involve repeated or dynamic muscular effort such as soccer, swimming or athletics. Sustained muscular tension also leads to an accumulation of lactic acid which causes pain, stiffness and fatigue.

11.2.2 PSYCHOLOGICAL EFFECTS OF ANXIETY

The psychological effects of anxiety include an inability to make decisions, forgetfulness and impaired concentration. A wide variety of research is available which suggests that the ability to concentrate or focus on the task in hand is advantageous in performance settings. In contrast the tendency to self-preoccupations or self-focusing has generally been associated with poor performance. Michael Mahoney (1979, 1983), an American psychologist who has worked with Olympic gymnasts, has suggested that the ability to concentrate or focus on the task at hand is what makes the difference between highly successful and less successful athletes. Better performers are able to control their attention, remain task oriented and block out distractions. Athletes who focus on themselves and how they are doing, and view themselves from an external perspective tend to perform less well because they focus on their own negative characteristics which may increase feelings of anxiety.

The intensity of the psychological and physiological reaction caused by performance anxiety depends upon the significance of the situation—whether it is perceived by the young athlete as irrelevant, benign, stressful or challenging—and his or her ability to cope with a perceived danger or threat. Research in child psychology suggests there are several different factors which influence children's ability to cope with stressful situations. These include the sex of the child, the presence or absence of support from the parent or coach, the child's intelligence and other problem solving skills.

Sex differences

Unlike the pattern which emerges during adolescence and which continues into adulthood, before puberty boys are more vulnerable to emotional problems like anxiety than girls. The reasons for this difference remain unclear although it has been suggested that parents are less supportive of boys in their attempts to cope, or the perceived importance of stressful events like sport may sometimes be greater for boys.

Social support

The presence of close, supportive relationships with family, friends or the coach plays an important part in protecting the child from stress. If

children feel they can talk about their worries and anxieties to someone it significantly decreases the symptoms of physical and psychological stress.

Intelligence

There is some evidence from research in psychology that good intelligence and school achievement may also act as a protective buffer from stress and anxiety. Little is known about why this should be so, although it may be that these children have high self-esteem or better problem solving skills than their peers.

11.2.3 INDIVIDUAL DIFFERENCES IN PERFORMANCE ANXIETY

Anxiety can range from mild arousal, characterized by 'butterflies in the stomach' and anticipation of the tournament, match or competition, to extreme fearfulness, panic and, occasionally, avoidance of the performance situation. This avoidance need not necessarily mean retirement or giving up sport—an athlete may pretend to be ill or injured in order to cope with the threat of a particular competition. Injury proneness may provide an acceptable form of retreat from sport seen by the child as socially, psychologically or physically threatening. However although this defence against anxiety may be useful in the short term, it could result in the athlete developing a mental barrier about training or competing if used persistently.

These types of extreme anxiety states can develop in all children. However, often they arise because of a pre-existing tendency within the child to react with increased anxiety to a wide range of ordinary stresses seen by other children as non-threatening or challenging. The term 'trait anxiety' has been developed to describe these individual differences in anxiety proneness. Children high in trait anxiety tend to view the world as more threatening than children with low trait anxiety: and they tend to respond to their perceptions of threat with more frequent increases in state or real anxiety. In sport, research consistently indicates that children who are high in trait anxiety show greater state anxiety before and during a competition than their contemporaries with low trait anxiety. The tendency to respond with high levels of anxiety is characteristic of children with poor self-confidence and low self-worth, who feel they have little control over events or situations. These thoughts and feelings often become self-perpetuating. Children like this regard effort and persistence in the task as self-defeating and so reduce their exertion ensuring a mediocre performance.

11.3 PERFORMANCE ANXIETY IN YOUTH SPORT

There are three major causes of performance anxiety in children's sport—the attitudes and motivations of parents and coaches, the attitude of the athlete him or herself, and overtraining or staleness.

11.3.1 SIGNIFICANT OTHERS: PARENTS AND COACHES

For many parents and coaches the young athlete can be a source of vicarious enjoyment and success. Parents report feeling 'great pride' and 'living out (their) own fantasy' through their child's sporting endeavours. Alternatively, observers of youth sport have proposed that when adults become involved in children's sport they have a tendency to place unreasonable demands on the young athlete, following ambitions of their own and placing an excessive emphasis upon winning. Under these circumstances children learn to fear evaluation from their parents who 'watch them like a hawk', or video the whole performance for later analysis. This can result in some young athletes developing unrealistic hopes and commitment to training as feelings of personal worth become equated with success in sport; a fear of failure or rejection may result if parental love is perceived to be contingent upon winning.

Kate, an 11 year old swimmer, is a typical example of this group. Her training load had increased and she had recently begun to feel anxious before training. Her main worry was that she would not be able to keep up with the other swimmers and that the coach would ignore or reject her. This meant that a lot of the time she didn't want to go training but felt she must, as 'If I missed one training session I would get unfit and wouldn't be able to win'. Her mother reinforced this notion by saying that she had to go training as 'You don't want to be unfit the next day'. Apart from the extreme anxiety which Kate experienced as a result of this situation, she also developed an unrealistic belief as to the meaning of training. Her attitude towards training became almost obsessional such that if she missed just one training session it would be calamitous—becoming unfit, being left behind in training and rejected by her coach.

A less well documented but equally effective cause of performance anxiety is for the athlete to 'catch' it from a parent or coach. A parent or coach who becomes overly anxious before competition can often transfer their apprehension and worry to the athlete. Children may be affected as much by the attitudes and mental state of their parents as by any pressures caused by the sports environment.

Examples such as these are often used by critics of youth sport to support their case that young children should be prevented from taking part in competition. Yet although it is clear that emotional problems do occur in children's sport it is more likely that sport *highlights* problems

that already existed in the family; it does not *cause* them. Children's beliefs about competition are shaped largely by parents, as are attitudes towards failure, persistence and commitment. It is likely that many of the emotional problems which occur during performance are simply mirror images of those which occur in the home.

11.3.2 THE ATHLETE

There are three specific areas of vulnerability which may put the young athlete at risk of developing an anxious reaction to competition: (a) frustration of achievement; (b) the conflict between schoolwork and training; and (c) peer relationships.

Frustration of achievement

Many children report feeling worried or anxious if expected to win. Frustrated achievement or the setting of unrealistic objectives can cause problems particularly if supported by a coach or parent, although the high achieving child may also develop emotional difficulties. Bryan Lask (1986), a psychiatrist working at a children's hospital, has described a group of children who 'somatize' their anxiety. They manifest their anxious feelings in terms of physical symptoms. Based upon clinical observations he describes children, usually girls aged between ten and 14, permanently disabled by mild illness or injury. These children are 'good at everything', particularly sports. Lask suggests that as the pressures build up so the child becomes anxious but feels unable to show or share it. Illness or injury provides a respite from the threat of continued participation.

Conflict between schoolwork and training

Although it is possible that many young athletes perceive educational attainment as another area of high achievement and are highly motivated to succeed in this as well as sport, the demands of school and sport can cause considerable stress for the child. Young swimmers and gymnasts taking part in intensive training routines have described difficulty concentrating at school due to tiredness, and homework being completed late at night or early in the morning. This conflict seems to be most stressful during mid-adolescence when national examinations occur. Recent findings of the Training of Young Athletes (TOYA) study (Rowley, 1992), a population based survey looking at the effects of intensive training in young children, found that 25% of athletes who retired from sport did so because of pressure of schoolwork.

Peer relationships

Concern has been expressed that the long hours spent training and competing may prevent the child from making or retaining lasting friendships, as she or he is unable to share in the common activities of the peer group, a factor which could influence the popularity and status of the young athlete.

A recent report based on findings from the TOYA study (Rowley, 1993) indicates that for many young athletes the problem may not be one of peer relationships but bullying and teasing. A significant number of children reported being teased and bullied because of their involvement in sport. In primary education young athletes appear more likely to experience severe bullying than a comparable group of children. Over a third attributed being teased to their involvement in sport. Gymnasts and footballers in particular reported being teased significantly more than other children their age. One young female gymnast said that the headmaster announced her sporting success to the school and this led to problems with peers. 'Other girls are jealous, they are horrible to me, I sometimes don't want to go to school.' Another complained of name calling 'and being pushed around' by other girls. Both boy and girl gymnasts described being bullied because of their size. 'I'm teased because I'm small', or 'Boys pick on me because I'm smaller than other girls'.

11.3.3 OVERTRAINING AND STALENESS

For some endurance sports, such as middle or long distance running and swimming, overtraining appears to be a prerequisite for peak performance in the elite athlete. Research on elite swimmers suggests that in certain cases overtraining can cause changes in mood suggestive of anxiety and depression. Sports psychologist Bill Morgan and his colleagues (Morgan *et al.*, 1987) discovered that as the training load increased many swimmers became irritable, had poor concentration, felt tired and depressed. These symptoms disappeared when training was tapered down or a swimmer was rested. Young children may be particularly susceptible to this problem as they are still growing and are therefore subject to the physical stress of growth and maturation as well as training effects.

11.4 COPING WITH PERFORMANCE ANXIETY

The final part of this chapter will suggest how coaches and parents can help to alleviate performance anxiety in young children. Coaches and parents often seem more willing to attribute failure to a lack of effort or fitness rather than psychological preparedness, yet many athletes would

benefit from an improvement of their understanding and skills in the productive use of performance anxiety.

11.4.1 IDENTIFYING THE ANXIOUS CHILD

The first stage in learning how to work with rather than against performance anxiety is for the coach to be able to identify those youngsters who are most at risk of experiencing high levels of anxiety. Unfortunately there is little research available to show how effective coaches are at identifying overly anxious athletes, although results suggest that many are poor judges. It is often difficult to establish children's emotional state. They may be unwilling to talk about their feelings because of embarrassment or the fear of being ridiculed, although their behaviour may show that they are anxious. There are, however, some common signs and symptoms associated with childhood anxiety. The following list contains several which coaches and parents need to monitor in order to help identify anxious children.

1. Loss of sleep, early waking or any change in sleep pattern;
2. Nightmares or bad dreams;
3. Any change in dietary habits such as loss of appetite;
4. Mood changes such as irritability or uncharacteristic displays of aggression either at home or during competition;
5. Manipulativeness—the child may become very controlling of situations;
6. Restlessness or fidgeting;
7. Hypochondriasis—the child may complain of physical symptoms on the days preceding a particular event in training or a competition;
8. Frequent urination or diarrhoea.

11.4.2 EDUCATION

Anxiety can be legitimized by explaining to the child that he or she is not unique in worrying about training or performance. Athletes at every level experience anxiety. Understanding this principle is the first and probably most important stage in teaching the athlete how to control and use anxiety. This explanation can be incorporated into a general educational package where the athlete is taught how to identify anxiety and about its cause and effect.

11.4.3 FEEDBACK

Girls differ from boys in the way in which they respond to feedback from

adults that they are failing. Carol Dweck, a psychologist who specializes in children's development, and her colleagues (1982) have shown that whereas boys tend to respond with greater efforts when they receive feedback from adults that they are failing, girls tend to give up and attribute their failure to their own lack of ability. It is important therefore that a coach does not adopt a stereotyped or fixed response to coping with failure, as in some cases this may actually increase the chance of anxiety occurring in the future.

11.4.4 GRADED EXPOSURE TO COMPETITION

Rainer Martens (1981), one of the foremost experts on children's sport, suggests that competitive stress may be likened to a virus. A heavy dose all at once can make a child ill. A small dose carefully regulated permits the child to learn how to channel anxiety so that it aids rather than inhibits performance. Carefully selected competitions together with realistic objectives and expectations will enable the child to learn that sport is fun and can be enjoyed whatever the result.

11.5 CONCLUSION

The two main causes of performance anxiety are uncertainty and threat. Yet these need not result in an impairment or avoidance of sport. Uncertainty should concern the result, not the child's emotional security, and any threat can be transformed into a healthy challenge by reviewing goals and objectives. The coach and parent must recognize their responsibility in making the experience of sport enjoyable and productive for the child. Most important is that winning does not have to mean coming first. A personal best, playing a certain stroke or shot, or successfully marking an opponent can be goals every child can strive for; all encourage the child to try to give his or her best. Every child can be a winner—if only the adults let them.

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Selecting the right targets

12

Rod Thorpe

SUMMARY

This chapter identifies some of the key evidence and opinion about goal setting. It is not intended to be a review of the topic, which has been done elsewhere (Beggs, 1990). Rather the intention is to provide a background of knowledge against which the coach can assess the value of goal setting with young people. Wherever possible sport examples are related to a central idea, rather than a specific piece of research, to enable the coach to transfer the 'principle', rather than the specific finding, to his or her coaching act.

12.1 WHAT IS GOAL SETTING?

Goal Setting is simply identifying what you are trying to do or to accomplish; basically it is the aim of an action or series of actions.

Harris and Harris, 1984

The critical word in the quotation above is 'identifying'. It is possible to take part in an activity with only a vague idea of what the intention is but for most people this is insufficient to maintain motivation. Identifying a goal gives purpose. This process of identification is even more important when a coach and athlete are working together. The coaching world abounds with anecdotal evidence of how the goals of the performer do not match that of the coach, often because they have failed to discuss them together. Perhaps by the end of this chapter you may feel that the word 'identify' is insufficient to reflect the care and attention that should go into the act of goal setting.

The procedures which sports psychologists suggest for goal setting are

derived from studies from a variety of sources, not least the area of business management, but also more structured academic studies in psychology and more recently in sport. An extensive review by Locke *et al.* (1981) based on the previous ten years of work in both laboratory and field situations (not sport specific) led to a number of conclusions, most importantly for us, that goal setting was a particularly powerful aid to motivation. The following two quotations reflect the importance placed on goal setting by sports psychologists.

The accomplishment of individual goals is the key to each person's success and to the development of their self concept. To know who you are and what you wish to accomplish is critical to each person's happiness.

Bunker, 1985

Expressed in performance achievement terms:

Success is about goal achievement; the more goals achieved, the more success the performer experiences, and the greater his self confidence becomes. The relevance of all this to the coach should be fairly clear. The setting of appropriate goals is critical for all performers in all sports.

Hardy, 1985

12.1.1 WHY DOES GOAL SETTING WORK?

Sports psychologists who advocate the use of goal setting (Bunker, 1985; Carron, 1984; Harris and Harris, 1984) agree that it is a powerful technique because it:

- directs and focuses attention;
- helps the individual mobilize energy and effort;
- encourages persistence and practice over time.

Bunker *et al.* add that it:

- forces the individual to take responsibility for his/her actions and attributions;
- influences expectancies;

and Harris and Harris suggest that it:

- generates the motivation to develop relevant and alternative strategies for reaching goals.

12.1.2 EFFECTIVE GOAL SETTING

Having accepted that goal setting is an important element of coaching there are some general findings which appear to apply to the sport situation. (It is important to note that there is some debate about just how universal these findings are (Weinberg *et al.*, 1988).)

Coaches who set difficult or challenging goals do better than those who set 'do your best' goals.

Goals seem to motivate best when stated in specific quantitative terms or actions rather than 'trying harder', 'giving 100%', 'concentrating better'—more judgemental/qualitative terms.

Harris and Harris, 1984

Because many of the major goals in sport may be several months or even years away, it is often necessary to develop short and long term goals. Bunker (1985) sees goals as 'stepping stones to success'.

Such an approach necessitates careful planning, firstly to identify the long term goal, and secondly, to see how a series of steps (short term goals) can lead to the long term end. Recognizing progress requires consideration of the ways in which achievement of the goal can be evaluated.

Embracing many of these ideas, Harris and Harris developed a list of guidelines for coaches in setting goals.

1. Goals are established by performer or performer and coach.
2. Goals should be put in writing.
3. Goals must be challenging but attainable, measurable, realistic and manageable.
4. When two or three goals are established they must be compatible.
5. Goals should be flexible enough to allow for revision and change.
6. Goals should have structured time frames or target dates.
7. Priorities should be structured for goals.
8. All factors related to goal attainment should be taken into account.
9. Goals must be stated to allow for evaluation of effort as well as performance.
10. Goals should be related to the overall aim of performance.

Harris and Harris, 1984

12.2 GOAL SETTING AND CHILDREN

Whilst there is evidence that school aged children are affected in much

the same way as adults by goal setting, it is important to remember that there are some key differences which must be considered when dealing with children in the coaching situation.

The coach should be aware of some of the broad principles of child development and individual differences and thus develop a framework within which to work.

12.2.1 PLANNING THE FUTURE WITH YOUNG CHILDREN

With the realization that the experience children receive in their early years can influence their attitudes to, and abilities at, sport for years to come, governing bodies and coaches see a value in working with the very young. In many cases the sports are adapted to encourage this to happen. For example, the Lawn Tennis Association and the Rugby Union have developed short tennis and mini rugby to give children the opportunity to play, practise and compete in games in a way commensurate with their age and ability.

It is not the intention of this chapter to discuss the merits and demerits, or the dangers and benefits of such developments, but it is important to note the major changes that affect the relevance of goal setting that can occur in the years before age 12. To do so it is perhaps necessary to look at the conclusions drawn by psychologists about child development as it might affect goal setting.

Whilst there is always some disagreement amongst psychologists about the precise nature of children's development there are some broad areas of agreement.

Awareness of time

In the 1950s and 1960s, a famous educational psychologist, Piaget, carried out a whole series of tests on children based on the understanding of time (Piaget, 1969). One simple conclusion from these tests is that many children, up to primary age, will have a quite poor understanding of time and would certainly not be capable of understanding the idea of a 'long term goal'. As the children pass through the primary school the time relationship develops, but even so, understanding goals requires an understanding of intention, etc.

This sort of information suggests that there is value in the exploratory form of play that young children often take part in, i.e. 'Let's try this—I'll have another go—Yes, that's O.K.—I like this—O.K. I've had enough for now'. Perhaps all we need do at this stage is provide equipment that allows this sort of 'play'.

This notion of immediacy and non-adult values might be made clearer by the following example. While on holiday I once watched a young boy,

2–3 years old, pick up a ‘large’ pebble and throw it. His pleasure seemed to be in the fact that it had gone—when he found it again he repeated the throw. This occurred several times and then he went to paddle. The satisfaction was very much in the movement, one could identify a curiosity satisfied in some way by the act itself, there was no concern as to where the pebble went and the whole throwing experience lasted only a few minutes. A child a little older may throw the pebble at something or someone but may still have no thought beyond the immediate throw.

It concerns me somewhat when young children are subjected to heavily directed practice which the coach says is necessary for some future goal. The best teachers and coaches of the young seem to be those who can provide varied ‘play’ experiences that are enjoyable in their own right but which form the basis for the achievement of more long term goals. These goals are frequently recognized by the coach but not stated to the child.

The parent or coach who throws and catches a ball with a child may well hope the child will become a good games player but might do better to show the pleasure in throwing and catching than express the goal for the future.

Time, intention and consequence

It is misleading to believe that, as youngsters begin to develop the idea of time and the future, they will necessarily link this accurately with consequence. Again it may be worth recounting a classic experiment, ‘the well intended act’ from the field of psychology.

A group of children between five and 12 years of age were told a number of stories. The basic story would consist of a well intentioned act which went wrong—e.g. ‘A young boy helps a shortsighted old lady across the road at a zebra crossing but a speeding car rounds a corner and the lady is knocked down’—followed by an appropriate question, e.g. ‘Is the boy naughty?’.

This sort of story elicits a ‘Yes, the boy was naughty’ from the younger children and ‘No, it was not his fault’ from the older children.

Whilst all the children can follow some sequencing of events young children have not as yet learnt to place intention and consequence within a moral framework. Events are usually judged simplistically.

At first sight the coach might ask what this has to do with coaching. Great care is necessary with young children to ensure that short term events ‘satisfy’ the child. A coach working with adults might well explain that on first developing a new skill they will perform ‘badly’ but by the end of the lesson the performance will be much improved. A similar strategy may not work with the very young. A coach who identifies a fault in an action with an adult will usually be accepted because the adult

can place the fault identification into the larger context of improving the skill. This is not necessarily so with the child. Similarly, whilst we might wish to develop the idea that 'It is the pursuit of victory that yields the joy, the fun, in sport' (Martens, 1985) we must recognize that the relationships involved in working for victory are complex and that, for the children, intention and effort may be less easily associated with consequence than for adults. It is not surprising, therefore, that children find it difficult to separate effort and ability, as described by Glyn Roberts in Chapter 1.

What seems to be needed is a development from a purely 'experiential play' situation, through a more guided period in which situations are designed to present quite immediate and achievable goals, e.g. 'I wonder if you can run all the way to the tree?', 'Can you throw the ball high?' and then with care toward goals which may last a few minutes and be a little more 'risky', e.g. 'Can you get five out of 10 in the bucket?'. Eventually longer term goals can be set, but there is evidence that the children are still not ready to move into adult goal setting strategies. When young children can set long term goals, they may still be unable to subdivide that goal into the stepping stones of short term goals (Bandura and Schunk, 1981). Clearly those working with the primary aged child, or indeed an elder performer with learning difficulties, must assess just how well these concepts like time, division and consequence are developed.

The 'well intentioned act' experiments discussed earlier are often further developed to show the importance of respected models when arriving at decisions. Very simply, the way a child reacts to the question 'Is the boy naughty?' is noted and similar stories are told, but this time before the child answers another person answers in a converse way to that expected of the child being observed. Very often the youngster conforms with the model, i.e. answers in a way differently to the way s/he would have answered alone. Although the results are a little more complex, suffice it to say that the young people changed their answers to conform. (Readers interested in the development of time, morality, etc. in children may wish to follow up the work of Wimmer or Kohlberg in the general psychology literature.)

Once again this has important implications for the coach in that setting 'having fun' and 'helping young people develop' objectives is doomed to failure while practising 'winning at all costs'. If performers are surrounded by 'win at all costs' models—in the coach or perhaps senior performers—the evidence seems to suggest that this will certainly override what the coach says and will probably override the performers' personal goals. Equally, it must be remembered what pressure the young performer is under when attendance at practice breaks the demands for conformity from a peer group.

At the specific level, the commitment to a goal may be affected by the way other performers accept similar goals (Hollenbeck and Klein, 1987). In other words, the goals set must match the social environment in which they are to operate.

Coaches and sports psychologists have recognized the importance of ensuring that, in team activities, individual goals fit with team goals. The coach of younger children must consider whether the youngsters have developed the social skills necessary to understand how their behaviour affects others. How well do the youngsters grasp the interdependence of individual and team goals?

12.3 SPORT—AN ACHIEVEMENT SITUATION

McClelland (1961) and Atkinson (1964) in the now famous books *The Achieving Society* and *An Introduction to Motivation* began to formulate an approach to motivation called Achievement Motivation. The case is presented that to be an achievement situation, three conditions are necessary:

1. The performer is more or less in control of his/her behaviour.
2. There is some risk (of success or failure).
3. The performer knows whether s/he has succeeded or failed.

It has been argued that competitive sport is a particularly good example of this form of situation in that it often meets all three criteria in a very clear way. This is particularly so in 'head to head' competition in sports as different as boxing, tennis, ice skating, high jump, swimming, etc.

Researchers in the area went on to investigate how variations in the chances of success and failure might influence the enthusiasm with which different individuals approached the task. They thought that as the probability approached 50:50 then the more attraction the task held for individuals who had a high need to succeed (sometimes called high achievers) but the less attractive it became for individuals who had a high fear of failure (often expressed as a low need to achieve). The situation was reversed when tasks were perceived as very easy or very hard, (i.e. the individuals who feared failure were more attracted to these tasks than the 50:50). Since much of competitive sport, e.g. leagues, ladders, knockout competitions, qualifying times, is structured to bring people of very similar abilities together in competition it follows that the 50:50 situations occur regularly in competitive sport. It is not surprising, therefore, that Carron (1980), in reviewing the evidence, noted 'that higher levels of nAch (need to achieve) are associated with superior performance'.

As will be seen later the theoretical base of attraction to the task has since been modified and the 50:50 goal is not always the appropriate

goal, even for the higher achiever. Even so, the underlying theory draws the attention of the sporting world to the nature of competition and the need to recognize that there are many people who might benefit from a sport experience but who fear failure to the extent that they do not welcome some of the challenges that sport poses. Carron (1984) further noted that 'research which has been carried out with motor skills has generally found that high nAch (need to achieve) individuals demonstrate superior performance to low nAch individuals but only in the early stages of development'. Clearly, first contacts with sport are most important in determining future participation, but a particular sport setting may present challenges unsuitable for some children.

12.3.1 LEVEL OF GOAL SETTING AND THE INDIVIDUAL

It is important to realize that everyone has motives to achieve success and to avoid failure which are independent of each other. That is, we would all like to enter a situation where we could succeed but we may be worried about failing. The key issue is how the balance of these two motives occurs. Other psychologists, notably Maehr (1974), question whether an individual's balance of motives are the same for every situation. Suffice it to say that children in sporting situations will wish to succeed, may fear failure, and will persist despite failure to different degrees. Much will depend on what they consider to be success or failure.

As an oversimplification, many coaches and most top performers can be expected to be high achievers; that is, they enjoy the risk that sport offers because they like to put themselves on the line and rise to the challenge. The danger is that many coaches believe that everyone who comes to sport thinks as they do. This is a commonly accepted phenomenon known as the 'assumed similarity of others' syndrome and is not restricted to coaches.

Let us suppose that the children are shooting basketballs. The danger is that the coach assumes the best place to shoot from is far enough away to provide a good challenge, i.e. where we might get 4 or 5 out of 10. Having achieved 5 the first time, the coach might then think it reasonable to suggest the shooter now tries to get 6. This may make the task attractive for some, but not all of the children. It may be that some children would prefer, certainly at first, to shoot from much nearer to get 8 or 9 out of 10; having got 8 a few children may welcome a goal of 7 from 10, something they are certain they can achieve.

Clearly, if we hope to keep all children playing basketball we will need to set individually determined goals. As this is not always easy to do with quite large groups, two strategies might be considered;

- (a) Careful note should be taken of those who relish the challenge, and those who do not, so that some option to continue practising or enter the challenge can be given;
- or
- (b) A movement toward child determined goal setting should be initiated.

Not surprisingly, different youngsters have different forms of goals, and Glyn Roberts (1984, 1986) has suggested that stress, competence and drop-out in adolescent sport are strongly related to the sorts of goals the youngsters focus on when competing. Certainly those young performers who strive to demonstrate ability and avoid demonstrating lack of ability (ability oriented) are the youngsters who only see winning and losing as important. Consequently they see competitive sport as stressful, in comparison to youngsters who focus more on mastery of the task for its own sake (task oriented). It is also important to note that the early teenage years are years of social comparison and therefore there seems some sense in recognizing:

The need to decrease the threatening nature of competitive sport for adolescents by emphasizing intrinsic enjoyment and the pursuit of personal performance goals...

Vealey and Campbell, 1988

Are performance goals always necessary?

A far more common indication of children's unwillingness to put themselves on the line is a lack of enthusiasm to keep score. How many times have coaches set a task or game which involves a fairly tight scoring system only to find that whilst some children (and perhaps adults) keep score with relish, others avoid scoring at all costs. Instead of admonishing the children for not keeping score the coach might make a note of the fact and consider the implications. The first step is to identify why they are in the sporting situation in the first place if they do not want to score. The incentives identified by Alderman and Wood (1976) have provided a framework for considerable research. This research suggests that being with friends and interacting with people (affiliation), doing something well and feeling competent (success), being active and stressed in a controlled way (stress), were the most powerful incentives even with young people in serious competitive situations. Jean Whitehead's extensive work with children in Britain (Chapter 9) indicates that whilst these incentives can be used as a broad framework, a slightly different approach to children's goals might be more appropriate.

Often the children who avoid scoring get considerable pleasure from playing, perhaps taking satisfaction from playing with a friend or the pleasure of doing something well by their own standards. They may simply enjoy 'running about'. It is not that they do not have goals, it is that they do not wish to accept those of the coach, i.e. they may not see the value of the goal and/or may reject the level set by the coach. They may see it as a good goal, but may not be interested in attempting to achieve it.

12.3.2 THE LEVEL OF GOAL SETTING AND THE SITUATION

It should now be apparent that goal setting should be related to the individual and a major influence on the goals is the confidence of the performer. Confidence in oneself is linked with personality dimensions like self-concept but confidence is also affected by the situation (self-efficacy).

Sport abounds with stories of individuals who can perform well in practice but cannot do the same in competition. Recognizing this, Hardy (1985) makes the link between an anxiety caused by competition, underperformance, acceptance of goals and therefore resultant goal setting. Simply put, the recognition that competition causes competitive anxiety leads Hardy to suggest that the goal difficulty likely to be accepted for competition should be less than that for training. What is perhaps worth remembering is that when children first attend a session with a new coach, etc., anxiety will be high. What might seem to be quite a reasonable goal for a confident youngster in a familiar situation will almost certainly be too hard for an anxious newcomer. It follows that the youngster may not accept the hard goal and one way to do this is to go away and not come back!

12.4 HOW IMPORTANT IS THE GOAL?

12.4.1 DREAMS AND GOALS

There will be little doubt that as young performers mature and associate with heroes they will have dreams of winning an Olympic gold, the Wimbledon Tournament or scoring the winning goal at Wembley, etc. This long term goal Orlick (1986) appropriately calls a dream goal. More realistically, the youngster might be aiming to win the regional championships. One has to question the need for the coach to set such absolute goals when the youngster has them anyway; more importantly, these forms of goal are largely outside the control of the performer and it may be inappropriate for the coach to stress them, e.g. failure to achieve these goals may be due to the inclusion of an 'international star' in the draw or an injury to the performer. Equally a win may be because other

good players are at another tournament. Hardy (1985) presents the case that

...specific goals within the control of the performer should:

(i) set a target for the next competition;

and

(ii) reduce the influence of other performers upon that target to a minimum.

Consideration of these two factors leads to the view that effective goals must be phrased in terms of scores, or times, rather than positions.

Hardy, 1985

The necessity for such an approach is of course magnified when one deals with young people. The young performers mature and develop skills at different rates. The youngster who is winning the Under 12 may not be winning the Under 14, despite ideal coaching and practice opportunities, perhaps because his or her peers have matured later and caught up, as John Aldridge has explained in Chapter 5.

12.4.2 WHEN THE SPORTING GOAL BECOMES TOO IMPORTANT

There has been considerable concern that in those sports which take large amounts of the athlete's time, if coach and parent are not careful, then the sport assumes such a central role in the child's life that achievement or failure to achieve major goals set in the sport become associated with feelings of self-worth in life. This has been documented in games like tennis in which precocious youngsters who have been successful as juniors begin to judge themselves and see others as judging them in terms of sport success to the extent that they dare not lose or they fail as a person.

Three years ago Lori said 'Tennis is everything; I wouldn't want to live without tennis'. A year later she walked away from the game.

McDermott, 1982

Whilst it is difficult to amass more than anecdotal evidence about this concern it is real enough to suggest that coaches must consider sport in the context of the total development of the young performer. Martens (1985) identifies three major objectives: 1) winning, 2) having fun, and 3) helping young people develop physically, psychologically and socially. Whilst it is possible that some coaches work for all three, others tend to favour one or another. This might be acceptable with adults but it could be that all coaches who work with children should place objective 3 as the major coaching goal.

12.4.3 WHAT SORT OF GOALS?

It has already been argued that performance goals, e.g. scores or times, are more appropriate than outcome goals, e.g. positions, because they are within the control of the performer. It can, of course, be argued that many performers set themselves this sort of goal anyway (Weinberg *et al.*, 1985), e.g. at this time the child is jumping 1.20m, she thinks she can manage 1.25m in two weeks and maybe 1.30m by the end of the season. With a little encouragement and sound reasoning she begins to see this as preferable to wanting to beat 'X' in two months time, which may happen anyway.

Even so, this approach has dangers in that, with rapidly maturing youngsters, these goals may become quite inappropriate. For example, as the child becomes sexually mature, physiological changes may combine to cause rapid increase in explosive power. This is not to say the coach should not use performance goals but there are other forms of goals which are within the performer's grasp, particularly (process) goals about training, attitude and behaviour. At a time when predicted performance can be difficult to assess it seems sensible to use these forms of goal as well.

An example might illustrate the point. A young cricketer loses concentration after a relatively short spell of bowling. Merely to say 'Concentrate more' is unlikely to help. If, however, the young bowler is asked to record his/her ability to concentrate on a given target during the bowling spell by giving the concentration a score out of ten, then the coach has caused attention to be given to the task. Of course, this assumes that the player is receptive to this sort of work, but many are. As matches are played, a row of concentration scores appears and it becomes a simple matter to set a goal for the next match or end of season, etc. This identification of present status and a future goal is at the root of an approach which encompasses much of the underlying theory of such goal setting (see Achievement Management Plans below).

12.4.4 WHO SETS THE GOALS?

Whilst you may well be able to set the most appropriate goals and should certainly have in mind short, intermediate and long term goals, you should take care when presenting them. Part of the education of young athletes might be to help them to develop responsibility for their own goal setting. This has a number of advantages:

1. If performers set their own goals, and particularly when they begin to enjoy the whole process involved in setting and working towards goals, motivation remains high.

2. Goals will only be valuable if accepted and it goes without saying that this is more likely if the performers are involved in developing their own goals.
3. When goals are set by the coach, failure to reach them may not be accepted as the responsibility of the performer.
4. Coaches cannot be present for all of the training time, and may be unavailable for relatively long periods. If youngsters get used to designing purposeful activity, this may not be a problem.
5. It is perhaps worth remembering that there are times (e.g. the early teens) when youngsters view adult intrusion with suspicion; striving to meet adult goals may cease to be relevant; striving to meet personal or peer group goals may remain attractive.
6. Older children will set, independently, goals of various types (Weinberg *et al.*, 1988); it seems sensible to encourage this 'natural' process to occur.

Of course, coaches play a major role in helping young performers arrive at sensible goals. Let us suppose that a coach and player are trying to set appropriate training time goals. The athlete might decide to practise two hours a day for five days each week. Notice that the goal is one of the sort described earlier and within the control of the performer. In this situation, it may be that the coach adds a touch of realism by pointing out that the athlete has homework or an alternative social commitment. The coach becomes a mentor and coaches should plan a little more carefully how to move the athlete to independent goal setting by the early teens. Understanding the social development of youngsters is as vital as understanding the physiological development.

12.5 ACHIEVEMENT MANAGEMENT PLANS

An approach which helps goal setting within the context of a training programme, and encompasses many of the points identified above, is the Achievement Management Programme described by Singer (1984, 1986). Examples from tennis are included in the explanation to help clarify the approach.

Singer outlines the stages in the process. First, coach and/or performer must identify what aspects are to be worked on (Skills and Processes). These might include performance skills, e.g. forehand; performance strategies, e.g. when to approach the net; physical conditioning, e.g. mobility; and psychological factors, e.g. coping with frustration. Secondly, if progress is to be assessed, the methods of measuring the skills and processes must be determined (Assessment Techniques). Singer recognizes that this assessment will, in some cases, be objective, but in others, e.g. coping with frustration, assessment will

rely on the coach or performer's subjective assessment. Even so, a numerical score must be attributed. The third step is to identify the nature and amount of training to be allocated to any given aspect of the work (Training Procedures). With a clear measure of the performer's present ability (Status) and recognizing the practice time available, goals can be set. Recognizing the need for steps along the road to the long term goal, Singer recommends regular checks on progress (New Status) and reassessment of the next short term goal. It is quite apparent from this how the goals and the feedback provided by the assessment function are embraced in a progressive learning experience. The approach outlined by Singer illustrates how goal setting is best seen as a central part in the design of the total development programme. Because the whole process is recorded both coach and performer are clear about the objectives and are making a commitment to them.

12.5.1 AND AFTER THE PERFORMANCE

It would be quite wrong to forget that once the performance has occurred the goals may or may not have been attained. What does the coach say? Stuart Biddle in Chapter 10 indicates just how important this can be.

12.6 SUMMARY OF THE KEY POINTS

1. Goal setting is a particularly powerful technique to aid motivation.
2. Goal setting should be adapted to suit not only physical maturity but also cognitive development. Coaches should be aware that young children have incomplete understanding of time and the relationship between intention and consequence.
3. Remember that what coaches often perceive as an appropriate challenge (harder than a 50:50 chance of success) motivates some children but may have the reverse affect on others.
4. Some children take part in sport for reasons other than winning competitive situations.
5. The logic that led Hardy (1985) to propose that goals should be reduced when the performer is in the stress of competition can be extended to the youngster (particularly those lacking confidence) in a strange environment, with a new coach, learning a new skill, etc.
6. Most young athletes will be dreaming of winning prestigious events. That goal is already there so the coach should concentrate on setting goals within the control of the individual, i.e. personal performance goals.
7. There are goals associated with training, concentration, emotional control, attitude, etc. completely within the control of the young

- performer and yet of perhaps longer term value than the more obvious goals of event success. (Remember these must be quantified to be most effective.)
8. Never let the attainment of sporting goals become so significant that the whole self-esteem of the youngster is affected by success and failure in the particular sport.
 9. Long term motivation is best enhanced when intrinsic incentives are operating and work is self-directed. Goal setting is just one of the many things which can be moved from coach to performer.
 10. In sport, goal setting usually occurs in a social context. Younger children may not have learnt the interdependence of social behaviour. For older youngsters the social situation can be a major factor in goal focused behaviour.
 11. Remember goal setting is only effective if well planned and designed to suit the individual youngster.

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PART FOUR

Applications to the Coaching Process

Up to this point the contributions in the book have provided, first, reasons why coaching children merits serious consideration beyond simply teaching skills and trying to win contests; second, descriptions of different aspects of development, why children ‘...are not mini-adults.’; and third, a review of some particularly important aspects of children’s psychological experiences in doing sport. In Part Four the authors give specific advice on specific skills which will help coaches to meet better the needs of their athletes. The material deals with the psychology of the relationship between coaches and children and helping children to deal with disappointments. It then goes on to give guidance on setting up appropriate training schedules, prevention and treatment of injuries, and encouraging children to eat healthily both in training and in competition.

The topics addressed are all to do with skills which coaches must call upon in order to do their job most effectively. They are also skills which are all too often left to chance. Coaches who attend the courses run by their governing bodies are, quite naturally, given considerable advice on how to teach specific sports skills. They will probably also receive instruction on developing fitness to meet the requirements of their sport, usually in adults. Less frequently do such courses include the design of programmes specifically to meet the special case of children. Even less frequently is advice given on how to communicate most effectively or how to deal with the individual problems which athletes experience as a result of the difficulties they face.

Martin Lee and Lew Hardy are psychologists who have considerable experience of working with young athletes. They use their experience to show how best to develop good coaching relationships. Martin Lee shows how coaches can learn to communicate most effectively with young players. He draws attention to the need for clarity and using language

suitable for young people based on a social skills training and shows the value of recognizing children's behaviour using a technique derived from counselling psychology.

It is inevitable that coaches find themselves in the position of dealing with children under stress and often in states of some distress. Lew Hardy explains how coaches can help children deal with problems caused by the stresses of competition. He gives good advice on the importance of being able to ask good questions and to listen carefully to the answers before suggesting ways of dealing with some of the different problems which commonly occur.

Neil Armstrong and Joanne Welsman build on their earlier explanation of how children respond to exercise by showing how to set up suitable training programmes specifically for children and young athletes. They outline the principles upon which training programmes should be based and introduce the acronym FIT (frequency, intensity, time) which is applied to aerobic, anaerobic, muscular fitness, and flexibility training.

Coaches are usually the first people on the spot when children suffer injuries and to whom children and parents turn for advice on dealing with them. While you should have a knowledge of first aid you cannot and should not be expected to undertake the role of a doctor or physiotherapist. However, it is important that you know something about the nature and treatment of different types of injury to which children are susceptible. Skeletal injuries are more common among children yet receive little attention in most texts. John Aldridge tells us about the ways in which injuries to the skeleton can occur as a result of training and the effects they can have upon development. Dennis Wright describes the processes involved in the repair of both hard and soft tissue injuries. He gives guidance on first aid but draws attention to the importance of seeking professional advice as soon as possible, in many cases immediately.

Lastly in this section is some very good advice on helping children to eat properly in a society where convenience foods are increasingly common. Food is the fuel for the body's engine and 'You can't run a Formula One car on 2-star petrol'. Juliet Wiseman explains the value of different types of food material and where they may be obtained before giving clear guidelines and examples of the types of diet children should be encouraged to follow. She finishes by suggesting meals for active children and the sort of food to take to competitions.

Communicating effectively with children

13

Martin Lee

SUMMARY

Good coaches are usually good communicators. In this chapter we will be exploring the skill of communication. Communication is examined as a social skill using an information processing approach similar to that used to analyse physical skills. The importance of understanding and using different forms of communication, words, tone of voice, and posture and gesture, is explained. In order to help coaches become sensitive to the nature of interaction between coach and athlete the principles of a counselling technique, transactional analysis, are explained. The chapter is concluded with some suggestions about how to use these techniques in the coaching situation.

13.1 INTRODUCTION

13.1.1 THE NEED FOR COMMUNICATION SKILLS

The need to exercise good communication skills is commonly held to be an important quality of people in authority. We all like to be 'kept in the know' by our superiors, especially when decisions which affect our lives are being made. As part of the communication process we also like to be listened to, consulted, as well as being given information and instructions. Not only are these things important but the way in which they are done is also very important. If instructions are not clear we often make mistakes; if information is incomplete we cannot make informed decisions; if nobody listens to us we feel unimportant; and if we are not consulted we may become apathetic.

Like others in positions of influence, good coaches are good communicators. Indeed, in a survey of young athletes opinions about the qualities of ideal coaches one experienced junior commented that being able to communicate well was essential because '...it's no good (him) having knowledge if he can't tell me; it might as well be locked up' (Lee and Austin, 1988). But communication is not only concerned with imparting knowledge, it is also a major ingredient of promoting and maintaining relationships. The way coaches manage relationships with their athletes has an important influence on the enjoyment of the sport by the athletes, their continued participation, and the ways in which they perceive themselves (Horn, 1985; Smith *et al.*, 1979; Smith *et al.*, 1983).

13.1.2 COACHING AS SOCIAL INTERACTION

Sport is an example of a social situation in that it involves the action of individuals in association with others. Therefore the patterns of interpersonal behaviour that apply are the same as those which apply in other settings. One person's actions are usually influenced by the behaviour of those around him or her. Therefore some form of agreement on the conventions involved and the understanding of signals from each other is necessary. There are rules of communication just as there are rules of sport to which people agree to play.

The purpose of this chapter, therefore, is to examine the processes which underlie communication in coaching. This will be done by introducing communication as a social skill and by describing a counselling approach to help understand the conflicts that sometimes occur between coach and athlete.

13.2 SOCIAL SKILLS

I want now to describe briefly a social skills approach to communication. It is akin to theories of skill acquisition. As with throwing a discus, performing a back somersault or shooting an arrow, social interaction may be described as skilled behaviour and assessed in terms of the attainment of certain goals. Any difference between the goal and the outcome can be used as feedback to the performer and result in a modification of the action next time.

Communication skills are an integral part of all social skills; it might be argued that the two are synonymous, and clearly the same processes of goal directed behaviour accompanied by feedback and subsequent modification apply. A most important element in the sequence is the feedback which demands that coaches are not only competent senders of messages but must also be expert at 'listening' to them. Listening here is

taken to include not only perceiving verbal messages but also to interpreting non-verbal messages.

13.2.1 COMPONENTS OF SOCIAL SKILLS

Good communication is conducted through a series of sequential processes and may use one or more different channels. This is much the same as the broadcasting process which involves programme making, transmission and reception, and then the programmes may go out on the radio or television.

Processes

Successful communication with others depends upon integrating a number of different processes. These include selecting material (selection), putting it into an amenable form (coding), sending it (transmission), another person receiving it (reception), recognition (decoding), and interpretation. How this is done may be different for different children and mistakes will result in unintended messages being received.

Selection is the process of choosing the most appropriate information to give in a particular situation. The type and amount will often differ according to the level of ability of the performer.

The form in which we present information is called the code. Verbal instruction is an oral code, demonstrations are visual, physical guidance may be a kinesthetic code. To be effective the code should be clearly understood by the learner. We have to use a language that children understand.

Transmission is the process of actually giving the information. Rather like a radio signal it should be loud and clear, and free from interference in the form of distractors.

Receiving the message can only be done if the receiver is attending. So it is important to gain attention, get the group to 'tune in' to your signal as it were, before giving information.

Once received, a message must be decoded and interpreted. That is to say, the information must be recognized by the athlete in a way that is meaningful to him or her. Clearly, if the coach uses a code that the child readily understands then it will be more easily understood. This may mean using particularly meaningful images with which they associate.

This is a complicated series of stages at any one of which mistakes can occur which may destroy the effectiveness of the coaching. For example, improving performance of a basic skill in a beginner will probably demand a different set of instructions from those for an experienced performer. Similarly it may be more helpful to use more than one code,

for example demonstrating a movement (a visual code) after explaining it (a verbal code). Even within the choice of a verbal code we often find that we use language which children do not understand. Research has shown that people from different social groups use different forms of language which results in some messages not being properly understood, so it is important to use a form of language or imagery which the child is happy with.

Communication channels

An understanding of good communication is not possible without a clear awareness of the channels we use. The most obvious is the spoken word, verbal communication. Nevertheless, the content of the spoken word is modified, most importantly by the patterns of speech—pauses, pace, intonation, and hesitations, for example—which are known as paraverbal, and also by non-verbal forms which include, for example, gaze, posture and gesture. Such is the importance of these other channels that it has been estimated that as much as 90% of the information in a message may be transmitted by non-verbal and paraverbal (body language and speech patterns) means (Mehrabian, cited in Turner, 1983) and Professor Michael Argyle of Oxford University has estimated that non-verbal messages are 16 times more powerful than verbal ones (Argyle, 1988).

Verbal

Speech takes several forms and provides the explicit content of the messages. Three forms are most commonly used in normal situations: giving information, giving instructions, and asking questions (Argyle, 1988). Good coaching requires the effective use of all three. Information is important for explaining to children what they are trying to do and how to do it. Instructions tell them what they must do; they may form a large percentage of coaching communications and can be persuasive or authoritarian. Questions extract information; good coaches can use questioning effectively to check children's understanding of what they are doing and their instructions.

Paraverbal

The way in which we speak gives a great deal of information to listeners. Hesitancy signals lack of confidence; slow speech may signal control and seriousness; the tone of voice gives clues to emotional states. Effective communicators command attention by change of tone and judicious use of pauses, and the voice is a prime tool for showing enthusiasm and

urgency. Practising and varying the use of the voice is particularly valuable when dealing with young children who may not recognize the intended messages in paraverbal signals because they are different to those used at home. I have come across one child who dropped out of a sport because he didn't like the voices of the coaches! They spoke rather harshly and he wasn't used to it. The inference here is to get to know the children individually and address them in a language and manner to which they can relate easily.

Non-verbal communication

It is not possible within the space available to explore comprehensively the forms and impact of non-verbal behaviour. However, such is its importance that we must refer to it, especially since it betrays our attitudes so clearly (Argyle, 1981). No matter what our words say, the gaze, facial expressions, gesture and posture we adopt give the game away.

Gaze Where we look and for how long is a very powerful non-verbal signal. On average people in neutral conversation look at the other for 60% of the time, but more when talking (75%) than listening (40%) and look only for about 3 seconds at a time. Eye contact occurs about 30% of the time and for 1.5 seconds on each occasion (Argyle, 1988). Changes from these rates might then be interpreted as unusual and associated with special qualities. For example, high rates of gaze generally indicate attention, high rates of gaze while talking indicate power over others, and high status people gaze more while talking and less while listening. There is also evidence that high rates of gaze indicate confidence, friendliness and maturity, while low rates of gaze indicate nervousness, coldness, caution and indifference (Argyle, 1988). Finally, people tend to look away from a speaker if they don't understand what is being said (Turner, 1983).

Facial expressions are particularly important for showing emotions and attitudes. Six major categories of emotion have been consistently identified and can be recognized by children by the age of two. They are: happiness, surprise, fear, anger, sadness and disgust (Argyle, 1988). Since facial expressions give so much away, lack of expression can result in lack of security in the observer. However, when we try to show emotions which we don't feel older children are able to detect it because they can take account of the context as well as the behaviour (Argyle, 1988).

Gestures can be used to support and emphasize words, to give feedback, and to simulate movements in coaching. Perhaps most important are the gestures of the head, arms and hands. Nodding while a child is talking, for example, signifies approval and encourages more talking. Looking away can signify boredom or disinterest and cause some anxiety.

Postural messages are given by the whole body and it has been suggested that they indicate the intensity of an emotion. For example, if you are happy with the performance of an athlete you may stand and become very animated, gesturing with your hands and arms. Clearly if you do not behave in this way children may interpret it as indifference. Urgency is conveyed by leaning forwards, looking directly at the other person, standing close, touching. Folded arms are perceived as rejecting and unyielding while standing with hands on hips expresses a negative attitude (Argyle, 1988). In a study of children's preferences for an ideal coach one swimmer told us that she hated to come out of the pool after a poor swim and see her coach at the other end of the pool with her hands on her hips. When that happened she kept away from the coach for at least an hour!

Both gestural and postural messages reveal our attitudes, however unconsciously. Nevertheless we can use them to convey important messages to children quite deliberately, although it requires becoming a bit of an actor. Not only should we be conscious of our body language but we must also be able to read the body language of the children we coach. This may not be as easy as it seems, specially in a multicultural society where cultural norms of behaviour may differ from our own. For example, some Asian children are brought up not to look adults in the eye. This may be interpreted as indifference or even insolence when it is intended to be respectful.

13.3 TRANSACTIONAL ANALYSIS

I would now like to turn to the perceptual side of good communication; the ability to observe and listen to what children are saying and feeling. It is rather like listening to a song; the words convey some meaning but the music can convey so much more!

A key feature of listening to the 'music' is the ability to develop empathy with the other person, the 'singer'. Empathy means being able to see others as they see themselves, to understand their view of the world, and to be able to help them to develop more fully (Nelson-Jones, 1982). When dealing with children, adults can be at a disadvantage because they haven't been that age for some time! We may not readily understand the difficulties that children face when learning or practising skills. Using the world of play and fantasy, for example, may be a better way of giving information than formal explanation in adult terms.

Transactional analysis (TA) is an approach to counselling which emphasizes the development of rational behaviour. It is based upon a particular view of personality and focuses on the behaviours shown in a relationship which was developed by psychotherapist Eric Berne (Berne, 1968). TA uses a simple, colloquial language and ideas which are based

on common sense experience. It is both a method of analysing communications and a theory of psychological development (Turner, 1983).

13.3.1 EGO STATES

The view of personality proposed in TA is encapsulated in the idea of 'ego states'. When we watch people, adults or children, we can describe their behaviour as if they were in one of three different roles or ego states: Parent, Adult or Child (Figure 13.1). The clues may be verbal or non-verbal but the behaviour represents a position which the individual is adopting at that time.

Parent

When people are in the Parent ego state they are concerned with care, control, and with goals that 'should' be pursued. Their views represent an internalization of the influence of their parents and teachers—and

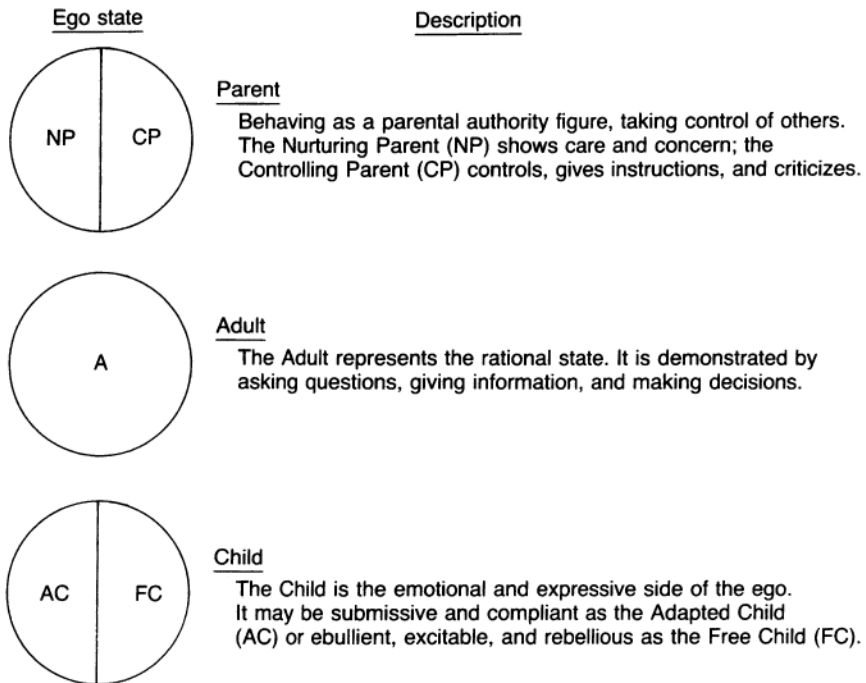


Fig. 13.1 Characteristics of ego states

maybe coaches, of course. Parent behaviour has two sides: (a) Controlling Parent which is judgemental and sets rules, and (b) Nurturing Parent which is concerned with caring for the well-being of others.

Adult

The Adult is often likened to a computer and is characterized by information processing. So we see the Adult in operation when the person is asking questions, giving answers, making assessments, and selecting between alternatives. It is objective and not concerned with emotions. The Adult develops very rapidly between the ages of six and 12 (Turner, 1983).

Child

The Child is characterized by the expression of feelings, responding to demands made by others, positively or negatively, and being creative, perhaps in playing. As with the Parent, the Child can take two forms. The Free Child is the first to appear and gives vent to powerful feelings, of pleasure and anger for example. The Adapted Child develops as the child learns to adapt his or her behaviour to meet the demands of parents and other adults. So he may learn politeness, submissiveness, and feelings of guilt and anxiety (Turner, 1983).

Table 13.1 summarizes the behaviours, attitudes and communications which identify different ego states. If you think of some youngsters in your care you can probably identify the ego states they are in at different times. You will also notice that different children spend more time in one ego state than another. There is always one who is mucking about when you want him to listen (Free Child); another who is serious and frequently asking questions (Adult); a third who likes to boss the others about (Controlling Parent).

13.3.2 TRANSACTIONS

A transaction occurs when two people communicate. It may be verbal or non-verbal. Clearly, if we can operate from any of five ego states, what we say or do is an expression of one of them. Further, it is directed at a particular ego state in the other person and may draw a reply from that ego state. This is called a complementary transaction (Figure 13.2). For example, a tennis coach may approach teaching a stroke differently for children at different ages. For a youngster who is habitually Adapted Child, the Controlling Parent may speak quite effectively like this:

Table 13.1 Behavioural indications of ego states (From Turner, 1983 by kind permission of the publishers)

	Controlling parent	Nurturing parent	Adult	Free child	Adapted child
Behaviour	Criticizes Commands Dictates	Protects Comforts Helps	Enquires Tests Reasons Gives and receives information	Cries Laughs Rages	Submits Accepts Rebels Reacts
Attitude	Judgemental Moralistic Authoritarian	Understanding Caring Giving Smothering	Interested Observant Rational Evaluating	Curious Fun-loving Changeable	Compliant Ashamed Apologetic Demanding
Key words	Must, Ought Always, Should, Wrong	Love, Good, Splendid, Well done, Help	How, What, Why, Consider, Probable	Super, Wow, Want, Fun, Ouch	Can't Try Sorry Thank you
Voice tone	Critical Condescending Sarcastic Firm Dominating	Loving Comforting Helpful Sugary	Calm, clear Enquiring Precise Monotone	Free, Loud, Sexy, Energetic, Happy, Angry	Whiny Defiant Placating Moaning Demanding
Gestures, postures	Pointing finger Hands on hips Foot tapping Looking down on	Arm round shoulder Leaning forward	Erect Pointing (to demonstrate)	Active energy Cuddles	Slumped Pouting Cringing Foot stamping
Expression	Frowning Set jaw	Smiling Sympathetic Accepting	Alert Interested Pre-occupied	Uninhibited Laughter Excited	Dejected Apprehensive Pleading

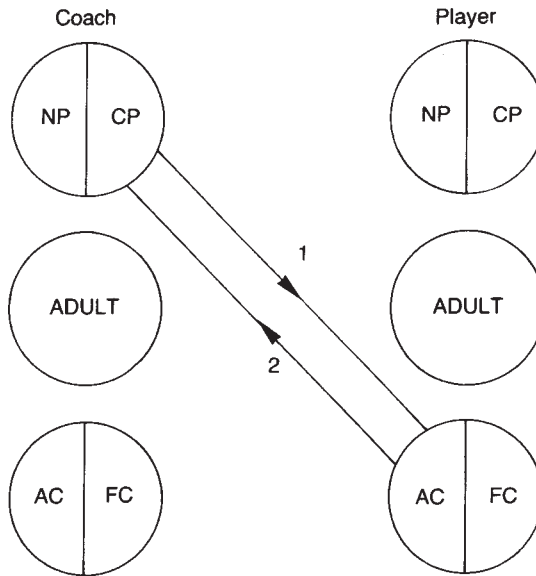


Fig. 13.2 Complementary transaction: Parent to Child

Coach: You *must* always get sideways on when you play the forehand.

Player: OK.

For a player who resists instructions and prefers to make his own judgements (Adult) the coach may find the relationship benefits by teaching from within the Adult as well (Figure 13.3).

Coach: If you get sideways on with your front foot to the ball you can get more weight into the shot.

Player: Oh, now I see what you mean. I'll try it.

In the second case the coach is supplying information which the player can evaluate and act upon if she wishes. Of course, the coach may not wish to give any choice in the matter. If that happens and the player responds from the Adult, the transaction may look like this:

Coach: You *must* always get sideways on when you play the forehand.

Player: But if I do that all the time I won't be able to get as much topspin. I can get more when I hit it front on.

This is known as a crossed transaction (Figure 13.4) and is a common source of conflict between people. When this happens the coach could carry on with Parental, controlling messages, trying to 'hook' the player's

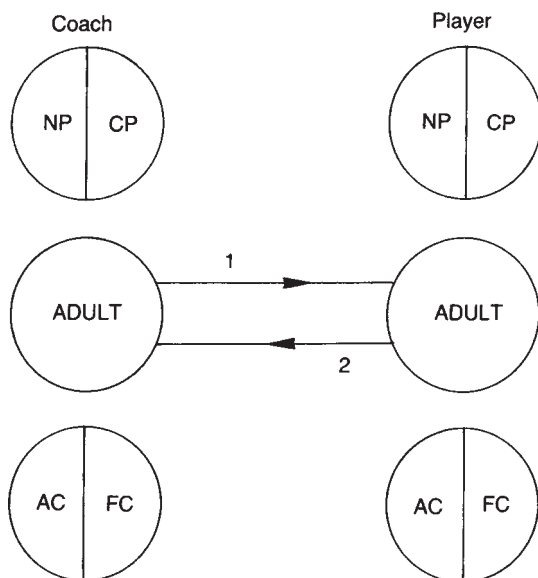


Fig. 13.3 Complementary transaction: Adult to Adult (exchanging information)

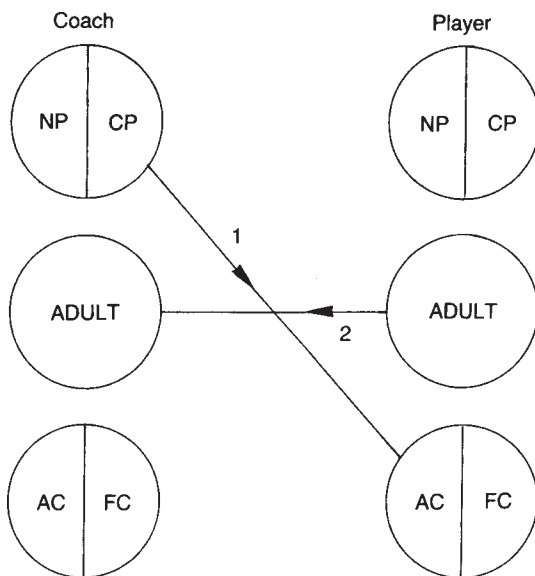


Fig. 13.4 Crossed transaction: Parent to Child with response from Adult to Adult

Adapted Child without trying to explain why the player should take the advice. But this may just provoke conflict and she could change her approach and give information from her Adult to the player's Adult.

Child to Child transactions occur when both coach and player are relaxed and having fun, sharing a joke or enjoying a performance. It is very important for coaches to let their Child show through and have some fun. Many young athletes we have interviewed consider having a good sense of humour to be an essential coaching quality and echo this remark: 'I like the person (*coach*) to have a joke. I like it when they joke about it...it makes you try harder' (U16 female international badminton player).

A final form of common transaction is the ulterior transaction in which the spoken message is used to mask another clear message apparent by implication. This may be conveyed by tone, speech pattern or by body language, or be couched in the situational context; whichever, it is the more powerful message. Ironic or sarcastic comments may fall into this category and can be damaging to the relationship because they are not honest.

This is just a very brief introduction to TA. It provides useful insights into social relationships and covers a great deal of ground which is relevant to coaches, teachers and managers. Above all it provides guidance into developing listening skills, being able to distinguish words and music. Readers who wish to pursue the ideas presented here are referred to Eric Berne's *Games People Play*.

13.4 APPLICATIONS TO COACHING

So what does this mean in practical terms for coaches? First, let us consider the outcomes of coaches' efforts to use the principles outlined here. There is strong evidence that learning to use good interpersonal skills greatly benefits young athletes.

A series of extensive studies with children's baseball and basketball coaches in America showed that players whose coaches who had been trained in a programme of interpersonal skills expressed more satisfaction with the season, were more likely to return to play again, and, most importantly, the teams had playing records as good as those whose coaches were not trained (Smith *et al.*, 1979; Curtis *et al.*, 1979; Smith *et al.*, 1983). In other words good communication skills are effective in enhancing children's sports experiences without detracting from success.

In a more recent study Thelma Horn, another American sport psychologist, looked more closely at the effects of coaches' feedback on girls' perceptions of their own competence in softball. She concluded that coaches' practice behaviour was related to children's perceptions of

their ability and to changes in those perceptions; to be effective, feedback, praise and criticism must be related to a specific performance, i.e. contingent upon behaviour. Further, children perceived criticism after failure as indicating that the performer had high ability and was expected to do better; overpraising of less successful girls indicated lack of ability (Horn, 1985). This study also showed that young athletes are, not unnaturally, less able to assess their ability than older athletes and rely on their coaches to tell them how good they are. Furthermore, they are not easily fooled!

On the basis of the account of communication given above, it is possible to make some suggestions about how best to communicate most effectively. I'll do this by making suggestions to facilitate different purposes. But first keep firmly in mind that children like to be coached by people who are happy and friendly with a good sense of humour and are consistently patient and understanding (Lee and Austin, 1988).

13.4.1 GAINING CONTROL

1. Be well prepared and have a programme ready to go. This shows that you are organized, are not there to waste time and have expectations of the group.
2. Cut down distractions: remove loose equipment, close doors to cut extraneous noise if you are inside, have the class face away from other groups moving about, and face the sun yourself. With children it is helpful to sit the group down; they can see you more easily and it reduces restlessness.
3. Be positive with your body language: give yourself some distance from the class, say 1.5 to two metres for small groups and up to four metres for larger groups, stand erect, establish eye contact, and wait until you have everybody's attention. To encourage informality and friendliness, specially with little children, sit down to be on their level.
4. Use your voice as an instrument; change the tone, pitch and volume. Sometimes it is best to talk very quietly so that children have to attend carefully to hear, but only if they are already interested.
5. Be prepared for a joke. Children like coaches who are human and can have a laugh with them.

13.4.2 GIVING INSTRUCTIONS

1. Choose material appropriate to the age, ability and experience of the children. They need to have their attention drawn to different aspects of the skill at different times. Detailed instructions that are important to a U15 county champion pole-vaulter are very different

to those required by a child who is just starting—it is actually a different activity!

2. Don't give too much information. As they get better they need to know more, and younger athletes cannot deal with as much information at once as older more experienced athletes.
3. Build on what has gone before, and check that it has been learned.
4. Keep the number of choices a child has to make small to start with. Don't expect children to make all the decisions that you can without thinking. Recall how children with a ball in their hands do not pass it because they are overwhelmed with choices which change continually—they freeze!
5. Use a language that the children understand easily. Find words that are meaningful to them and use visual images that capture their imagination.
6. Be clear and concise; don't ramble on too much, you may lose their interest because they want to do things. Watch and listen to the 'music'; if they get fidgety it is a sign they are ready to do something else, and looking away may mean that they don't understand.
7. *Always* check to see that instructions are clearly understood before starting a practice.

13.4.3 GIVING FEEDBACK

1. Start by asking questions about a performance. Children will learn more if they have to recall and think it through themselves.
2. Find something to comment positively about; mention the 'good news' first, then the 'bad news' (the things that need correcting next time) and finish with some more 'good news'. Criticism *must* be constructive; tell them how to correct a fault. As an U16 footballer said to us, '...they should tell you *how* you went wrong...and you can change it next time'.
3. Again, don't give children too much to think about; deal with one thing at a time.
4. Don't use 'we' when the athletes do well and 'you' when they do badly. These pronouns indicate identity and can imply credit and blame.
5. Give messages which are high on information and not overlaid with judgement unless that is specifically the purpose. For example, 'If...I have done something wrong I should be told...but (she should) not start complaining...because...it is finished, but (she should) tell you how to improve it' (U16 swimmer).
6. Choose your time carefully. 'I like to sit down and think about it myself, and then I go and see the coach and he tells me what I have done wrong' (U16 badminton player).

13.4.4 REINFORCEMENT

1. Always reward children when they have done something well and ensure that they know what they have done. In other words make your reinforcement contingent upon behaviour. Give praise when it is earned and make sure your body language matches your words. It might be, “‘Well played”, and pats you on the head’ (U10 rugby player).
2. Do not overpraise as you will lose credibility. Save the superlatives for superlative performance. ‘It doesn’t mean much when they go over the top’ (U12 swimmer).
3. Be consistent, don’t have favourites and be fair.
4. Don’t let misbehaviours pass; use some sort of sanction immediately, but do not punish poor performance.

13.4.5 ASKING QUESTIONS

1. Use questions to check comprehension and give yourself the opportunity to listen to your athletes.
2. Encourage children to talk by asking open-ended questions. Closed questions which require ‘yes’ or ‘no’ answers cut off conversation.
3. Listen attentively to the answers; don’t interrupt, look at the speaker, use nods and phrases like ‘Yes, I see’, ‘Mmm’, ‘Uh-huh’ so that he knows you are listening.
4. Paraphrase the answers to check that you understand correctly.
5. Listen with your eyes as well as your ears. Try to see where the athlete’s response to you is coming from, Parent, Adult or Child, and address him or her accordingly. When you get a crossed transaction change your own messages.

13.4.6 A WORD ABOUT PARENTS

This chapter has focused on communication with the children you coach. This is because most of your interaction will be with them. However, children cannot take part in sport these days without the support of parents and to maximize the benefits of the experience to the children, coaches have to deal with them in some form (see Tony Byrne’s review and advice in Chapter 4). Although the most common complaint of coaches, in my experience, is about parents, coaches do not always initiate good relationships and some even promote antagonism by excluding them completely. The relationships between athletes, coaches and parents are of paramount importance to successful outcomes and coaches can use their skills to involve the parents in the coaching process by keeping them informed fully about what is going on and what is

expected of the child. Remember, the child is part of their family, not yours! Hence the skills which have been outlined here should be used to promote good relationships between all those involved.

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Counselling young athletes and how to avoid it

14

Lew Hardy

SUMMARY

This chapter discusses some of the more commonly occurring problems: problems of interpersonal relationships, difficulties in coping with failure, recurring negative self-talk, performance anxiety, coping with injuries, and fear of physical harm. It suggests ways in which coaches and parents can reduce the probability of these problems occurring and how they might be dealt with if they do. The strategies discussed include development of communication skills, reward patterns, helping children to develop and maintain self-confidence, sustaining positive training environments, reframing thoughts, and a structured programme of competition training as part of a preparation strategy.

14.1 INTRODUCTION

Essentially, the need for counselling athletes arises because the complex interaction between athlete and environment which constitutes performance goes wrong. Figure 14.1 shows some of the factors which influence this interaction, and hence determine its outcome.

It is perhaps worth noting how loosely the term environment is used here, since many of the major determinants of a performer's environment are in fact other people. Indeed, many of the psychological problems which lead to young performers requiring counselling involve the very people who love the performer most dearly; for example, parents, coaches and friends. It is with relationships with those others that I wish to begin since they can have a profound influence on the athlete's progress.

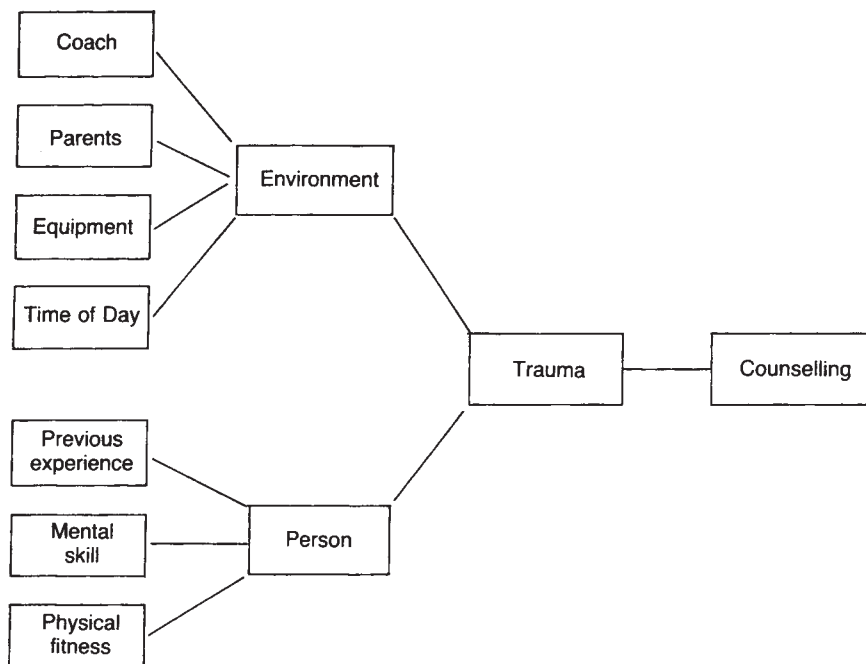


Fig. 14.1 Interaction of personal and situational factors contributing to trauma and a need for counselling

14.2 COACH—PERFORMER AND PARENT—PERFORMER RELATIONSHIPS

In order to perform or train at their optimal level, any performer must have a positive, supportive environment. For example, two Swedish psychologists have shown that one of the most important factors which determined whether good young tennis players became genuinely world class or not was how supportive and democratic (even permissive) their relationship was with their parents and coach. Another important finding was the lack of expectancy which the parents of successful players had regarding their children's involvement in tennis; that is not to say that the parents were disinterested in their children's progress, it is just that they did not put their children under pressure to achieve (Carlson and Engstrom, 1987). The line between being supportive and expressing expectancy about a child's involvement in sport is clearly a very thin one which needs treading carefully. However, actively involving children in decision making processes, and respecting and supporting their decisions and objectives will go a long way towards establishing the sort of

relationship which is required. The reason why this sort of relationship is so important is probably because it helps to develop the child's (non-critical) awareness and independence—crucial commodities if the performer is going to cope with the pressures of serious sport. Remember, it is the performer who has to get up and perform, not the coach or the performer's parents!

Other ways of enhancing awareness and independence include asking questions, listening to answers, allowing mistakes to happen, providing informational rather than extrinsic rewards, and developing good goal setting skills.

14.2.1 ASKING QUESTIONS

For example, when one of my gymnasts has a technical problem with a move which they cannot identify, I often tell them that after their next attempt I am going to ask them a question about whatever part of the movement I think is causing the problem. Often, just drawing their attention to a problem area in this non-judgemental way is all that is required for them to be able to put the problem right. The important thing about asking questions like this is that the question should not imply that something is 'wrong', and should not *lead* the person to a 'solution'. The question should simply guide the performer's attention to where it is required. In this way, the performer develops his or her own awareness of the relationship which exists between certain actions and the environment, rather than being dependent upon the coach for instruction all the time. The most important thing to realize is that some questions imply considerably more criticism of the performer than others. As a rough guideline, questions which ask 'What?', 'Where?', 'When?' or 'How?' are fairly safe, whilst questions which ask 'Why?' seem to contain some threat.

14.2.2 LISTENING

I am sure that we all believe that we listen to our performers. Yet coaches are busy people whose time is in great demand, and I cannot help wondering how many of us can honestly put our hands on our hearts and say that we never cut our performers off in mid-sentence even though it is only to agree with them. It is not that long before 'Yes, that's right, well done!' comes to be interpreted as 'There's not much point saying anything to him because he will already know about it anyway'. I wonder when was the last time you heard a coach say 'That's a good idea, I would never have thought of that. How did you work it out?' after the performer had finished speaking. Listening is a skill, and a very powerful one at that. Cultivate it!

14.2.3 ALLOWING MISTAKES TO HAPPEN

Knowing when to allow mistakes to happen and how far to let them develop is another skill which good coaches possess. Unfortunately, there are few easy guidelines, although encouraging children objectively to evaluate the consequences of their actions and decisions will help to resolve the problem. The decision of whether or not to let someone make a mistake should be largely determined by a consideration of the relative value of letting the mistake occur, in terms of experience and lessons learned, versus the psychological or physical damage which could occur as a result of the mistake. Of course, allowing mistakes to happen takes time; but this is well spent, for in the long run it will save far more time than it costs.

14.2.4 INFORMATIONAL REWARDS

Another area where counselling is frequently required is when the athlete has motivational problems. Whilst all performers will need emotional support when they are having a 'hard time of it', children who regularly need motivational help are probably engaged in the sport for inappropriate reasons; for example, because they think their parents want them to do it, or because they get badges and trophies when they do well. Such performers would probably be well advised to seek out other activities which they find more inherently enjoyable. The likelihood of this sort of situation occurring can be reduced by providing children with 'informational rewards' which tell them that they are competent, rather than 'controlling rewards' which lead the child to believe that the reason for being involved in the sport is to obtain the reward.

14.2.5 GOAL SETTING

Many of the worst pressures which children have to overcome can be traced to inappropriate or unrealistic goals. This only serves to emphasize how difficult parents' and coaches' roles are. On the one hand, they must allow performers the scope to make their own decisions and develop their independence whilst, on the other, they must somehow try to protect them from decisions which they know will cause damage or disappointment at some future time. Goal setting is therefore a most important skill for performers, coaches and parents to develop. It is discussed in more detail by Rod Thorpe in Chapter 12.

14.3 COPING WITH FAILURE

14.3.1 DEVELOPING SELF-CONFIDENCE

It could be argued that if appropriate goals are set, then failure should rarely occur. However, when setbacks do occur self-confidence plays an important part in coping with them. Although it takes quite a lot of planning and structured hard work to increase self-confidence, it does not seem to take quite as much planning and hard work to change it in the other direction! A theory by an American psychologist called Albert Bandura helps to explain how self-confidence is developed.

Bandura showed that self-confidence is influenced by four main factors:

1. previous success;
2. observing others succeed;
3. verbal persuasion;
4. interpretation of your physiological state.

All these factors are important determinants of self-confidence, but one of the crucial things about Bandura's work is that it implies that performance accomplishment is by far the most important of them. It really doesn't matter what your performers say to themselves on the day; if they have only ever experienced failure in the past, then they are unlikely to feel confident in the present! Now, to complete the circle, performance accomplishment is about success, and success is about goal achievement; the more goals your performers achieve, the more success they experience, and the greater their self-confidence becomes (Figure 14.2). The ability to set goals in an appropriate way is therefore once again a most important skill.

14.4 DEALING WITH NEGATIVE SELF-TALK

Whilst negative self-talk disrupts performance by distracting attention and lowering self-confidence, positive self-talk can form a very important part of peak performance by focusing attention, raising self-confidence and enhancing motivation.

14.4.1 POSITIVE TRAINING ENVIRONMENTS

Perhaps the simplest thing you can do to encourage young performers to think positively is to create a very positive training environment. For example, every failure provides at least two opportunities. One is to practise goal-setting, and the other is to achieve a whole set of new goals,

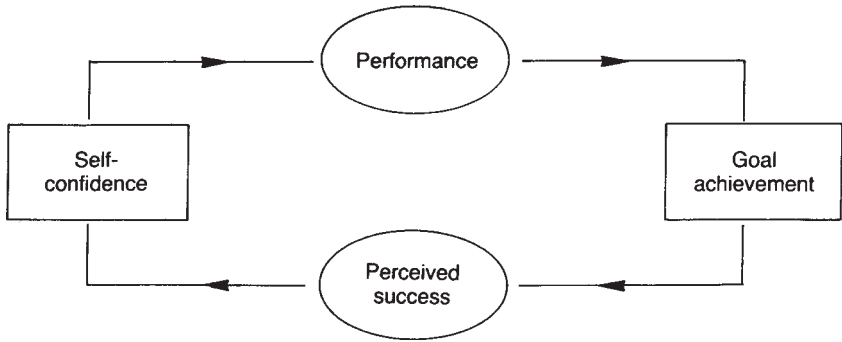


Table 14.1 Refraining negative thoughts as positive ones

thereby enhancing self-confidence. Of course, it is hopeless expecting young performers to think positively if they work in an environment where they are bombarded with negative criticism. Consequently, it is important to try and phrase your coaching in terms of positive statements telling your performers what you would like them to do, rather than negative statements telling them what you would like them not to do.

14.4.2 REFRAMING

Reframing is a means of changing the way you think about situations so that instead of describing them in negative terms you describe them in positive terms. For example, instead of thinking ‘I hate bumpy pitches, we never play well on them’, the performer could think ‘Nobody likes playing on bumpy pitches. I bet they get really fed up with playing on it every week. We’ve only got to play on it this once, so I am just going to go out there and keep everything very simple’. The key to reframing is that the athlete must recognize what it is that he dislikes about the situation, and why he is worried about it. He should then change the negative self-statement to a positive one. A useful exercise to help develop reframing skills is to have performers keep a log of all their negative self-statements, then sit down with them and identify what is involved in each statement and why they feel negatively about that situation. They should then write down next to each negative statement a positive substitute statement (Table 14.1). In doing this, they should use the present tense, and try to avoid using perfectionist statements like ‘I always...’ or ‘I never...’, as these can end up putting them under considerable pressure at a later time.

14.4.3 SUPPORT ‘ON THE DAY’

Sooner or later you will probably have the misfortune to find yourself at

Table 14.1 Refraining negative thoughts as positive ones

Negative Thoughts	Positive Thoughts
There's no point trying. I'm useless.	I've seen some really good players who had to work hard to succeed. If I can just stick at it I'm bound to make progress after a couple of sessions.
Oh no, she's here. She always beats me.	She isn't relevant to how I perform. I am going to concentrate on my game regardless of what she does.
If I can just win this point I'll win the match.	This point is just like any other point. Let's just concentrate on playing it the same way as the last one.
I don't really feel like training today. I think I'll have a play with Jack today.	Jack's always ready for a play. I must take care not to be distracted today. I think I will pair up with someone else.
The coach never takes any notice of me. He's always too busy with Steven.	The coach has a lot of people to look after. I must go up to him and ask him what he thinks I should do next.
Why can't I do this? I could do it yesterday, and even Amanda can do it today.	I know I can do this because I did it yesterday. I must be doing something not quite right. I wonder if Amanda can help me to sort it out.

a major competitive event faced by a performer who has 'gone negative'. You might reasonably expect that this chapter should enable you (and the performer) to cope with that event. Unfortunately, I would be doing you both a great disservice if I led you to believe that you could easily talk the performer round into thinking positively. Once things like attitude or motivation have gone wrong on the day, it is very rare that anyone can get the performer into a good performing state. However, if you manage to catch things early enough, you can sometimes get performers back on an 'even keel', by:

1. being generally supportive without smothering them;
2. reassuring them that other people do not have unreasonable expectations of them; and
3. reassuring them that their worth as human beings does not depend upon their performance in the competition. This is difficult to do without diminishing their self-confidence if you only ever reward 'performance' in training. On the other hand, it will be much easier to do if you reward things like effort, persistence and determination in training.

14.5 PERFORMANCE ANXIETY

Most performers experience some anxiety when they are about to perform and there may even be some beneficial effects to be obtained from a mild concern about the importance of an event, since this will presumably lead the performer to invest an appropriate amount of effort in the event. Furthermore, learning to cope with such stressors is an important aspect of the sport experience. However, there can be no place in children's sport for the high levels of performance anxiety which are occasionally observed in young performers. Excessive anxiety is also thought to disrupt performance by tampering with the body's physiological readiness to perform, and by distracting the performer's attention away from the task in hand towards task irrelevant thoughts, which are usually associated with the consequences of failure.

14.5.1 COMPETITION TRAINING

The most effective way for coaches to combat performance anxiety is by careful preparation and planning for events in terms of structured goal setting to build self-confidence. For, as well as being an important factor in coping with failure, self-confidence is probably the best insurance there is against failure occurring. Part of this preparation should include a programme of competition training. This is a programme of training situations structured to reduce the impact of the competitive environment by desensitizing the performer to it. Usually, this is done by constructing a mock competitive environment which gradually includes more and more aspects of real competition.

The idea of slow and steady progress, so that the performer never experiences failure, is central to all forms of competition training for two reasons. First, competition training is almost always done during the 'run-in' to competitions, so that every effort should be made to build self-confidence; and secondly, if failure is experienced then the anxiety which accompanies it can easily become conditioned to the competition training, and even the competition itself.

The detailed format for competition training programmes will, of course, vary from sport to sport, and even sometimes from person to person within a sport. However, Table 14.2 gives an example of a competition training programme for a group of young male gymnasts preparing for an important competition.

Competition training can, of course, be made as general or as specific as you like. For example, the technique can be used to help performers develop strategies for coping with poor refereeing decisions, evaluative audiences, failure feedback, verbal abuse, niggling fouls, etc. All that is required is an appropriate response to the troublesome stimulus. As an

Table 14.2 A programme of general competition training for a group of young gymnasts

Step	Goal	Achievement
1.	Perform routines in two halves after a prolonged warm-up.	
2.	Full routines after a prolonged warm-up.	
3.	Judged routines after a prolonged warm-up.	
4.	Judged routines after a 5 minute warm-up.	
5.	Judged routines after a 2 minute warm-up.	
6.	Judged routines after a formally structured warm-up (30 seconds work followed by 10 minutes sat waiting). No feedback on how mark is arrived at until the end of the session.	
7.	Introduce co-performers.	
8.	Introduce more judges, and 'bad' scores.	
9.	Invite people to come and spectate.	
10.	Play tape recorded distractions from a real competition.	

example, suppose that you wanted to help a young footballer who was easily distracted by refereeing decisions which he considered to be poor or unfair. This sort of distraction usually manifests itself in two ways. Firstly, the player is likely to criticize other decisions made by the referee; and secondly, he is likely to make silly mistakes during the period immediately following the decision (e.g. commit unnecessary fouls, miss shots, fail to identify team-mates in space, etc.). The solution is to structure training sessions so that bad refereeing decisions are deliberately given against the player during certain practice games. Of course, the player must understand the purpose of the practice, and must agree to take part in it of his own free will; otherwise, he will simply get frustrated (or, worse, still, upset) and give up. The practices must also always be structured so that the player succeeds.

To start with, you might only give one or two bad decisions against him, but gradually you must build up the number so that he is able to handle however many may occur during a game. Sometimes the player will cope quite easily with the distraction, but at others he will start to get upset and you will have to take him quietly on one side to patiently remind him that the practice is structured to help him with his problem, and that every distraction which he copes with represents an improvement to his game.

Eventually, when he has learned to cope with the distractions in these games, you can introduce them into practice games without prior warning, so that he gradually learns to cope with them in 'real' games. Remember, however you structure competition training, success is absolutely essential.

Finally, it is worth noting that general competition training desensitizes the performer to both the good and the bad aspects of competition stress. Consequently, some performers are likely to lose 'that little extra spark' which competition can give. In some non-technical/high effort sports (for example, middle distance running, distance swimming) this might be disastrous. However, in my experience, young athletes who consistently perform better in big competitions are a rare breed, so that young performers in most sports are much more likely to benefit than lose out from some form of competition training.

14.5.2 RELAXATION

It will probably be very obvious to most readers that I have so far studiously avoided mentioning relaxation strategies in this discussion. Most psychologists agree that, in all things except name, deep relaxation is the same thing as hypnosis. Furthermore, whilst deep relaxation and self-hypnosis are enormously powerful and useful skills to learn, they can also release very powerful emotions from deep in the subconscious. Children are particularly suggestible in terms of hypnosis, so that the teaching of relaxation skills is beyond the scope of most coaches. They are best left for qualified and experienced sport psychologists to teach.

14.6 INJURY

The frustration and negative moods which often accompany injury are probably brought about by two factors: anxiety about the amount of hard-earned ground which will be lost as a result of the enforced inactivity; and hormonal imbalance due to a suddenly changed lifestyle. The best thing you can do is reassure the performer that they will quickly recover their previous form, and may even lose some 'bad habits' as a result of the rest, then encourage them to reframe their negative worries and feelings into statements about things which they can do whilst they are injured. For example, they could work on mental training techniques, catch up on school work, or engage in other activities which they do not normally have time to do.

14.7 FEAR OF PHYSICAL HARM

Because of the adventurous nature of young people's lives, fear of physical harm is not usually a serious problem except in situations of very obvious potential danger or when someone has just had a 'narrow escape', for example, almost hurt themselves in a tackle or fallen from a piece of equipment. Helping young performers who are afraid of hurting themselves because they perceive the situation to be potentially

dangerous is really just another application of Bandura's theory of self-confidence. Verbal persuasion needs to be handled carefully. Trying to deny that there is a problem by convincing the performer that 'they can do it' can have disastrous effects upon the coach—performer relationship if either you or the performer fail! The real solution lies in acknowledging the fact that the situation is threatening, and helping the performer to structure a set of realistic goals which they are committed to and which will overcome the problem.

14.7.1 NARROW ESCAPES

The 'narrow escape' syndrome is analogous to falling off a horse, and there is an important part of this analogy which coaches often seem to forget. When someone falls off a horse, they usually do so because they have done something wrong. It is therefore important that they identify what this something is, and change it before they get back on the horse to have another go. The performer is also highly likely to be understandably worried about the outcome of his next attempt anyway, and this anxiety will probably further disrupt an already faulty performance. Consequently, it is inappropriate to say to someone in this position, 'Now, get back up and have another go straight away, otherwise you will lose your nerve'. Something must be done about the problem which led to the fall before the rider can reasonably be asked to have another go! This statement is particularly true for young performers, as they are very vulnerable, and you command great respect.

The best thing to do in this situation is to analyse the problem and make whatever technical changes are necessary, then encourage the performer to go back a stage if he is in any doubt, or leave the practice until the next training session. Children often forget all about such problems between sessions, and in any case, you can always go back a few steps at the start of the next session 'to warm up for it'.

14.7.2 MENTAL REHEARSAL

A good way of deciding whether or not someone is ready to have another go at something like this is to ask them to mentally rehearse, or 'see' themselves, doing the activity, but not let them actually try it until they report that they can successfully mentally rehearse it. Mental rehearsal is in fact a very powerful technique, which can be used for many things from mentally warming up to improving self-confidence. It is also a very easy skill for young children to acquire.

14.8 CONCLUSION AND RECOMMENDATIONS

This chapter has discussed ways of avoiding and dealing with six

different types of emotional problem which arise with young performers. These problems were associated with personal relationships, coping with failure, negative self-talk, performance anxiety, injury, and fear of physical harm. In order to avoid these problems as far as possible, and to deal with them should they arise, coaches can:

- (a) help their performers to develop good goal setting skills;
- (b) encourage their performers to use mental rehearsal;
- (c) help the performers to develop positive self-talk;
- (d) develop their own listening skills;
- (e) prepare structured competition training programmes;
- (f) learn how to use mistakes when they do occur.

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Training young athletes

15

Neil Armstrong and Joanne Welsman

SUMMARY

This chapter builds upon the information describing children's physiological responses to exercise in Chapter 6 and aims to provide guidelines for the safe and effective enhancement of children's aerobic and anaerobic performance based upon sound physiological principles. Central to all training programmes are the key principles of overload, progression, reversibility, adaptability, periodization and evaluation. These, along with the FIT taxonomy for recommending appropriate frequency, intensity and duration of exercise, provide the framework for training programmes and are discussed with particular reference to children and adolescents. Aerobic and anaerobic training programmes are considered separately with consideration given to the trainability of children, appropriate types of activity and the physiological changes which result from training. The ways in which these changes may be used for the evaluation of the progress of the training programme are key elements of the discussion. The appropriateness of muscular fitness training at different stages of maturity is considered and the importance of concurrent flexibility training to optimize fitness gains emphasized.

15.1 INTRODUCTION

Research concerned with the response of the growing child to physical training is accumulating but is still relatively rare when compared to the number of adult studies in the area. The main reason for this lack of documentation is the confounding problem that children grow at their

own rate and it is very difficult to separate the relative contributions of growth and training to the observed changes. Training young athletes

With adults, training effects are dependent upon intensity, frequency, duration, specificity of training, and the subject's fitness at the onset of the programme. With children there have been few controlled studies which have systematically analysed the effects of training intensity, frequency, duration and specificity and even then the results available are often conflicting. Some workers have reported higher training thresholds for children than for adults while others have found the training threshold to be the same for both adults and children. The contrasting results probably reflect differences in the initial fitness of the subjects. Some investigators have used non-specific criteria to assess the effectiveness of their training programme. It is not uncommon for a swimming training programme to be assessed by the determination of maximal oxygen uptake ($\dot{V}O_2$ max) on a cycle ergometer! Few studies have analysed the effects of specific² training programmes and researchers are loathe to expose children to invasive techniques such as muscle biopsies in order to investigate subcellular changes.

For the above reasons knowledge of children's and adolescents' responses to training is still fragmentary and the optimum training programmes for children have yet to be designed. Nevertheless, in the following sections we will try to provide guidelines to be followed when developing training programmes for children.

15.1.1 SAFETY

Coaches working with children and adolescents must stress the importance of taking sensible precautions before, during and after exercise sessions. Safety precautions cannot be overemphasized and considerations should include appropriate footwear and dress in relation to the weather conditions—children are particularly vulnerable at extremes of temperature—and current health status. As a general principle children should be feeling well when they train. It is probable that all viral illnesses, including the common cold, will respond negatively to exercise and attempts to 'sweat out' colds are not to be recommended. It is quite possible that the heart can be affected during or after a non-specific respiratory infection and following a high temperature illness, exercise should be avoided for several days. Children and adolescents should be taught how to warm up correctly before exercising and how to cool down progressively following the exercise session. The benefits of a warm-up in terms of both improved performance and avoidance of injury are well known but the cool-down phase is often ignored despite the abrupt changes in blood pressure resulting from a sudden termination of exercise. The optimum warm-up should include some general whole body activities, some flexibility

(stretching) exercises and some specific activities related to the following sessions. The warm-up prior to a training session should last about 10 to 15 minutes and the cool-down perhaps 5 to 10 minutes. Children should gradually assume responsibility for their own warm-up and cool-down.

Coaches who use external resistance such as weights in their programme have additional responsibility when working with children. The safety precautions necessary when using weights should be emphasized and time spent educating children in the correct procedures will be a sound investment for the future.

15.2 TRAINING PRINCIPLES

The principles upon which training programmes should be based are described in Figure 15.1 and are applicable to both adults and children.

The fundamental principles of training are said to have been discovered by Milo of Crotona who developed his muscles by lifting a young calf each day until it grew to be a full-sized bull. Milo progressively increased the load as the calf gradually grew heavier and as he was forced to lift more and more weight he consistently *overloaded* his muscles. Gradual *progression* is particularly important with young athletes but it is necessary to habitually overload a system to cause it to respond and adapt. Training for sport must also adhere to the principle of *specificity* to derive optimum benefits. A particular activity may induce a change in one tissue or organ but not in another; therefore training programmes should reflect the specific requirements of the sport or particular needs of the athlete. For example, although swimming and

Overload:	Exercising against a resistance greater than that which is normally encountered.
Progression:	The volume and intensity of exercise should be gradually increased over a period of time.
Specificity:	Exercise induced changes are stimulus-specific.
Reversibility:	Training effects are reversible (detraining).
Adaptability:	Training programmes must be flexible.
Evaluation:	Training effects should be periodically monitored in order to evaluate the success of the programme.
Periodization:	An organized division of the training year (or several years) in pursuit of optimal improvements in performance and peaking at specific times.

Fig. 15.1 The principles of training

running are both excellent activities for improving cardiopulmonary fitness there is no doubt that swimmers will improve their performance more by exercising in a pool than by running around a track. If training is infrequent or not sufficiently intensive the effects of a previous training programme will be *reversed* (see our section on detraining).

All training programmes must be *adaptable* with allowances being made for illness and injury. With adolescent athletes individual growth and development rates must also be considered in relation to training demands, particularly in fixing appropriate overloads. Because of different and largely unpredictable rates of growth and development it is extremely difficult to *periodize* programmes for young athletes to peak at specific times. Periodization techniques are therefore probably of limited value with young children. It is, however, important to periodically *evaluate* training programmes so that appropriate modifications can be made if necessary. Evaluation using simple tests is problematic with growing children and adolescents (we have discussed this in detail elsewhere (Armstrong and Biddle, 1992)). Coaches working with children and adolescents should contact laboratories accredited by the British Association of Sports Sciences if they require an accurate physiological assessment¹.

Training prescriptions based on these principles can be easily described in terms children can understand using the FIT taxonomy.

F	Frequency	—How often?
I	Intensity	—How hard?
T	Time	—How long?

Fig. 15.2 The FIT principle

Because of the interaction between frequency, intensity and duration there is no single optimal frequency that is suitable for all purposes. However, from a physiological viewpoint the frequency of training sessions with children and adolescents should not be more than five per week with the possible exception of flexibility exercises which may be performed on a daily basis. Increases in the intensity of training must be progressive and optimum intensity is best described in terms of a percentage of the child's maximum. There is an intensity threshold below which little or no training effect will result and in some situations (e.g. aerobic training) there is also an upper limit above which no significant further benefits will accrue although there may be disadvantages (e.g. excess lactate formation). When deciding upon the duration of a training session the coach must consider the child's

¹A list of accredited laboratories can be obtained from the National Coaching Foundation, 4 College Close, LEEDS LS6 3QH.

attention span and seek to maintain interest during the whole session. A well structured session may consist of 10 minutes warming up, 20 to 40 minutes during which the intensity threshold is exceeded, and 5 to 10 minutes cooling down.

15.3 AEROBIC TRAINING (CARDIOPULMONARY FITNESS)

Any activity which is rhythmical, uses large muscle groups and can be maintained continuously for a reasonable length of time can be used to improve cardiopulmonary fitness. Typical activities include running, swimming, cycling, skipping, skating, some types of dancing and cross-country skiing but remember the principle of specificity. Activities which involve the predominant use of small muscle groups and/or static contractions are not recommended because of the enhanced blood pressure response.

The aerobic fitness of children and adolescents seems to respond to training in a similar manner to that of adults but some evidence suggests that a maturational threshold exists below which pre-pubertal children do not respond. The evidence is conflicting and several investigators have demonstrated that the pre-pubertal child will respond to appropriate aerobic training. The explanation for these contrasting findings probably lies in the interaction between the intensity, duration and frequency of training, mode of exercise, initial fitness and habitual activity of the subjects. Children's systems may respond in a different manner to various training protocols. For example, logging miles by continuous running has been shown to be more effective than interval training in one study and others have shown swimming to be a more effective stimulus than other sports in improving aerobic processes. It may be that the 'sacred cow' of VO_2max is not the most sensitive indicator of changes in children's aerobic fitness.

The decrease in heart rate in response to standardized submaximal exercise is a very sensitive indicator of improved aerobic function and

Frequency:	3–5 times per week
Intensity:	80–90% of maximal heart rate*
Time:	20–40 minutes at the above intensity

*Although there are individual variations in maximal heart rate a value of 200 beats/min can be assumed for the design of training programmes with children and adolescents

Fig. 15.3 Aerobic training prescription

coaches can use this parameter as an easily determined method of monitoring improvement as long as they realize its limitations. Growth and maturation may also reduce submaximal heart rate regardless of training!

15.3.1 THE USE OF BLOOD LACTATE TO MONITOR TRAINING PROGRAMMES

Once an individual's ceiling for $\dot{V}O_2$ max has been reached further training can result in improvements in aerobic endurance performance through adaptations within the muscle which improve the muscle's capacity for aerobic metabolism. These include an improved capillary supply to the muscle and increased activity of oxidative enzymes. These improvements will not be reflected in a laboratory measure of $\dot{V}O_2$ max but can be accurately and sensitively detected through monitoring changes in the blood lactate response patterns during graded exercise. With training the blood lactate curve shifts to the right (Figure 15.4) and the athlete is able to exercise closer to $\dot{V}O_2$ max before a given level (2.5 or 4.0 mmol/l) of blood lactate is reached², i.e. for a given intensity of exercise post-training blood lactate levels are lower than those demonstrated pre-training.

Few training studies with children have included blood lactate

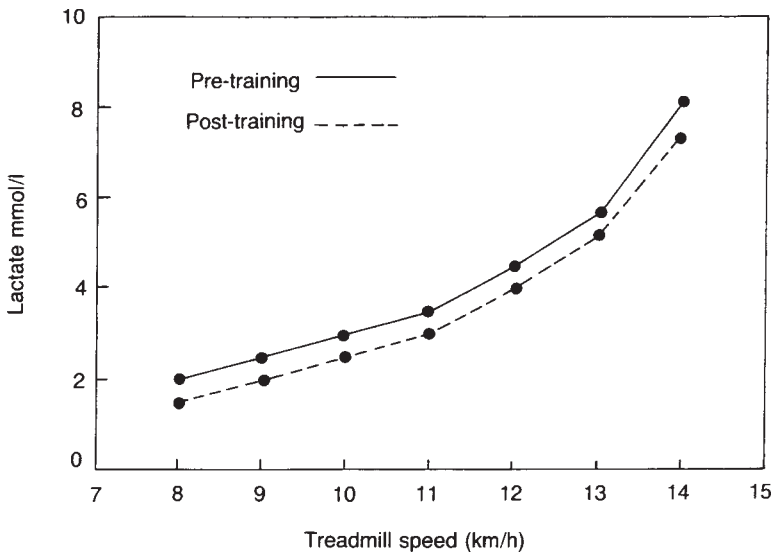


Fig. 15.4 Pre- and post-training blood lactate responses to a graded exercise test

measures but the data available do indicate that trained and untrained children can be differentiated by their blood lactate responses to laboratory tests. Decreases in blood lactate at the same relative exercise intensities have been demonstrated after short term training programmes in children. Monitoring blood lactate responses over longer periods of training must be interpreted carefully and with regard to growth. Although blood lactate responses in children and adolescents are clearly lower than adults, the exact age or stage of biological development at which these responses become adult has not been firmly established. Some evidence has indicated that changes occur with sexual maturation but more recent work suggests that responses are consistent between the ages of 11 to 16. However, as responses at age 16 and full sexual maturity may still differ from adults at some point regular monitoring will detect changes which will reflect growth rather than training. As this change is likely to be in the opposite direction to those expected with training, interpretation of blood lactate indices of aerobic performance may be difficult during late adolescence and should be considered in conjunction with growth, particularly muscle development.

There is some evidence—at least in adults—that superior training benefits can be accrued by maintaining a given blood lactate level during exercise rather than adjusting intensity according to $\dot{V}O_2$ max or heart rate responses. Usually the recommended training intensity has been set at a blood lactate of 4.0 mmol/l as this has been assumed to correspond to the maximal lactate steady state. However, this assumption has been questioned as the level of blood lactate at the steady state varies considerably between athletes. Indeed there is evidence to suggest that training is associated with a maximal lactate steady state which is lower than 4.0 mmol/l. If this type of training is required then the maximal lactate steady state must be determined individually by monitoring blood lactate during a series of steady state exercise bouts of increasing intensity. The anaerobic threshold has also been suggested to represent an optimal training intensity but, once again, there is very little conclusive evidence which supports this premise.

Scientific evidence to support the value of lactate training with children and adolescent athletes is insufficient for unequivocal recommendations to be made. Some swimming coaches have employed lactate training with children, often based upon the 4.0 mmol/l level. This is likely to be misguided in the light of children's lower blood lactate levels during exercise. Training set at this level may be too intense for aerobic conditioning and therefore may result in increased susceptibility to injury and overtraining. During treadmill running children's maximal lactate steady state tends to occur close to 2.5 mmol/l when a whole

blood assay is used. However when the concept of specificity is considered it is unlikely that this value can be extrapolated for practical use in, for example, swim training.

One further problem with the use of the 4 mmol/l level is that it was developed on the basis of laboratory data which often derived the lactate measures from plasma. Most poolside lactate analysers are whole blood assays and so will give lactate values which are approximately 30% lower than plasma values (see Williams *et al.*, 1992).

15.4 ANAEROBIC TRAINING

The effects of training on children's and adolescents' anaerobic energy systems are not well documented and the available information is fragmentary. Only a limited number of studies have employed the necessary invasive techniques with children but these have demonstrated similar improvements to those expected in adults. Pre-pubescent children are known to have a low anaerobic capacity and power but little or nothing is known about their trainability in this dimension. The available evidence suggests that lactacid training with children is probably of little value until late adolescence.

Training prescriptions are difficult to ascertain but adherence to the principles and examples outlined in Figures 15.5 and 15.6 will allow effective programmes to be developed.

Lactacid anaerobic training is very strenuous and coaches should carefully plan when they wish to include it in their training cycles. Heavy anaerobic training may require some dietary modifications including an increase in the carbohydrate content of the child's diet.

15.5 MUSCULAR FITNESS TRAINING

Muscular strength and endurance programmes may be structured around each type of muscular contraction (Figure 15.7). However, because of the disadvantages of isometric (enhanced blood pressure response), eccentric (increased muscle soreness) and isokinetic (expensive apparatus required) contractions, isotonic exercises are usually acknowledged as the most appropriate for children although successful programmes may be designed using other methods.

Pre-pubescent children have low levels of male sex hormones (androgens) and immature nervous systems. These biological facts, combined with the results of early studies which failed to show significant increases in muscular strength following training programmes, led to the belief that training could not improve the strength of pre-pubescent children. However, more recent research has demonstrated that pre-pubescent children are quite capable of increasing

Frequency: 3 times per week					
Intensity: Maximal					
Time: 5–10 seconds work period with a 'rest': work ratio of 5:1. 5 repetitions per set, 3 sets with a recovery of 5–10 minutes between sets*					
e.g.	<u>Exercise</u>	<u>Repetitions</u>	<u>Sets</u>	<u>Intensity</u>	<u>Rest recovery</u>
	50 metre run	5	3	Maximal	40 seconds walk between repetitions. 5 minute jog between sets
* The rest recovery period is extremely important if the quality of work is to be maintained					

Fig. 15.5 Prescription for training the phosphagen system

Frequency: Not more than 3 times per week					
Intensity: Not less than 90% of maximum					
Time: 20–30 seconds work period with a 'rest': work ratio of 3:1 (which may be eventually reduced to 2:1 as training progresses). 5 repetitions per set, 2 sets with up to 10 minutes jogging between sets					
e.g.	<u>Exercise</u>	<u>Repetitions</u>	<u>Sets</u>	<u>Intensity</u>	<u>Rest recovery</u>
	150–200 metre run	5	2	90% max	90 seconds jog between repetitions 10 minutes jog between sets

Fig 15.6 Prescription for training the lactacid system

muscular strength in response to resistance training although they experience more difficulty in increasing muscle mass.

Due to the possible damage which could occur to the growth zones of the skeleton (epiphyses) it is, however, probably best to be cautious about maximal resistance training until the growth spurt is virtually over. On the other hand the capillary blood supply to the muscles appears to be highly responsive during the growth period and therefore local muscular endurance exercises may be particularly suitable at this age. Pre-pubescent children should be encouraged to use submaximal resistances perhaps using their own body weight (e.g. sit-ups, press-ups,

Isotonic (dynamic or concentric):	The muscle shortens with varying tension while lifting a constant load
Isometric (static):	Tension develops but there is no change in the length of the muscle
Eccentric:	The muscle lengthens while developing tension
Isokinetic:	The tension developed by the muscle while shortening at constant speed is maximal over the full range of motion

Fig. 15.7 Types of muscular contraction

Frequency:	3 times per week
Intensity:	6–8 RM per set
Time:	3 sets

Fig. 15.8 Strength training prescription

Frequency:	3 times per week
Intensity:	10–25 RM per set
Time:	3 sets

Fig. 15.9 Local muscular endurance training prescription

pull-ups), but heavier weight training is advantageous during late adolescence.

In addition to the principles of training previously described, it is necessary to understand the concept of a repetition maximum (RM) in order to design isotonic muscular fitness programmes. RM is the maximal load that a muscle group can lift over a given number of repetitions before fatiguing. Training prescriptions for muscular fitness are outlined in Figure 15.8 and Figure 15.9 but for balanced development each muscle group should be exercised and it is advisable to start with large muscle groups and work down to smaller muscle groups. Upper legs and hips, chest and upper arms, back and posterior aspects of legs, lower legs and ankles, shoulders and posterior aspect of upper arms, abdomen and then anterior aspect of upper arms would be a suitable rotation of exercise. The resistances used should be periodically checked

Frequency:	3–7 times per week
Intensity:	muscle stretched beyond normal length
Time:	3 times

Fig. 15.10 Flexibility training prescription

and when, say, the 8 RM becomes a 12 RM the resistance should be increased to the new 8 RM.

15.6 FLEXIBILITY TRAINING

Poor flexibility can be a cause of overuse injuries and imbalance between muscle strength and flexibility may result in muscle or joint injury. There appear to have been no investigations showing on a scientific basis how training of flexibility affects children. It does seem, however, that training for increased joint mobility should start before puberty as long as it is carried out with a concern to avoid damage to the joints and vertebral column.

Two basic kinds of stretching exercises can be used to develop flexibility: ballistic stretching and static stretching. Ballistic stretching uses momentum to produce the stretch. The momentum is generated by a bouncing, bobbing or jerking movement and because this produces a sudden and sometimes excessive stretch on the muscle there is a potential for injury through overstretching the muscle. Static stretching involves slowly stretching a muscle longer than its normal length and holding the stretch for 6–10s. There is much less chance of tearing the soft tissue and less likelihood of causing muscular soreness. Static stretching is therefore recommended for the development of flexibility and an appropriate training prescription is described in Figure 15.10. More advanced flexibility training techniques (e.g. assisted passive stretching and the use of proprioceptive neuromuscular facilitation) are available but they must be carried out cautiously and further explanation is beyond the scope of this chapter (see Alter, 1988, or McNaught-Davis, 1991, for details).

15.7 DETRAINING

Elucidating the effects of detraining (reversibility) on children is confounded by the child's continued growth and development during the detraining period. As in adults it seems that adaptations to training are transient and will steadily decay once training has stopped. Long term benefits depend upon the continuance of training sessions into adult life.

A classic study of young female swimmers (12–16 years) who trained from six to 26 hours a week demonstrated that both functional and dimensional measures of cardiopulmonary fitness may be improved by long term, strenuous swim training. The girls were followed up ten years later and by this time all of them had stopped swimming and most did not engage in any physical activity in their spare time. All the girls showed a decrease in $\dot{V}O_2$ max which was 29% on average and took them to a level some 15% below the mean for women of the same age. Despite the marked detraining effects the most striking impression left by this study is the way that the girl swimmers were 'turned off' activity as adults. In spite of the physiological advantages they had developed through training they were functioning at levels below average for women of the same age. It seems likely that chronic, intensive training from a young age had turned them off exercise during adulthood.

15.8 CONCLUSION

Children are adequately equipped to handle activities which require short but intensive exertion (phosphagen system) or more prolonged periods of moderate exertion (aerobic system). They are not well equipped to cope with training which demands a significant contribution from the lactic acid system. Training of the lactic acid system should therefore generally be left until after the peak of the growth spurt has been reached. Similarly children are responsive to muscular endurance training but work with heavy weights should probably be avoided until puberty is complete.

Training regimes introduced at the appropriate time in the child's development will induce favourable changes in the child's physiology of a similar magnitude to those expected in adults. A period of detraining will cause many of these changes to decay gradually. There is no strong evidence to support the suggestion that training must be started early in order to experience success as an adult and early specialization is often counter-productive. Coaches need to be sensitive to the fact that childhood success in sport is often linked to rate of maturation—early maturing boys have a distinct advantage in most sports but with girls it is often the late maturers who are successful (e.g. gymnasts). Children should be encouraged to internalize the motivation to exercise so that when the extrinsic motivation of the coach is removed they are not 'turned off' like the girl swimmers described earlier. Youngsters must be helped to understand the principles underlying fitness and health and taught how to develop their own training programmes which can be periodically re-appraised and modified as they grow older and their aspirations change.

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The effect of injuries on growth

16

John Aldridge

SUMMARY

Injuries in children more commonly involve damage to bone than injuries in adults. This chapter presents a description of both traumatic and stress injuries to the skeleton that can occur in children. Descriptions of injuries to long bones, growth plates, the spine, joints, and tendon—bone attachments are accompanied by a brief statement of the causes (aetiology) of the common sites of occurrence, and likely outcomes. Particular attention is paid to injuries to the growth plates of the long bones and vertebrae in view of the effect they can have on future development.

16.1 INTRODUCTION

Children run the same risk of being injured during sport as adults but the results can be more serious. The skeleton is at considerably more risk in children than in adults although soft tissue injuries do still occur. This chapter will deal with the effects of trauma on the immature skeleton and identify problems which can interfere with normal growth. Some injuries can lead to asymmetrical growth and long term disability. Most children, of course, go through their developing years without suffering any long term consequences as a result of their sporting activities. Injuries that cause disability are generally rare but nonetheless are important and coaches should know about them.

16.2 ACUTE INJURIES TO THE SKELETON

16.2.1 SHAFT FRACTURES

Types

An acute injury to the skeleton is known as a fracture. In children fractures differ from those in adults because of the peculiarities of growing bone. Because it is more resilient and springy growing bone can accept a greater degree of deformity before it breaks. As a result there are three types of fracture commonly found in children which are described below. They are greenstick fractures, complete fractures and buckle fractures.

Greenstick fractures

These are the most common type of break in children. They are so called because what happens to the bone is similar to what happens when you try to break a young tree shoot. There is an incomplete break which tears the bone on the convex side and compresses it on the concave side of the fracture (Figure 16.1a).

Complete fractures

These occur when the bone is completely broken and are caused, as are greenstick fractures, by excessive angular or rotational forces (Figure 16.1b).

Buckle fractures

When forces are transmitted through the long axis of the bone, such as in a heavy landing, there is a compression of the bone tissue. In adults it results in an impacted fracture. In children it causes a buckle fracture characterized by a bulge on the surface ring which encircles the shaft (Figure 16.1c). Injuries like this are very minor and can often be missed because they do not cause recognizable deformity and often only very little swelling.

Outcomes

Angular deformity

Those fractures which result in angular deformity usually heal very well. If the deformity is marked the bone can usually be manipulated into an

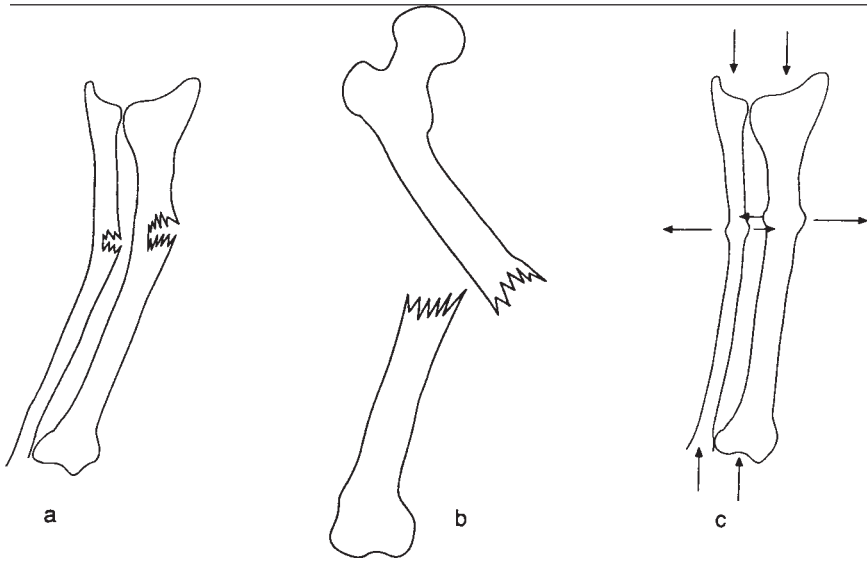


Fig. 16.1 Three common types of fracture: (a) greenstick, (b) complete, (c) buckle

acceptable position and the damaged parts will unite very quickly due to the active nature of growing bone. Indeed, the bone is so active that remodelling can occur and a certain degree of angular deformity can be corrected naturally. Figure 16.2 shows how bones will grow straight by deposition of new bone on the concave side of the fracture and reabsorption on the convex side. Hence these fractures need not cause great concern to parents or coaches.

Rotational deformity

The ability to repair and remodel bone is very important in children and makes the treatment of acute injuries very successful. However, whereas angular deformity can to some extent be overcome, rotational deformities do not correct naturally and, if untreated, will persist permanently. For example, if a tibial fracture is left in a rotated position it will unite but the deformity will not grow out and the child will walk with the toes permanently pointing in or out (Figure 16.3).

Overgrowth

Fractures of long bones can stimulate the epiphyseal growth plates to increased activity. Hence the bone grows longer more quickly. So, while a fractured femur will unite perfectly well, for a while the overall length

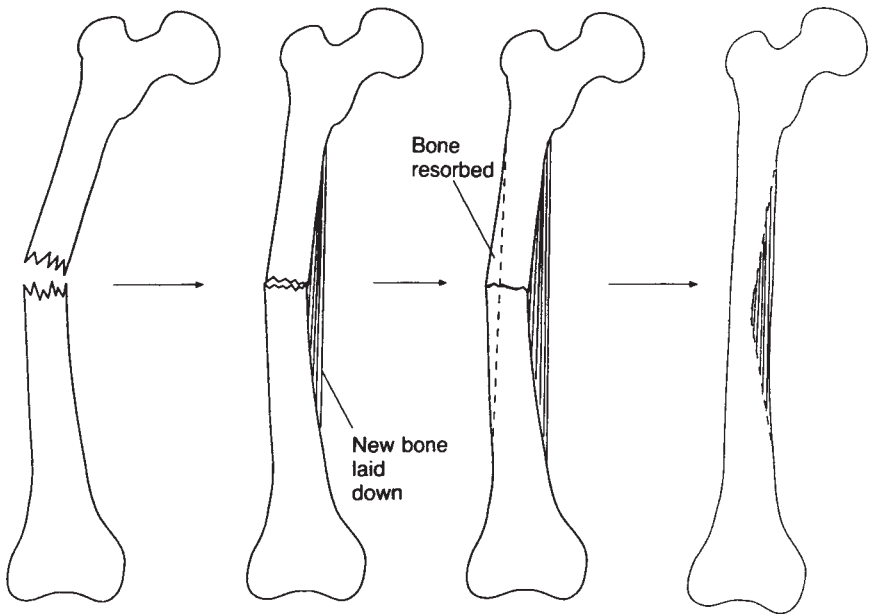


Fig. 16.2 Correction of deformity in fractured long bone during healing

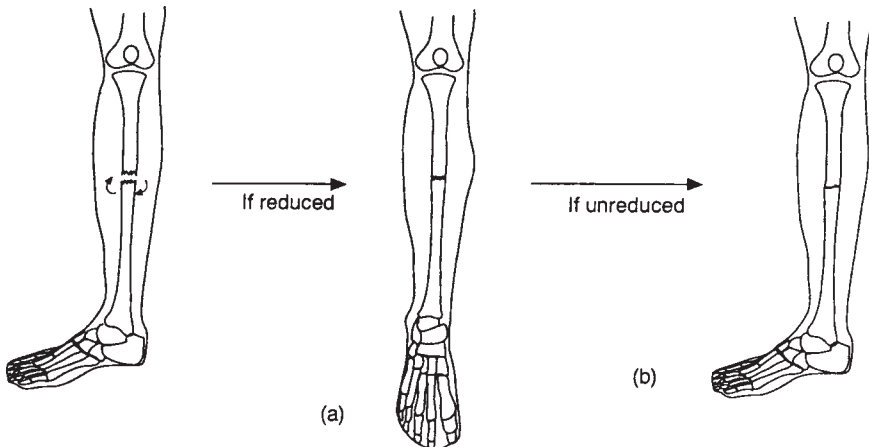


Fig. 16.3 Repair of rotational fracture in lower leg if (a) reduced, and (b) unreduced

will be greater than in the opposite leg. Catch-up growth usually takes place in the other limb. However, occasionally, a fracture of a long bone can lead to unequal limb length at maturity. It is important therefore to

recognize which deformities are acceptable, which have to be reduced, and which can be left for nature to take its course.

16.2.2 JOINT INJURIES

Unlike shaft fractures injuries to joints can often cause permanent problems in spite of adequate treatment. Three types of injury will be described before explaining their outcomes. The injuries are dislocations, articular surface injuries, and meniscal injuries.

Types

Dislocations

Almost any joint can be dislocated by trauma. In children the elbow, patella and shoulder are perhaps the most common sites.

Articular fractures

Articular surfaces are those surfaces of bones that move on each other in a joint. They can be damaged by shearing and compression forces. The fracture then extends through the cartilaginous layer of the joint into its underlying bone. Figure 16.4a shows the appearance of such a fracture. Sometimes pieces of the articular surface separate and become loose in the joint capsule (Figure 16.4b). The fracture causes bleeding into the joint which results in intense swelling and great pain.

Meniscal injury

Menisci are the cartilages in the knee joint and are commonly damaged in adults. However cartilage injuries are becoming increasingly common in young athletes. The damage occurs when a part of the meniscus becomes trapped by the articular surfaces of the knee joint and a rotational stress causes it to tear. The torn portion can then flip in and out of the joint.

Outcomes

Dislocations

Dislocation of the shoulder and patella can commonly cause weakening of the joint capsule so that recurrent dislocation occurs and surgical intervention has to be undertaken. Dislocations, and indeed fractures, around the elbow joint can be complicated by myositis ossificans. This is

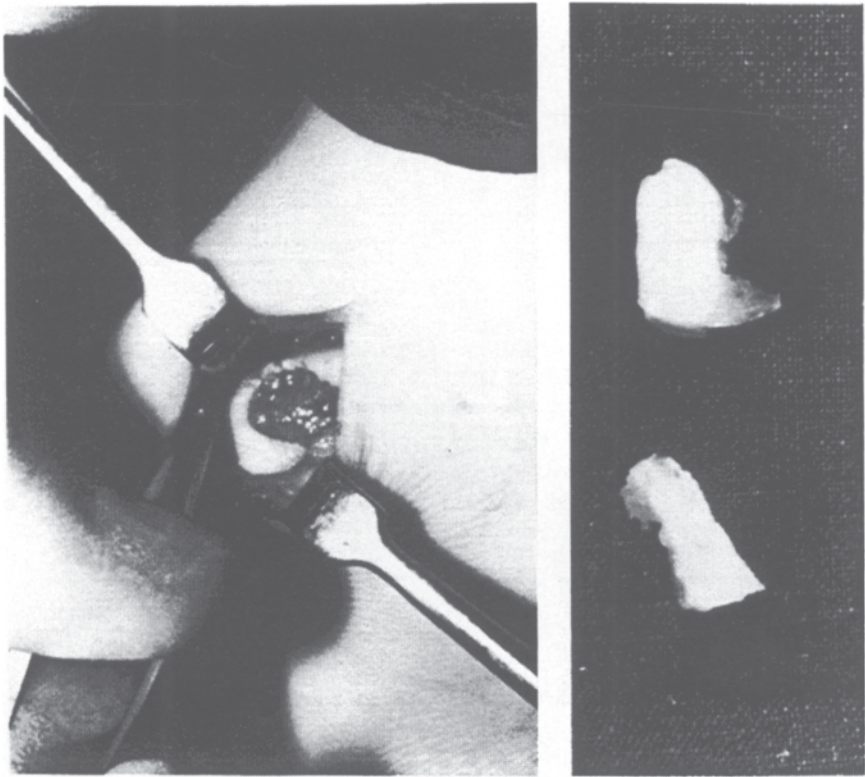


Fig. 16.4 (a) Example of ankle joint injury; (b) loose pieces removed from the joint surface

a condition in which new bone forms within the damaged soft tissues. This then interferes with joint movement and causes permanent stiffness, although growth is not impeded. A late complication of dislocation is arthritis.

Articular fractures

Articular fractures leave the joint surface damaged and scarred. Consequently the joint can wear more rapidly and degenerate arthrosis can occur. The rate at which this wear occurs depends on the degree of scarring and the stresses placed upon the joint. Intense activity is, therefore, not advisable especially if it involves a weightbearing surface.

Meniscal injury

The function of the meniscus in the knee is to distribute the weight evenly throughout the joint. If one of the menisci is damaged this function is lost, the loading of the joint becomes uneven and can lead to early arthritis. Unfortunately there is little which can be done to avoid this happening though surgery tries to preserve as much meniscal tissue as possible to reduce the risk.

16.2.3 EPIPHYSEAL INJURIES

Fractures that involve the epiphyseal growth plates (Figure 16.5) form a special group of injuries that have no counterpart in adults. They are common fractures because the cartilaginous plate is weaker than bone and may be caused by shearing, avulsion and compression forces. These fractures are of particular concern because damage to the dividing epiphyseal cells or interruption of their blood supply can interfere with the growth of the bone.

Types

Epiphyseal fractures have been classified into five types (Salter and Harris, 1963) so that a more accurate prognosis in terms of growth interference can be made. The different types of injury in the classification are shown in Figure 16.6.

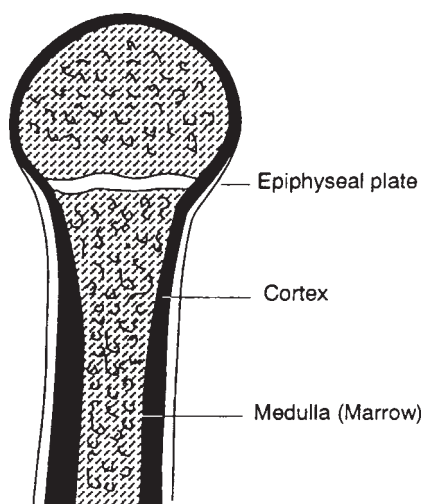


Fig. 16.5 Growth area of long bone

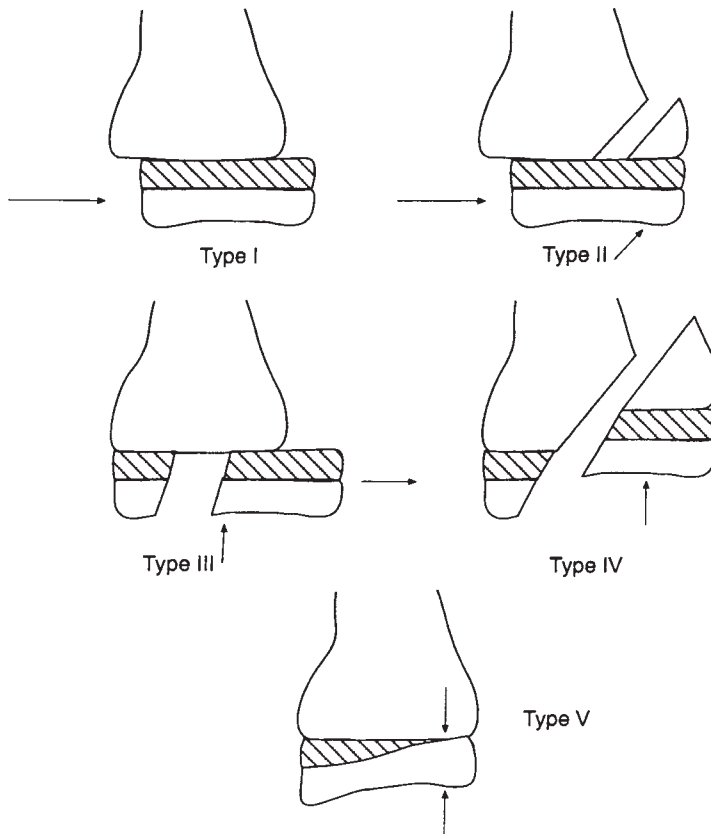


Fig. 16.6 Classification of epiphyseal fractures (adapted from Salter and Harris (1963) by kind permission of the publishers)

Outcomes

Type I and Type II fractures are common but, since the growth plate is intact, they have a good prognosis and no long term deformity is likely. Even some deformity and displacement can be accepted at the time of the injury since growth will progress normally and deformities can be corrected as part of the growth process.

Type III and Type IV fractures are more serious and can, even with good management, lead to deformity. In these cases the plate has been divided and displaced. Unless the fracture can be reduced anatomically normal growth can be disturbed (Figure 16.7).

Figure 16.8 shows what can happen when a displaced Type IV fracture is not properly reduced. Bone at B will unite with bone at B1 so that the epiphysis at C will be fixed and further growth will not occur. The result

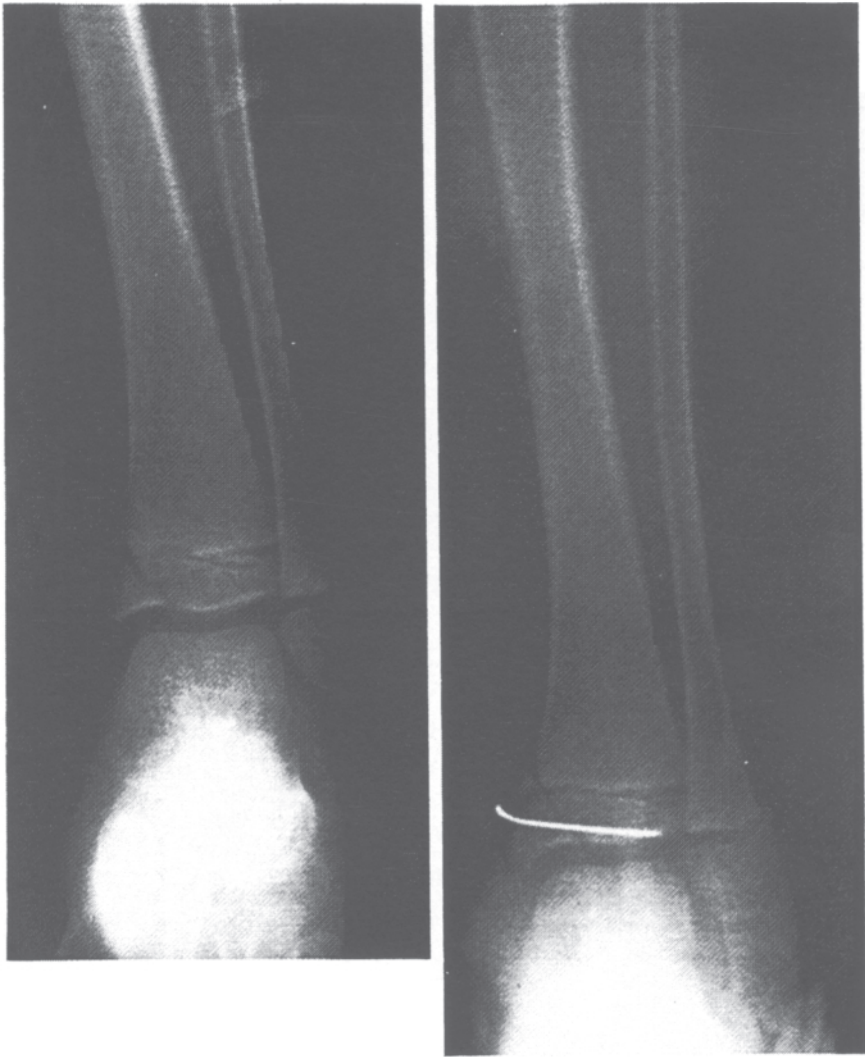


Fig. 16.7 Type IV fracture (a) before treatment, and (b) after treatment

is an asymmetrical growth of the bone and a deformity. The results of this can be seen in the example given in Figure 16.9. These angular deformities are often unsightly and occasionally disabling, in which case corrective surgery may be necessary. Whether such deformities will affect athletic performance depends upon the degree of displacement.

In Type V fractures the epiphysis is compressed and the resulting

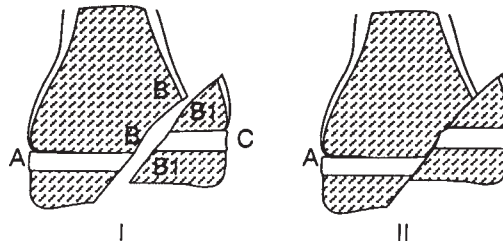


Fig. 16.8 Progress of unreduced Type IV fracture on bone growth

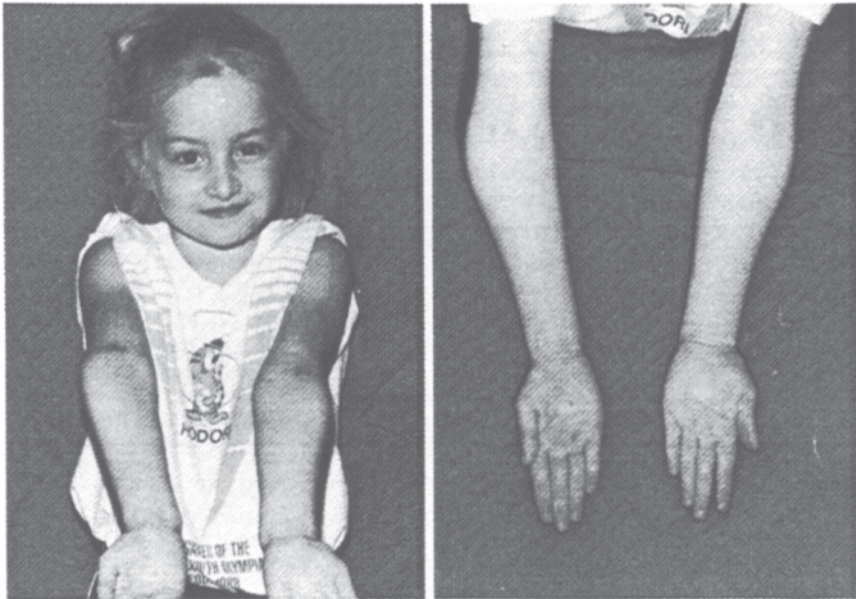


Fig. 16.9 Outcome of unreduced type IV fracture (note the deformity of the right elbow)

damage can stop further growth or cause unequal growth and lead to deformity or shortening of the bone. Unfortunately this can be a difficult injury to recognize because the X-ray appearance may be normal and the extent of the damage may only become apparent over a period of time.

16.3 STRESS INJURIES TO THE SKELETON

Acute skeletal injuries should not be difficult to recognize although minor buckle fractures may be missed. Acute injuries occur at a specific

moment as a result of a sudden force on the bone. Stress or overuse injuries, on the other hand, result from repeated stress over a period of time and may be slow to show themselves. They initially present as a minor pain for no particular reason which gradually gets worse. Therefore they can easily be ignored and progress to a point when treatment may be difficult and prolonged.

Stress fractures occur in both children and adults. In youngsters they can be seen as early as seven years of age and their frequency increases through adolescence. They may result from a frequently repeated movement under normal load, as in long distance running, or by less frequent movement with a higher load, as in weight lifting. A combination of high frequency and high load is most dangerous. Fractures of this sort are similar to metal fatigue, which can be demonstrated by repeatedly bending and straightening a paper clip until it breaks. As with the metal, microscopic changes in the bone structure get worse until the bone breaks.

It is important to recognize the symptoms of a stress fracture as early as possible. Typically there are 'crescendo pains' in which the pain experienced in the activity comes on sooner and more severely in each training session. It also lasts longer after each session and eventually becomes continuous.

16.3.1 LONG BONE FRACTURES

In principle, fractures can occur in any bone but they are most common in the lower limbs. They occur in the metatarsals, the navicular, the fibula above the ankle, the tibia, less commonly the femur, but certainly the pelvis. Typically these injuries are associated with local tenderness on examination.

Initially X-rays can be normal and it can be some time before the fracture can be seen (Figure 16.10). Sometimes it is necessary to confirm the diagnosis by a technique known as isotope scanning (Figure 16.11). If a fracture is suspected on clinical grounds, even if not on the evidence of X-rays, the athlete must be made to rest.

Once the stressful stimulus has been removed then the fracture will heal but the process of healing can sometimes be very protracted. It is unlikely, however, that there will be any long term consequences.

16.3.2 SPINAL FRACTURES

Stress fractures in the vertebrae occur in the part of the vertebral arch known as the lamina between the upper and lower articular processes (Figure 16.12). The defect in the bone is known as spondylolysis. A similar defect can sometimes be seen as a congenital anomaly. These

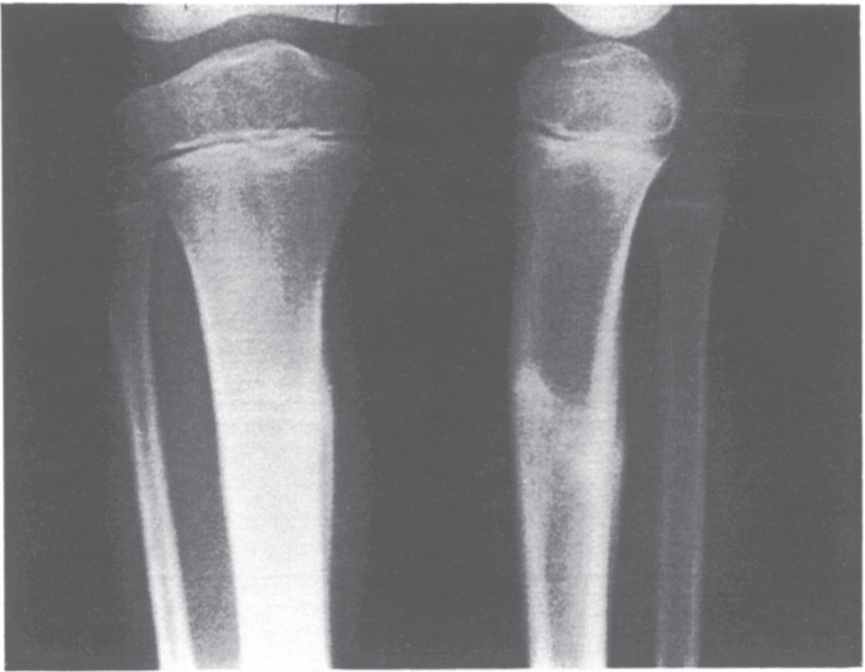


Fig. 16.10 X-ray photographs of stress fractures in the tibia

fractures can affect normal growth and development. They rarely heal and occur in a position in the vertebra which can lead to instability in the spine. It allows one vertebra to slip forward on the one below; when this happens the condition is known as spondylolisthesis (Figure 16.13).

The younger the age at which this stress defect occurs, the greater the risk of suffering the slippage. After skeletal maturity has been reached it is unusual for it to occur. Not all spondylolyses develop into spondylolistheses. Slipping occurs when shearing forces are large and is most commonly seen in gymnastics, diving, javelin throwing, wrestling, and weight lifting.

This injury is typical of adolescents. It is not necessarily a reason to give up activity, provided that limits imposed by pain are observed. If a vertebral slip occurs, and if there is evidence of nerve roots being involved, then it is more serious and surgery to stabilize the spine must be considered. Sometimes pain alone indicates the need for surgery.



Fig. 16.11 Bone scan of stress fracture of the tibia

16.4 TENDON—BONE ATTACHMENT INJURY

16.4.1 DESCRIPTION

Growth can be modified by injury mainly in those areas where there is actively growing bone. Points of major tendon to bone attachments, the traction epiphyses, are at great risk and it is not uncommon to find problems there. In adults the stress at these points is almost always taken by the muscles and tendons themselves, so causing soft tissue injury. In

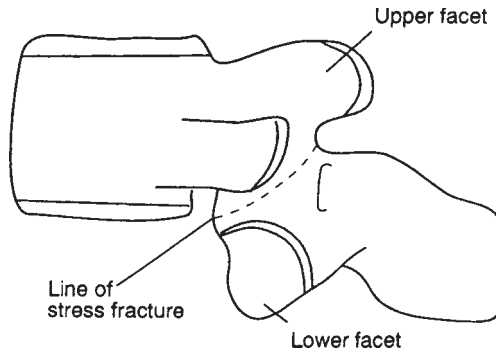


Fig. 16.12 Stress fracture of vertebral lamina

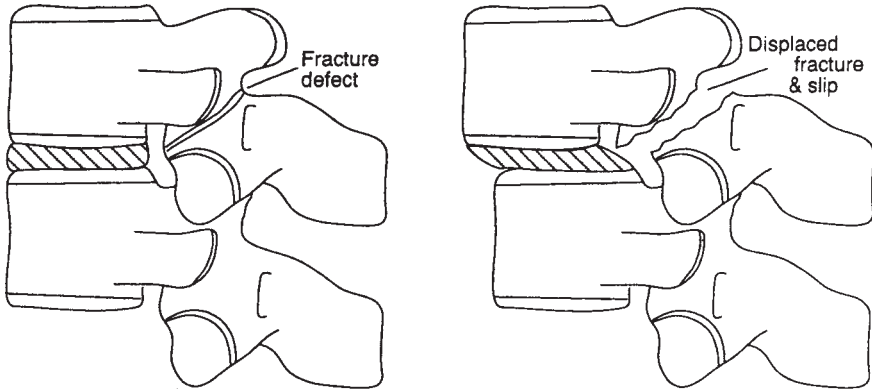


Fig. 16.13 Spondylolysis developing into spondylolisthesis

children, however, the normal process of ossification is more likely to be disturbed and the bone can fragment (Figure 16.14). This is a condition known as osteochondritis.

16.4.2 AETIOLOGY

Because physical training increases the strength of muscles and tendons more quickly than a comparable change in bone, the attachment is at risk. To be safe it is best if children only use their own body weight as a load. However, the limit at which osteochondritis occurs differs from child to child; some can take bigger stresses than others. Certainly the condition can occur in children who are not particularly active; others appear to be able to undergo heavy training without developing any symptoms.

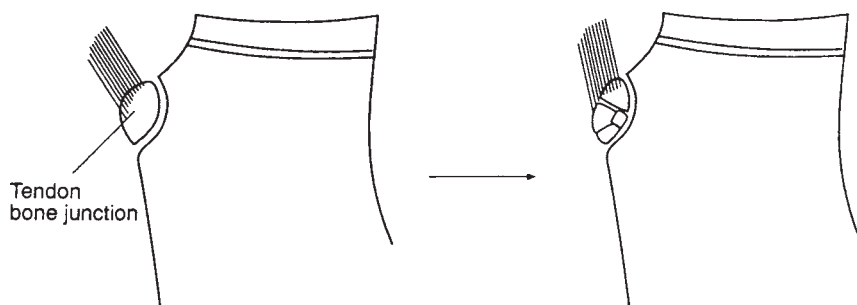


Fig. 16.14 Osteochondritis of a traction epiphysis

During the adolescent growth spurt the increases in bone length outstrip increases in muscle length. The muscles are relatively shorter and exert a greater pull on the bony attachments which increases the risk of osteochondritis of the bone. The greatest risk occurs during adolescence and periods of intense activity.

16.4.3 SITES

The most common site for osteochondritis is the attachment of the patellar tendon to the tibial tuberosity just below the knee. The condition is known as Osgood-Schlatter's disease. The child experiences local pain, tenderness and swelling. The condition is very common among young football players but may also occur in other sports. Other common sites for osteochondritis are the lower end of the patella itself and the insertion of the Achilles tendon at the heel. In the upper limb the insertion of the triceps tendon into the olecranon process, the point of the elbow, is another area at risk.

16.4.4 OUTCOME

If it is untreated osteochondritis can take a long time to heal. Apart from some residual bony swelling in the case of Osgood-Schlatter's disease, there are rarely any permanent complications. Healing can be encouraged by a period of relative rest by restricting activity or by complete rest in a plaster cast.

16.5 JOINT SURFACE INJURIES

16.5.1 DESCRIPTION

The surface of a joint consists of cartilage laid on a base of bone. Segments of cartilage and subchondral bone can die and separate from the underlying bone. This is known as osteochondritis dessicans (Figure 16.15).

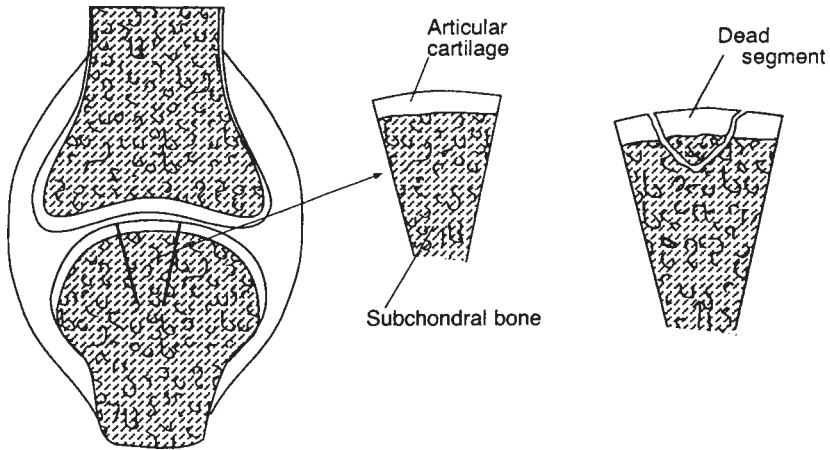


Fig. 16.15 Osteochondritis dessicans

16.5.2 AETIOLOGY

This injury is usually caused by repetitive jarring of the joint. The blood supply to an area of articular surface is damaged and a segment dies. The condition can occur within families and it is possible that it can be genetically determined.

16.5.3 SITES

This injury occurs most commonly in the knee but can also be seen at the ankle and the hip. In throwers and gymnasts the elbow can be affected. The child suffers a painful joint which is often swollen. If a loose fragment develops the joint can give way and lock. Any child with a swollen joint must seek medical advice.

16.5.4 OUTCOME

The blood supply to a dead fragment may slowly be re-established and permit healing to take place. Otherwise the fragment may separate and float within the joint (Figure 16.16a). If it heals perfectly the articular surface will be normal but usually there is some remaining irregularity (Figure 16.16b).

The long term consequences are not good. Since the joint surface is damaged it will wear more quickly and early arthritis may develop. In some cases it may be necessary to give up sport altogether. Treatment is by rest which includes non-weightbearing and occasionally

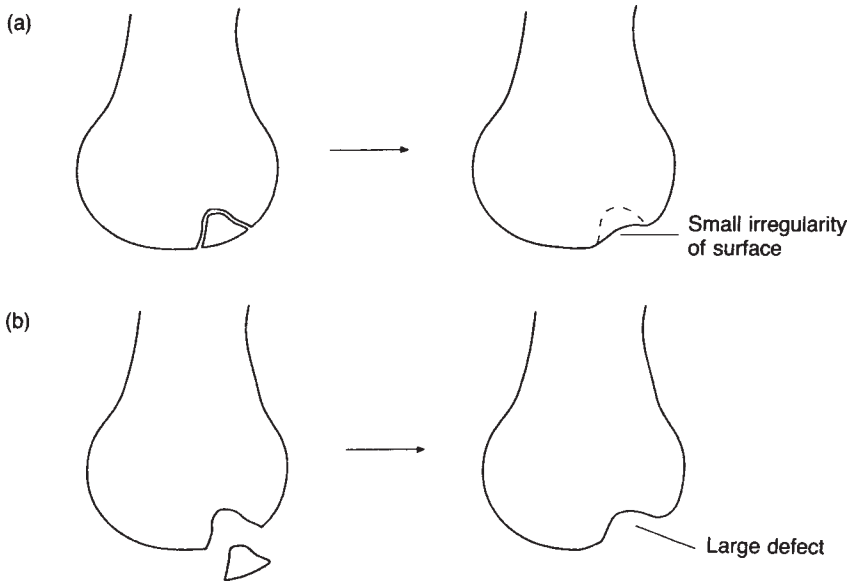


Fig. 16.16 Common outcome of osteochondritis dessicans

immobilization. If the fragment is loose or separated then an operation to replace or remove it is necessary.

16.6 EPIPHYSEAL GROWTH PLATE INJURIES

16.6.1 DESCRIPTION

The epiphyseal plates at the ends of the bones can also be damaged by overstress. When this happens the normal process of ossification can be interrupted, growth is affected and deformity can follow.

16.6.2 SITES

The spine

One of the most common sites for epiphyseal damage is in the growth plates at either end of the vertebral bodies in the spine (Figure 16.17), a condition known as Scheurmann's disease. The region most affected is the thoracic spine but it is also found in the lumbar region.

Repeated flexion causes stress which can damage the anterior part of the growth plate and prevent further growth. The vertebrae then become

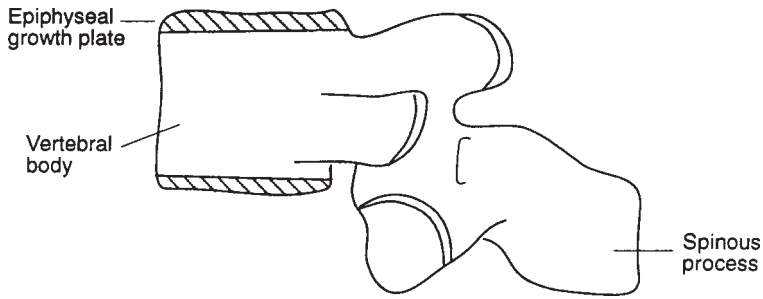


Fig. 16.17 Growth plates in a typical vertebra

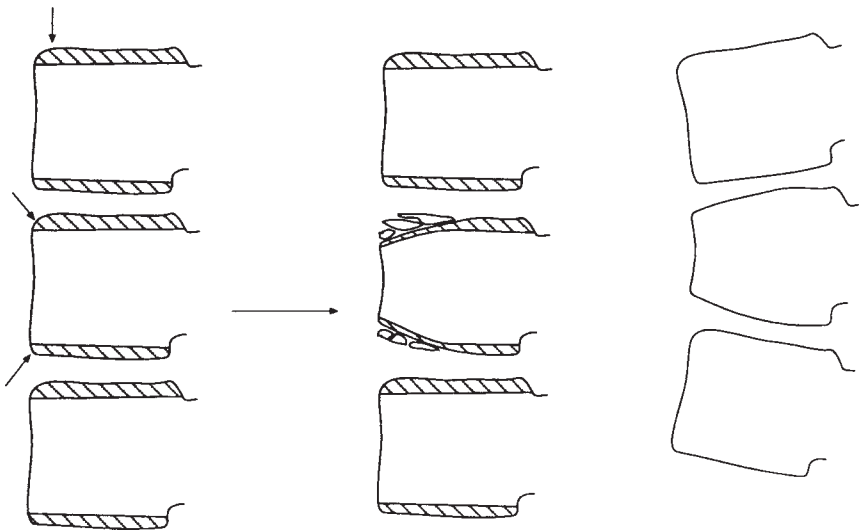


Fig. 16.18 Results of repetitive flexion stress on vertebral growth

wedge-shaped instead of rectangular (Figure 16.18). The condition can occur in non-active children and is often associated with tight hamstrings. This muscle group limits flexion at the hip so bending forward puts extra stress on the back. Typically adolescents are most affected. They report back pain which can be associated with some tenderness, muscle spasm and limited movement.

Long bones

A common site for this condition in gymnasts is the lower end of the arm, the distal radial epiphysis. When it is damaged through stress

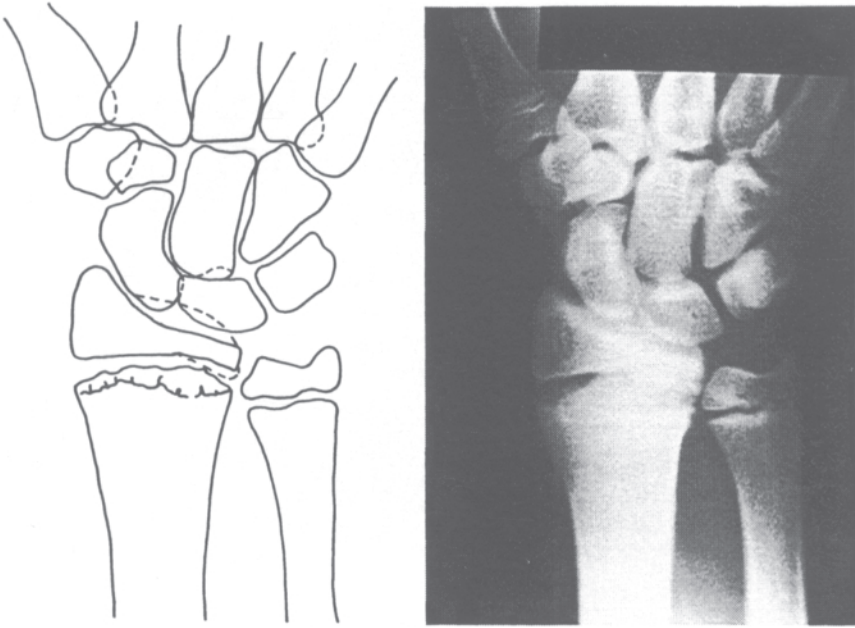


Fig. 16.19 Results of repetitive stress on long bone growth: (a) diagrammatic representation of distal radial epiphysis; (b) equivalent X-ray showing widened growth plate

growth temporarily stops. There is usually pain and swelling in the area and X-rays show a widened plate (Figure 16.19b). In other athletes, notably throwers and others who do activities which place great demands on the arms, the olecranon epiphysis at the back of the elbow can be damaged.

16.6.3 OUTCOME

Spine

The treatment for Scheurmann's disease is rest when the pain is severe during the acute stage. It may include a period of splintage in a spinal support. The condition heals as bony maturity is reached. More than one segment of the spine may be affected and if several vertebrae are involved there is a marked forward curve and the person becomes very round-shouldered. There may be no ongoing pain but any resulting severe deformity may cause degenerate change later in life.

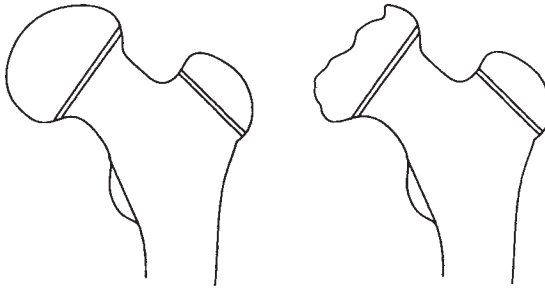


Fig. 16.20 Epiphyseal collapse in femur (Perthes disease)

Long bones

Again rest is the treatment until the appearance of X-ray photographs returns to normal. However, it is possible that growth in length may be depressed; the radius may finish up shorter than the ulna causing a permanent deformity at the wrist.

16.7 EPIPHYSEAL COLLAPSE

16.7.1 DESCRIPTION

The final group of growth injuries is one in which the whole epiphysis undergoes an avascular necrosis; the epiphysis dies, softens and collapses.

16.7.2 AETIOLOGY

A similar condition called Perthes disease can occur in any child when the head of the femur dies and collapses (Figure 16.20). Children who develop this problem often have a bone age which lags behind chronological age. Repetitive impact appears to be the reason this condition develops in other bones. However it may be that delayed skeletal maturity puts some children at greater risk.

16.7.3 SITES

Many epiphyses can suffer from this condition. It can occur in the wrist and the foot, and in the elbow the epiphysis of the capitellum can collapse (Figure 16.21).

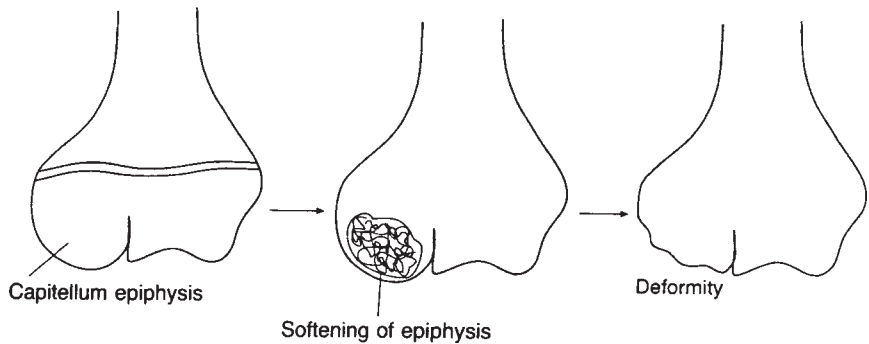


Fig. 16.21 Epiphyseal collapse of capitulum in the elbow

16.7.4 OUTCOME

As with all osteochondroses disturbance to the normal process of ossification eventually heals. However, since the bone has softened and become deformed it may heal misshapen. Because the epiphyses are associated with joints, deformity can lead to early arthritis with its pain and disability. They are therefore serious conditions and necessitate giving up active sport.

16.8 CONCLUSION

Growing bone is vulnerable to damage as a result of accidents or overuse in sport and long term harm may occur from participation. But there are other influences which affect the outcomes. Heredity, skeletal maturation and growth spurts are all important. The common factor, however, is trauma. Fortunately the great majority of children can, and do, withstand the stresses inherent in sport but in some their biological limits are exceeded and injury occurs. Occasionally there are long term effects and it is essential that accurate diagnoses are made at the outset and the prognosis made clear.

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Treating and managing injuries in children

17

Dennis Wright

SUMMARY

In this chapter the immediate response to injury is explained and different degrees of severity are described in order to assist coaches to recognize the symptoms, relieve pain and minimize the initial reaction. Different forms of injury to soft tissues, bones and joints, head and spine are briefly described and, where appropriate, guidance is given on the steps that coaches can take to assist control of damage and aid recovery. The importance of suitable training is emphasized and coaches are urged to seek expert help immediately where there may be a suspicion of serious injury.

17.1 INTRODUCTION

Coaching children carries considerable responsibilities, not least of which are the care and management of injuries. The possibility of injury is present in all physical activities but coaches who are able to deal with injuries can reduce both the short term and long term effects on children and their participation. This chapter will explain and clarify the problems encountered and provide guidelines for a sensible approach to treatment and management. It is not intended that it should substitute for proper first aid training which is recommended to all coaches.

17.2 THE BODY'S REACTION TO INJURY

The body reacts to all injuries in a standard sequence of events known as the inflammatory reaction. It may be localized or widespread, according to the nature of the injury, but always includes redness, swelling, heat, pain and restricted function.

Redness is caused by increased blood flow to the damaged area and its surroundings, bringing cells and substances which help to remove debris and promote the healing process. The depth of the structure involved determines the extent to which the redness is visible. For example, an infected cut may be readily visible where a pulled deep muscle may not be.

Swelling is an accumulation of excess tissue fluid which provides the nutritional link between the capillaries and the cells. It is facilitated by the permeability of the capillary walls and may be increased by bleeding from ruptured blood vessels.

Heat or, more accurately, the rise in temperature of an inflamed area is caused by the activity of cells involved in the healing process and the increase in blood supply.

Pain is an important symptom of injury and inflammation without which athletes would not be aware of the occurrence or status of an injury. The pain may result from damage to nerves, chemical irritation or pressure from the swelling at the site.

Restricted movement associated with injuries is due to the pain, swelling and stiffness.

17.2.1 SEVERITY OF THE INFLAMMATORY REACTION

Inflammation occurs with different degrees of intensity which are classified as acute, subacute and chronic. Not all injuries provoke acute reactions; the severity depends on the circumstances of the particular injury.

Acute reaction is produced by a considerable degree of sudden physical damage. Within hours the symptoms will be at their most severe and remain so for between two and three days.

Subacute reaction may result from a less severe trauma or be the natural sequence of improvement from the acute state. There are no rigid time schedules but an additional seven to ten days of symptoms can be expected.

Chronic reaction is important because it may easily be dismissed. It may result from relatively minor physical damage or again be part of the continuing progression from the subacute stage. In either case there are minor grumbling symptoms of minimal pain, negligible and localized swelling, undetectable heat, and only slightly impaired function. However, coaches should not ignore them because lack of care and discipline can lead to deterioration and recurrence.

17.2.2 TREATMENT OF THE INFLAMMATORY REACTION

While treatments are designed to be anti-inflammatory, there will always be some reaction. It is important to stop further activity immediately and

prompt attention, first aid, will minimize the reaction. This is a natural response which reduces the effect of the injury and protects the injured part after which the repair process can begin.

Acute stage

The main objectives are to relieve pain and stop swelling. Pain can be reduced by rest, support and the application of cold to the affected part. The degree of rest and support needed depend on the extent of the injury; complete bedrest at one extreme and a bandage support at the other. The severity of the injury also determines the period of rest and support needed but 72 hours is recognized as the minimum period before real improvement will be seen.

Applying cold reduces the metabolic rate in the area and slows the conductivity in the nerves which signal the pain. It can be done by applying an ice pack followed by cold water compresses. Compresses should be replaced regularly because the heat produced by inflammation dries them out. Do not put ice or ice packs directly onto the skin since they will burn. Put them in a plastic bag or smear a film of oil on the skin first.

Because first aid is so important young athletes should be told what to do in case of an accident. The basic rules are:

- Stop the activity;
- Move only within the limits of pain;
- Keep the part cool, do not apply heat;
- Do not rub it;
- Do not try to 'run it off'.

Sub acute stage

It is still important to relieve pain but further treatment can now be given. Gentle radiant heat, perhaps from a hot water bottle or a lamp, whilst not directly influencing deep circulation, will relieve pain by soothing nerve endings and relaxing protective muscle spasms. The blood supply is increased and provides the nutrition necessary for the healing process.

Despite precautions, some swelling will accumulate and must be removed or minimized. The increased tissue fluid contains a clotting factor which can create adhesions between adjacent structures. These are inelastic strands, both across joints and within and between muscles, which can prevent a return to full mobility.

The most effective method of removing inflammatory swelling by physical measures is a combination of massage, simple active exercises and elevation of the part. Massage helps drainage through mechanical

pressure on the veins and lymphatic vessels and promotes mobility between adjacent structures. Exercise enhances the 'muscle pump' action on surrounding vessels and helps to retain the mobility and tone in muscle. It should be restricted to the limits of discomfort. In the case of injury to joints static tensing of muscle may be sufficient. Keeping the part elevated helps drainage of tissue fluid.

Chronic stage

More vigorous physical measures can be implemented here whether or not the stage is a progression from the acute or provoked by a minor longstanding irritant. Progression from the acute stage still requires attention to the factors creating discomfort such as residual swelling, adhesions or shortening of structures. Relief of pain from deep structures requires treatment by professionals. Residual swelling and thickening can only be dispersed with deep and specific massage procedures. The restoration of joint mobility is achieved by movements in a greater range and in sport specific patterns. Rest results in loss of strength and endurance. Carefully controlled resisted movements within the limits of discomfort and selected with particular sporting skills in mind can be used to offset these losses during the chronic stage.

Chronic inflammation is often produced by overuse. Injuries are typically brought about by inappropriate training, overspecific activities and neglect of warning signs. It is always best to take advice until the discomfort has gone. Chronic 'overuse' injuries often gradually limit mobility and function. Mobility can be restored by careful use of specific exercises which conform to neuromuscular and biomechanical principles.

17.3 REPAIR PROCESSES FOLLOWING INJURY

The inflammatory response is the start of the repair process. The final outcome depends on how the injury is managed subsequently.

The repair process consists of a series of overlapping changes in the blood vessels and tissues surrounding the damaged area. A fibrous tissue is produced both to repair damaged tissue and replace that which has been destroyed. It is tough and pliable but insensitive and inelastic and needs efficient treatment to limit its production. Initially, the tissue contains capillaries but later the shrinkage of collagen fibres strangles them. The healed area then becomes a vascular and is known as scar tissue. This process may take as long as nine months.

If injuries are neglected inflammation is prolonged and the repair process is delayed with the result that more fibrous tissue forms which may lead to reduced mobility and joint instability. Insensitivity and a

lack of elasticity in tissues can impair function and the risk of injury recurrence increases.

17.4 TREATMENT OF SPECIFIC INJURIES

While all injuries provoke the inflammation reaction, different injuries require particular treatments.

17.4.1 SOFT TISSUE INJURIES

Soft tissue injuries can be conveniently divided into four categories: contusions, strains, sprains, and lacerations and abrasions. Each has specific characteristics and requires specific treatment.

Contusions

Contusions are caused by direct blows which both squeeze and stretch the tissues. Blood vessels are ruptured and the escaping blood creates pressure which causes pain. External bleeding, though unpleasant, releases the pressure and often results in less pain and discomfort. Where there is extensive damage a whole limb may become distended and remain extremely painful until the contained blood is absorbed. The discolouration known as bruising is due to the dead red cells lying in the superficial tissues.

Immediate swelling indicates bleeding and, in the case of a joint, suggests serious injury. If this happens you must call a doctor immediately because there may be a fracture or serious ligament damage.

The management of contusions is straightforward and is concerned with stopping the bleeding, relieving pain and promoting drainage.

First aid

- (a) Stop activity in order to reduce blood flow and lower local blood pressure.
- (b) Apply ice packs or cold compresses to discourage bleeding and to relieve pain.
- (c) Elevate the part to reduce pressure and aid drainage.

Early treatment

- (a) Stroking massage towards the heart to assist drainage further.
- (b) Gentle active exercise or static muscle tensing within the limits of pain to maintain mobility.

Later treatment

This is designed to improve the general circulation of the part and remove the clot of blood. It should consist of (a) gentle heat, (b) more specific, localized massage, and (c) a gradual resumption of activity.

Comment

When treating bruises, never use forced stretching. It may restart bleeding or damage deeper structures and start calcification of deep blood clots. When this does occur there is a loss of mobility, pain when stretching, and a gradual loss of function in that limb. The only cure is complete rest for a long time or surgery.

Strains

Strains of muscles or joints result from prolonged irritation by minor trauma such as overuse or postural problems. Common examples of strain from sporting activities in children are tendon strains around the ankle in athletes and low back strain in swimmers. Strain typically produces chronic inflammation.

Treatment

A period of complete rest is essential until there is no pain on normal function and when the part is pressed with the fingers. The ligaments or muscles should be pain free both when stretched and when resisting movement. Recurrence is inevitable if the cause has not been isolated and eliminated.

Sprains

Sprains are due to sudden traumatic events. Muscle sprains usually involve those which act on two or more joints and perform several functions, e.g. hamstrings. Joint sprains result from forced excessive movements, e.g. sprained ankle, which stretch the tissues and cause inflammation and accumulation of fluid within the joint. This produces a swelling and the pressure causes severe pain.

Treatment

Immediate first aid measures, as described above, are particularly successful and a full recovery in three to six weeks can be anticipated.

Lacerations and abrasions

No matter how small the break in the skin there is a risk of infection. Because bleeding often washes out dirt and infection it is a good idea to avoid stopping the bleeding too quickly unless a major blood vessel is cut. If this is suspected (bright blood which flows freely) then the blood flow must be stopped.

Lacerations (cuts) create the problem of deciding when stitching is needed. In full thickness cuts the edges fall apart and bleeding is profuse; they should be stitched within 12 hours. In partial thickness cuts the blood tends to seep out and the edges can be pulled together satisfactorily by adhesive strips.

Abrasions are caused by friction and most frequently involve skin overlying bone, e.g. kneecap, hip and elbow. There may be extensive superficial open wounds with initial bleeding followed by seepage of straw-coloured serous fluid.

First aid

Clean the wound with antiseptic solution followed by dusting with antibiotic powder to dry it. Later, to allow further activity, a raised ring of adhesive felt can be used to prevent direct pressure on the affected area. Do not seal in infected material by spraying with a plastic skin dressing before cleansing.

17.4.2 BONE AND JOINT CONDITIONS

Growing bones are particularly vulnerable to the extra demands of sport. If there is any reason to suspect damage to bones always arrange for an X-ray examination. Inform the family doctor and make sure that any paramedics who help are qualified. There are several injuries associated with bones which coaches may spot. They are described below.

Apophysitis

Apophysitis is the condition in which inflammation occurs at the attachment of tendons to bones as a reaction to the pulling action of the muscles. It may be noticed as an ache following activity or after resting in a fixed position and occurs frequently during the adolescent growth spurt. Apophysitis is an excellent example of a chronic inflammatory condition. Although it is possible to get short episodes of an acute flare-up where the area is tender, even to a light touch, it is more generally a low level persistent discomfort.

Treatment

The first step is to ensure complete rest from activity, possibly for several weeks. Physical therapy is designed to (a) relieve pain by ice, cold compresses or heat, depending on the inflammatory state, and (b) subsequently offset the effects of rest by static muscle tensing. As the immature bone ossifies and matures the effect of muscle pull becomes less.

Stress fractures

Stress fractures result from prolonged high intensity training and are frequently indicated by persistent activity-related pain in the limbs. The feet and lower legs are commonly affected but stress fractures also occur frequently in the spine. Diagnosis may require the magnification of an ordinary X-ray, repeated X-rays, or even a bone scan. Clearly, when there is reason to suspect a stress fracture medical opinion should be sought immediately.

Treatment

Immediately stop weight-bearing stress for a period of 4–6 weeks. To retain some fitness, alternative activity may be considered, e.g. swimming in the case of limbs.

Osteochondritis

Osteochondritis refers to inflammation of an area of bone and overlying cartilage the causes of which are not clearly understood. It tends to occur most commonly in the hip, knee and spine. Because the condition is so common in non-active children, sporting activity is not the cause. However, activity makes it more evident and it will eventually seriously limit participation. The condition is, again, indicated by persistent discomfort and should be investigated through correct medical channels.

Treatment

Effective management of Osteochondritis is based on its self-limiting nature. Rest is relative to the degree of discomfort experienced. Physical activity need not be stopped but excessive strain as in strong muscle work or excessive weight-bearing, e.g. weight-lifting, running on hard surfaces or jumping on unyielding floors, should be avoided.

Chondromalacia

The softening of articular cartilage covering bone at a joint is known as chondromalacia. It is almost exclusively confined to the under-surface of the patella (kneecap) and is most noticeable when the quadriceps muscles contract strongly. When the kneecap is pulled firmly against the underlying bone the contact with the ulcerated cartilage is painful.

The degree of damage does not always correspond with the amount of discomfort experienced and it is frequently incorrectly diagnosed. Therefore it is important to seek advice from doctors or paramedicals who have a particular interest in biomechanical analysis and can examine lower limb posture, joint mobility and muscle strength. Incorrect footwear can be an important contributory factor.

Treatment

Adopt the procedures previously described in line with the stage of inflammation.

Postural defects

The relative position of our joints determines the posture of our body as a whole or the position of a single limb. Within broad limits coaches can recognize acceptable general and local postures during performance of skills, e.g. a forehand stroke in tennis. Such deviations from normal posture may often arise from poor technique which later results in a condition requiring medical treatment. The lower limbs and the trunk are the areas most frequently affected.

Asymmetric development may occur in young athletes as a result of overspecificity of training and indicates a lack of balance in the programme. Imbalance of muscle strength and asymmetric joint mobility always threaten efficient postures which allow maximum effect with minimal effort. Since exercise increases muscle tone, overdevelopment can cause an imbalance of opposing groups and create malposture of joints. This may result in reduced joint mobility.

Treatment

Discomfort or pain from postural problems can usually be temporarily relieved by rest but the underlying cause must be overcome if physical measures are to be successful. The problem can be treated by gradually stretching the tightened structures, strengthening opposing groups, teaching relaxation and practising posture correction. If children complain of persistent aching in muscles, medical advice should be sought, particularly if the ache is accompanied by increasing weakness.

17.4.3 HEAD INJURIES

These injuries are the dread of all involved in sport. They can occur in most sports but are obviously more prevalent in the contact sports. Because head injuries can have serious consequences they should never be ignored or neglected. The manifestations of head injury are too complex for this short text but the length of time for which the memory fails is often an indication of severity. There are several rules of thumb which should be firmly applied in guiding decisions about continued participation.

- (a) Loss of consciousness, no matter how brief, should result in immediate withdrawal from participation and medical advice should be sought.
- (b) The athlete should not compete or train for six weeks.
- (c) After three occurrences the athlete should give up the sport.
- (d) Sickness and vomiting associated with head injury is an adverse sign and medical aid is necessary at once.

Treatment

First aid measures are designed to revive the patient by applying strong sensory stimuli such as cold water douche, shouting, smelling salts, etc. A period of observation in a quiet environment until medical assistance arrives is necessary. Do not give painkilling drugs, such as codeine or alcohol, because they will cloud the clinical picture.

17.4.4 SPINAL INJURIES

The proportion of young athletes who suffer spinal injuries is, fortunately, extremely small. Nevertheless the lack of knowledge and equipment necessary to deal with this possibility at sporting events is very worrying. Safe handling of suspected spinal injuries is essential for minimizing the damage and coaches and officials should attend an approved course, e.g. St. John's Ambulance First Aid Course, to at least acquaint themselves with the problems which can occur. **In the absence of detailed knowledge the athlete should not be moved and must be kept still and warm until trained ambulance personnel arrive.**

17.5 CONCLUSION

The so-called pressure to succeed in sport, when applied to children, is a figment of the imagination; no sporting award is important enough to risk damaging future health. Furthermore there is little virtue in trying to

understand every possible injury which could affect children involved in sporting activities. It is better to appreciate the basic facts which apply to all and to realize that there is a simple plan in dealing with them. If at all possible, coaches should attend a recognized course in first aid and/or sports injuries.

FURTHER READING

Grisogono, V. (1991) *Children and Sport: Fitness, Injuries and Diet*, John Murray, London.

Healthy eating for sport

18

Juliet Wiseman

SUMMARY

Good nutrition is necessary to support growth and activity, and young athletes need a balanced diet to provide all the necessary nutrients which the combination of growth and very high levels of activity demand.

The first section of this chapter describes the nutrients needed in any diet; those which provide energy (carbohydrates, fats and proteins) followed by other elements such as fibre, fluids, vitamins and minerals. The contribution towards health of the present United Kingdom diet is discussed and recommendations are given which would improve the balance of the diet. The way in which food provides energy for the body is also described.

The second section is specific to the needs of children and child athletes. This section includes a review of what children eat, what shapes their eating habits, the nutrient needs of active children, and practical guidelines relating to food provision for children in sport.

18.1 THE ENERGY PROVIDING NUTRIENTS

Energy from food is used by the body to fuel muscular activity and for normal metabolism at rest. Obviously, people who are active for a greater proportion of the time use more energy and need to eat more energy providing foods. Fats, carbohydrates, proteins and alcohol are all able to supply energy in the diet. Each provides a different amount of energy per gram, which may be measured either in calories or joules (1kcal=4184kJ). Fat and alcohol are the most concentrated sources of energy, providing nearly twice as much energy as either carbohydrate or protein. This is

Table 18.1 Energy value of nutrients

Nutrient	Kcal/g	kJ
Fats	9.00	37.6
Carbohydrate	4.00	16.7
Protein	4.00	16.7
Alcohol	7.00	29.3

Table 18.2 Recommended daily energy intake for children by age and sex

Age	Boys		Girls	
	Kcal	MJ	Kcal	MJ
1	1200	5.00	1100	4.5
2	1400	5.75	1300	5.5
3–4	1560	6.50	1500	6.25
5–6	1740	7.25	1680	7.00
7–8	1740	8.25	1900	8.00
9–11	2280	9.50	2025	8.50
12–14	2640	11.00	2150	9.00
15–17	2880	12.00	2150	9.00

(1 MJ=1000kJ=239 Kcal; DHSS, 1979)

(Adapted from Department of Health and Social Security, 1979)

clearly shown in Table 18.1 which gives the energy available in different nutrients in both kilogram calories per gram and in kilojoules.

In a typical British diet 40–45% energy is provided by fat, 47% by carbohydrate and the rest from protein and alcohol (MAFF, 1985).

The DHSS has produced guidelines giving recommended daily amounts of energy for children and adults. The recommended amounts for children aged 1–17 are given in Table 18.2. The following foods would provide 100 kcals each: one large slice of bread (50g), one small portion of boiled spaghetti (100g), a medium sized bowl of cornflakes (30g).

Recommended amounts of energy for children (unlike those for adults) do not vary according to activity; it is assumed that children are all similar in their activity levels. Recent research indicates that in fact children consume less than the recommended amounts of energy foods, due to reduced levels of physical activity.

However, while most children are becoming less active a minority who train or play sport regularly have energy needs as high as and in

some cases higher than the recommended amounts. For example, a cross country run lasting half an hour would use about 300 kcals, a game of tennis for one hour about 400 kcals, so a child who trains and competes daily will be adding considerably to her or his basic energy needs.

18.1.1 BODY STORES OF ENERGY

The body is not dependent on a continuous supply of food for activity, because considerable amounts of energy are stored. The main energy store is fat which can provide enough energy to last 40–50 days, whereas glycogen in muscles and liver can provide only enough energy for 6–8 hours. Glycogen stores can only be maintained by a supply of carbohydrate in the diet; fat cannot be converted to glycogen. The brain and central nervous system depend on a constant supply of glucose from the liver. Muscle glycogen can only be broken down to supply glucose locally, it is not transported to other tissues.

Eating excess protein will not result in more and more muscle being synthesized. The glucose from amino acids may be used as an energy source or may be converted to fat. High protein diets containing little carbohydrate and fat are sometimes used by body-builders, but these diets will not result in any greater gain in muscle than could be achieved on a normal balanced diet. Also they will not prevent body fat from being synthesized and stored, if immediate energy requirements are exceeded.

18.1.2 FUEL FOR EXERCISE

The major fuels used by active muscles are glucose (from glycogen) and fatty acids (from fat stores). A mixture of these is usually used, in proportions which depend on the intensity and duration of exercise and the availability of glycogen. Each muscle cell contains a substance called adenosine triphosphate (ATP) which releases energy when it is broken down to adenosine diphosphate (ADP). This is a constant process. The energy is used to power the contraction of the muscle cell. Energy is needed to re-synthesize ATP, and this is supplied by the breakdown of glucose or fatty acids.

Metabolism and energy sources

Although most of the energy releasing reactions require oxygen, breakdown of glycogen can also occur to some extent without oxygen, providing a very limited immediate energy release. The advantage of this process, anaerobic metabolism, is that it can provide some energy

when exercise is so intense that oxygen supply cannot meet demands. At lower intensities, with adequate supply of oxygen most glycogen and all fatty acids are broken down by aerobic metabolism (oxygen dependent) although both types of metabolism occur at once. A complete description of these processes is given in Chapter 6.

Muscle activity is normally fuelled by a mixture of fat and carbohydrate. Some muscle cells are better adapted to oxidizing fats and some to using carbohydrate as the main fuel. There is no sudden switch from one energy source to another, but as glycogen stores become more and more depleted a greater proportion of energy is derived from fats. At the start of exercise, or when exercise is very intense, glycogen provides the majority of the fuel needed. Some energy is obtained from glycogen even when oxygen cannot be supplied rapidly enough; in this case glycogen is partially broken down to pyruvate and then to lactic acid. Only a small amount of energy is generated in this way, so high intensity exercise cannot be maintained for very long.

Fat used for energy is first released from fat stores as fatty acids which are transported in the bloodstream to the muscle where they are needed. Fatty acids are then oxidized within the muscle cells to produce ATP. The energy yield from fat is far higher than that from carbohydrate, but fat cannot be used anaerobically so it cannot provide the rapid energy needed for high intensity exercise.

Because glycogen supplies in the muscle are limited any condition which increases the capacity to use fat or maximize glycogen stores will be an advantage in ensuring fuel supplies for prolonged or regular activity. Three conditions which help are training, diet and rest. Training improves the muscle's capacity to use fat as a fuel source. A diet which is high in carbohydrate, that is in which 50–70% of the total energy is supplied by carbohydrate, will ensure maximum glycogen storage. Carbohydrate foods eaten straight after exercise, when glycogen stores are depleted, will ensure highest rates of replacement of glycogen. Finally, adequate rest periods between training or events will ensure that glycogen stores are fully replaced. Training continually on depleted stores results in fatigue.

Energy density

Most foods contain a mixture of the energy providing nutrients; for example, biscuits contain fat and carbohydrate, cheese contains fat and protein. A food which contains a high level of energy per unit weight is termed *energy dense*. Such foods are high in fats and/or sugars. Foods which are high in complex carbohydrates, fibre and water are less energy dense; examples are foods such as bread, potatoes, cereals, fruit and vegetables. A diet based on these will tend to be higher in volume and

lower in total energy and they are therefore advised for weight reducing. Highly energy dense foods are not necessarily the best sources of energy for health. Foods which are high in energy and low in bulk are too easily overeaten and may contain a high proportion of fat.

18.1.3 COMPARISON OF SOURCES OF ENERGY

Dietary energy should, and does, come from a mixture of sources: carbohydrate, fat and protein. It is important to achieve the correct balance of energy giving nutrients.

Carbohydrate

Carbohydrate is the preferred 'main' energy source, both for general health and for sports activity although, per gram, it provides less energy than fat. This is because (a) it can readily replace the body stores of glycogen in muscles and the liver, and (b) it does not increase the risk of conditions such as coronary heart disease, obesity and diabetes. A diet in which too much of the energy comes from fat and too little from carbohydrates inhibits the replacement of glycogen and may increase the risk of certain diseases and conditions (NACNE, 1983).

There are two main groups of carbohydrates: (a) simple carbohydrates (sugars) which in turn may be disaccharides (sucrose, maltose, lactose) or monosaccharides (glucose, fructose and galactose), and (b) complex carbohydrates (starch and glycogen). Starch, a polysaccharide consisting of many linked sugars, is by far the commonest dietary complex carbohydrate. It is broken down to simple sugars by the process of digestion.

Simple carbohydrates

Sugars occur in table sugar, honey, jam and confectionery, and are often associated with fats in manufactured foods such as biscuits, chocolate and cakes. Sugar is a pure carbohydrate which provides nothing but energy. For example, a 1 lb bag of sugar provides roughly the amount of energy needed for a woman each day. However, as sugar provides no other nutrients it could not support life for any length of time.

Complex carbohydrates

The main sources of starch are potatoes, cereals and cereal products such as bread. Starch is often associated with dietary fibre in foods for example in unrefined or 'whole' cereals such as wholemeal bread, oats

and wholemeal flour products. Until quite recently starch and carbohydrate were often considered to be 'bad' for health. Foods were, and still are, promoted as 'starch reduced' or 'low in carbohydrates', and carbohydrate and starch were described as 'fattening'. Now it is recognized that starchy carbohydrate foods would form the main part of a healthy diet.

Dietary fats

Fat is the most concentrated source of energy and fat stores are the greatest energy reserves in the body. Excess energy in the diet which is not used will be stored as fat, whether it comes from protein, carbohydrate or dietary fat.

Fats contain fatty acids and different types of fatty acids occur in mixtures in foods. Fatty acids may be saturated, mono-unsaturated or polyunsaturated. The amounts and types of fatty acids determine the characteristics of the fat. Those which contain mostly saturated fats will tend to be solid at room temperature, like lard, hard cheese or butter; those which contain more polyunsaturated fat tend to be liquid, like sunflower oil.

Some polyunsaturated fatty acids are essential in the diet, because they cannot be manufactured in the body. They are found in vegetable, nut and seed oils and in oily fish. Most of our dietary fat is saturated, for example the fats of meat and dairy products. Saturated fats are not essential, but do provide energy and the fat soluble vitamins A, D and E.

Other energy providing nutrients

Protein provides about 10% of the total energy in the UK diet. However, it is not primarily an energy source and protein is only used for energy when excess protein is eaten or when there is a shortage of other energy sources. A wide variety of proteins occur in foods, made up of smaller units called amino acids. There are 20 different amino acids, eight of which are essential in the diet because they cannot be synthesized in the body. The main function of protein is to provide these amino acids for body protein manufacture. Alcohol also provides some energy in the diet but is not a necessary source of energy.

18.2 DIETARY NEEDS

It is now thought that the average British diet contains too much fat, too much saturated fat and too little starchy carbohydrate and fibre. In addition we eat more sugar and salt than is recommended for health.

This type of diet is believed to contribute to the increasing incidence of obesity, coronary heart disease, diabetes and other diseases linked with carrying excess weight. Recommendations have been made in order to improve the average diet. These are primarily for older children and adults, but the diets of younger children should approach the recommended changes so that they become accustomed to eating healthy foods. Children's diets are often very high in fatty and sugary foods. Some parents may think this is acceptable for active children who show no signs of becoming overweight, but poor eating habits in childhood tend to be continued and may contribute to health problems later.

The amount of total fat and saturated fat in the diet should be reduced (NACNE, 1983). If the intake of fatty food is reduced more energy must be provided by carbohydrate containing foods. This would result in a less energy dense diet, which would be higher in fibre from the carbohydrate foods. In practical terms this means eating less fatty meats, dairy products, biscuits and confectionery, spreading fats, high fat cheeses and fried foods, and eating more bread (wholemeal and white), potatoes, fruit and cereals, pasta and rice.

While these dietary measures seem quite simple, they are often not compatible with the current trend of relying on convenience foods. It is quite difficult to achieve a lower fat, higher

or fibre diet in these circumstances and motivation is needed to eat healthily when it is easier to eat whatever is most readily available and takes least preparation.

18.2.1 HOW FOOD PROVIDES THE BODY WITH ENERGY

Carbohydrates, fats and proteins are digested in the stomach and small intestine to give glucose (and other sugars), fatty acids and amino acids. These are absorbed and provide the fuels needed by the tissues. The time taken for digestion and absorption to occur is dependent on the types of food eaten. Fats and certain types of fibre delay the process, while sugars are absorbed more quickly. Nutrients are taken to the liver and processed in various ways which depend on the current needs of the body.

Carbohydrates

Glucose, from starch and sugars, may be taken directly to tissues where it is needed and used for energy, or it may be taken to muscles and converted to glycogen for future use, or it may be converted to fat and stored.

Fats

Fatty acids when absorbed will be transported to the liver and may be used as fuel, rebuilt into fats and exported for storage, or they may bypass the liver and pass straight into the circulation to be distributed to tissues for storage or use as an energy source.

Protein

Protein is broken down into amino acids and transported to the liver. Some may be converted to other amino acids, depending on the body's needs. Most are rebuilt into proteins such as muscle protein, hormones and enzymes, but once this need is met excess dietary amino acids are used as an energy source. The nitrogen containing part of the amino acid is removed and used to form urea which is excreted, and the remaining part of the amino acid can be converted into glucose in the liver. Fluid is lost as urea is excreted (in urine or in sweat) so a diet very high in protein, in which a lot of the energy is provided in this way, will increase fluid losses and might result in dehydration. (The effects of dehydration are described more fully below.)

18.2.2 FOOD FOR GROWTH

Growing children require far more protein per unit of body weight than adults. The main function of dietary protein is to provide the amino acids needed to synthesize body proteins. These are needed to replace worn out proteins or for synthesis of muscle tissue and growth. The recommended daily allowances for protein are given in Table 18.3.

Table 18.3 Recommended daily allowance of protein for children by age and sex

Age (yrs)	Boys (gms)	Girls (gms)
1	30	27
2	35	32
3-4	39	37
5-6	43	42
7-8	49	47
9-11	57	51
12-14	66	53
15-17	72	53

(Adapted from Department of Health and Social Security, 1979)

One pint of milk contains about 18g protein, an egg 5g protein, an ounce of beef (28g) provides 6g protein and 100g baked beans contain 5g protein. The total daily requirement for a ten year old girl, for example, could be met from:

One pint of milk	18g
Two slices of bread	9g
A portion of baked beans	5g
An egg	5g
A bowl of cornflakes	3g
An ounce of cheese	8g
A pot of yogurt	5g

Dietary proteins contain a mixture of amino acids so they are not equally good at providing the essential amino acids which cannot be made in the body. Bread and cereal products do provide considerable amounts of protein in the diet, but as they have a poorer balance of essential amino acids it is important to include some better amino acid sources such as pulses, cheese, milk, meat, fish and nuts in the diet as well.

Protein is constantly being made and broken down, particularly in the liver and muscles. The breakdown product of protein is urea, excreted in urine and in sweat. A daily supply of amino acids in the diet is needed for protein manufacture to continue.

Because muscle is made of protein, the importance of protein in the sports person's diet may have been exaggerated in the past. Diets containing large quantities of meat, eggs, milk and cheese have often been advocated as 'muscle building'. In fact, above a given level there is no advantage in eating excess protein; it is simply broken down, partly used as energy or stored as fat, and partly excreted as urea. A disadvantage of a high protein diet is that it is often high in fat and low in carbohydrate, the opposite of the diet currently recommended for health.

In practice, the foods which supply protein in the diet are meat, eggs, dairy products, fish, cereals, pulses, nuts. The lower fat sources of protein are fish, lean meat and poultry, low fat dairy products, e.g. skimmed milk, pulses and cereal.

18.2.3 MAINTAINANCE OF HEALTH

In addition to providing energy and the materials for growth, an adequate diet also ensures the continuing health of the body. The primary materials for this are vitamins and mineral salts which must be taken in small quantities and are present in most normal diets.

Vitamins

Vitamins are essential to health. All are needed in relatively small quantities and do not provide energy. They are usually referred to as 'fat soluble' and 'water soluble' groups. The fat soluble vitamins A, D, E and K can be stored in the body and so deficiencies are slow to appear; symptoms will not show until body stores are used. The water soluble vitamins, C and B groups, are needed on a daily basis; they cannot be stored so any excess is excreted. Vitamin deficiencies are rare in this country and are not liable to occur in a good mixed diet of sufficient energy content.

The only circumstances in which shortages might occur are when the diet is restricted in any way, for example, vegan diets (those which exclude all animal products), food preferences which limit the diet to a small range of foods (quite common in young children), or in those who are attempting to lose weight by restricting their total energy intake.

Sources of vitamins

Vitamin A comes from two sources in the diet, a fat soluble form (retinol) from liver and dairy products, and a water soluble form (carotenes) from carrots, tomatoes and dark green vegetables. A very low fat diet might be deficient in vitamin A unless a good range of vegetables is included to provide carotenes.

B group vitamins are widely distributed in foods including meat, milk, cereals, pulses and nuts. A varied diet is needed to provide all of these vitamins. The diets most likely to be deficient in the B vitamins are very low energy diets such as weight reducing diets. This group includes thiamin (B1), riboflavin (B2), pyridoxin (B6), pantothenic acid, niacin, folic acid and cyanocobalamin (B12). Folic acid is mainly found in liver, pulses and leafy vegetables, so diets which are low in vegetables might be lacking in this vitamin. B12 is only found in animal products (meat and dairy), so strict vegetarians might need a supplement. However, there is some B12 in yeast extracts such as Marmite.

Vitamin C (ascorbic acid) is provided by fruit, vegetables, fruit juice and potatoes. A daily supply of fresh (or frozen) vegetables and fruit will ensure an adequate vitamin C intake. Fruit juice is a useful and convenient source.

Vitamin D is contained in the fat part of dairy produce and in oily fish. Low fat diets may lack vitamin D, but our main source of this vitamin is from the action of sunlight on skin so deficiency is unlikely to occur except in housebound people.

Vitamin E is present in vegetable oils, liver and dairy products and grains. It is unlikely to be lacking in a varied diet.

Many of our foods are now fortified with extra vitamins and minerals; for example, breakfast cereals are mostly fortified with extra B group vitamins, and some low fat dairy products (milk and yogurt) have added vitamins A and D. These may be useful sources of these vitamins if the diet is restricted in any way. It is worthwhile reading the small print on food packets to see what has been added to processed foods.

There should be no need to take extra vitamins in the form of supplements if the diet is sufficient in quantity (i.e. energy intake is high enough) and is varied. There is also little evidence that exercise increases the need for any vitamin. Increased use of vitamins associated with energy metabolism (e.g. thiamin) will occur but if the required amount of energy is eaten the extra vitamins should also be provided.

Minerals

Several minerals are essential in the diet, some form part of the structure of the body (e.g. calcium and phosphorus in bones) and some are needed to take part in reactions which occur constantly in the body. They are widely distributed in foods. One group is needed in relatively large amounts—calcium, magnesium, sodium, potassium and chloride—and another group is essential but only needed in tiny amounts—iron, copper, zinc, manganese, iodine sulphur, cobalt, chromium and selenium.

Mineral deficiency

Mineral deficiencies are unlikely to occur if a varied diet is eaten; however, iron and calcium supply may be low in certain restricted diets. Since the best sources of both iron and calcium are restricted to a single group of foods, a diet might be deficient when these are avoided.

Calcium is widely found in dairy products and may hence be deficient in the diet if dairy products are avoided, due to allergy or strict vegetarianism. It is important then to eat enough non-dairy sources of calcium, e.g. nuts, tahini (a paste made from sesame seeds, now sold in most health food shops), fortified soya milk or to consider supplementing the diet. Calcium is particularly important during periods of bone growth.

Iron is found in red meat and is likely to be lacking in the diet where this is avoided. There are vegetarian sources of iron, but iron from them is less available. Vitamin C aids iron absorption, so drinking fruit juice with meals will assist the iron absorption from foods such as cereals and pulses.

Other minerals, including sodium, potassium, copper, fluoride,

manganese, chromium and selenium, are available in a variety of foods and from water. They are unlikely to be lacking in the diet, and we may eat more sodium (salt) than is ideal for health as salt is present in so many processed foods. Zinc, which is present mainly in protein containing foods, may be low in a low protein diet.

18.2.4 NUTRIENT DENSITY

Any diet may be made less adequate in terms of vitamin and mineral content by diluting the 'nutrient density' with foods which supply large amounts of energy but no nutrients. The more dietary energy that is supplied by sugar, alcohol and confectionery, the less chance there is of meeting vitamin requirements, unless a very high energy diet is consumed. This is increasingly relevant in children's diets as many now depend on large amounts of sugar and sweets and sweet drinks for energy.

Any or all vitamins and minerals will be low in the diet if total energy is overrestricted, and supplementation is necessary on very low energy diets. However, a healthy active child or teenager eating a varied diet is unlikely to be lacking in any vitamin or mineral.

In general, it is not necessary to rely on supplements to supply minerals and vitamins, but these might be useful if:

1. a child is extremely fussy and eats only a small number of foods. However, he or she should still be constantly encouraged to try a greater range of foods;
2. the diet is very low in energy (not recommended for growing children for any reason);
3. the diet is restricted for other reasons: allergies, religion, strict vegetarianism.

18.2.5 FLUIDS

A high percentage of the body is water. It is the means by which waste products are removed and the body is kept cool. Fluid losses in urine and sweat have to be replaced or dehydration will occur. In hot weather during exercise large amounts of fluid can be lost, and loss of fluid may impair performance.

A normal diet provides adequate fluid from water, milk, sweet drinks, watery foods, tea and coffee. We drink as a habit, as well as to satisfy thirst. Although thirst is used to indicate the need for fluid, it only operates when fluids are already depleted and it is better if fluids are replaced before thirst occurs. The body is able to absorb fluid from water and dilute solutions while exercising, and it is important to take some

fluid during prolonged exercise. Children may need to be reminded to do this as they may become so involved in the activity that they forget to drink.

The best drinks to take generally are those which do not provide sugar (water, tea) or drinks which may provide some sugar but also provide some useful nutrients (milk, low fat milks, fruit juice).

The drinks often preferred by children, e.g. squash, fizzy drinks and milk shakes, also provide large amounts of sugar. On a warm day, an active child who relies on lemonade or Coke to quench thirst might also consume up to 250g of sugar. Very concentrated sugary solutions such as these are more slowly absorbed, so are not ideal for rapid replacement of lost fluid. Water and very dilute squash would be far more effective.

18.3 WHAT CHILDREN EAT

It is pointless to consider what children should eat for health without looking at what they like to eat, and what influences their choice of foods. Any advice given must take into account the current patterns of eating among young people. Changes in eating habits have occurred in recent years; fewer formal meals are eaten and frequent snacks are taken instead. The content of school meals is no longer specified by law and cafeteria style meals are now more common, allowing children complete choice over most of their own daily food intake.

A recent report on the diets of British school children (DHSS, 1986) indicates that chips, crisps, fried foods and sweets and biscuits provide an increasing proportion of the energy content of children's and teenagers' diets. Most children are now less active than in the past and energy intakes are lower than the levels recommended to match reduced energy output. This combination of falling energy intakes, plus sugary foods and drinks playing an increasing part in the diet, may mean that diets are low in useful nutrients. Influences such as food advertising, friends' eating habits, the contents of the snack machine at school, the proximity of a chip shop to school, all have an effect on children's diets now, perhaps more so than family eating patterns. These trends in eating habits result in diets with a high proportion of energy from fat and sugar, and children and parents with little knowledge of planning or preparing balanced meals.

Because snack foods (sweets and fizzy drinks) often do form an important part of the diet they cannot be cut out without finding an alternative. In fact, there is nothing wrong with 'snacking' if the foods eaten are providing useful nutrients. This means replacing chips, burgers, sweets and crisps (or most of them) with lower fat, higher carbohydrate foods such as bread, toast, teacakes, sandwiches, fruit and

yogurts, which are still portable or available instantly as required. Sugary drinks must be replaced with lower sugar drinks to maintain the same fluid intake.

18.4 NUTRITION EDUCATION

With so many influences encouraging poor eating habits, it is important for children to learn about good nutrition. Children are notoriously difficult to influence towards measures which might protect future health; by and large they are healthy and have difficulty considering the future effects of their actions. However, children who are actively involved in sports and keen to optimize their performance do have an immediate reason for health to be an important consideration. For this reason they may be more readily influenced towards good eating habits. For this to occur the adults around them must themselves consider nutrition to be important. They must understand the influence of diet on health and must be prepared to explain it. Even very young children can understand that (a) when they have used energy they need to replace it with food, (b) certain foods are good sources of energy, and (c) fluids are necessary before and after exercise, particularly on hot days.

If this type of advice is given from a very early age and linked to training and performance, more complex ideas of nutrition can be introduced as appropriate and poor eating habits are less likely to develop. Coaches as well as families and teachers are in an excellent position to provide a positive influence by offering healthy and palatable foods and by setting an example of good eating habits.

18.5 FOOD FOR YOUNG ATHLETES

For any child, a diet of fast food and sweets is undesirable. For the child athlete, with added constraints of limited time and extra nutrient needs, this is also true. A balanced diet is important for all children, but there are a few points to emphasize for very active children.

18.5.1 NUTRIENT NEEDS

Energy

While most children are eating less than the recommended amounts of energy, very active children may need as much as or more than is recommended to support activity and growth. A high proportion of this energy should come from carbohydrate foods, which includes mainly

starchy foods and some sugars. Energy is provided by the carbohydrate containing foods, e.g. bread, potatoes, cereals, pasta and rice.

Growth and development

Most people receive sufficient protein from a normal mixed diet. There is no reason to take any form of protein or amino acid supplement. Good dietary sources include meat, fish, cheese, milk, pulses. At least three portions of protein containing foods should be eaten each day. Lower fat sources such as fish, poultry and pulses should be eaten frequently.

Fluids

Children are less well able to control their body temperature than adults, so dehydration during or after exercise, particularly in hot weather, is a common problem. Children should be encouraged to take drinks with them to training sessions and events. Suitable drinks are fruit juice, diluted fruit juice, water, tea.

Vitamins and minerals

Very active children may actually have an advantage in respect of vitamin and mineral intake. Those most likely to be deficient in nutrients are on the lowest energy intakes. Active children on the highest energy diets should easily be able to meet their needs for vitamins and minerals through diet alone. There is no evidence that extra vitamins are helpful in improving sports performance, although such claims are sometimes made by supplement manufacturers.

Only those children whose diet is very restricted for any of the reasons mentioned earlier might benefit from a good mixed multivitamin and multi-mineral. In such a case, a dietitian should be consulted first as many of the supplements on sale are unsuitable and could be dangerous if taken in the wrong combinations.

18.5.2 PRACTICAL GUIDANCE FOR TRAINING AND COMPETITION

Young athletes with high energy and nutrient needs require a good balanced diet to support training. Meals in preparation for particular events are important, but far more important is the basic day to day eating which establishes good habits and provides the energy needed for constant training and growth.

The following guidelines may help in designing a good daily diet.

Food content

Carbohydrates

A complex carbohydrate source (without added fat) should be the basis of each meal, e.g. *breakfast*—cereals (less sweet ones are better), bread (preferably wholemeal but white is OK if brown is not acceptable); *lunch*—pasta, rice, bread or potatoes, cooked without added fat; *evening meal*—as lunch. Make sure this carbohydrate source is varied, i.e. not always bread or always potato. Variety will help to provide necessary vitamins and minerals.

Protein

Make sure that three portions of protein containing foods are eaten daily: meat, milk, cheese, pulses, nuts and fish. Ensure that the majority of this is low fat protein foods; meat should be lean, and fish, poultry, lower fat milks and cheeses could be used.

Fruit and vegetables

Include some fresh fruit and vegetables in the diet daily. Try to vary these to include as many different varieties as possible, to ensure vitamin and mineral supplies.

Availability of suitable food

- (a) Provide regular meals including breakfast, midday meal and evening meal with between meal snacks. If training times prolong the school day always provide suitable snacks and drinks for before and after. Do not allow young children to choose their own food.
- (b) Do not rely on cafes (e.g. at leisure centres) or snack and drink machines to provide food and drink. They usually sell only sweets and sugary drinks.
- (c) Investigate food provision at school and at sports clubs or centres. Complain if food provision is poor, and provide alternatives when necessary.
- (d) Make sure that suitable drinks are always available before, during and after training.

Explaining the importance of diet

- (a) Explain the importance of diet for sports performance and health to children from the youngest possible age. With all the other

influences to eat badly, they will need to have good reasons to eat well. Children who are highly motivated to succeed at their sport may be receptive to advice on good eating.

- (b) Don't overdo it. Children will always eat some sweets and crisps, and the occasional snack food does no harm if the basic diet is good.

18.5.3 FOOD FOR EVENTS AND COMPETITIONS

It is not advisable to try out any new meals, diets or drinks just before a major event. At this time familiar foods should be eaten; a reasonable amount of carbohydrate foods and plenty of fluids.

The pre-event meal should be taken at least two hours before competing and should consist of easily digested carbohydrates, e.g. toast, cereal, sandwich, with plenty of fluids, e.g. water, tea, orange juice. Sugary foods and chocolate bars are not an ideal source of instant energy. The sugar will increase the levels of sugar in the blood rapidly, but then levels will fall again quickly. More slowly absorbed carbohydrate foods are better in this respect.

Fluids can be taken up to ten minutes before competing and drinks should be taken at intervals in events, if possible. Drinks should also be given straight after an event.

It is important to always take food and drink to an event, particularly for long or all day events, and those distant from home. A child who has competed and is not given food or drink before a long journey home will arrive home exhausted and dehydrated. Recovery from the event will be delayed and car sickness is more likely to occur. If such feelings of discomfort become associated with competitions or matches they may reduce the child's interest in taking part in such events.

If there is a long gap between training and evening meal (more than an hour) it is useful to have an after-training snack, e.g. bowl of cereal, muesli bar, toast or sandwich. An after-training drink is also essential, particularly in hot weather; diluted fruit juice is ideal.

Quantities of food should depend on the child's appetite and individuals will vary considerably. However, the main part of each meal should be the carbohydrate foods, bread, potato, rice, pasta, etc. If the child is continually hungry (e.g. after the midday meal) give extra bread, sandwiches or rolls rather than including sweets in the meal or providing extra biscuits.

Foods to take to events and competitions

You can't rely on the organizers of events to provide suitable food and drink. It is important to be adequately fed prior to competition, and to

replace energy and fluid as soon as possible after competing. When a child must compete several times at intervals during the day it is vital that food and fluid are available between events, for example in an all-day athletics or swimming match when a child may take part in several races.

The following are useful:

- (a) Sandwiches (e.g. cheese, jam, honey, peanut butter, Marmite), scones, fruit, dried fruit (e.g. dates, raisins, sultanas), muesli bars, fruit yogurt, malt loaf, fruit cake.
- (b) Drinks: diluted fruit juice or water enough to ensure a supply throughout the day; flasks of tea, soup and hot milk are useful for cold days, and for swimming when the child may become very cold between races. Always drink after an event and at intervals throughout the day. Food should be taken as soon after an event as possible.

Example of appropriate meals for active children

Breakfast

Cereals; corn or branflakes, Weetabix, muesli, etc.

Milk

Bread or toast, honey or jam

Fruit juice

Tea

Mid morning snack

Fruit juice

Banana or apple

Digestive biscuits

Lunch (packed)

Sandwiches or rolls with lean meat, cheese, fish

Tomato

Fruit

Yogurt

Milk or fruit juice to drink

School lunch

Potatoes (not always chips) or pasta or rice

Meat or vegetarian alternative

Vegetables

Pudding or fruit (fruit based or milk puddings are preferable to pastries)

Mid afternoon (pre-training)

Muesli bar or digestive biscuits or scone

Fruit

Fruit juice or milk (extra water pre-training in hot weather)

Evening meal

Potatoes, rice, pasta or bread

Lean meat, poultry, fish or vegetarian alternative

Vegetables

Fruit, yogurt or pudding

18.6 CONCLUSION

Clearly a healthy diet is essential to the health of all children and adults. It is important to encourage children to eat a balanced diet, and coaches can be influential in supporting parental efforts to ensure that children eat properly. However, young athletes have particular nutritional requirements to support high levels of energy output and the demands of muscular development associated with exercise. Yet frequently children are under pressure to fit the demands of school, travel and training into very short time periods. Under these circumstances they may easily neglect their food and exist on snacks and convenience foods. The problem may be worse where both parents work and there is no-one at home after school. But it remains the case that 'You can't run a high performance car on two star petrol!' and coaches can have a valuable influence on the eating habits of their athletes. Encourage them to eat a healthy diet, to eat sensibly to support their training and performance, and to take suitable food to events.

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PART FIVE

Good Practice in Coaching

Part five of this book is directed towards providing examples of how the principles put forward earlier can be put into practice. The idea that children are substantially different from adults in the structure and proportions of their bodies, their physiological responses, their ability to deal with information, and their perceptions of the world has been put forward to give coaches a more complete basis from which to make decisions which may profoundly affect the experiences of the athletes. As a result they may engage in the activities more safely, with less frustration and more satisfaction, and be more likely to carry on. However, whatever the future holds for them, coaching which is based upon an understanding of the material presented here will ensure that what they do in sport is more likely to be fun and will contribute to their growing up.

We have seen that children differ from adults in the proportions of their bodies and the ways in which they respond to exercise. This means that the rules, sorts of implements and size of playing areas which are laid down for adults are often totally unsuitable for children. Martin Lee and Ross Smith suggest ways in which coaches can modify sports so that children can more easily learn the skills and sustain the activity. In recent years this has become rather easier thanks to the introduction, by sports goods manufacturers, of modified equipment. However, many sports are not yet catered for. Dr Lee and Dr Smith lay down a challenge to coaches to look at their own methods and ask how they can modify the structure of the activities for children to learn and perform more easily.

Rod Thorpe is an experienced university lecturer and tennis coach who is well known for his work with children and in teacher education. Because of this he has undertaken to pull together the information in earlier chapters and explain how coaches can have an effect on the children they teach and shows how the principles introduced can be incorporated in the coaching process. In Chapter 20 he is directly

concerned with putting theory into practice and shows how coaching children implies responsibilities which extend far beyond teaching skills. He discusses the responsibilities of various adult agencies involved with the provision of sport for children and outlines the implications of recent initiatives which relate to the accreditation of coaches. Using illustrations from tennis, which is his specialist activity, he then discusses the specific responsibilities of coaches for the safety of the children not only in the sense of protection from injury but also in the sense of avoiding upsetting normal growth patterns. He shows why it is important to work within a framework which includes parents and schools to provide the best possible support for children when they may come under the pressure caused by conflicting demands. In particular it is important to work alongside parents and encourage them to understand how they can contribute to the child's experience by reducing pressures on them.

Making sport fit the children

19

Martin Lee and Ross Smith

SUMMARY

Earlier chapters presented strong arguments to support the modification of sports activities to allow children to develop competence, confidence and enjoyment. In this chapter we review the implications of the theoretical and research information for the modification of sports so that children can more easily master the skills required. We acknowledge that in many cases governing bodies of sport in England have instituted modified sports which fit children better than the adult form and we provide examples from Australia. However, we also provide a rationale to encourage coaches to make changes to their sport at a local level to assist children to enjoy and benefit more. We suggest that changes can be made to playing areas, equipment, rules and organization. For each we provide a rationale based on physical, physiological or psychological knowledge and examples of how different sports have been, or may be, modified.

19.1 INTRODUCTION

Research has shown that children do sport because they want to have fun, learn new skills and be with their friends (see Chapter 9). They should be given the greatest possible opportunity to experience the joy and satisfaction they seek. It is better for them to see the cricket ball going to the boundary of a small field rather than only reaching halfway on an adult field, or a netball scoreline of 20–18 and not 2–1 because they can't get the ball up to the ring and the result is more a matter of luck than skill. It is possible and fruitful to structure coaching situations and competitions to work within the capacities of the competitors so that

they have a greater number of successful experiences before having to meet the more rigorous demands of adult oriented playing conditions. The rules and conditions imposed on children in the early stages of learning a sport can be crucial not only to immediate enjoyment and satisfaction but also to long term involvement. Effective coaching means making the sport fit the child as much as possible.

To help achieve this there has been a gradual change in the conduct of many games in recent years. Adaptations have been made with the purpose of making it easier for children to experience the nature of the sport, to understand the basic structure of games, and to develop skills in a simplified setting. This has resulted in changes to the size of equipment and playing area, the duration of play, the rules of games, and the ways in which they are organized. Where such modifications have been introduced it has been important that the integrity of the game should not be altered and the participants see and experience the game as very similar to the adult model (e.g. rugby union).

The purposes of this chapter are to give an understanding of why such changes are helpful, to describe some of those that have been developed, and to encourage coaches to examine critically and creatively the ways in which they present their sport to children.

19.1.1 NATIONAL INITIATIVES

A very extensive application of the principle of adapting sports to meet the needs of children has been instigated by the state government of South Australia. It has produced a policy for the provision of sport for children and young people between five and 17 based upon six fundamental principles:

1. A focus on enjoyment, participation, success, and developing self-esteem.
2. An assumption that sports help develop team skills and co-operation.
3. Progress is developmental from fundamental movement skills to sport specific skills.
4. Children develop at different rates.
5. Games should be modified to take account of children's physiological and psychomotor limitations.
6. The nature of competitions should differ from that of adults by emphasizing participation, performance, enjoyment and satisfaction rather than outcomes.

Education Department of South Australia, 1990

As a result of this statement the state governing bodies of sport have

prepared extensive guidelines for the conduct of junior sport. Each set is designed within a format designated by the South Australian Junior Sports Development Unit (see example in Table 19.1). Notice that recommendations are made on skill development, competition, the development of talented performers, and minimal coaching qualifications for five age groups. The detail within the categories may deal with length and content of practice sessions, modifications to equipment, the organization and nature of competition, and the responsible agencies.

As we have seen, in comparison with adults children have limited capacities, not only in their growth and development and physiological capabilities, but also in their perceptual-motor and psychosocial development. Programmes like those outlined above take account of those differences and, in Chapter 20, Rod Thorpe develops in detail ways in which the information in earlier chapters can be translated into practice. While physical differences are easily recognizable only informed coaches are aware of, and make allowances for, the less obvious differences children display in physiological, decision making, motor control and psychosocial capacities. In Britain there is not yet an equivalent policy to that developed in South Australia. However, there is a thriving programme of coach education operated by the National Coaching Foundation, a significant element of which is designed specifically to assist coaches who work with children.

19.2 AREAS TO CONSIDER FOR MODIFICATION

There are a number of ways in which coaches can alter the characteristics of a sport so that children are more easily able to participate with enjoyment. In some instances these may be promoted by governing bodies with the intention of advantaging all participants; but your own situation may pose specific problems which could be solved by applying your understanding of children to creating new conditions of practice and even competition. The areas which we will consider here are playing areas, equipment, rules, and organization.

19.2.1 PLAYING AREAS

Rationale

We have seen that children go through a series of stages in their physical growth and that the timing of the stages varies across the sexes and between individuals. The differences in size which are not only inherent between individuals but which are frequently exaggerated during the growth spurts can make a great difference to the demands placed on performers. It is no accident that the most successful high jumpers and

Table 19.1 Example of a policy of adaption of sport for children and youths (by kind permission of the Education Department of South Australia)

Rugby league						
Age & year level	Skill development		Competition			
	Frequency and duration of sessions	Organization	School responsibilities			
			Intra school	Zone district	Metro & country knock out comps	State competition
Age 5–7 yrs year levels R-2	Introduction to the basic general movement and coordination skills. Development of group cooperation and participation.	No regular organized structured competition offered to boys or to girls at this level. The equipment used and the activities conducted are modified. Maximum participation is encouraged which may include appropriate small-sided, modified games. Children of either sex and/or with disabilities are encouraged to participate.	Regular, organized, structured competition not appropriate at this level			
Coaching level	Level 0 Desirable qualification	Level 0 Desirable qualification				
Age 8, 9, & 10 yrs year levels 3, 4, & 5	1 or 2 Sessions per week. Modified game – Mini Footy. Size 4 ball. Duration 45–60 minutes maximum. Development and awareness of the principles of good sporting behaviour.	Modified. Modified game. 1 Game per week. Modified ball, laws and rules. 8 players per side. Rotation of players optional. No premierships points. No finds. Maximum participation encouraged. Offered to boys and to girls as a single sex competition. Lightning carnivals offered as required. Children with disabilities encouraged to participate.	Aussie sports 'Mini Footy' offered and conducted in schools as a class activity only.	NIL	NIL	NIL
Coaching level	Level 1 Mandatory qualification	Level 1 Mandatory qualification	Level 0 Desirable			
Age 11, 12 yrs year levels 6 & 7	1–2 Sessions per week – 'Mod League'. Modified game. Modified ball. Duration 45–60 minutes maximum. Development and awareness of the principles of good sporting behaviour.	Modified. Modified game – 'Mod League' 1 Game per week. Modified ball, laws and rules. 11 players per side. Controlled, organized and supervised environment. Maximum participation encouraged. Offered to boys and to girls as a single sex competition. Lightning carnivals offered as required. Children with disabilities encouraged to participate.	Aussie sports 'Mod League' offered and conducted in schools.	NIL	NIL	NIL
Coaching level	Level 1 Mandatory qualification	Level 1 Mandatory qualification	Level 0 Desirable			
Age 13, 14 yrs year levels 8 & 9	1–2 Sessions per week. Adult game. Modified ball. Modified game. Duration 45–60 minutes maximum. Development and awareness of the principles of good sporting behaviour.	Adult game – Modified game when necessary. 1 Game per week. 11 players per side. Maximum participation encouraged. Offered to boys and to girls as a single sex competition. Players with disabilities encouraged to participate.	Adult Rugby League offered and conducted in schools as a class activity only.	NIL	NIL	NIL
Coaching level	Level 1 Mandatory qualification	Level 1 Mandatory qualification	Level 0 Desirable			

Table 19.1 Continued

Rugby league					
Competition		Talent development			Responsible agencies
Club responsibilities		National competition	Talent squads	Talent camps	
Country	Local/district				
Regular, organized, structured competition not appropriate at this level		NIL	NIL	NIL	South Australian Rugby League inc. education authorities & junior sports development unit
NIL	NIL	NIL	NIL	NIL	South Australian Rugby League inc. education authorities & junior sports development unit
NIL	NIL	NIL	Talent squads Identified and conducted by Australian Rugby League Mod League authorities.	Talent camps Identified and conducted by Australian Rugby League Mod League authorities.	South Australian Rugby League inc. education authorities & junior sports development unit
NIL	NIL	NIL	Level 1 Mandatory	Level 1 Mandatory	South Australian Rugby League inc. education authorities & junior sports development unit
NIL	NIL	NIL	NIL	Talent camps Selection by South Australian Rugby League Criteria.	
Level 1 Preferred					

Table 19.1 Continued

Rugby league						
Competition		Talent development			Responsible agencies	
Club responsibilities		National competition	Talent squads	Talent camps		
Country	Local/district					
Age 15, 16, & 17 yrs year levels 10, 11 & 12	1–2 Sessions per week. Modified game when necessary. Development and awareness of the principles of good sporting behaviour. Physical fitness programme under the supervision of qualified coach	Adult game – Modified game when necessary. 1–2 Games per week. Modified game when necessary. 7 players per side with up to 3 substitutes. Maximum participation encouraged. Offered to boys and to girls as a single sex competition. Players with disabilities encouraged to participate.	Adult Rugby League offered and conducted in schools as a class or interclass activity only.	Adult Rugby League offered and conducted between schools by the Education Authorities & SARL.	NIL	Under 15 and Open School Age Competition offered and conducted by SARL Authorities & Education Authorities.
Coaching level	Level 1 Mandatory qualification	Level 1 Mandatory qualification	Level 1 Preferred			Level 1 Preferred

basketball players are very tall! The effects of difference in size can be seen in the number of steps that a player must take to move about a tennis or badminton court, the time taken to run between the wickets in cricket and the length of the field in rugby, or in the distance a child can hit, throw or kick a ball.

Not only does physical size of the participant influence the dimensions of ideal playing areas but so do the limitations of physiological development. Young children do not have the strength, speed or endurance of fit adults. They cannot, therefore, run similar distances so easily, cover the ground in the same time, or throw, hit, kick a ball as far as adults. To play on a full sized pitch changes the nature of the game for children. If you have taught football on a full-sized, muddy field to a group of ten years olds playing eleven-a-side, you will be familiar with either ‘beehive’ soccer, where everyone chases the ball around the field, or with half of the kids standing around at one end of the field hoping that one of those at the other end is strong enough to kick over the halfway line! This suggests that it is wise to adapt the size of playing areas to the physical size of the players. After all, this is the case for adult sports.

Examples

Smaller playing fields have long been the norm in junior football (soccer) and are becoming formally promoted in junior versions of rugby league and rugby union in Britain. But even in these sports formal pitches may still be too large for certain age groups and levels of skill and coaches

Table 19.1 *Continued*

Rugby league					
Competition		Talent development			Responsible agencies
Club responsibilities		National competition	Talent squads	Talent camps	
Country	Local/district				
NIL	Club competition offered and conducted by South Australian Rugby League.	Under 16 or open age competition selected & conducted by South Australian Rugby League Authorities.	Talent squads selected and conducted by South Australian Rugby League Authorities.	NIL	South Australian Rugby League, education authorities, Australian Rugby Association & junior sports development unit.

could adapt their own organization to make adjustments specifically for children of different age and size. The relationship between the size of the pitch and the ability of the player to kick a ball over a distance or run the length of the field may change dramatically during childhood and again change the nature of the experience of the sport.

The introduction of short tennis, in which the size of the court is reduced and the net is lower, has allowed many more children to enjoy the game in ways which were not possible on adult sized courts. They are also able to learn more sophisticated techniques of play. The advantages of such adaptation have been possibly even more salient in badminton. By adapting the court dimensions short badminton allows children to approximate more closely the movement patterns of adult players and hence the techniques of the game, which can be taught and can more readily transfer to adult form later.

In cricket the use of short pitches allows bowlers to be more accurate which itself benefits batsmen because the ball will arrive more often in the striking area. However, faster bowling will pose a further problem to batsmen because they will have less time to see the ball and respond so it is important to create a balance between the demands of batting and bowling.

19.2.2 EQUIPMENT

Rationale

Changes in the size of equipment for children's sports is made necessary not only by the physical size limitations but also by the relative lack of

skill of children. For example, boys of ten and 11 have difficulty in performing a lay-up in basketball because the ball is too large and heavy to handle with the ease required for the adult skill; not to mention that a ten foot high ring poses entirely different problems for them! Some years ago one of the authors attended a conference on encouraging children to take part in sport. In one presentation a leading basketball coach showed a film used as a motivational aid in which top players were seen making slam dunks, a technique available to only a few. A member of the audience commented that he would find the film demotivating because very few youngsters could aspire to such techniques. This story highlights the point that the relative size of the players to the equipment changes the nature of the skill to be learned. Perhaps this is best demonstrated by the changing demands of pole-vaulting as the bar is raised. Vaulting at 1.50 metres or 2.00 metres is very different from vaulting at 4.50 metres or 5.00 metres.

Portable equipment

Fortunately small sizes in balls, bats, racquets, and so on are now commonly available though in some cases this has taken some time to be accepted and there may still be further miniaturization possible and desirable in certain sports. Little research is available which examines the effects of relative size of implements on the mechanics of skill performance and any gains may need to be set against the psychological disadvantages that children have in manipulating smaller objects.

Because children have small hands with which to hold and control a ball or grasp a bat or racquet, the use of lighter implements is particularly important in facilitating handling skills. Young beginners do not have the accuracy of movement of adults and it helps if they can use equipment with an increase in the relative size of striking surfaces and target areas. This facilitates contact in striking games and goal scoring potential respectively. For example, junior cricket bats and tennis racquets may be reduced overall but retain a large hitting surface to increase the likelihood of contacting the ball which makes it easier to succeed without imposing excessive demands on accuracy.

Fixed equipment

The same rationale of estimating the ratio between size of participant and size of equipment also applies to such fixed equipment as nets, goals and so on. Junior sized equipment is available in many sports but some coaches continue to use adult sized fixed equipment for children when smaller versions could be provided.

Examples

The advent of new materials used in the manufacture of sports equipment has advantaged not only professional players but also children. If the material is light children can manipulate the implements more easily than when it is heavy which can result in developing incorrect movements or techniques to compensate for lack of strength. The ratio of length to striking surface has also benefited in tennis from the evolution of mid-size racquet heads as the norm. In cricket, however, smaller bats tend to be proportionately smaller and hence there is a reduced contact area, making hitting the ball a little harder than it need be. Coaches could overcome this by cutting down larger bats to fit children.

A striking example of adapting equipment from that used by experts to meet the needs of beginners, whether children or adults, has been the development of the *ski evolutif* method of teaching skiing. A major difficulty faced by beginner skiers lies in turning the ski. The longer the ski the more difficult it is. *Ski evolutif* meets this problem by starting beginners with very short skis, little longer than a boot, and progressing through a series of skis of graduated length until the full length is reached. The method enables learners to experience the skills of skiing more easily and to achieve success and confidence more quickly. In other sports, such as sailing, equipment has also been designed specifically to allow children to enjoy the fun of the sport without having to meet excessive demands.

One area which does not perhaps receive the consideration it deserves is the nature of the balls which are used in certain sports. For example, a common problem that junior tennis players have, particularly when they start, is in dealing with high bouncing balls. Yet because they are shorter than the adults for whom the balls were originally designed, many more balls come to them at or above shoulder height. Tennis balls are now available which bounce less and are particularly suitable for children.

Adaptations to fixed equipment are exemplified by tennis, badminton and basketball. In the first two, the net is lower than normal. This is particularly advantageous in badminton because it enables children to get the racquet head above the net and hit the shuttle downwards. Thus the smash can become an integral part of the game from an early age which would not be possible for small children using a standard net. In both these sports the combination of smaller court and lower net enables children to enjoy the game and develop more sophisticated techniques and patterns than was possible previously. The use of a slower and lower bouncing ball in tennis and slower shuttle in badminton also allow beginners to play more easily. The object can be seen for longer before it

must be played and therefore allows a longer time for decisions affecting shot selection, positioning and completion of the shot.

In mini basketball, court size, basket height, ball size and length of playing time are all modified to fit children. In this sport, for which there is an international organization, the basket height is specified to enable children not only from different clubs but also from different countries to play together. The demands for a formal requirement which are brought about by the needs of competition conceal the possibility of further adaptations at a club level for teaching and coaching purposes. Hence the use of adjustable height baskets has much to recommend it.

19.2.3 RULES

Rationale

Just as playing areas and equipment can be adjusted to meet the needs of children, so too rules can be changed to allow them to learn and enjoy the game better. Some governing bodies have already introduced laws of play specifically for the junior game which can apply in competitive matches and there is now a wide range of activities which have well established 'mini' versions of the parent game. Mini rugby, mini basketball and short tennis are widely played. The latter has national championships and we have already referred to the international organization of mini basketball which is played worldwide.

However, the guidance given by institutionalized rule changes which different groups may use as the basis for competition may only be the beginning of adaptation for modifications which can help children to get more enjoyment from their sport. There is no reason why local rules need not be applied for teaching purposes and even be agreed between teams for competition. The key is to determine the essence of the activity and devise ways of allowing children to experience it within the limits of their ability and skill level. For example, allowing the ball to bounce once when starting children playing volleyball allows children to experience the pattern of the game without the frustration of the ball falling to the floor after each shot.

Examples

Good examples of rule adaptations can be found in rugby union and basketball. Each case has special rules (laws in the case of rugby!) which encourage children to play and have fun, which may not be possible under the conditions of the full game.

The governing body of rugby in England, the Rugby Football Union (RFU), has developed a game known as 'new image rugby' in which children from both sexes and of differing ages can take part together. This is achieved by removing the rougher aspects of contact from the game. Children often find that tackling and contact in scrums and in loose play put them off the game, at least at first. By substituting a two-handed touch for tackle, introducing scrums in which there is no pushing, and removing contact in loose play by having a pass after a 'tackle', this fear is removed. Moreover, the dominance of big children is eliminated and the emphasis is on running and handling skills. In doing this the game retains the structure of the full game. The purpose is to carry a ball over the opponents' goal line by running, carrying and passing among the players. Players assume the roles of ball winners (forwards) and runners (backs), and the game can accommodate groups of three to 12 players. Consistent with the advice in Chapter 8, coaches are advised to start children in small groups to enable them to understand better the structure of the game. However, this might be extended by requiring children to play in different positions from an early stage in order that they can experience the different demands of those positions.

Adaptations to equipment in mini basketball have been referred to previously. In addition the game, which is designed for children up to 12 years old, incorporates some changes in rules. The game is divided into four periods of ten minutes and if scores are equal at the end of that time then the game is drawn; there is no extra time to get a winner. In order to encourage maximum participation teams may consist of ten players of whom five may be on court at any given time. Each member of the team must play in at least one period and substitutions may only be made at the intervals, except for once in the last period of play. This sort of organization encourages participation and enjoyment as we know that children prefer to take part than sit on the bench. A further modification could be introduced in relation to the three second rule. Relaxation of this requirement to four seconds in the mini game would allow for the longer period of time it usually takes for children of this age to make decisions.

The notion of substitution for young players can readily be extended to other sports. As a teacher, one of the authors recalls frequently arranging rugby and soccer matches for 11 year old boys with other schools in which substitution was agreed in order to allow more children to play. In one case we would also mix the teams to create more balance if it was necessary, so essentially the match became a learning experience rather than merely a contest. Of course, not all teachers supported the idea!

19.2.4 ORGANIZATION

Finally let us turn to the question of how sport for children is organized. The provision of sporting activities for children is not the same as the provision of sport. The latter has a ring of institutionalization in which the activity is owned by adults. Sports activities, or games, on the other hand may be thought of as being owned by the children, as an extension of their play. While we acknowledge that as children get older, as athletes, they become more accomplished, a transition from playing to achieving must be assisted to make that change in a way that retains enthusiasm and keeps as many children in sport as possible.

The importance of acknowledging the constraints introduced by adults into children's sport are perhaps best demonstrated by the sadness expressed by Ray Williams of the Welsh RFU who was instrumental in developing the game of mini rugby as a means of allowing young players to develop the skills of the game without the pressures of competition. Within a relatively short time, competitions had been established in which the prime object was victory, not learning, and the game was owned by the adult coaches (Williams, 1986).

Rationale

So what can be done? The first thing is to return to the ideas in Chapter 3 and examine the goals of a programme and ask to what extent are children's needs being made a priority. Secondly, ask to what extent those needs are being met by the way in which the programme is organized. Thirdly, examine the competitive structure of the programme in the light of the demands on the children. When competitive demands exceed children's perceptions of their ability to meet them then they will be under stress and not enjoy the game.

The timing and way in which competition is introduced and developed is an important issue in children's sport, so much so that the Olympic Scientific Congress of 1984 in Eugene, Oregon, devoted a session to considering children's readiness for competitive sport. Robert Malina, an expert in growth and development from the University of Texas, has argued persuasively that readiness for competitive sport is determined by the individual characteristics of children, that is growth, maturation and development, and the nature of the sport. He has also commented that the focus of youth (children's) sport should be children but that focus is often distorted (Malina, 1986). Other speakers drew attention to the need to develop 'competitive' environments which emphasize skill development prior to adolescence so as not to disadvantage those who are small or late developers; to the need to allow for the relative immaturity of children in being able to assess

productively the competitive experience itself; the need to promote success experiences as an aid to enhancing self-esteem in younger children; and the need to ensure that coaches are adequately prepared for the specialist task of coaching children (Coakley, 1986; Halbert, 1986; Passer, 1986; Sharkey, 1986).

Examples

So what can be done to organize sports more beneficially for children? The key here seems to be to develop a competitive structure which maximizes enjoyment for the children participating, while at the same time acknowledging that different children enjoy different aspects of the sport. There is good reason to make changes to the competitive structure with changes in age, as has been done in the South Australian system mentioned previously.

Coakley (1986) suggests that pre-teen children need a less demanding structure than those who have reached teenage. During the 1980s a study commissioned by the International Tennis Federation recommended restrictions on the liberty of children to play at the top level which included the abolition of international tournaments for children under 12. This prompted the withdrawal of Swedish and German federations from such tournaments and a requirement in Germany that young tennis players also did other sports (Ryan, 1988).

Tournament organizers can further examine the extent to which events should follow senior patterns. When tournaments run from early morning to midnight in order to find 'winners' and those who survive can think not of winning but only of getting home, one is left wondering about the value of the event. In mini basketball, which caters for children under 12, one strategy is to organize 'rallies' and 'jamborees'. In both cases mixed sex teams are encouraged and in rallies, while teams play against each other, the organizers do not make a final ranking of the teams, hence there is no formal winner or loser! In jamborees children come from different clubs, areas or countries to play together and teams are composed of members from all the different groups which attend. Both of these strategies have the effect of focusing on playing performance rather than outcome. How different from the organizers of a mini rugby tournament in which winners of each match were given a soft drink for which the losers had to pay (Tennick, 1987).

19.3 RECOMMENDATIONS

There are compelling arguments to support the modification of sports activities to allow children to develop competence, confidence and enjoyment. In recent years the governing bodies of many sports have

initiated appropriate modifications but for the purposes of promoting participation, learning and enthusiasm coaches should consider making local adaptations for teaching and possibly for competition which should be incorporated wherever children demonstrate difficulty in carrying out the task. Many adaptations already adopted in specific sports can provide models for similar changes in others. These changes should make the task easier for the players, promote success, encourage continuation in the sport, and maintain the integrity or essence of the activity.

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Putting theory into practice—a sport example

20

Rod Thorpe

SUMMARY

Throughout the previous chapters one statement—‘children are not miniature adults’—frequently appears. The occurrence of this statement is equalled only by the statement that ‘our knowledge of children in sport is incomplete’. Unfortunately the coach has to work with this incomplete knowledge.

It is not the intention here to review each chapter or even to relate each topic area to coaching practice; rather it is the intention to develop selected examples in a practical way to indicate how the coach of children, and those others responsible for promoting the coaching environment, might have to review more carefully the way in which they think about organization and content. It is hoped to clarify some of the issues raised by focusing on one sport, tennis, which has at various times been highlighted because;

- (a) of the pressure it places on youngsters;
- (b) it can provide an enjoyable pastime for many;
- (c) it can be perceived as a lucrative profession for some.

Whenever appropriate, examples will be given from other sports.

20.1 IMPLICATIONS FOR THOSE ORGANIZING AND/OR PRESENTING SPORT FOR YOUNG PEOPLE

Two things have become apparent. Firstly, coaches who have not been alerted to the issues that are important when coaching young people

might be at best inefficient and at worst a danger to the young people in their care. Secondly, sport can be a powerful influence in the physical, psychological and sociological development of young people. It follows, therefore, that coaches working with young children should have the necessary training to do so, safely and efficiently. In a country that has traditionally accepted that much of the sport experience has been provided by volunteers, it is difficult to see how such training can reach the many people involved in young people's sport. There are, however, some points of influence that might, if prompted, be able to help spread 'good' practice.

20.1.1 THE EMPLOYERS

It may be that the local authority, sports club, youth centre, play scheme, etc., who 'employ' a coach to work with children should look first for the qualification that indicates an ability to work with young people, and only second for the qualification that indicates sport specific knowledge. In the short term, it would seem sensible to encourage employers to build into their conditions of employment the completion of the National Coaching Foundation (NCF) course 'Coaching Children'. The development of Scottish/National Vocational Qualifications (S/NVQs, see later) pertinent to both coaching and working with children may in the near future provide a mechanism for ensuring that all coaches employed to work with children are appropriately qualified.

20.1.2 GOVERNING BODIES

The basic coaching award in many sports is seen as the qualification that prepares the coach to introduce the activity. Of course, a large number of the people being 'introduced' to many sports are children. The National Coaching Foundation course 'Coaching Children' presents, in four hours, the information considered essential to the coach of children. Entry to the Lawn Tennis Association Intermediate Coaching Award is now dependent, in part, on completion of this course. Other governing bodies recommend or require coaches to attend this course. In some cases this may not be enough. In tennis, the Intermediate coaches often find themselves operating with county and regional level youngsters, who give considerable time and effort to their sport. These children can be said to be truly competitive, and it would seem desirable that the more extensive knowledge provided by the NCF Advanced Level course 'Children and Competitive Sport' be embraced.

As mentioned earlier, so many of the sporting opportunities provided for young people, even at the competitive level, are run and organized by amateurs who have given their time and money to take coaching awards.

Many may feel that the additional time for specialist courses, like those of the NCF, requires a commitment they cannot give. It is vital, therefore, that in a desire to produce the 'ideal' provider of sport opportunity for children, we do not exclude the many people who, with an appropriate short training, can make a valuable contribution. Thus a major task for those who design coaching awards is to determine just how much information about children they can include within the programme without excluding prospective coaches because the time or expense becomes too great.

It may be that the obligation to attend the more advanced course on children should not be governed by the coaching award, but rather by the role the coaches occupy. Thus all intermediate coaches may not be obliged to take the course, but all county and regional development officers would.

The evidence from earlier chapters suggests that more time spent on considering the adaptations necessary to meet the needs of particular groups, even if this means a little less on the technical and/or tactical elements, might be advisable. Even so one must question how much time can be allocated to children, how much to players with disabilities, etc. Those in the sport must assess the relative values of each element of the course; for example, I would expect as much information about some aspects of child development in a one-day 'Tennis Leaders' course as in a 36-hour 'Elementary Coaches' course, because of the anticipated markets in which these leaders and coaches will operate. The tennis leaders will work predominantly with the younger child, the coach will be expected to develop technique and tactics with a wide range of ages and abilities.

Clearly each governing body must make this sort of decision. In sports like tennis, swimming and gymnastics in which the young dominate the competitive scene, a considerable input about children would seem to be advisable. In other sports where coach/leader awards are designed for the young, for example mini basketball, mini rugby, etc., these particular awards could well include considerable information on children, whereas the normal coaching award may not (see NVQ).

Ultimately, the idea of incorporating material about child development into coach training programmes would seem to be the most suitable way forward. Certain aspects of child development may be important in one sport but only peripheral in another. Clearly the emphasis given to the different aspects of child development will, and should, vary from sport to sport. An attempt to integrate child development issues into sport specific coaching was central to the philosophy of the training of coaches for the Champion Coaching Programmes run in 1991 (NCF, 1992). Incorporating child development into national governing body coach education might at first sight appear to put pressure on the 'tutors of the coaches'. In 1989, the LTA asked all

their panel tutors to include the information from the NCF Introductory Study Packs in their courses for the Elementary Coaching Award (LTA, 1989). It appears that, after a little difficulty, most tutors feel comfortable with the material and a thorough integration of theory and practice can now take place. At the time of writing a number of NGBs are wrestling with the problems of ensuring that the coach training syllabus can be interpreted as competencies measurable in the coaching situation, in order to satisfy NVQ requirements. Because many tennis coaches work with children, and because the need to match the coaching behaviour to the needs of the group is central to good coaching, it follows that any assessment should ensure the coach has knowledge of, and competencies in, coaching tennis to children.

20.1.3 SPORTS COUNCIL AND GOVERNMENT

A number of important events have occurred, and are continuing to occur, at the national level which will affect the coach of children. It is beyond the brief of this chapter to do more than highlight the main implications; indeed, any attempt to discuss finer points would be futile because, at the detailed level, change is so rapid that the information presented would be outdated before publication.

During the 1980s it would seem that the Sports Council retained a focus towards Sport for All and targeted a variety of groups such as the over-50s and women, with an underlying thrust towards 'participation'. In the 1990s, the balance has shifted somewhat, with more attention being given to 'performance and excellence', i.e. to those who wish to improve and those destined to reach the top levels. In addition, the Sports Council made a strong commitment to the support of young people (5–18) in sport, in the belief that if you 'catch them young', they will wish to continue in sport. These re-orientations of Sports Council objectives, coupled with the development of the national curriculum for physical education which clearly highlighted the need for partnerships between schools and other sports providers, has thrown the need for 'good' coaches of children into the spotlight. Certain other legislative changes, like local management of schools and the Children Act, have changed the 'climate' in which sport provision for children may be offered. These issues are beyond the scope of this chapter, but suffice it to say that the need for a more informed, better qualified coach of children is apparent.

The Industry Lead Body for Sport and Recreation, a group of people chaired by a representative of the Sports Council, has been charged with bringing some order to the multitude of sport (and recreation) qualifications and determining the knowledge and competencies required for given levels of sport workers. Work is ongoing, through the

NCF, to help sport governing bodies to review their coach training programmes against this framework. It may take some time before we see all coaching awards embrace the common framework, and there will always be sport specific differences, but as an employer of coaches or as a parent whose child is being coached I am sure I would welcome a clearer idea of what I can expect the coach to know and be able to do. It is comforting to note that the needs of children are well represented within the NVQ awards and these issues will reach the coach trainers and assessors.

20.1.4 BRITISH INSTITUTE OF SPORTS COACHES (BISC) AND THE NATIONAL COACHING FOUNDATION (NCF)

In 1991, the four Sports Councils in the United Kingdom produced *Coaching Matters—A Review of Coaching and Coach Education in the United Kingdom* (Sports Council, 1991). In addition to representatives from the Sports Councils, the other officers contributing were the Director of the NCF and Chief Executive of BISC. In some senses this reflects the fact that it is these two agencies, working together, who will be charged with moving coaching forward. *Coaching Matters* provides a framework and embraces many of the ‘person awareness’ issues which become so important when coaching children. Coaches have ready helplines in these two organizations.

20.1.5 IMPORTANT OTHERS

It is important to recognize that much of the sport provision for children has been developed, and is presented by, individuals and organizations not mentioned so far. The list is immense and varies from the helper at Brownies or Cubs evening to the lecturer in Higher Education who has given a lifetime to producing materials suitable for children’s sport experiences. It is beyond the scope of this chapter to discuss the roles of all of these, but it is important for the coach to be sensitive to the fact that there are many different perspectives of sport, and there is a need to enter some situations with tact and diplomacy. There are people who spend a considerable time working with children who are yet to be convinced that sport is a positive experience. Coaches would do well to listen to the reasons these people give for this negative response as often it is based on their own experiences of sport as children.

20.2 IMPLICATIONS FOR THE COACHES

20.2.1 THE PHYSICAL SAFETY OF THE CHILD

Coaching responsibility (short term)

Most parents entrust their children to a person called a ‘coach’ in the expectation that that person would, at the very least, provide a safe environment in which to learn. It seems reasonable to anticipate that the law would expect that a coach of children would take extra care of the child, because children cannot be expected to foresee danger or understand the concept of responsibility.

Before and after the session

This added responsibility requires thought even at the simplest of levels; for example, the coach may well have to assess the point at which responsibility is taken from and passed back to the parent. It is not uncommon to see young children waiting for parents unaccompanied because the coach has left or is taking the next class. The coach of children may have to build into the session planning the ‘handover’ procedure—once this is defined, the coaching session can then be planned with safety in mind.

A particular problem with tennis is that coaching sessions often occur outside and children leaving the court thus easily leave the confines of the coach’s perception. Coaches can of course overcome the problem of safe transfer by devising a rota which nominates one parent to take on the role of ensuring all children are safely collected.

Within the session

In Chapter 7, Rosemary Connell makes the point that ‘Recognizing spaces, judging direction and speed of movement of other players and balls needs practice...’. These skills are not well developed in children. Place this alongside the fact that children tend not to walk onto court and await instruction, particularly if the sessions are ‘fun’, and it becomes quite apparent that the safety procedures which operate for adults, e.g. checking space to swing the racket, ensuring balls are not underfoot and that there is a clear space to hit into, have to be extended. The fact that many coaches use modified courts to ensure more appropriate activity can mean that the children may operate in areas less well defined than adults playing on a full court. There are clearly laid down guidelines for spaces between and at the back of regulation tennis courts, but the good coach modified the court to suit ability and as a result markings may be

less clear, distances between courts more arbitrary, etc. Modification may occur at an age when space, consequence of actions, etc., are not fully understood so it follows that safety has to be a priority. A gentle introduction of the rules we apply to play safely need not be oppressive and can be a first step from free play toward the organized world of competitive sport. It can also be the first step toward understanding that all competitive sport is played within agreed rules and that most sport is played with friends.

Often, in those sports in which the environment risk is obvious, for example the gymnasium, climbing wall or diving pool, safety is often built into the coaching programmes. It is often those activities like badminton, soccer, basketball, which people play unsupervised and with no formal tuition, in which the safety is overlooked. The argument that children 'play' these activities unsupervised may not satisfy the parents of a child who has an accident when care was entrusted to the coach.

The reader might accept that showing 'care to those you are coaching' and identifying 'foreseeable risks and taking positive action to prevent them' (see Appendix 2) can, whilst protecting the coach, be an integral part of the education of the children.

Coaching responsibility (long term)

Whilst accepting that sport is often associated with a healthy lifestyle, it is immoral to ignore the fact that youngsters may be seriously injured by sport. We have to be concerned at the number of young players who play in strapping, who complete games only to rush for the 'ice', who spend hours with the 'physio', etc. Some injuries occur through accidents, but some overuse and stress injuries can be avoided if the coach takes the time to consider the risks. Many of the risks are obvious once the coach considers them. For example, many British youngsters play tennis on 'hard' porous concrete courts, therefore the moment a commitment is made to the game it is vital that the coach educates the performer and parent about the need for appropriate footwear. Children often attend their first session with a racquet borrowed from a friend or parent. Few know what to buy, but it should be obvious that an inappropriate racquet could cause injury. The coach can remedy these factors quite quickly, but there are often less obvious influences on the child's safe development.

Tennis is one of the sports which can cause asymmetric development. It is not surprising that tennis players have relatively more muscular development of the hitting arm but it is perhaps less well known that the bone density is also greater in the hitting arm. These developments may not be directly linked to injury in themselves,

but it would seem logical to suggest that extreme asymmetry will put disproportionate stresses on the body. Far more concern has been expressed about the stresses produced by extreme asymmetric body rotation, particularly with certain double-handed techniques. The tennis coach must, when dealing with young children, consider the need for a balanced physical development; if tennis does not provide it, then it seems desirable to encourage compensatory exercise. In the older, committed children this might well take the form of a prescribed exercise regime. In the younger children, the encouragement of other forms of activity, e.g. swimming, team passing games or gymnastics, might be appropriate.

One further observation about tennis is necessary. Neil Armstrong points out why the American Academy of Pediatrics recommend 'that, under no circumstances, should a full marathon be attempted by immature children'. Whilst tennis tournaments are not the same, it is worth considering that many junior matches last over an hour and the youngsters are often called upon to play more than one match in a day, particularly if entered into singles, doubles and handicap competitions. Often these matches take place on porous concrete and can occur in very warm weather. Most tournaments last several days. The implications for diet, fluid intake, rest, overuse injury, etc., may be as important, but are far less obvious than those anticipated for marathon running.

Clearly each sport places particular physical demands on players. The example of tennis is used to illustrate how what at first sight appears a 'safe' activity can, under certain circumstances, put the child at risk. It is necessary to look beyond the obvious, like the possible head injuries in boxing and neck injuries in rugby, and include the more cumulative effects of training and competition.

At times, governing bodies may be competing for youngsters, particularly the talented. It is not uncommon to find youngsters who are talented in more than one sport. One can understand why a coach may be reluctant to encourage the player to take part in the other activities (s/he might fear that the youngster will begin to prefer another sport), but coaches have to realize that they are important people in the child's overall physical education and a single sport may not best provide a healthy physical development.

20.2.2 PSYCHOLOGICAL WELL-BEING OF THE CHILD

Whilst it would be difficult to make the case that the 'over-zealous' or 'careless' coach had damaged the child emotionally, there is sufficient evidence, in tennis at least, that the intensely competitive junior circuit can dramatically affect the well-being of the child (see Chapter 12). 'Fortunately' many children drop out before this becomes a major

problem. Several chapters deal with the way factors as varied as the coach's values, goal setting, anxiety control and so on, can influence the way children associate sport performance with self-worth. Once again there would appear to be certain principles that might alert the coach to possible dangers in their sport. Does the activity demand a large time commitment? Can the child be easily judged by others? Can conflicts arise between school and sport? Is success likely to be affected by physical maturation? Are parents involved in the sport? Are children individually ranked? Of course, the answer to these questions for tennis is 'Yes'. It follows therefore that tennis coaches must be sensitized to these dangers. It would seem desirable that all governing bodies examine the likely sources of psychological pressure in their sport and ensure that coaches are made aware of them. It is not surprising that gymnastics and swimming are coupled with tennis as examples of sports with mid-teen drop-outs. All contain the elements that make them prone to rejection during adolescence.

20.4 ACCESS TO SPORT

20.4.1 THE PARENT/GUARDIAN—CHILD—COACH INTERDEPENDENCE

Tennis typifies the need for the coach and parents to act as a co-ordinated team. The sport itself recognizes the value of family interaction at top level with father/son, mother/daughter events, and at the lower club levels with handicap tournaments, which are often peppered with family doubles. The game is difficult to play (although short tennis overcomes this somewhat) and parents can be quite important as practice partners. Those parents who cannot become the practice partner often act as transporters to meet a prearranged practice partner. As the child reaches the higher levels, it becomes apparent that appropriate practice partners, coaches, squad sessions and competitions become more widespread. The time and the cost become prohibitive for some, and inconvenient for most. Whilst the Indoor Tennis Initiative is designed to bring appropriate facilities nearer to the player, the problem will never be totally eradicated; the coach might do well to consider how s/he can reduce this pressure. John Atkinson, Director of Coaching for the British Amateur Gymnastics Association, made the comment that a mini-bus might be one of the best pieces of equipment for a gymnastics club, in order to overcome the major problem of 'getting the children to the venue'.

If we consider that social interaction is a most valuable part of the sport experience and that travelling together allows time for 'gossip', etc., and if we add to this the fact that children around age 12 sometimes make moves away from parental control toward their peers, it follows

that coaches should consider the methods of 'getting the children to the event' as an important educational tool and an important motivational factor. It might need only a word to arrange that two players call round for a third, to ensure that child, who would not be allowed to go alone, can attend. The advantages may go far beyond the obvious safety factors, in that affiliation incentives may be satisfied.

20.4.2 THE SCHOOL

The dependence of children on their parents to play sport is unfortunate for those whose parents lack the time, means and/or inclination to support their children. One site of access to sport has always been the school. Contrary to media myth, even the much maligned Inner London Education Authority (ILEA) saw the value of competitive sport (ILEA, 1988), and the sport input to the 'new' PE is perhaps better reflected by an attempt to provide more balanced sporting opportunities for more children. One sure fact is that the extra-curricular opportunities to fulfil this aim cannot be met by the PE staff. The Report from the School Sport Forum (Sports Council, 1988) and the ILEA Report, *My Favourite Subject* (ILEA, 1988) anticipate an increased relationship between coaches and PE teachers.

The coaching world has to accept that teachers must be cautious when opening the doors to a coach who in all probability has had no specific training to work with children. Additionally, the coach may have to recognize the way in which the extracurricular activity is being offered. If the teacher provides a tennis-like activity, for example a short tennis type of game, presented in a way that attempts to overcome the problems of different physical abilities (see Thorpe *et al.*, 1986) and thereby interests many of the youngsters, there may be a great demand for extracurricular sessions. If the tennis coach who helps with the extracurricular activity immediately focuses on the technical aspects, thus excluding many less able children, the teacher will immediately see the extracurricular activity undoing a major aim of the PE programme.

This situation need not occur, but it is important that coaches become aware of the different ways in which sport is used by agencies dealing with young people. The recent School Sport Forum indicates a climate in which this form of co-operation can work, but Chapters 2 (Whose sport is it anyway?) and 3 (Why are we coaching children?) raise some of the issues the coach must face before s/he is welcomed into the school. It is the opinion of this author that the curriculum PE has to be an integrated whole and as such should be the domain of the PE teacher, but a child should not have to take the giant steps from school to club, from teacher to coach, and from an approach which recognizes relative ability to one based on performance criteria, all at the same time. By welcoming the

coach into the school facilities, but ensuring the coach understands both the developing child and the aims of the PE department, the opportunities open to children can be much increased. These working relationships have been expanded elsewhere (Thorpe, 1990).

Attention has been drawn earlier to the fact that children receive a sport experience in many other situations (playschemes, voluntary organizations, etc.). In all situations the coach must try to be sensitive to the ethos of the particular group with which s/he is working.

20.5 EDUCATING THE PARENT

Tony Byrne in Chapter 4 has dealt fully with the performer—parent—coach triangle, but to understand the problems, the coach may have to look more carefully at his or her particular sport. In tennis, a major problem is that the performance is so easy to judge. We can all see when a young player hits a ball, which ought to have produced a winner, well out into the back netting. We can sit 'calmly' on the side and recognize that if s/he had played a gentle drop shot instead of trying to 'blast' the ball, the point would have been won. We can see that the decision as to which shot to play was inappropriate, and the execution of the shot was poor. Whilst the young performer should not be 'overloaded' with the theory, a little time spent with the parent explaining why we cannot expect good decisions to be made when under stress in a game would be time well spent. Further, if we can explain why comments made at that point about bad decision making might increase the anxiety, which in turn makes good decision making even less, rather than more likely, most reasonable parents will try to react in a way which reduces rather than increases the pressure.

The fact that in tennis parents can easily evaluate both the intention and the result is even more apparent with technique than with decision making. One of the most commonly heard comments at the tennis court is 'How can you play such a bad backhand? You were working on that shot with the coach last week'. By definition, if the coach was working on an aspect of the game, it was probably because s/he wished the performer to learn something. Experienced coaches and sports scientists interested in skill learning would anticipate that whilst the backhand works perfectly well in practice, even under a little pressure, it will not work every time in the game. It needs practice. The parent needs to understand this so that, if the child attempts the shot and it goes wrong, the reaction is not blame, but may even be praise for putting it into the rally at the correct time.

Tennis is somewhat unique in that, whilst many children have lessons from coaches, only a few have a coach watch their matches; most, particularly the younger ones, have parents watching the matches.

Coaches of other sports might take time to consider the areas in which the shortcomings of performers are most obvious and most embarrassing; the missed tackle in rugby, the shot 'off-goal' in hockey, soccer or basketball, the slip on the beam in gymnastics, and so on. These provide the basis of parental criticism because they are obvious but, because they are also the sources of embarrassment, the last thing the child needs is parental criticism. The coach should be aware of these sources of conflict and ensure that the parent does not magnify them.

Because many parents become involved in the sport through their children, coaches might do well to recognize that there are many areas of the sport experience where parents can help; for example, keeping an eye on play, running the games that occur in most coaching sessions and so on, freeing time for the coach to coach. Indeed tennis coaches now have the chance to encourage parents to take 'leader's courses'.

20.6 THE ADULT MODEL

Whilst accepting that children are not miniature adults, the coach has to recognize that imitation is a strong learning vehicle. In my experience, coaches rarely consider the environment in which the children operate. It might be that arranging to have good players, perhaps a little older, working hard on the next court but reacting to success and failure in ways which the coach would wish to instill will do far more than any degree of 'telling'. It might do much to overcome other undesirable models which the children may meet elsewhere.

20.7 WINNING AND LOSING

A number of authors make the point that winning is not synonymous with success and losing does not mean failure. Stuart Biddle (Chapter 10) describes how the coach can help the performer develop a sensible approach to 'attributing cause', whilst Jean Whitehead (Chapter 9) gives some insight into the variety of reasons that children give for playing sports. It is not the intention here to deal with the way the coach can exploit this knowledge (this has been done perfectly well in the respective chapters); rather it is the intention to suggest that governing bodies and sport organizations often make it difficult for the coach to operate in a way which facilitates long term development. Tennis is a particularly good example of this.

I welcomed the advent of short tennis in that it seemed to provide a medium in which children could show ability and task mastery, and gain social approval. In that a variety of new tactics and skills are possible (in direct contrast to tennis), breakthrough might seem to occur more often, games could be structured quickly, with simple scoring that satisfied the

victory goal, and the pleasure of seeing lots of youngsters having fun together seemed to suggest that teamwork was a real possibility. Thus the modified game seems appropriate to meet the six main goals identified by Jean Whitehead. It was unfortunate, therefore, that a game designed for young children became structured in a way which exaggerated the 'showing ability', 'victory' or 'outcome' goals. One has to question (and indeed sensitive people in the LTA have) the wisdom of allowing club, county, regional and national short tennis competitions to dominate the sport if one accepts the rationale for drop-out suggested by Dr Whitehead. Of course, such a structure reflects the junior tennis game which is based on an 'outcome' pyramid; any child with ability is soon drawn into the selection procedure based predominantly on victories at tournaments that mirror senior play. But how does this match the statement made by Whitehead that 'When there seem to be no more new or exciting things to do, a curiosity goal that brought children into sport will naturally take them out again...'?

Some tennis coaches share this concern, in that they feel that many children who have their competitive tennis experience early may not stay through the teens. This becomes more critical if the children who gain success early cease to achieve later on. Other children who start late may not be able to break past the reputations of the early starters.

These concerns are real, but can be overcome if the sessions are structured to meet different needs; this may be easier if the coaches, parents and children are not led to believe that the central reason for the activity is to 'Search for a Champion'. It is unfortunate that in a game which so adequately brings tennis to a wide range of abilities, the desires of the sponsors force the 'search for a champion' onto much of the short/mini tennis literature and packaging. Of course, coaches can rapidly overcome the implication that if 'you are not going to be a champion, you can leave', but governing bodies might well consider the way they promote their mini game by recognizing that 'packaging' that embraces more of the children's likely incentives and goals will attract and, perhaps more importantly, keep them in the game.

It is often difficult for the coach of a mini basketball team, a junior sailing squad or a primary school soccer team to see the 'winning and losing' as part of a development of their performers, rather than an end in its own right. For the coach, the performer or team then move on. The winning team or performer is often seen as the test of the coach's own competence. This need not be detrimental to the child's progression through sport, but the coach has to be able to assess his or her own involvement in the coaching process. It is often worth reminding ourselves that success at this age is often a function of early maturation, and that 'good' coaches are often merely the coaches who have access to good performers. It is also worth the coaching world considering how it

can reward those coaches who can lay the foundations that allow youngsters to become committed senior performers, rather than short-lived junior champions.

20.8 CONCLUSION

Childhood is the time when most people are introduced to sport. The attitudes they develop at this stage will influence them for life. Pertinent knowledge, like that presented in this book, is becoming available, but how quickly this influences coaching behaviour will be dependent on the many organizations who provide the sport opportunities, particularly those that train the coaches. Coaches of the young, perhaps more than any others, need to reflect on the aims of their coaching.

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Appendices: Legal Matters

In recent years there has been a marked increase in the number of cases brought to court concerning behaviour in sports settings and the pursuit of claims for sports injury. Since the damages awarded can be quite substantial, coaches are well advised to be aware of their legal responsibilities and how they can insure against claims against them. The following two appendices are included in order to provide that information, albeit to a minimal degree, and not in order to be alarmist. Since accidents can easily happen and, in an atmosphere where pressure to win is on the increase at all levels of sport, the margins for error are smaller, coaches should be clear about their position.

Valerie Collins explains how the law applies to coaches. She makes it clear that people who are injured in sport can seek compensation if they can show that someone else has been negligent in a way which contributed to the injury. Most importantly, where children are concerned coaches have a greater responsibility since they are charged with the care of the athletes and that duty is greater according to, among other things, the age and experience of the athletes. Miss Collins explains the conditions of care and how negligence may be shown. She also describes the defences which may be used and how damages are awarded.

Finally, in Appendix B, Harry Towers follows the explanation of coaches' legal position with specific advice on the steps to take to protect yourself against claims which may arise. He outlines the practical problems of coaching from which claims may arise. These include the nature of the facilities and equipment, the organization of practices, the vexed question of when you may safely join in, and the problems caused by adventurous and ambitious children. Lest you may think it is not worth your while getting involved at all he then goes on to explain how to protect yourself against unfortunate events. As a coach you may find this the most important part of the book!

Appendix A

Coaching and the law

Valerie Collins

A.1 INTRODUCTION

All participants in sport run the risk of injury and the problem facing lawyers when a participant is injured is to decide which injuries must be accepted as 'occupational hazards' and which should be the subject of a claim for financial compensation from the person responsible. The person responsible may be either a fellow participant, the organizer of the activity, the occupier of the premises used or the coach. This section is dealing with the liability of coaches. Coaches should be aware of the tort of negligence which is particularly relevant to them. A tort is a civil 'wrong' and anyone committing a tort may be sued in the civil courts for compensation by anyone who has suffered personal injury or damage to property as a result.

A.2 NEGLIGENCE

A person who has been injured while taking part in sport may seek financial compensation at civil law if that person can show that somebody has been negligent and that it was that negligence which caused the injury.

To establish that there has been negligence, the following elements must exist:

1. A duty of care must be owed.
2. There must be a breach of that duty of care.
3. Actual damage must have resulted from breach of the duty of care.

To decide whether or not a duty of care exists in a particular situation one must apply the test established in the case of *Donoghue v. Stevenson* in 1932. This test is known as 'the neighbour test' and was formulated as follows:

You must take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to injure your neighbour. Who, then, in law is my neighbour? The answer seems to be—persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question.

(Donoghue *v.* Stevenson [1932] AC 562, p580)

Anyone involved in coaching must owe a duty of care to those being coached. However, difficulties may be experienced in deciding exactly what comprises the duty of care. The law is not and cannot be precise on this matter; it can only lay down principles to be applied in each particular situation. However, the following matters should be considered:

1. The age of the persons being coached;
2. Their experience/expertise;
3. How dangerous the particular activity is;
4. The degree of risk and the cost of prevention;
5. 'Foreseeability' of the accident occurring;
6. Suitability of the environment/premises/equipment;
7. Adequate instruction/supervision.

These matters will now be considered separately.

A.2.1 AGE

Where children are involved a stricter duty of care is imposed than would be the case with adults. This is particularly true where coaches and children are concerned because they will be considered by the law to be *in loco parentis* where the pupils are under 18. This means that a general duty of care is owed to the pupils to exercise reasonable care for their safety. This duty is to take the care that one would expect reasonably prudent parents to take. For example, a coach would be expected to supervise the activity properly and also to be aware of the strength and capabilities of the persons concerned. In *Affuto Nartoy v. Clarke and ILEA* (1984), a teacher forgot momentarily that he was playing rugby with young schoolboys who were smaller and weaker than himself and he injured a 15 year old boy when he tackled him. The teacher was found to be negligent.

A.2.2 EXPERIENCE/EXPERTISE

The experience, expertise or any other relevant characteristics of the

people being coached should be taken into consideration. For example, more care should be exercised in taking a class of beginners for gymnastics than in supervising a training session for Olympic gymnasts.

A.2.3 DANGER

The more dangerous the activity the higher the degree of care that should be exercised. A further consideration would also be the potential danger of any equipment that was being used. For example, there would be a breach of the duty of care to leave a trampoline out in a sports hall which was unlocked and unattended.

A.2.4 THE RISK OF INJURY AND THE COST OF PRECAUTIONS

The court will consider the risk of a particular accident occurring and the cost of taking precautions and will usually conclude that there has been no breach of duty where the risk of the particular type of injury was small and the cost of guarding against it prohibitive.

A.2.5 FORESEEABILITY

A coach will be expected to take reasonable precautions to prevent accidents which are reasonably foreseeable. Foreseeability was discussed in the case of *Clarke v. Bethnal Green Borough Council* (1939). In this case a child was preparing to dive off a springboard when another child holding on to the under part of the board let go. The child on the board was thrown onto the edge of the pool and injured. The court decided that there had been no negligence as this type of accident had not occurred before and was not foreseeable. But note, once a particular type of accident has occurred it may be deemed to be foreseeable in the future.

A.2.6 SUITABILITY OF THE ENVIRONMENT, PREMISES OR EQUIPMENT

It is important before commencing any activity that the coach should ensure that the environment, premises or equipment are suitable for the particular activity. In *Ralph v. London County Council* (1947), Ralph was a pupil at one of the defendant's schools. He was taking part in a game of 'touch' supervised by a teacher in the assembly hall, one side of which consisted of a glass partition. During the game, which involved a lot of running about, Ralph put his hand through one of the glass partitions and was injured. The court decided that the teacher was negligent because he should have foreseen that such an accident might occur.

If faulty equipment is responsible for an accident the coach may be liable if the fault could have been found easily. The duty here includes regular safety checks of any equipment used. Complex or technical equipment should be regularly checked and serviced by the manufacturer to fulfil this duty. The checking of most equipment used for sport can be done easily although equipment such as trampolines would require regular servicing. Should a fault have occurred which could not be discovered by a simple safety check then the manufacturers may be liable to anyone injured while using that equipment, to whom they will owe a duty of care (see *Donoghue v. Stevenson*).

A.2.7 ADEQUATE INSTRUCTION/SUPERVISION

To fulfil the duty of care a coach must be both qualified to teach the particular activity and to coach to the standard he is coaching. Coaches should also ensure that the group is small enough to be properly supervised.

In any case that comes before the courts it will be up to the courts to decide whether or not there has been a breach of duty in each particular situation. The court will look at cases decided previously before reaching a decision.

However, the court could find that there has been no negligence because the activity had been conducted as safely as could reasonably be expected. In *Jones v. London County Council* (1932) Jones was doing a course of physical exercises which included the playing of certain games. An experienced instructor had been appointed to supervise the games. During one of these games Jones fell and was injured. The court decided there was no evidence of negligence. An experienced instructor had been in charge and there was no evidence the particular game was dangerous. The court said it would be unreasonable to consider an activity dangerous just because an accident might happen at some time.

If the court decides that there has been negligence the question then arises concerning who actually pays the damages. The person responsible will be liable to pay but through the operation of the principle of vicarious liability, that person's employer can be sued and be liable to pay any damages awarded. This is because an employer is more likely to be able to pay the full amount than the employee; they will also usually have to be insured against the public liability of their employees. Difficulties may arise concerning the position of coaches who may be either employees or independent contractors; in other words, self-employed. Self-employed coaches will be liable personally.

An employer will only be liable where the employee is negligent

during the course of his employment, in other words, he must be doing what he was employed to do. Employers are also under a duty to ensure that a person employed to do a particular job is competent to do that job.

A.3 DEFENCES

One of the following defences may be pleaded to try and avoid liability:

1. A claim that the particular accident was unforeseeable.
2. Volenti. This defence, which is given the Latin tag *volenti non fit injuria* meaning 'no harm is done to he who consents', is available where the person injured has freely consented to the particular risk resulting in the injury. Volenti cannot be claimed if the injury is caused negligently or deliberately or is not a risk associated with the particular activity concerned, for example, injuries caused by faulty equipment.

To establish the defence of volenti it would have to be established that the 'victim' 'consented' to the act complained of with full knowledge of the risks involved and that he consented voluntarily. If a participant in sport is subjected to risk in the course of his employment or education, for example because participation in sport is compulsory, then he cannot be said to have consented freely. In *Hall v. Brooklands Auto Racing Club* (1933) a spectator at a motor race was injured when two cars collided in the race. The court decided that the owners of the race track were not liable in respect of the spectator's injuries. In such cases there is no liability for dangers inherent in a particular sport which could have been foreseen by a spectator who therefore accepted the risk of them occurring.

3. Another defence, or partial defence, is that of contributory negligence. Should a participant suffer injury partly due to his fault and only partly due to the conduct of another then the amount of damages recoverable for his injuries will be reduced by an amount adjudged by the court to cover the participant's share of responsibility for the injuries. Anyone pleading this defence must prove that the participant was negligent and that this negligence contributed to the injuries suffered.

There are three qualifications relating to this defence. First, that the person concerned should take into account the possibility of others being careless in relation to his own actions. Second, that although a child may be negligent the age of that child will be taken into consideration and, in fact, this defence is rarely pleaded against children successfully. The third qualification is that the participant will not be considered to have been negligent where he has acted reasonably in the face of sudden danger even though his action contributed to his harm. When deciding how much responsibility should be attributed to each party the judge is

under a duty to be fair and just according to the circumstances but he has no set rules to follow. Contributory negligence has been successfully pleaded in cases concerning accidents involving motor cyclists who have not been wearing crash helmets.

4. Liability may also be avoided where another event occurs which breaks the chain of events started by the defendant's conduct. In such a case the defendant is only responsible for the loss occurring prior to the intervention, and not for the whole loss. A classic example of this type of situation is where a person is taken to hospital with a minor injury and due to an error at the hospital ends up having major surgery!

A.4 DAMAGES

A participant bringing an action for negligence will be claiming damages as compensation for injuries suffered. Although the aim of an award of damages is compensation some injuries that have been suffered may be felt by the court to be too 'remote' from the conduct complained of and that it would be unfair to make the defendant liable for all the injuries resulting from his conduct. There will always be total responsibility for all injuries arising from intentional conduct. Where unintentional injuries have been caused then the person responsible will only be liable for the injuries that were reasonably foreseeable as a result of his action (or inaction).

Once it has been established that the kind of injury that occurred was foreseeable, the person responsible will be liable for that injury even though it was more extensive than he could have anticipated. Anyone who is negligent must 'take his victim as he finds him' and will be liable if an injury is more serious than anticipated due to a weakness of the participant; for example, a person who suffers a fractured skull from a blow that would normally only cause a slight head wound because he has an unusually fragile skull.

Any attempt to avoid liability is now subject to the Unfair Contract Terms Act 1977 (something of a misnomer as it does not apply only to contractual situations). This Act provides that liability can no longer be excluded or restricted for negligence arising in a 'business' context resulting in death or personal injury.

Damages may be claimed for pain and suffering, the cost of medical treatment, loss of earnings, loss of potential earning capacity and loss of enjoyment of life as these are all deemed to be foreseeable losses by the court.

A.5 COMMUNITY LAW DIRECTIVE

In November 1990 a proposed European Directive was put forward that the supplier of a service should be liable for damage to health and physical integrity or the physical integrity of movable or immovable property, caused by a fault committed by him in the performance of the service. Such a Directive was felt to be necessary to take account of legal developments and case law in Member States which could create an atmosphere of uncertainty to consumers and to the forthcoming single market in services.

Discussions concerning this Directive have resulted in a lot of opposition as many Member States resent this interference with existing laws relating to civil liability. There has also been a lot of opposition to the inclusion of all services which means the Directive will extend to recreational activities.

The principal aim of the Service Liability Directive (COM (90) 482) is to reverse the burden of proof so that the onus is on the supplier to prove he was **not** negligent when a consumer suffers because of poor or defective service.

This proposed Directive was still the subject of debate at the time of writing but readers should be aware that the burden of proof concerning negligence may be reversed.

A.6 CONCLUSION

Anyone who undertakes the coaching or supervision of another person or persons puts themselves in a duty of care situation. This situation arises whether or not the person concerned is paid for their work. Such people should remember the following points:

1. Always take reasonable care.
2. Follow any codes of practice issued by and therefore accepted by the governing body of the sport concerned.
3. In any legal action the above recommendations will not guarantee success as the outcome will depend on what the judge considers to be reasonable in the circumstances.

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Appendix B

Ensure you are insured

Harry Towers

B.1 INTRODUCTION

If one of your charges is injured while you are coaching or giving instruction you must assume that 'someone's going to pay'. Sensible and responsible people will recognize that in all areas of competitive sport accidents do occur and can result in injury. This appendix will seek to demonstrate where, in general terms, risks to the coach lie, how they might be minimized, and, most importantly, how the coaches might protect themselves against those risks which cannot be eliminated.

B.2 THE PROBLEMS

Simply by putting yourself forward as a coach, instructor or teacher in a sport or leisure environment you inevitably place yourself in a position of risk. Like it or not, you assume the following responsibilities

1. You owe a duty of care to those you are coaching.
2. You must identify foreseeable risks and take positive action to prevent them.
3. If you fail, you will place yourself in breach of duty and will be liable in negligence and for any injury or damage sustained.

All of this is perfectly reasonable, but it is aggravated by the fact that young athletes are juveniles and many are, in the eyes of the law, minors. Consequently you are standing in a position of parent or guardian, i.e. *in loco parentis*. For practical purposes you are absolutely responsible for those children under your control because, in the majority of cases, the law will not ascribe to them any responsibility for their own stupidity.

B.2.1 SOURCES OF RISK

After you have defined your position you need to recognize the sort of situations and incidents that may threaten you and, indeed, make you vulnerable to allegations of negligence, litigation and the award of damages against you. Let us consider some of the common sources of threat of which you should be aware.

Environment

Whether your activities are indoor or outdoor, land-based, water-based or, indeed, airborne, the following considerations are constant and relevant to all coaches and teachers. The environment in which you conduct your activities must be a safe and suitable place bearing in mind the nature of the activity. For example, you must take into account the amount of glass in the activity area, protruding radiators, the suitability of the floor space and surface, available lighting, the weather conditions, and so on. Standing in the place of the parent you must make a value judgement and satisfy yourself that it is reasonable and safe to proceed. If your judgement is in error and an accident occurs you will be in severe difficulty.

Equipment

Any equipment, from a table tennis bat to a javelin, from a judo mat to a canoe, must be in good repair and suitable for the practice of your activity. It is your responsibility to ensure that this is the case prior to using it.

Matching participants

Overcrowding, which in itself can lead to accidents, may well prove to be indefensible. Matching incompatible children has been, and will continue to be, frowned on by the courts. Children may be considered incompatible on grounds of differences in ability, or of disproportionate height and weight despite being of the same ability, age and experience.

Joining in the activity with young athletes

Involving yourself in competitive situations with children is fraught with danger. There is a catalogue of case law in which a coach has been successfully prosecuted in negligence for injuries sustained by children arising directly out of a coach's participation in an activity. Obviously the greatest risk occurs in contact sports, such as rugby football, but it may also be dangerous to join in other types of sport.

Facilities

Your responsibility is not restricted to the welfare of the children you coach; you are also responsible for the facilities you use. Wherever you conduct your sport you are likely to be using premises owned by someone else. Whether you have a lease, a verbal agreement or just a tacit understanding, you will, almost without exception, be obliged to hand back those premises or facilities in the condition in which you found them at the outset. It is likely to be your responsibility to repair any damage which occurs whilst you are in occupation. This may amount to a broken light fitting in a gymnasium, a broken hand basin in a changing room, or a broken window following a five-a-side session. These and similar problems are likely to find their way to your door sooner or later.

Ambitious athletes

Young athletes often wish to excel. Perhaps more importantly, and more seriously, their parents also wish to see them excel. From time to time, therefore, it will be necessary to be absolutely certain that your athletes are physically capable of undertaking the rigorous activities you propose for them. You should be particularly wary in relation to children returning to activity following a period of sickness or injury. Remember, you are *in loco parentis* and there is a grave danger that over-ambitious parents will react violently against you if they believe that you have in any way damaged their children or, more significantly, their children's potential!

B.3 THE SOLUTIONS

If you are still interested in coaching after reading about these responsibilities this section will show how you can minimize the risks involved and, where they cannot be removed, transfer a significant proportion of the responsibility to someone else.

B.3.1 AFFILIATION

The first and most important step is to recognize the risks involved in coaching; the second is to set about reducing them. In this regard the governing body of your sport or activity will, almost without exception, prove to be a valuable ally. It is most important that all coaches are affiliated to their appropriate governing bodies and, wherever possible, carry the endorsement of the governing body as an accredited coach. Contrary to the popular view, in matters like this the 'Lone Ranger' is seldom the victor.

Many governing bodies license or register their coaches and registration automatically affords a degree of protection. It is also probable that the governing body will issue a code of conduct, the observance of which will, to a very large degree, eliminate a great many potential claims against the coach.

B.3.2 INSURANCE POLICIES

Most governing bodies carry public liability insurance on their own behalf which can be extended to include both coaches and participants who are affiliated. All too frequently coaches are unaware of the nature and extent of the insurance programme provided by the governing body and it is vital that, in the absence of the fullest information, they take the initiative and establish their own position quite clearly. It is a good idea, if you have not already done so, to contact your own national governing body (NGB) to establish the protection that is available to you and what your responsibilities are.

Strengths and weaknesses

Governing body insurances, whilst always desirable, may not always be enough; of necessity they tend to reflect what is affordable rather than what is adequate. With some justification NGBs frequently assume that coaches have made their own arrangements.

Currently there are clearly moves to take sport out of the public sector and there is evidence that a substantial proportion of sport and leisure facilities, such as sports centres and swimming pools, are coming increasingly under private control. The effect of these developments on coaches is difficult to forecast but certainly it will become increasingly dangerous to rely on the protection of the operator of the facility you intend to use.

Once you have identified the risks involved, reduced them as much as possible by your own careful actions, and assessed the degree of protection you can be afforded by others, you are left with a final opportunity to protect yourself. The risk remains with you but it can be transferred to someone else simply by buying an insurance policy. For the payment of a premium an insurance company will take over your risks.

Personal insurance policies

Since there are well over 100 insurance companies and over 6000 registered insurance brokers in the United Kingdom, all aggressively seeking to sell insurance policies to all and sundry, you could be forgiven

for resisting advice to buy further protection. Nevertheless, it is advice that you should seriously consider in order to protect yourself against potential claimants. If you wish to buy a policy make certain that you use only a registered insurance broker for advice. In order to be registered he, in turn, must carry his own form of insurance that protects him if he fails to do his job adequately.

So, what policy should you look for? Quite simply a policy known as a Public Liability or Third Party Policy that will provide you with insurance protection for claims made against you for injury or damage to others arising from your activities as a coach. Such policies are generally sold to provide cover in multiples of £250 000. In current terms, you should purchase one with a limit of not less than £1000 000 and, if you can afford it, you should increase this amount to £2000 000.

A word of warning

The pursuit of excellence continues to foster the development of coaching techniques in every sport. Consequently many coaches seek to sell their expertise and many more athletes are prepared to pay for it. Almost all Public Liability Policies provide cover for the provision of advice and tuition; equally, almost all then go on to exclude such cover where the coach charges any sort of fee. Unfortunately, the word 'fee' is not defined and there is no way of knowing whether it extends to include expenses or benefit in kind, such as free use of club facilities.

Historically the insurance industry has always regarded professionals as those members of the classical professions, e.g. lawyers, accountants, doctors, architects, etc., who sell their expertise for a fee. Only a limited number of insurers are prepared to offer cover for professionals, whilst the whole insurance industry is happy to provide cover for sports clubs. Unfortunately, there is a lack of recognition of currently changing conditions within sport and, regrettably, in too many areas coaches compound the problem themselves.

Many coaches are reluctant to admit that they enjoy fees of any kind, but there is no doubt that aggrieved parents in hot pursuit of a negligent coach will quickly bring to the attention of their solicitor the fact that they were actually paying for the coach's expertise. When this information reaches the insurer the insurance policy may prove to be a worthless piece of paper. There may be a reluctance to admit or acknowledge receipt of payment, but if that refusal is likely to invalidate your insurance protection it must be regarded as naive at best and, at worst, crass stupidity! The absence of insurance protection will not inhibit the court in awarding damages against negligent coaches, and if the family home must be sold to satisfy a judgement the court is unlikely to show any sympathy.

B.3.3 CHECKLIST OF THINGS TO DO

1. Affiliate to the governing body.
2. Observe the recommended code of conduct.
3. If no code exists, ensure that:
 - (a) the environment is suitable;
 - (b) the equipment is safe;
 - (c) participants are suitably matched;
 - (d) you limit your participation to supervision;
 - (e) you always err on the side of caution.
4. Participate in the NGB insurance scheme.
5. Check the adequacy of the scheme.
6. Consult a registered insurance broker if you are in doubt.
7. If still in doubt, insure yourself.

B.4 CONCLUSION

If you are providing advice and tuition you put yourself at risk; it is highly unlikely that anyone will remove that risk for you. At the same time it is highly probable that accidents will happen and possible that allegations will be made to the effect that you were responsible. It is at that point that you should be in a position to hand over the whole problem to an insurance company which will, under the terms of the policy, defend you. Don't take a chance!

Glossary

Abduction	Movement of a limb away from the midline of the body.
Ability	A goal to show high ability and avoid showing low ability.
Achievement goal	A child's view of what success is.
Adrenal gland	A hormone producing gland situated on top of the kidney.
Aetiology	Causes of a condition.
Ammenoerhoeic	Indicates failure to menstruate.
Anabolic	Growth promoting.
Anaerobic threshold	Originally hypothesized to represent the onset of anaerobic metabolism in the muscle due to insufficient oxygen supply. Identified during incremental exercise as the point at which blood lactate levels begin to increase rapidly.
Approval goals	Goals which depend on satisfying other people.
Arterio—venous oxygen difference	The difference in oxygen content between the blood entering and leaving the pulmonary capillaries.
Attributions	Reasons or causes stated for outcomes, such as ability and effort. Attributions are thought to be related to expectations about future performance, and emotional feelings.
Bone density	A measure of the strength of bone.
Breakthrough	A goal to experience novelty and progress.
Capitellum	That part of the lower humerus which articulates with the radius.

Cardiac output	The volume of blood ejected into the main artery per minute.
Cardiopulmonary fitness	The ability of the circulatory and pulmonary systems to supply fuel and to eliminate waste products during physical activity.
Carpal	Bone of the wrist.
Chondrocytes	Cells that produce cartilage.
Clavicle	Collar bone.
Clitoral hypertrophy	Enlargement of the clitoris.
Diffusion	In the lungs, the process by which the exchange of respiratory gases between the lungs and the blood occurs.
Ego goal	When success is defined as demonstrating superior ability in comparison to others.
Endochondral ossification	Process of converting cartilage into bone.
Epiphyseal growth plates	Area where linear bone growth occurs.
Epiphysis	Area of bone growth.
Femur	The long bone of the thigh.
Fibula	The smaller of the two bones in the lower leg; it is found on the outside of the tibia.
Flexibility	The range of motion about a joint.
Glucocorticoids	Hormones produced by the adrenal gland.
Glycogen depletion	A decrease in the stores of glycogen in the muscle and liver.
Heart rate	The number of ventricular contractions per minute.
Hormones	Chemical produced by endocrine glands and carried in the blood. They exert a control on physiological processes in the body.
Hypertrophy	Becoming larger.
Lactate steady state	The highest level of blood lactate which can be sustained without a progressive increase during an extended bout of exercise.
Lactate threshold	Often used in preference to anaerobic threshold to describe the point at which blood lactate begins to increase rapidly during incremental exercise.
Lamina	The posterior part of a vertebra.
Learned helplessness	Apathetic response resulting from perceived lack of control over failure and recovery from failure. Thought to be

	related to the type of attributions given for failure.
Lysed blood	Blood which has been chemically treated to break open the red blood cells (cell lysis) thus releasing intracellular lactate.
Maturation	Increase in the ability to function, usually associated with growth.
Maximal oxygen uptake	The highest rate of oxygen consumed by the body in a given period of time during exercise involving a significant portion of the muscle mass.
Menarche	The age of the onset of menstruation.
Meniscus	The cartilaginous body in the knee that distributes the weight in the joint. It can be torn and become the subject of a 'cartilage operation'.
Metatarsals	The long bones in the foot that articulate with the toes.
Mineralocorticoids	Hormone produced by the adrenal glands.
Minute volume	The volume of air inspired per minute.
Muscle biopsy	The removal of a portion of muscle for examination.
Muscular endurance	The ability of a muscle group to perform repeated contractions against a light load for an extended period of time.
Muscular strength	The ability of a muscle group to exert force against a resistance in one maximal effort.
Navicular	A small bone in the foot.
Osteoporosis	Thinning of bone associated with loss of calcium and resulting in weakness.
Outcome goals	Goals which relate to the result of an event.
Peak oxygen uptake	The highest rate of oxygen consumed during an exercise test to exhaustion.
Plasma	The fluid portion of the blood. When blood is centrifuged before coagulation occurs the red blood cells are separated from the plasma.
Process goals	Goals which relate to the process of performing.
Puberty	Onset of sexual maturation associated with physical and psychological changes.
Radius	The outer of the two bones in the forearm.
Reduce	To put back into place.
Respiratory frequency	The number of breaths per minute.

Serum	The yellow coloured fluid which separates from the clot when blood is left to coagulate.
Skeletal maturation	Level of maturation of the skeleton. May be considered complete when ossification ceases.
Social approval	A goal to gain the approval of others.
Spondylolisthesis	A slip of one vertebral body on another.
Spondylosis	Osteoarthritis of the spine.
Stroke volume	The volume of blood ejected by each ventricular contraction.
Task goal	When success is defined as task mastery or self-improvement.
Task mastery	A goal to master skills and learn more.
Teamwork	A goal to succeed by working with others, rather than independently.
Tibia	Major bone of the lower leg; the shin bone.
Tidal volume	The volume of air inspired per breath.
Ulna	The inner of the two bones in the forearm.
Ventilatory threshold	The point at which ventilation increases disproportionately to the increase in exercise intensity. Originally hypothesized to coincide with the anaerobic threshold.
Vertebral bodies	Major part of the vertebra which is responsible for weight bearing.
Victory	A goal to defeat others in direct competition.
Whole blood assay	Most modern semi-automatic and automatic lactate analysers measure lactate levels in blood as soon as it has been sampled and without any further treatment.

Index

Entries in **bold** type represent figures, those in *italics* represent tables.

- Ability
 - and goals 109, 111, 116, 153
 - orientation 128, 153
 - perception of 1, 5, 7, 117, 175
- Abrasions, *see* Injuries, treatment of
 - soft tissue
- Access to sport 281–3
- ACEP, *see* American Coaching Effectiveness Programme
- Achievement
 - anxiety as result of frustration
 - of 140
 - context 4
 - goals 7–10
 - see also* Goals
 - management plans 157–8
 - see also* Goal setting
 - motivation 151–2
 - need to achieve 151
- Adenosine diphosphate 65, 75
- Adenosine triphosphate 65, **66**, 75
- Adolescence 100, 101
- Adolescent growth spurt 55, **56**
- Aerobic training 195–8, **195**
 - see also* Training programmes
- Aldridge, John xi, 49, 50, 162, 204
- American Coaching Effectiveness Programme (ACEP) xiv, 28, 37
- Anaerobic
 - power 75
 - threshold 69, 72–3, 197
 - training 198
- Anatomy of skeletal development, *see* Growth, skeletal
- Anxiety
 - characteristics of 136
 - coping strategies 141–3, 186–9
 - and feedback 142–3
 - gender differences 137
 - identifying anxious children 142–3
 - individual differences in 138
 - nature of 135–6
 - performance anxiety in youth
 - sport 134, 139–41, 186–8
 - physiological effects of 136–7
 - psychological effects of 137
 - role of significant others 139–40
 - trait 138
 - types of 136
- Argyle, Michael 166
- Armstrong, Neil xi, 49, 64, 162, 191, 280
- Arteriovenous oxygen difference 69–70, 71
- Attention 80–1, 146
 - see also* Information processing
- Attitudes 41, 92, 93
- Attributions
 - classification 123–4
 - conflict of 130, 132
 - locus of causality 124–6
 - spontaneous 124–6
- Beliefs 41, 92

- Berne, Eric 174
 Biddle, Stuart xi, 107–8, 122, 284
 Blood lactate 64, 71–4, **72**, 196–8, **196**
 Body
 composition and shape 61–2
 fat 52
 language **131**, 174, 177
 proportions 51–3, 52, 53
 Bone
 age 55
 density 61, 62
 growth, *see* Skeletal growth
 British Institute of Sports
 Coaches 277
 Bruises, *see* Injuries, treatment of soft tissue
 Byrne, Tony xi, 2, 39, 283
- Cardiac output 70, **71**, 195
 Cardiopulmonary system 68
 see also Aerobic energy systems
 Cartilage 52–5, 208
 see also Meniscus
 Champion coaching 275
 Child development xiii, 51–105
 Children Act, the 23, 24, 276
 Clarke, Harrison 60
 Coaches 139
 Coaching
 courses 274–7
 legal liability in 289–95
 responsibilities 278–80, 297–8
 style 88–90
 Collins, Valerie xi, 287
 Communication
 channels of 166–8
 control 175
 feedback 176
 guidelines for 175–7, 181
 instructions 175–6
 need for skills 162, 163–4
 non-verbal 167
 paraverbal 166–7
 with parents 177–8, 283–4
 promoting relationships 164
 reinforcement 177
 verbal 166, 181–2
 Competence, *see* Ability; Goals; Motivation
- Competition training 186–7
 see also Anxiety
 Connell, Rosemary xi, 50
 Contributory negligence, *see* Defences, legal
 Coping
 strategies, *see* Anxiety
 with failure 183
 Corbin, Charles 131
 Counselling 179–90
 see also Communication; Relationships
 Creatine phosphate 65, 75
- Damages, legal 294–5
 Defences, legal 293–4
 Detraining, *see* Training programmes
 Development
 emotional, and anxiety 135
 personal 93–9
 psychomotor 78–90
 psychosocial 3, 4–5, 91–105
 of self-concept 95–9
 skeletal growth and, 51–63
 see also Growth
 skill 12, 78–90
 social 99–103,
- Diet
 children's 242
 dietary requirements 241–8, 243, 249–54
 eating habits 248–9
 energy
 density 239–40
 sources 238–41
 stores 238
 fluids 247–8
 food for athletes 249–54
 growth requirements of 243–4
 in maintenance of health 245–7
 nutrient density 247
 nutrients 238–41
 sample foods 252–4
 Dropping out 115–19
 Drugs 19–20
 Duda, Joan 4
 Duty of care 289, 296
- Education Department of South Australia 260, 262–5

Ego states

- adult 170, 171
- behavioural indicators of 171
- child 170, 171
- controlling parent 171
- nurturing parent 171
- parent 169–70, 171
- in Transactional Analysis 169–70, **169**

Energy systems

- aerobic systems 64, 65, **67**, 67–74
- anaerobic systems 64, 65, 74–6
- differences between adults and children 73
- lactacid system 65, **66**, 75–6
- phosphagen system 65, 74–5

Family 22–3, 39–47, 96–7

Fear of failure 151, 188–9

see also Anxiety

Feedback

- coaches 175
- and coping with failure 142–3
- kinaesthetic 87
- knowledge of results 87–8
- positive cycle of 184

FIT principle **194**

see also Training programmes

Fitness

- aerobic 67–74, 194, 195–8
 - anaerobic 74–6, 198
 - cardiopulmonary 194, 195–8, 202
 - muscular 198–200
 - tests
 - Cunningham Speed 76
 - Margaria Step Test 75
 - Wingate Anaerobic Test 75, 76
- see also* Training programmes

Food, *see* DietFractures, *see* Injuries, skeletal

Gilroy, Sarah xi, 1

Glycogen 65, 68

Goals

- achievement 7–10
- approval 114
- and children 147–50
- changes with age 114–15
- ego 128, 132
- and enjoyment 129

gender differences 115

- importance 154–6
- intrinsic and extrinsic 156–7
- long-term 148, 150
- mastery 118
- outcome 113, 118
- participation 111–16, **113**
- performance 153
- persistence 115
- process 109
- short-term 12, 147, 150
- source of 156–7
- task 129, 132, 153
- time scales 117
- and values 37

see also Goal setting; Motives

Goal setting 145–60

- and children 147–8
- defined 145–6
- guidelines for 147
- individual levels of 152–3, 182
- situational influence 154
- sources of 156–7

Governing bodies 274–6, 298

Groups

- peer 101, 141
- roles in 102, 104
- teams as working 101–3
- working in 99

Growth

- components of 55–6
- dietary requirement of 243–4
- effect of training on 60–2
- factors affecting 56–60

Haemoglobin 68, 70, 71

Hardy, Lew xi, 161, 179

Health and diet 244–7

Hellstadt, Jon 41

Helplessness 127–8, 132

Hormones

- growth hormone 58
- insulin 59
- sex hormones 59, 62
- steroid hormones 59
- thyroxine 58

Horn, Thelma 174

In loco parentis 23, 296Inflammatory reaction, *see* Injuries,

- treatment of
- Information processing
 - capacity 80
 - decision making in children 85–6
 - explanation of 79–88, 80
 - memory 83–5
 - perception 81–3
- Injuries, skeletal
 - acute injuries to skeleton 205–16
 - correction of deformity 205–7, 207
 - effect on growth 204–24
 - epiphyseal 210–13, 211, 220–4, 221, 222, 223, 224
 - joint injuries 208–10, 209
 - shaft fractures 205–8, 206, 207
 - spinal 214–15
 - stress injuries to skeleton 213–16, 215
- Injuries, treatment of
 - bone and joint conditions 231–3
 - head injuries 234
 - massage 227
 - postural defects 233
 - radiant heat 227
 - reaction to injury 225–8
 - soft tissue 229–31
 - spinal injuries 234
 - treatment of inflammatory
 - reaction 226–8
- Insurance 287, 296–301
- Knowledge of results 87–8
 - see also* Feedback
- Lacerations, *see* Injuries, treatment of
 - soft tissue
- Law, coaching and the 289–95
- Lawn Tennis Association, the 148, 274
- Learning, *see* Skill
- Lee, Martin xi, 2, 27, 91, 161, 163, 259
- Locus of causality 124
- Malina, Robert 270
- Martens, Rainer 28, 143
- Mastery climate, *see* Motives
- Maturation, *see* Development
- Maximal oxygen uptake 64, 67–8, 192, 195
- Meniscus 208, 210
 - see also* Cartilage
- Menstruation 62
- Mental rehearsal, *see* Anxiety, coping strategies
- Metabolism 238–9
 - see also* Energy systems
- Modifications of sport
 - equipment modifications 265–8
 - organization of children's sport 270
 - to playing areas 261–5
 - rules, adaptations to 268–9
- Mosston, Mouska 88
- Motivation 10–12, 109–10, 158, 182
 - see also* Goals; Goal setting; Motives
- Motives
 - ability orientation 128
 - achievement
 - goals 8–10
 - motivation 151–2
 - alternative activities 118–19
 - coaching 32–4
 - mastery orientation 12, 128
 - motivational climate 10–12
 - participation 109
 - and values 37
 - see also* Achievement goals
- Muscle fibres 66, 72
- Muscular
 - contraction, types of 200
 - fitness training 198–201
- National Coaching Foundation (NCF) xiv, 21, 22, 24, 74, 277
- National Governing Bodies xiv, 258, 274–6
- National Vocational Qualifications 274
- NCF, *see* National Coaching Foundation
- Negative self-talk 183–5
 - see also* Anxiety, coping strategies
- Negligence 289–93
- Nutrition 56–7, 236–55
 - see also* Diet
- Nutrition education 249
- Olympic Games xiii, 31
- Olympic Scientific Congress 270

- Osgood—Schlatter's Disease 218
Osteochondritis, *see* Tendon-bone attachment
Osteochondritis dessicans 218–20, 219, 220
Osteoporosis, *see* Bone density
Outcome goals, *see* Goals
Overload principle 193
 see also Training programmes
Overtraining 141
- Parents
 as coaches xiii
 goal orientation 11
 over-involved 44–6
 who promote anxiety 139
 relationships 177–8, 180–2, 281–4
 role in sport 39–47
 under-involved 43–4
- Parental
 guidelines 46
 involvement continuum 42–6
- Participating with children, *see* Insurance
- Parry, Jim 29, 37
- Peers 5, 6, 7, 141, 150
 see also Relationships
- Perthes' Disease 223, 223
- Piaget, Jean 148
- Playboard 21, 22
- Playing areas 261
- Practice
 blocked 84
 distributed 77
 massed 77
 methods of 84
 variable 84
- Psychological well-being 280–1
 see also Counselling
- Psychosocial development 3, 4–5, 91–105
 see also Development, psychosocial
- Puberty 51, 52
- Readiness for competition 270–1
- Reframing 184, 185
- Relationships
 circle of influence on children 40
 coaching 161
 interpersonal 92, 179
 see also Transactions
- parent—coach 177–8, 283–4
 parent—performer 180–2, 281–3
 peer group 5, 11, 141, 150
 see also Development; Transactional Analysis
- Response to exercise 69–70, 71–4
 see also Training; Training programmes
- Rewards 10, 182
- Risk, *see* Sources of risk
- Roberts, Glyn xi, 1, 27, 150
- Rokeach, Milton 28, 35
- Rowley, Stephen xi, 134
- Rugby Union, the 148
- Rules, children's understanding of 102
- Safety 192–3, 278–9
- Schema Theory 84
- Scheurmann's Disease 220, 222
- School 20, 282
- School Sport Forum 282–3
- Self-concept
 body image 96
 coaches influence on 97
 development of 95–9
 and group affiliation 100
 nature of 93
 significant others 96–7
 sources of information 97–9, 98
 structure 94–5, 95
- Self-confidence 126, 132, 146, 154, 183
- Self-esteem 5, 93, 98, 155, 159
- Significant others 96, 139
- Skeleton, *see* Development, skeletal; Growth
- Skills
 learning 49, 78–90
 interpersonal in coaching 174
 facilitating 266–8
 response characteristics of children 86–8
- Smith, Ron 33, 34
- Smith, Ross xi, 259
- Smoll, Frank 33, 34
- Social
 identity 100
 interaction 164
 skills 165–8, 181–2
 see also Communication
- support 184–5

- Sources of risk 297–8
- Sport
- models of 18–20, 24–5
 - nature of 20
 - participation 4
 - persistence 115–17
 - and physical education 20–2
- Sporting Triangle, the 41, 42
- Sports Council 24, 35, 276–7
- Sprains, *see* Injuries, treatment of soft tissue
- Strains, *see* Injuries, treatment of soft tissue
- Stress
- and anxiety 135
 - family pressure 22
 - mechanical 60
 - perception of 6–8
 - sources of 135–6
 - see also* Anxiety
- Stress fractures, treatment of 214–16, 232
- Stretching 201
- Success, meaning of 128–9
- Success and failure
- attributions for 123–8, **124, 125**
 - others perceptions of 130–1
 - own perceptions of 110–15, 122
 - structuring the training environment 284–6
- Teachers xiii, 12
- Teaching for Understanding 86
- Teaching styles 88–9
- Tendon—bone attachment
- injury 216–18, **218**
- Thorpe, Rod xi, 108, 261, 273
- Towers, Harry xi, 287
- TOYA, *see* Training of Young Athletes Project
- Training
- demands of 24, 140
 - detraining 201
 - effect on growth and development 60–2
 - environment 183, 284–6
 - programmes 49, 65, 71
 - see also* Training Programmes
- Training programmes 191–203
- aerobic 195–8
 - anaerobic 198
 - blood lactate monitoring 196–8
 - FIT principle 162
 - flexibility 201, **201**
 - lactacid system **199**
 - muscle
 - endurance 198, 199, **200**
 - strength 198, 199, **200**
 - phosphagen system **199**
 - principles of 193–5, **193**
 - see also* Energy systems
- Training of Young Athletes Project 108, 140
- Transactional Analysis 168–74
- see also* Ego states; Relationships; Transactions
- Transactions
- complementary 170–2, **172, 173**
 - crossed 172, **173**
 - ulterior 174
 - see also* Relationships
- Treasure, Darren xi, 3
- Unfair Contract Terms Act 294
- Values
- attainment 29–30
 - children's 35–7
 - classification of 30
 - coaching 32
 - competence 30
 - and goals 37
 - importance of 28–9
 - instrumental 28–32
 - moral 30, 40
 - nature of 29–31
 - own 31–2
 - social 30, 40
 - Sport Value Survey 32
 - terminal 28–32
- VO_{2max}, *see* Maximal oxygen uptake
- Warm-up 192–3
- Welsman, Joanne xi, 39, 64, 162, 192
- Whitehead, Jean xi, 27, 107, 108, 284
- Winning and losing, *see* Success and failure
- Wiseman, Juliet xi, 162, 236
- Wright, Dennis xi, 162, 225