



University
of Glasgow

Woods, Catherine B. (2000) *Exercise behaviour change in a young adult population: a qualitative and quantitative analysis*. PhD thesis.

<http://theses.gla.ac.uk/2177/>

Copyright and moral rights for this thesis are retained by the author

A copy can be downloaded for personal non-commercial research or study, without prior permission or charge

This thesis cannot be reproduced or quoted extensively from without first obtaining permission in writing from the Author

The content must not be changed in any way or sold commercially in any format or medium without the formal permission of the Author

When referring to this work, full bibliographic details including the author, title, awarding institution and date of the thesis must be given

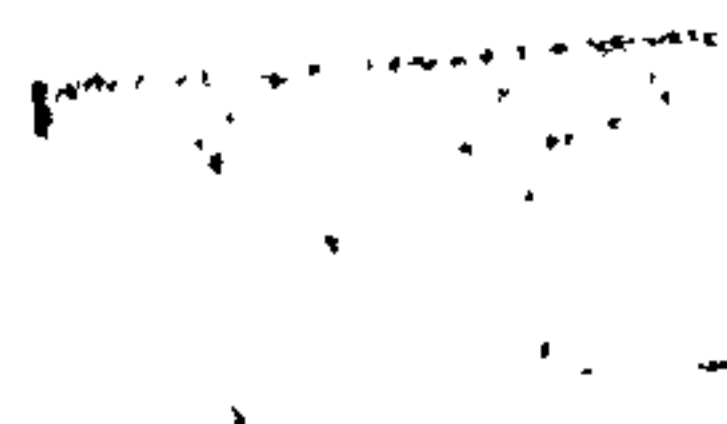
**Exercise Behaviour Change in a Young Adult Population:
A Qualitative and Quantitative Analysis**

By

Catherine B. Woods

BA (Physical Education and English)

**This thesis is submitted in fulfillment of the requirements for the Degree of Doctor of
Philosophy in the Institute of Biomedical and Life Sciences, Faculty of Medicine,
University of Glasgow**



Declaration

I declare that this thesis was composed by myself and that all data were collected and analysed by myself.



Catherine B. Woods

The copyright of this thesis belongs to the author, under the terms of the United Kingdom Copyright Acts, as qualified by the University of Glasgow Regulation. Due acknowledgements must always be made of the use of any material contained in, or derived from, this thesis.

Abstract

Participation in regular physical activity among young adults (16-24 years) is suboptimal. Research has attempted to understand what determines exercise behaviour and how interventions can assist individuals in adopting and adhering to exercise. This thesis consists of a literature review, and three separate studies. In the literature review, inactivity is defined, and the current physical activity patterns of industrialised society are discussed. Models of behaviour change that enhance our understanding of the adoption and adherence process in physical activity are examined. In particular, the transtheoretical model of behaviour change [TTM] has been selected for further study. This model is unique to the study of exercise behaviour because it provides researchers with an opportunity to identify and work with an inactive population, and permits the tailoring of physical activity interventions to make them more suitable for sedentary individuals. Initially, the TTM and its core constructs are explained, followed by a critique of the model. A review of empirical research in physical activity that has been based on the TTM is included. Over fifty key studies were identified; the limitations and strengths of these studies are explored. Finally, the discussion will summarise what has been learned to date about the application of the TTM to the understanding of behaviour modification in physical activity.

In study one, constructs from the transtheoretical model of behaviour change were chosen to help understand the process of exercise behaviour change of a student population. A total of 2943 respondents completed a baseline questionnaire and 1058 completed a follow-up 7 months later. A 5-item stage of change and a 40-item process of change questionnaire was used. There were significant differences in physical activity patterns from baseline to follow-up. There were also significant differences in process use across the stages. The process data was factor analysed to refine it further. A three-factor model revealed different motivational clusters underlying actual stage of behaviour change. Recommendations for intervention design suggest that adopting a positive behaviour should be treated differently to ceasing a negative behaviour.

In study two, a pre-post randomised control design was used to investigate the effectiveness of a self-instructional intervention for helping a sedentary undergraduate population to become more active. The intervention was based on the transtheoretical model of behaviour change. Significantly more of the experimental group in comparison to the control group improved their stage of change from baseline. Self-efficacy and not decisional

balance was found to be a useful predictor of stage improvement. Discriminant analyses revealed that discrimination between stage improvement versus non-improvement was possible using the processes of change data. For stage improvers, the processes self-reevaluation and self-liberation were most frequently used, while social liberation was used significantly more by the experimental than the control group.

Studies in physical activity that use qualitative research methodologies to ask or listen to individual experiences of physical activity are relatively new. The final study used a focus group research method. Individuals who had been part of studies one and two discussed their experiences of physical activity, its meaning and determinants. All of the focus group discussions were transcribed and content and group dynamic analyses were carried out. Participant verification procedures enhanced the validity of the study. From the raw data several themes and theories emerged. These suggested that the determinants of physical activity are a mixture of psychological, physical, social, cultural and structural variables. In summary, the qualitative data have shown that the TTM did not offer a complete understanding of exercise behaviour change in a young adult population. The main additions to emerge were autonomy, motivational climate, sense of self, social and cultural influences, individual rationale and structural opportunities. A proposed model for the development of the TTM was outlined in the conclusion of the thesis.

ACKNOWLEDGEMENTS

To Nanette, who gave of her time, knowledge and experience, generously and willingly, thank you. Without your help, guidance and constant belief in my ability this thesis would not have been possible. I hope many more students experience your inspiration.

To Marian, for your help with numbers, thank you for making everything a lot simpler.

To all my friends in No. 48, especially Petrina, thanks for the encouragement and support in helping to get me through the last five years.

To the Sport and Recreation Service [SRS] who supported this work financially. To the SRS staff -particularly the teaching team- for your encouragement and help, especially during those anxious moments with cover... Finally, to all the SRS members for completing all the pilot questionnaires – you will be glad I have eventually finished! Thank you.

To the research team for help in data collection and input, thank you.

To the students involved in this study, thank you for your time in completing questionnaires and for attending the focus groups.

To the focus group review panel, too numerous to mention, thank you for your comments on script development and on the data analysis.

To the ‘Dubai Dollies’, thanks for the reality checks and the laughs along the way.

To my family, thank you for your constant enquiry and abundant patience; without your support everything would have been a lot tougher. Janette you are next.

Finally, to Guy, I would like to dedicate this thesis to you. Thank you for your support, kindness and love.

TABLE OF CONTENTS

CHAPTER 1 1

INTRODUCTION 1

Physical Activity Defined 2

Health Benefits of Physical Activity 2

Current Recommendations 3

The Public Health Burden of Sedentary Living 4

Physical Activity and Young People 5

RESEARCH DESIGN 9

Research Approach (Methodological Justification) 9

Fostering the Intersection between Quantitative and Qualitative Research 12

NEED FOR RESEARCH 13

STATEMENT OF AIM AND OBJECTIVES 13

Study One 14

Study Two 14

Study Three 15

PLAN OF THESIS 15

DELIMITATIONS OF THE STUDY 15

CHAPTER 2 17

LITERATURE REVIEW 17

Introduction 17

From Childhood to Adulthood 17

MODELS OF BEHAVIOUR CHANGE 24

The Health Belief Model (Maiman & Becker, 1974) 25

The Theory of Social Behaviour (Triandis, 1977) 28

Protection Motivation Theory (Rogers, 1983) 29

Theory of Reasoned Action (Ajzen & Fishbein, 1980) 30

Theory of Planned Behaviour (Ajzen, 1988) 33

Social Cognitive Approach to Physical Activity 35

The Natural History Model (Sallis & Hovell, 1990) 37

Relapse Prevention Model (Marlatt, 1985) 38

THE TRANSTHEORETICAL MODEL OF BEHAVIOUR CHANGE 41

Core Constructs 43

 Stages of Change 43

 Processes of Change 46

 Decisional Balance 49

 Self-Efficacy 50

Measurement issues 51

CRITIQUE OF THE TTM 54

REVIEW OF THE TTM 58

Search technique and results 58

SOC structure studies 59

Application 63

Health Behaviour Change 73

Intervention Studies 76

Limitations 81

DISCUSSION 82

CHAPTER 3 86

A LONGITUDINAL STUDY OF EXERCISE BEHAVIOUR CHANGE, A PROFILE OF THE PROCESSES OF CHANGE, AND IMPLICATIONS FOR PHYSICAL ACTIVITY INTERVENTIONS IN A YOUNG ADULT POPULATION 86

Introduction 86

METHOD 87

Procedure 87

Measures 87

<i>Data Analysis</i>	88
RESULTS	88
<i>Sample</i>	88
<i>Physical Activity Participation</i>	89
<i>Stage of Exercise Change</i>	91
<i>Process of Change</i>	92
<i>Interaction between the longitudinal SOC and cross-sectional process data</i>	95
<i>Qualitative Comments</i>	98
DISCUSSION	99
<i>Implications for Intervention Design</i>	100
CHAPTER 4	107
FROM PRECONTEMPLATION TO ACTION: THE EFFECT OF A COGNITIVE-BEHAVIOURAL INTERVENTION, DESIGNED USING THE TRANSTHEORETICAL MODEL OF BEHAVIOUR CHANGE, TO HELP YOUNG ADULTS INCREASE PHYSICAL ACTIVITY	107
<i>Introduction</i>	107
METHOD.....	109
<i>Procedure</i>	109
<i>Measures</i>	110
<i>Intervention</i>	113
<i>Data Analysis</i>	115
RESULTS	115
<i>Sample</i>	115
<i>Physical Activity Participation</i>	116
<i>Stage of Change and Behavioural Intention</i>	117
<i>Decisional Balance and Self Efficacy</i>	118
<i>The Processes of Change</i>	120
DISCUSSION	124
CHAPTER 5	128
A QUALITATIVE STUDY ON PHYSICAL ACTIVITY, ITS MEANING AND DETERMINANTS IN A YOUNG ADULT POPULATION	128
<i>Introduction</i>	128
METHODS	129
<i>Focus Groups: Research Design</i>	129
SAMPLE	130
<i>The Selection of Participants</i>	130
PROCEDURE	132
<i>Recruitment</i>	132
<i>Location & Time</i>	134
<i>Moderation</i>	134
<i>Script Development</i>	135
<i>Pilot Focus Groups</i>	136
<i>Role of the Researcher</i>	138
<i>Access and Ethics</i>	139
DATA ANALYSIS	139
<i>Replicability and Validity</i>	139
<i>Analysis Procedure</i>	141
CONTENT ANALYSIS.....	143
<i>Phase 1: Raw-data codes</i>	143
<i>Phase 2: First Level Theme Identification & Description</i>	143
<i>Validity Check: Analytic Propositions</i>	146
<i>Phase Three: Second Level Theme Identification & Description</i>	146
<i>Phase Four: Theory Development</i>	146
GROUP DYNAMICS ANALYSIS	147
RESULTS	148
<i>Questionnaire data</i>	148

Contents

CONTENT ANALYSIS.....	151
SELF-EMPOWERMENT.....	152
<i>Autonomy</i>	152
<i>Competence</i>	152
<i>Identity</i>	155
SOCIAL INFLUENCE.....	157
<i>Social Behaviour</i>	157
<i>Image</i>	158
RATIONALE.....	159
<i>Self-Evaluation</i>	160
<i>Environmental Evaluation</i>	160
<i>Habit Formation</i>	161
<i>Level of Structure</i>	161
THE TRANSTHEORETICAL MODEL OF BEHAVIOUR CHANGE (TTM).....	163
<i>TTM Extensions</i>	167
INTERVENTION CRITIQUE.....	169
WHAT CAN THE SPORT AND RECREATION SERVICE LEARN FROM THE FOCUS GROUP DATA?.....	172
<i>Social Persuasion</i>	172
<i>Encouragement</i>	172
<i>More Relaxed Atmosphere</i>	173
GROUP DYNAMICS ANALYSIS.....	175
<i>Activity status</i>	176
<i>Categories</i>	178
<i>Indifference</i>	181
<i>Vanity Culture</i>	183
DISCUSSION.....	185
CHAPTER 6.....	193
CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH.....	193
THE STUDIES.....	193
CONCLUSIONS OF THE THESIS.....	194
<i>Physical Activity Associations</i>	194
<i>Exercise Stage of Change</i>	195
<i>Self-Efficacy</i>	196
<i>Decisional Balance</i>	197
<i>Processes of Change</i>	197
<i>Intervention</i>	199
<i>Determinants of physical activity</i>	200
FUTURE RESEARCH.....	203
REFERENCE LIST.....	208
APPENDIX 1. ETHICS APPROVAL LETTER.....	233
APPENDIX 2. BASELINE QUESTIONNAIRE.....	234
APPENDIX 3. FOLLOW-UP QUESTIONNAIRES.....	235
APPENDIX 4. INTERVENTION MATERIAL: PACKAGE ON ACTIVE LIVING 1.....	237
APPENDIX 5. INTERVENTION MATERIAL: PACKAGE ON ACTIVE LIVING 2.....	238
APPENDIX 6. TELEPHONE, LETTER AND INTERVIEW SCRIPTS.....	2389
APPENDIX 7. FOCUS GROUP TIMETABLE.....	243
APPENDIX 8. RAW DATA AND LOWER ORDER THEME LIST FOR ALL FOCUS GROUPS.....	245
APPENDIX 9. FIRST AND SECOND LEVEL THEMES.....	251

LIST OF FIGURES

FIGURE 1.1. RELATIVE RISK OF INACTIVITY.....5

FIGURE 1.2. PERCENTAGE OF 11-16 YEAR OLDS EXERCISING 4 OR MORE TIMES/WEEK IN 1990 AND 1994.....6

FIGURE 1.3. PERCENTAGE OF 11-16 YEAR OLDS EXERCISING 4 OR MORE HOURS/WEEK IN 1990 AND 1994.....7

FIGURE 1.4. PERCENTAGE OF 11-16 YEARS SPENDING 4 HOURS OR MORE IN SEDENTARY LEISURE ACTIVITIES.....8

FIGURE 1.5. QUANTITATIVE HIERARCHICAL MODEL 12

FIGURE 2.1. PERCENTAGE OF ADULTS REGULARLY ACTIVE (E.G. GARDENING, WALKING) EVERY WEEK. 18

FIGURE 2.2. PERCENTAGE OF ADULTS REGULARLY ACTIVE EVERY WEEK (E.G. JOGGING). 18

FIGURE 2.3. PERCENTAGE OF ADULTS VIGOROUSLY ACTIVE SEVERAL TIMES A WEEK. 19

FIGURE 2.4. PERCENTAGE OF INDIVIDUALS IN DIFFERENT LEVELS OF PHYSICAL ACTIVITY AT DIFFERENT AGES. .21

FIGURE 2.5. CHANGES IN MEN AND WOMEN'S PHYSICAL ACTIVITY STATUS FROM THE AGE OF 16-34.....22

FIGURE 2.6. THE HEALTH BELIEF MODEL.27

FIGURE 2.7. PROTECTION MOTIVATION THEORY31

FIGURE 2.8. THE THEORY OF REASONED ACTION.....32

FIGURE 2.9. THE THEORY OF PLANNED BEHAVIOUR.....34

FIGURE 2.10. A SOCIAL COGNITIVE APPROACH TO PHYSICAL ACTIVITY.....35

FIGURE 2.11. THE NATURAL HISTORY OF EXERCISE MODEL.37

FIGURE 2.12. THE RELAPSE PREVENTION MODEL.39

FIGURE 2.13. A SPIRAL MODEL OF THE STAGES OF EXERCISE BEHAVIOUR CHANGE.[SOC].....44

FIGURE 3.1. SOC DISTRIBUTION BY PARTICIPATION OR NON-PARTICIPATION IN PE AND EC.....90

FIGURE 3.2. STAGE OF CHANGE OF FIRST YEAR STUDENTS.91

FIGURE 3.3. ARROW DIAGRAM OF 10 VARIABLES (X1-X10) AND 3 COMMON FACTORS (F1-F3).....94

FIGURE 3.4. MEDIAN PROCESSES OF CHANGE FOR SOC REGRESSORS, STAGNATORS AND IMPROVERS.98

FIGURE 3.5. A FACTOR ANALYSIS ON THE PROCESSES OF CHANGE DATA..... 103

FIGURE 4.1. STAGE OF CHANGE POST INTERVENTION..... 117

FIGURE 4.2. BEHAVIOURAL INTENTION POST INTERVENTION..... 118

FIGURE 4.3. LOGISTIC REGRESSION PLOT OF PROBABILITY OF SHIFT IN SOC BY SELF-EFFICACY..... 120

FIGURE 4.4. EXPERIENTIAL AND BEHAVIOURAL PROCESSES OF CHANGE BY EACH SOC. 123

FIGURE 5.1. SCHEMATIC DIAGRAM OF THE ANALYSIS PROCEDURE IN FOCUS GROUPS 142

FIGURE 5.2. AN EXAMPLE OF A DATA TREE OUTLINING THE DATA REDUCTION PROCESS 147

FIGURE 5.3. THE EMERGENCE OF THE THEORY OF SELF-EMPOWERMENT FROM THE FOCUS GROUP RAW DATA... 154

FIGURE 5.4. THE EMERGENCE OF A MINI-THEORY CALLED SOCIAL INFLUENCE 157

FIGURE 5.5. DATA TREE FOR THE EMERGENCE OF THE MINI-THEORY OF RATIONALE 160

FIGURE 5.6. DATA TREE FOR THE EMERGENCE OF THE PROCESSES OF CHANGE. 164

FIGURE 5.7. DATA TREE FOR THE EMERGENCE OF THE CONCEPT OF A PERSON-CENTERED ENVIRONMENT..... 173

FIGURE 5.8. THE PROPOSED DEVELOPMENT OF THE TTM FOR PHYSICAL ACTIVITY207

Contents

LIST OF TABLES

TABLE 1.1	<i>THE HEALTH BENEFITS ASSOCIATED WITH REGULAR PHYSICAL ACTIVITY¹</i>	3
TABLE 1.2	<i>SELF-REPORTED PHYSICAL ACTIVITY LEVELS BY AGE GROUP: SCOTLAND, 1996 (%)</i>	9
TABLE 1.3	<i>IT-BEINGS AND HUMAN BEINGS: TWO DISTINCT PARADIGMS</i>	11
TABLE 2.1	<i>SUMMARY OF THE PRINCIPAL THEORIES OF PSYCHOTHERAPY</i>	42
TABLE 2.2	<i>NAMES AND DEFINITION OF THE STAGES OF CHANGE FOR EXERCISE</i>	43
TABLE 2.3	<i>STAGES OF CHANGE [SOC]</i>	45
TABLE 2.4	<i>DEFINITION AND ITEM EXAMPLES OF THE PROCESSES OF CHANGE</i>	47
TABLE 2.5	<i>PROCESSES OF CHANGE LISTED UNDER THE SOC IN WHICH THEY ARE EMPHASISED MOST</i>	49
TABLE 2.6	<i>MEASUREMENT ISSUES IN SOC FOR EXERCISE BEHAVIOUR</i>	53
TABLE 2.7	<i>CONSTRUCT VALIDITY STUDIES OF THE SOC MODEL AS IT RELATES TO PHYSICAL ACTIVITY</i>	60
TABLE 2.8	<i>THE SOC MODEL AND ITS INTERACTION WITH THE OTHER CORE COMPONENTS OF THE TTM</i>	65
TABLE 2.9	<i>THE POPULATION PREVALENCE OF EXERCISE SOC</i>	74
TABLE 2.10	<i>INTERVENTION STUDIES</i>	77
TABLE 3.1	<i>MEDIAN COMPARISONS FOR PROCESSES OF CHANGE ACROSS STAGE OF CHANGE</i>	93
TABLE 3.2	<i>A FACTOR ANALYSIS OF THE PROCESS OF CHANGE DATA FOR EACH SOC</i>	95
TABLE 3.3	<i>LINEAR DISCRIMINANT ANALYSIS OF SOC SHIFT</i>	96
TABLE 3.4	<i>RANKED MEDIAN COMPARISONS FOR PROCESSES OF CHANGE ON LONGITUDINAL SOC DATA</i>	97
TABLE 4.1	<i>A SELF-EFFICACY MEASURE FOR ADOPTING PHYSICAL ACTIVITY</i>	113
TABLE 4.2	<i>THE PROCESSES OF CHANGE TARGETED BY THE INTERVENTION AND STRATEGIES USED</i>	114
TABLE 4.3	<i>MEDIAN DECISIONAL BALANCE AND SELF-EFFICACY</i>	119
TABLE 4.4	<i>RANKED MEDIAN PROCESS SCORE FOR SOC IMPROVERS ONLY BY GROUP</i>	121
TABLE 4.5	<i>MEDIAN PROCESSES OF CHANGE ACROSS STAGE OF CHANGE FOR SOC IMPROVERS ONLY</i>	122
TABLE 5.1	<i>POTENTIAL NUMBER OF PARTICIPANTS FOR EACH FOCUS GROUP</i>	132
TABLE 5.2	<i>THE NUMBER OF PARTICIPANTS WILLING OR UNWILLING TO TAKE PART IN THE FOCUS GROUPS</i>	133
TABLE 5.3	<i>QUESTIONS ON PILOT STUDIES</i>	136
TABLE 5.4	<i>QUESTIONS TO EVALUATE THE USEFULNESS OF THE DATA OBTAINED</i>	137
TABLE 5.5	<i>AN EXAMPLE OF GENERAL AND REFINED DATA INDEXING</i>	144
TABLE 5.6	<i>THE NUMBER AND DEMOGRAPHICS OF PARTICIPANTS WHO TOOK PART IN EACH FOCUS GROUP</i>	151
TABLE 5.7	<i>EXAMPLES IN THE DATA THAT CORRESPOND TO THEMES LISTED UNDER SELF-EMPOWERMENT THEORY</i>	155
TABLE 5.8	<i>EXAMPLES OF DATA FROM THE MINI-THEORY OF SOCIAL BEHAVIOUR</i>	158
TABLE 5.9	<i>EXAMPLES OF DATA LISTED UNDER THE MINI-THEORY RATIONALE</i>	162
TABLE 5.10	<i>DESCRIPTIVE COUNTING OF STRATEGIES OF CHANGE</i>	166
TABLE 5.11	<i>EXAMPLES OF DATA LISTED UNDER THE CATEGORY TTM EXTENSION</i>	167
TABLE 5.12	<i>EXAMPLES OF DATA THAT CORRESPOND TO THE THEMES UNDER INTERVENTION CRITIQUE</i>	170
TABLE 5.13	<i>QUOTES LISTED UNDER THE THEME OF A PERSON-CENTERED ENVIRONMENT IN THE SRS</i>	174
TABLE 5.14	<i>AN EXAMPLE OF SNOWBALLING AS PARTICIPANTS RECOUNT PAST EXPERIENCES OF PHYSICAL ACTIVITY</i>	176
TABLE 5.15	<i>AN EXAMPLE OF HOW PARTICIPANTS DESCRIBED THE OPPORTUNITIES TO BE ACTIVE IN UNIVERSITY</i>	178
TABLE 5.16	<i>AN EXAMPLE OF A STABLE SEDENTARY INDIVIDUAL</i>	179
TABLE 5.17	<i>AN EXAMPLE OF A REGULARLY ACTIVE INDIVIDUAL</i>	180
TABLE 5.18	<i>AN EXAMPLE OF THE THEME INDIFFERENCE</i>	182
TABLE 5.19	<i>AN EXAMPLE OF JUSTIFICATION ARGUMENTS PUT FORWARD BY SEDENTARY PARTICIPANTS</i>	183

Chapter 1

Introduction

Physical activity is part of a healthy lifestyle, and inactivity is a significant public health problem. To date, a large body of scientific evidence has established a role for physical activity in the prevention of coronary heart disease, cancer and other chronic diseases. Psychological benefits such as mood improvement and management of anxiety and depression are also accepted as a result of a regularly active lifestyle.

According to the Scottish Health Survey (1995, N = 8,000), approximately 23% of men and 26% of women stated that they were inactive (that is no moderate or vigorous activity in an average week) (The Scottish Office Department of Health, 1995). Similarly, the findings of the Pan European Union [EU] survey (1999), where 1000 people from each member state of the EU took part in an interview led survey, concluded that in the EU on average 31% of individuals indicated that they were not participating in any physical activity. This average decreased to approximately 23% in the United Kingdom (Vaz de Almeida et al., 1999). Promoting physical activity and encouraging adults to change an established sedentary behaviour pattern and initiate a physically active lifestyle is difficult (Marcus, 1995).

Longitudinal and epidemiological studies show that participation in physical activity declines with age, beginning in childhood (Telema, Leskinen, & Yang, 1996). A steep decline in physical activity occurs during adolescence (approximately 15 to 18 years of age) and young adulthood (approximately 20 to 25 years of age) (Stephens, Jacobs, & White, 1985). Recently, publications by the Health Education Authority [HEA] in England, and by the Health Education Board for Scotland [HEBS] have targeted young people (Currie, Todd, & Thomson, 1997; Health Education Authority, 1997; Health Education Authority, 1998b; Turtle, Jones, & Hickman, 1998). The white paper on health, 'Towards a Healthier Scotland – A White Paper on Health', identified several goals for a physical activity task force to achieve (The Scottish Office Department of Health, 1999). Among them was to increase the proportion of 11-15 year olds taking vigorous exercise four times a week from 32% in 1994 to 40% by the year 2005. The aim being to increase participation levels earlier in life, and to encourage prevention rather than cure. In order to achieve this aim, more research is needed

to develop an understanding of the determinants of participation in physical activity, and to increase existing knowledge of exercise behaviour modification.

Physical Activity Defined

Physical activity need not be strenuous to achieve health benefits. People who are usually inactive can improve their health and well being by becoming even moderately regularly active. A sedentary individual is someone who participates in little or no physical activity. Physical activity is an umbrella term and it refers to any musculo-skeletal movement that results in energy expenditure (Caspersen, Powell, & Christenson, 1985; Pate et al., 1995). This energy expenditure is more than that normally expended at rest (and can be equated to 1 MET, where a MET is a measure of an individual's oxygen consumption at rest). There are four main types of physical activity that are currently measured in self-report physical activity recall questionnaires. These include activity at work, activity at home (housework, gardening, DIY), walking, sport and exercise activities (Blair et al., 1985; Lowther, Mutrie, Loughlan, & McFarlane, 1999). Exercise and sport are subsets of physical activity but are usually more planned and structured.

Health Benefits of Physical Activity

In the eighties, epidemiological studies emerged which provided evidence that sedentary living was detrimental to health, while appropriate physical activity could provide some protection against disease and mortality and promote health (Blair, Kohl, Paffenbarger, Clark, & Cooper, 1989). Research today has established that a range of physiological and psychological health benefits can be gained from leading a physically active lifestyle in comparison to a sedentary lifestyle (American College of Sports Medicine, 1998; DiLorenzo et al., 1999; Haskell, 1994; Johnson, Nichols, Sallis, Calfas, & Hovell, 1998; Lee & Paffenbarger, 1996; Morrow, Jackson, Bazzarre, Milne, & Blair, 1999; Shephard & Bouchard, 1994; U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, & National Center for Chronic Disease Prevention and Health Promotion, 1996). A list of these benefits is shown on Table 1.1.

Table 1.1

The health benefits associated with regular physical activity¹.

Decreased risk of	Helps
<ul style="list-style-type: none"> • dying prematurely • of dying prematurely due to Coronary Heart (Artery) Disease • of developing diabetes, colon cancer. • of developing high blood pressure 	<ul style="list-style-type: none"> • weight control • reduce blood pressure in people who already have high blood pressure • build and maintain healthy bones, muscles and joints. • older adults become stronger and better able to move about without falling • promote psychological well-being • reduce feelings of depression and anxiety

Note. ¹Table adapted from the findings of research listed in the previous paragraph.

Current Recommendations

The shift from an ‘exercise training-physical fitness’ paradigm to include the ‘physical activity health’ paradigm occurred during the last decade (Haskell, 1994). This shift was due to scientific studies that showed that there was a reduced morbidity and mortality with an increase in moderate amounts and intensities of physical activity (Blair et al., 1989; Blair & Connelly, 1996; Leon, Connett, Jacobs, & Rauramaa, 1987; Paffenbarger, Hyde, Wing, & Hsieh, 1986; Shaper & Wannamethee, 1991). This evidence became known as the physical activity dose-response curve (Phillips, Pruitt, & King, 1996), and from this the concept of lifestyle physical activity interventions began to develop. However, debate over the minimum amounts, intensities and frequencies of physical activity required to confer health benefits is still ongoing (Lee, Hsieh, & Paffenbarger, 1995; Morris et al., 1973; Morris, Clayton, Everitt, Semmence, & Burgess, 1990; Morris, 1996; Morris, 1999).

In 1995, physical activity recommendations from the U.S. Centres for Disease Control and Prevention and the American College Sports Medicine [CDC/ACSM] emphasised moderate activity (3-6 METs), and stated that “Every US adult should accumulate 30 minutes or more of moderate-intensity physical activity over the course of most, preferably all, days of the week” (Pate et al., 1995), p. 402). In 1998, the ACSM revised its earlier recommendations of continuous moderate to vigorous physical activity (American College of

Sports Medicine, 1990) to incorporate the moderate accumulative message. Recommendations are not rigid specifications; they are merely guidelines and are subject to change with future research. There is a need for constant research into the prescription levels for children, adolescents, young people, adults and older adults to ensure accuracy.

The Public Health Burden of Sedentary Living

The most commonly measured public health burdens are disease and death; these are described in terms of incidence rates, prevalence rates, and mortality rates (Powell & Blair, 1994). Sedentary living is one of the major risk factors for coronary heart disease [CHD], which has a high prevalence rate in Scotland. Figure 1.1 shows how the estimated population risks for CHD, cancer and diabetes are lower in the more active segments of the population. The Scottish Office Department of Health Consultation Document, 'Working together for a healthier Scotland' (The Scottish Office Department of Health, 1998), has shown that over 25% of all deaths in Scotland in 1996 were attributed to CHD. It also revealed that the prevalence of obesity in Scotland is high: 40% of men and 30% of women were classed as overweight, and 16% of men and 17% of women were identified as obese. Their conclusions acknowledged the need to promote health by increasing physical, mental and social well being and fitness while tackling and preventing health problems.

Research indicates that the rate of participation in regular physical activity among industrialised populations is low (Health Education Authority & The Sports Council, 1992; Health Education Board for Scotland, 1997; The Scottish Office Department of Health, 1995; Vaz de Almeida et al., 1999; The Scottish Office Department of Health, 1995; Health Education Board for Scotland, 1997). In Scotland, activity levels are seen to decline as an individual gets older, "two in ten people aged 16-24 years were inactive compared to six out of ten aged 65+" (HEBS, 1997, p. 2). Parallel to this, the attrition rate from exercise programmes is approximately 50% within the first six months (Dishman, 1988), p. 1-9). Physical inactivity is a public health burden, and an inadequate understanding of why individuals are inactive, is a major obstruction in the successful promotion of a physically active lifestyle. More research is needed into the application of behaviour change models to exercise behaviour to help us understand how to increase physical activity levels among general population.

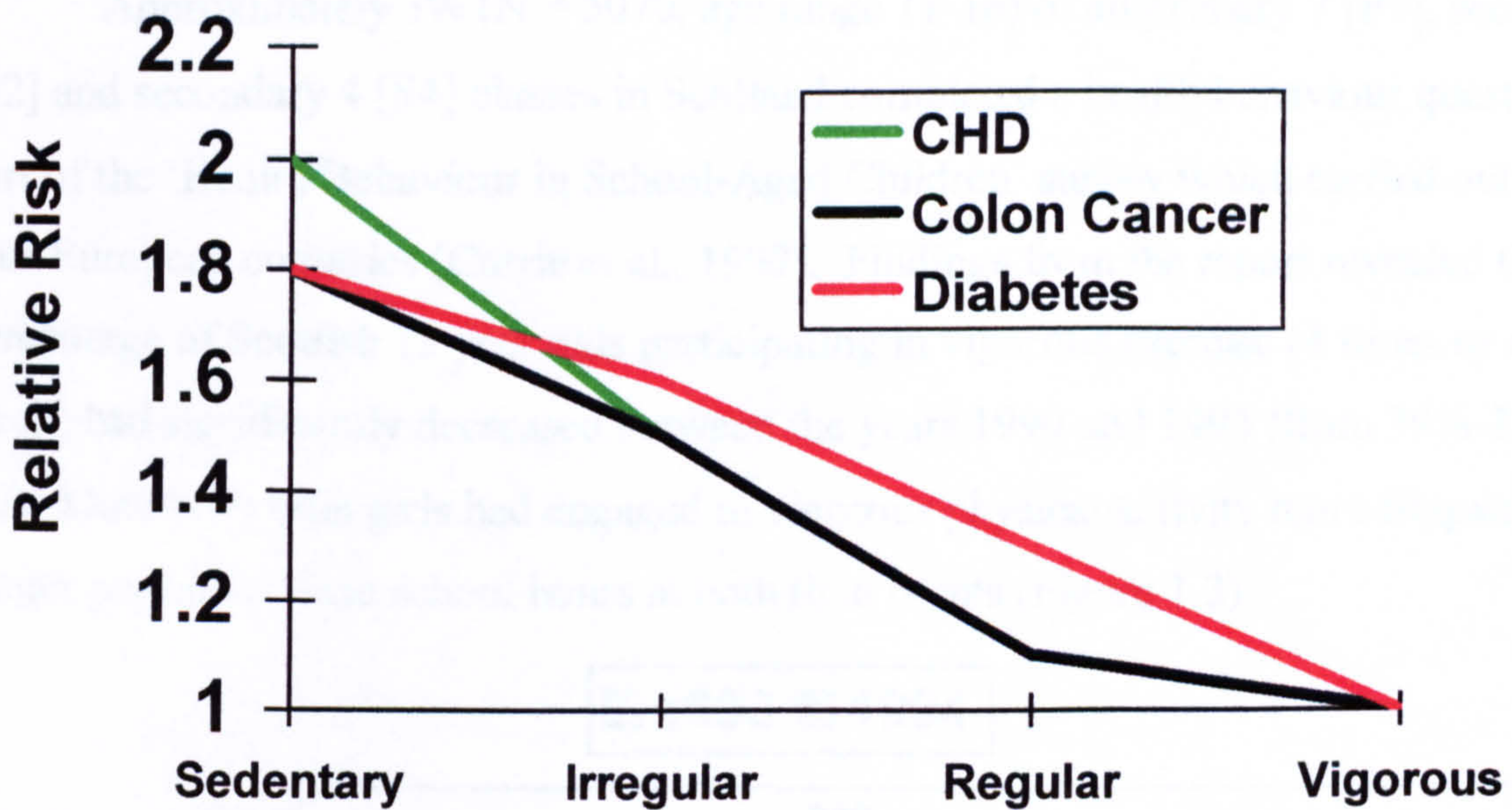


Figure 1.1. Relative risk of inactivity.

Note. Sedentary = no physical activity.

Irregular = engage in light to moderate physical activity (≤ 30 mins/day or ≤ 5 days/week).

Regular = light to moderate physical activity (≥ 30 mins/day or ≥ 5 days/week).

Vigorous = engage in vigorous (50%+ of capacity) leisure-time physical activity (≥ 3 days/week for a minimum of 20 mins/session).

Adapted from "The public health burdens of sedentary living habits: theoretical but realistic estimates" by K.E. Powell and S. N. Blair, 1994, *Medicine and Science in Sport and Exercise*, 26, p. 853.

Physical Activity and Young People

Some researchers suggest that 'normal' children and adolescents are the fittest or most active group in the population of Britain (Armstrong, 1995; Armstrong & Van Mechelen, 1998; Health Education Board for Scotland, 1997; Sharp, 1995). However, determining the actual amount of participation in physical activity by young people is problematic due to the diversity of approaches in defining physical activity and in measuring participation levels. The assessment of habitual physical activity among young people is difficult, the accuracy with which parents report the amount of regular physical activity their children take part in,

and the use of self-reported levels of physical activity are all questionable (Armstrong & Van Mechelen, 1998; Saris, 1985).

Approximately 3% (N = 5070, age range 11-16) of all primary 7 [P7], secondary 2 [S2] and secondary 4 [S4] classes in Scotland completed a health behaviour questionnaire as part of the 'Health Behaviour in School-Aged Children' survey which carried out in twenty-four European countries (Currie et al., 1997). Findings from the report revealed that the percentage of Scottish 15 year olds participating in vigorous exercise (4 times or more per week) had significantly decreased between the years 1990 and 1994 (from 39%-32%) (Figure 1.2). More boys than girls had engaged in vigorous physical activity more frequently and for longer periods outside school hours at both time points (Figure 1.3).

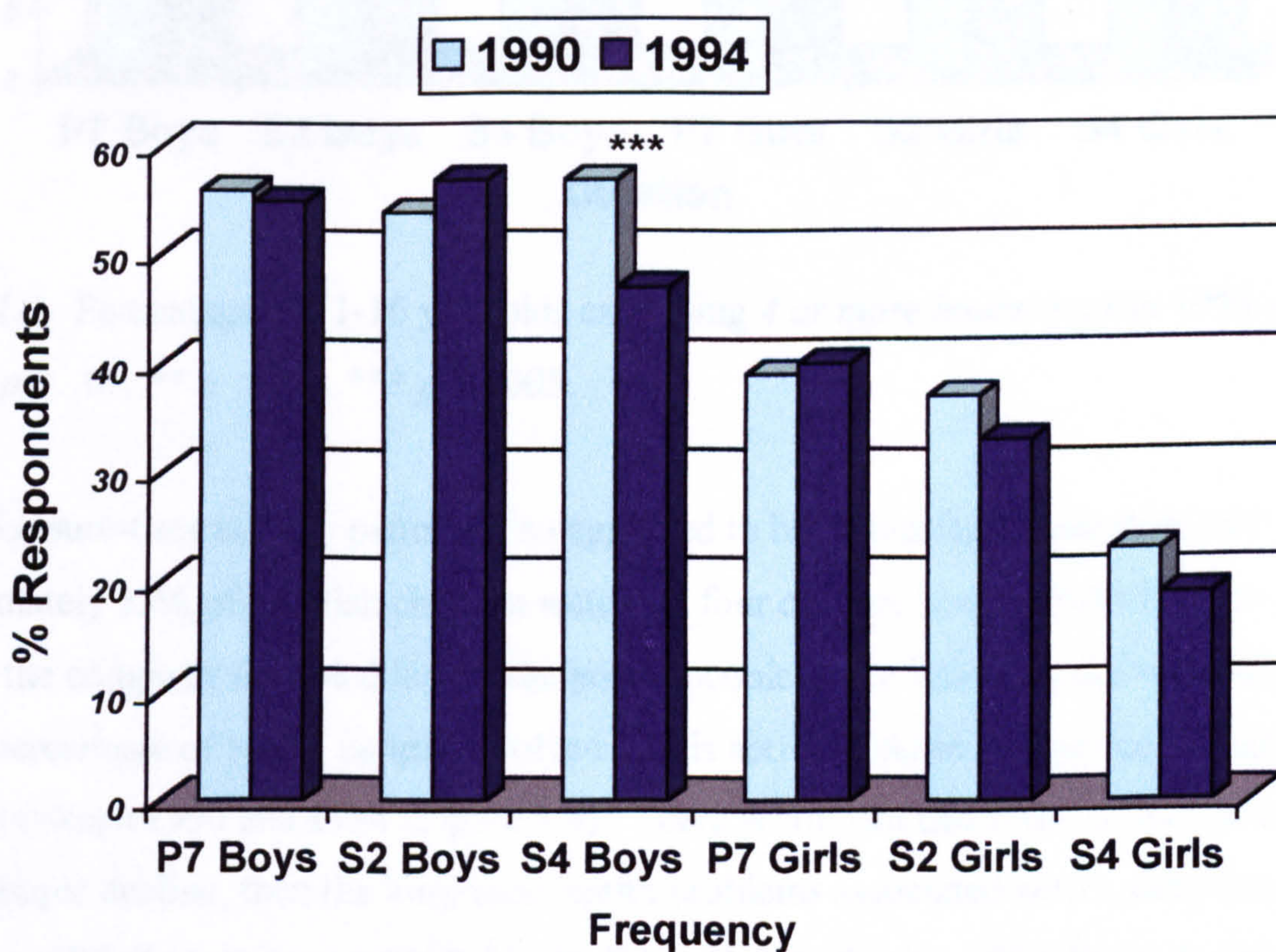


Figure 1.2. Percentage of 11-16 year olds exercising 4 or more times/week in 1990 and 1994.

Note. *** $p < .005$; P7 = primary 7, S2 = secondary 2 and S4 = secondary 4.

Figures 1.2-1.4 adapted from "Health Behaviours of Scottish Schoolchildren: Report 5: Comparisons of national patterns in 1990 and 1994" by C.E. Currie, J. Todd and C. Thompson, 1997, p. 26-27.

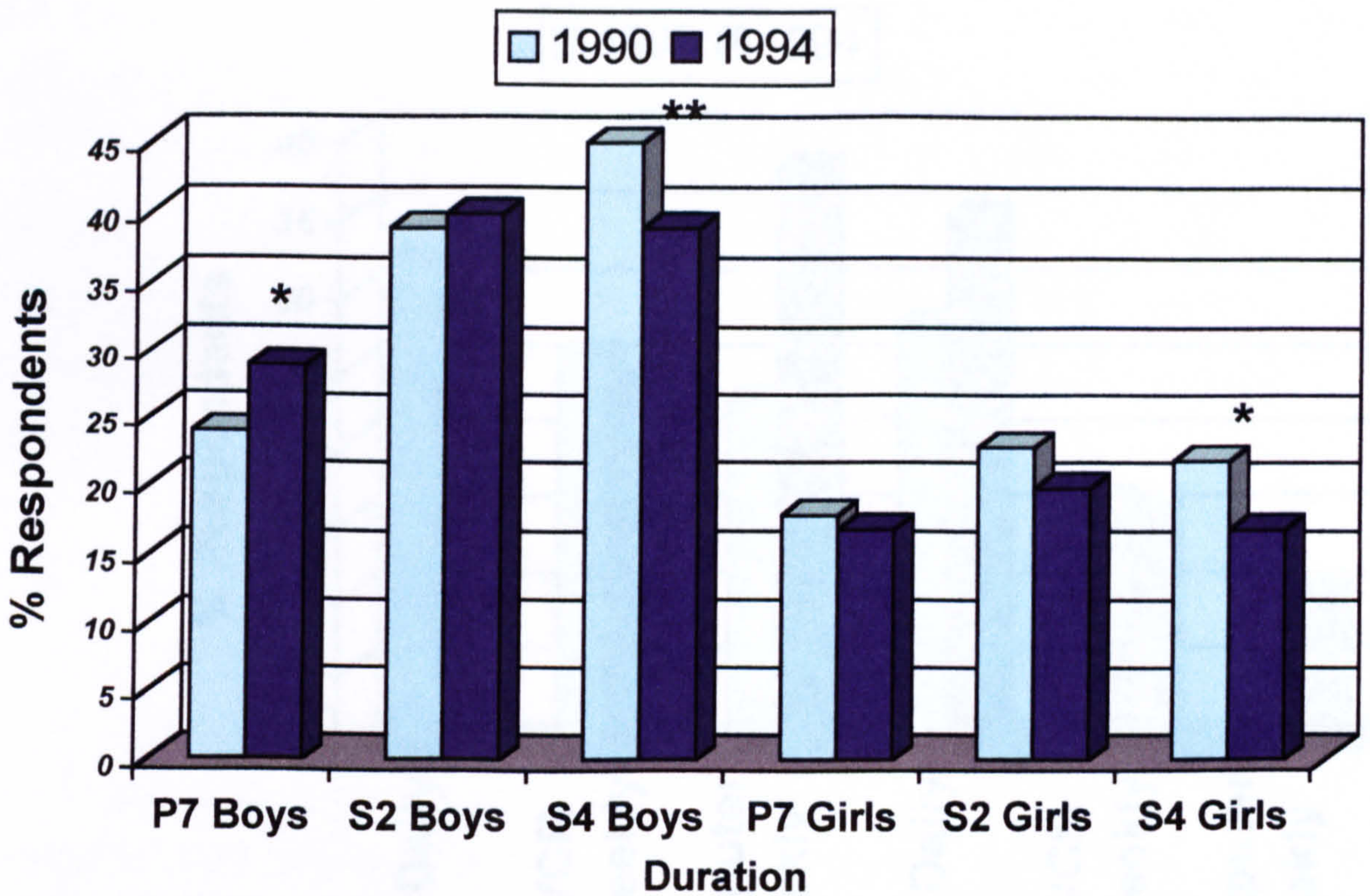


Figure 1.3. Percentage of 11-16 year olds exercising 4 or more hours/week in 1990 and 1994.
 Note. * $p < .05$, ** $p < .01$, *** $p < .005$.

Leisure-time activity patterns also appeared to be increasingly sedentary with approximately 33% of Scottish children watching four or more hours of television every day. Playing the computer occupied less of the young people's free time than did watching the TV but the percentage of young people involved in this activity had increased very significantly ($p < .001$) between 1990 and 1994 (Figure 1.4). There is concern that if the activity patterns of young people decline, then the long-term health problems associated with a sedentary lifestyle may be amplified (Armstrong, 1995; Health Education Authority, 1997; Sallis & Patrick, 1994)

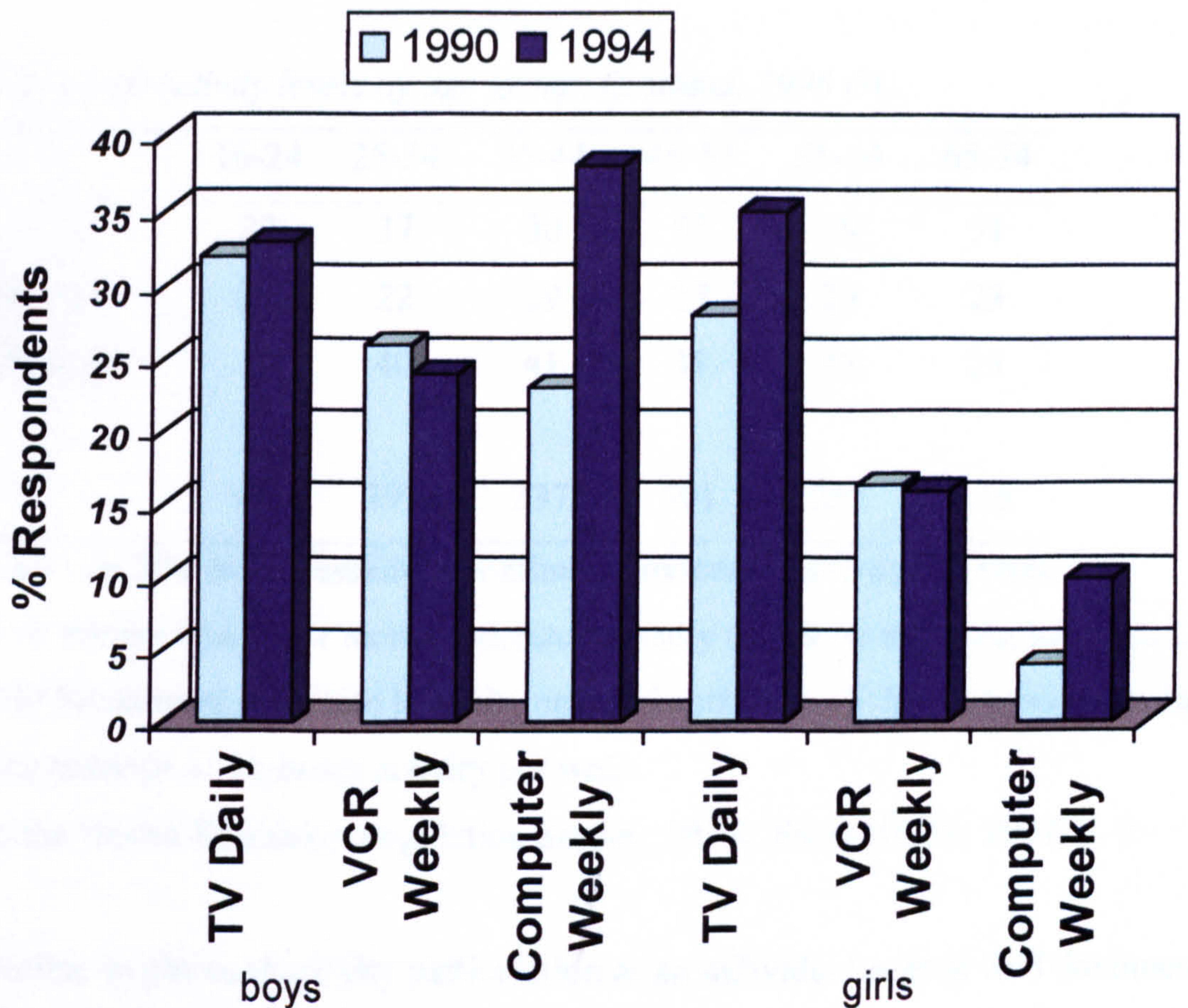


Figure 1.4. Percentage of 11-16 years spending 4 hours or more in sedentary leisure activities.
 Note. * $p < .05$, ** $p < .01$, *** $p < .005$.

This thesis is concerned with the activity levels of young adults. The HEBS (1997) report showed that 62% of 16-24 year olds were not achieving the minimum requirements of physical activity for health as outlined by the ACSM, 1990 guidelines. Additionally, a study on the health behaviours among adults in Glasgow 1988-1995, revealed that 58% of men and 75% of women aged 18-23 reported that they were not achieving these minimum requirements (Roberton, Uitenbroek, Hay, & Platt, 1997). These reports show that physical activity is not as high as it should be among this population, that girls participate less than boys, that participation physical activity decreases from adolescence to adulthood and this decrease in participation levels continues as the individual grows older. Table 1.2 gives an example of this decline in participation in physical activity among a Scottish population.

Table 1.2

Self-reported physical activity levels by age group: Scotland, 1996 (%)

	16-24	25-34	35-44	45-54	55-64	65-74
Sedentary ¹	22	37	30	43	38	51
Irregular moderate ²	26	22	29	27	29	23
Regular moderate or Vigorous ³	52	40	41	31	33	25
N=	300	397	337	301	255	218

Note. ¹ Less than one 30 minute session of continuous moderate activity per week.

² At least one 30 minute session or more moderate intensity activity a week but less than 5.

³ A minimum of 30 minutes moderate intensity physical activity on 5 days a week, or at least three 20 minute sessions of vigorous activity per week.

Adapted from the Health Education Population Survey, 1996. From HEBS, 1997, p. 9

The decline in physical activity participation as an individual ages is well documented (Barnekow-Bergkvist, Hedberg, Janlert, & Jansson, 1996; Engstrom, 1986; Health Education Authority, 1998b; Health Education Board for Scotland, 1997; Kuh & Cooper, 1992; Sharp, 1995; Telema et al., 1996). Sharp (1995) commented that “if adult health-related activity patterns are significantly determined in childhood, then the falling energy levels of children give grounds for considerable concern, both intrinsically and for their adult future” (p. 54). The Allied Dunbar National Fitness Survey [ADNFS] reported that only 2% of active adults were inactive as children. This suggests that activity patterns tend to last through time and have their origins in childhood (Health Education Authority & The Sports Council, 1992). There is a need for research to address the issue of attrition from exercise and how to prevent active young people developing sedentary habits as they grow older.

Research Design

Research Approach (Methodological Justification)

In order to research a topic, a researcher needs to identify how “we know what we know” (McDowell & MacLean, 1998) p. 15). In other words, certain research paradigms exist and each involves different assumptions, beliefs and values as well as methods of study in

order to answer specific research questions. Both the qualitative and quantitative paradigms address the question of connection between the external world and the process of knowing in different ways (Filstedd, 1979). (Brochhaus, 1987) believed that research was impeded by a concern for doing the correct type of research rather than researching the correct type of questions, using whatever approach is appropriate. This thesis, due to the nature of the research questions, required a combination of both quantitative and qualitative research methods.

Quantification permitted nomothetic generalisations. It provided an objective method of manipulating and controlling isolated variables for the measurement of their relationship with others. It permits verification of theories that already exist. In reporting findings, it values freedom, as the researcher remains exterior to the subjects, and his or her interpretations are screened out, thus allowing the research to be reported in a clear, unmediated manner (Banister, Burman, Parker, Taylor, & Tindall, 1995). In study one, for example, the relationship between the use of the processes of change variables and exercise stage of change can be identified and explained through the use of quantitative measures. This information can then be used to help in the design of physical activity interventions to help inactive young adults become more physically active.

However, in order to gain a deeper insight into the reasons for inactivity amongst this young adult population, it was felt that their behaviour could not be fully understood without an understanding of the people who act in this reality. The ontological assumptions about reality and the natural world are not suited to the nature of reality in the social world. In the natural world, reality is objective, and explained by a set number of variables. In the social world, reality is viewed holistically; an understanding of what inactivity meant to the individuals concerned, and how experiences had influenced their behaviour was required. A comparison of the two paradigms is listed on Table 1.3.

A combination of methods can potentially allow the strengths of each approach to balance against the biases and limitations of the other. Various rationales for combining qualitative and quantitative methods in one research study are evident (Barbour, 1999). Different methods can be employed as a validity checking procedure, where researchers use different methods to see if one method supports the findings of another, a form of triangulation. The combination of methods can also be dependent on the specific research question or stage of the research project, for example qualitative methods can be used as a

preliminary to prepare the ground for subsequent quantitative research. Thirdly, a combination of methods can be used for compensatory reasons. This implies that one method is used as an adjunct to the other to compensate for the shortcomings of the other; for example, the use of open-ended questions in conjunction with closed questions on a questionnaire instrument.

Table 1.3

It-beings and human beings: two distinct paradigms.

	Quantitative Paradigm	Qualitative Paradigm
Ontological beliefs about reality	Exterior, Objective, Single Reality	Subjective, Interpretative, Changing Realities
Epistemological beliefs about knowledge	Value Freedom	Neutrality
Reality can be understood by	Remaining objective and exterior to the subject	Getting close to the subject
	Reduction of the natural world	Adopting a holistic view of social phenomena
	Manipulation and control of isolated variables for the measurement of the relationship between them and others.	View social phenomena in their natural environments
	Nomethetic generalisations	Idiographic generalisations
Suited to the study of	It-Beings	Human-Beings

The aim of this study was to develop an understanding of inactivity amongst a young adult population. Although there is reference to triangulation within the project, the main rationale for combining both qualitative and quantitative methods was due to the specific research questions to be answered. The quantitative methods were used to establish a more general picture of exercise stage of change and the applicability of the transtheoretical model of behaviour change to the target population. The qualitative methods were used to particularise and isolate perceptions among small groups of individuals.

Fostering the Intersection between Quantitative and Qualitative Research

As this study was deductive, that is theory driven – the transtheoretical model of behaviour change was used as a basis from which to structure its investigations - a quantitative-hierarchical model was chosen for the combination of both research methods (Figure 1.5). The hierarchy is based on time; the quantitative methods were used as the primary and the qualitative research was used as a follow-up to amplify the findings provided by the first method. This model of integration allowed a supplementation procedure. That is, qualitative focus groups were used to clarify and amplify and develop further the data collected using the standard TTM questionnaires.

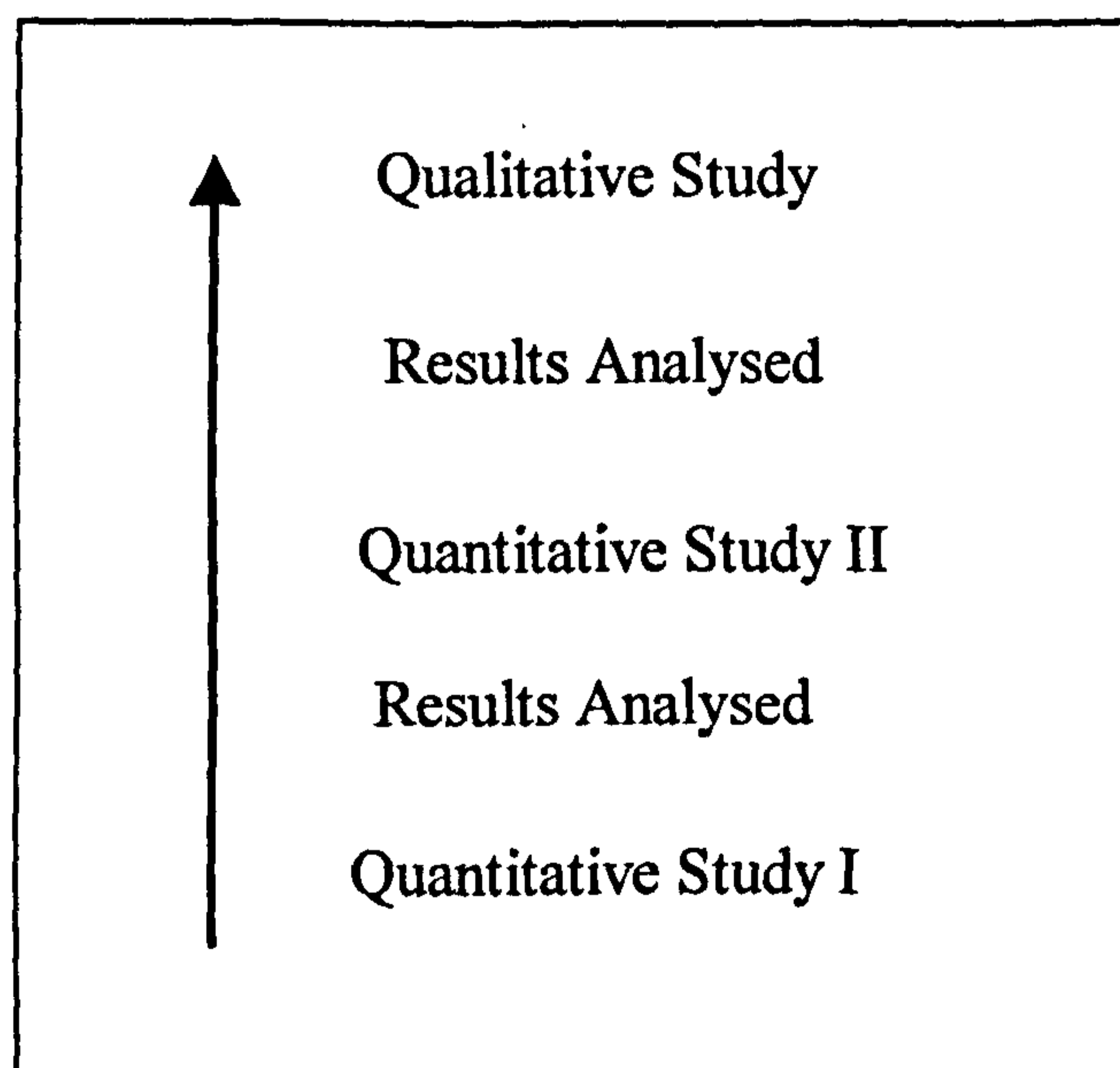


Figure 1.5. Quantitative Hierarchical Model

Need for Research

Research has suggested that interventions for increasing the uptake of active lifestyles from childhood to adulthood are needed (Dishman, 1994a). Similarly, an understanding of the determinants of physical activity participation in youth, and young adulthood has been identified as a research priority (Sallis et al., 1992). The environmental, cultural, behavioural, psychological, developmental and socio-economic determinants that potentially influence physical activity participation in young adults need to be studied to advance our knowledge of exercise behaviour modification.

The transitional periods in a person's life (e.g. adolescence, retirement, pregnancy) have an influence on their exercise behaviour patterns (Dishman, 1982; Dishman, 1994a; Marcus, 1995). The transition from late adolescence to young adulthood has been identified as a key intervention period to help young adults to adopt and maintain an active lifestyle (Dishman, 1994b; Pinto, Cherico, Szymanski, & Marcus, 1998). This influence can serve to enhance their level of participation in physical activity or it can serve as a barrier. This is an important area for further research, and establishing the most successful ways of addressing behaviour change in this young adult population as they leave school and move on to other areas of life is a current research challenge.

Finally, more research on this target group needs to employ both qualitative and quantitative methods (Biddle, Cavill, & Sallis, 1998). For example, a literature search using BIDS (ISI), Medline and Sports Discuss and the key words physical activity, exercise, young people, young adults, qualitative research and focus groups resulted in no articles being identified that carried out qualitative research on sedentary young adults. Qualitative methodology has been identified as playing a central role in the quest for psychological knowledge (Henwood & Pidgeon, 1992). In order to achieve this knowledge, this research has been driven by a gap in the physical activity literature to date, which suggested the need for both quantitative and qualitative research methods.

Statement of Aim and Objectives

The aim of this research was develop an understanding of the determinants of participation in physical activity, and to increase research knowledge in exercise behaviour modification in a young adult population. Three research studies were identified: a

longitudinal tracking study, a randomised-control trial of an intervention and a qualitative study. Each study was linked in an hierarchical time structure. The aims and objectives of each study are listed below.

Study One

The aims of this study were to track the self-reported exercise behaviour of a student population over a seven-month period, to identify any changes that occurred in this behaviour and to examine how the use of the processes of change varied with each stage of change. The specific objectives were:

- i. To establish stage of exercise behaviour change for a first year undergraduate student population.
- ii. To track these students over a seven-month period at university, and establish patterns of exercise behaviour change within this time frame.
- iii. To identify key processes of change used in relation to the initiation of and adherence to a physically active lifestyle, using constructs from the transtheoretical model of behaviour change,

Study Two

The purpose of this research was to determine the efficacy of a postal intervention designed as a strategy to help inactive young adults become more active. The intervention was designed using the stage appropriate processes of change, and the outcome measures included all the constructs of the TTM. The specific objectives were:

- i. From the baseline study, highlight a target group of sedentary individuals for further research.
- ii. Randomly assign the students into a control or experimental group
- iii. Design a stage-matched intervention based on the TTM to encourage physically active lifestyles amongst the sedentary students.
- iv. Target the experimental group with the 6-month intervention based on the TTM.
- v. Identify if there are any differences in the control and experimental groups in relation to exercise stage of change, use of the processes of change, decisional balance for activity, exercise self-efficacy or behavioural intention post-intervention.

Study Three

The purpose of this study was to analyse the reasons for inactivity or behaviour change among young adults through listening to their past experiences of physical activity, and how they felt these experiences might impact on their current and future exercise behaviour. The specific objectives were to explore:

- i. What the concept of 'physical activity' meant to a group of inactive young adults?
- ii. What led to these young people to being inactive by the time they entered university?
- iii. What could have helped them (in the past) to maintain a physically active lifestyle?
- iv. What can be done to help them either adopt (or maintain) a physically active lifestyle in the future?
- v. What was thought of the intervention, how could it be improved?
- vi. What can the Sport and Recreation Service of the University of Glasgow learn from these interviews?

Plan of Thesis

The second chapter of this thesis is a literature review of the relationship between activity in childhood, young adulthood and adult life, and the current theoretical models used to advance our understanding of behaviour change in physical activity. In particular, the TTM is singled out and subjected to a detailed explanation, review and critique of its applicability to physical activity. This chapter concludes with a reiteration of the aims of the study in light of the literature review.

The third chapter outlines the aims, methods, results and discussion of findings of study one, while chapter four focuses in a similar fashion on study two. Chapter five details the qualitative study, similarly, outlining its aims, methods, results and concluding with a discussion of the findings. Chapter six presents a summary of the findings from all three studies and links the findings in providing the overall conclusions of this research.

Delimitations of the study

The use of self-report measures of physical activity is a delimitation of this study. Self-report is a main source of data in psychology and in social science (Schwarz, 1999). These measures for physical activity assessment have been used in three general areas of

investigation: epidemiological, behaviour change and correlation studies (Baranowski, 1988). Unfortunately, self-report is a fallible source of data as there are limits to the validity and reliability of these measures. However, there are also limits to any measure of activity, for example, the heart rate monitor detects emotion as well as activity. Improvements in the validity and reliability of self-report measures is an ongoing research challenge. In this research, approximately three thousand students completed a baseline questionnaire, a large percentage of whom were subsequently tracked in a longitudinal study over a seven-month period. Due to the large number of subjects, a self-report measure was chosen as an indication of level of physical activity, this was the exercise stage of change questionnaire. The five-point ordered categorical staging-algorithm has numerous practical advantages in population-based studies; it is easy for respondents to follow, and understand; it is a short standardised measurement tool, and its construct validity and reliability has been extensively tested across different ages and cultures in physical activity (Cardinal & Sachs, 1995; Cardinal, 1995b; Marcus, Eaton, Rossi, & Harlow, 1994a; Marcus & Simkin, 1993; Cardinal, 1997a; Lowther et al., 1999; Wyse, Mercer, Ashford, Buxton, & Gleeson, 1995).

Other delimitations were respondent bias and generalisability of findings. To lower the impact of response bias all questionnaires were anonymous, confidentiality of information was guaranteed and the respondents never met the researcher (author). As an undergraduate student population, which was mainly white, Scottish, middle-class individuals, was chosen as the sample for this study and this limits the generalisability of the findings.

Chapter 2

Literature Review

Introduction

The decline in physical activity participation as an individual ages is well documented (Barnekow-Bergkvist et al., 1996; Engstrom, 1986; Health Education Authority, 1998b; Health Education Board for Scotland, 1997; Kuh & Cooper, 1992; Sharp, 1995; Stephens et al., 1985; Telema et al., 1996). Sharp (1995) commented that “if adult health-related activity patterns are significantly determined in childhood, then the falling energy levels of children give grounds for considerable concern, both intrinsically and for their adult future” (p. 54). The ADNFS reported that only 2% of active adults were inactive as children (Health Education Authority & The Sports Council, 1992). This suggests that activity patterns tend to last through time and have their origins in childhood. (Dishman, 1994a) referred to the idea of children maintaining their “relative ranking on a variable over time as tracking” (p. 320). The following section will review some studies that tracked exercise behaviour from childhood to adulthood.

From Childhood to Adulthood

Engstrom (1986) claimed that “early experiences of physical education... seem to be of utmost importance for involvement in physical activities” later on in life (p. 91). His research aimed to substantiate this claim. He surveyed a random sample of 2,000, 15-year-old students from various parts of Sweden, and tracked their exercise behaviour over a period of fifteen years. He was interested in tracking their behaviour as regards participation in keep-fit activities (these included everything from competitive sport to walking). A survey method was used where individuals completed a baseline questionnaire at school, and a follow-up questionnaire at three five-year intervals. The overall number declined to 1,675 (or by 19%) at the end of the study. His findings revealed that according to the definition of physical activity being used (especially in relation to effort level) the changes between participation levels at 15, at 20, at 25 and at 30 years of age differed dramatically (Figures 2.1-2.3). Almost 90% of individuals sampled were active from the age of 15 to 30 if you class physical activity as walking once a week. If however, the effort level increases, such that physical activity is

defined by participation several times a week, at a vigorous intensity, then the percentage of individuals who were very active at 15 drops significantly by the age of 30 (Figure 2.3).

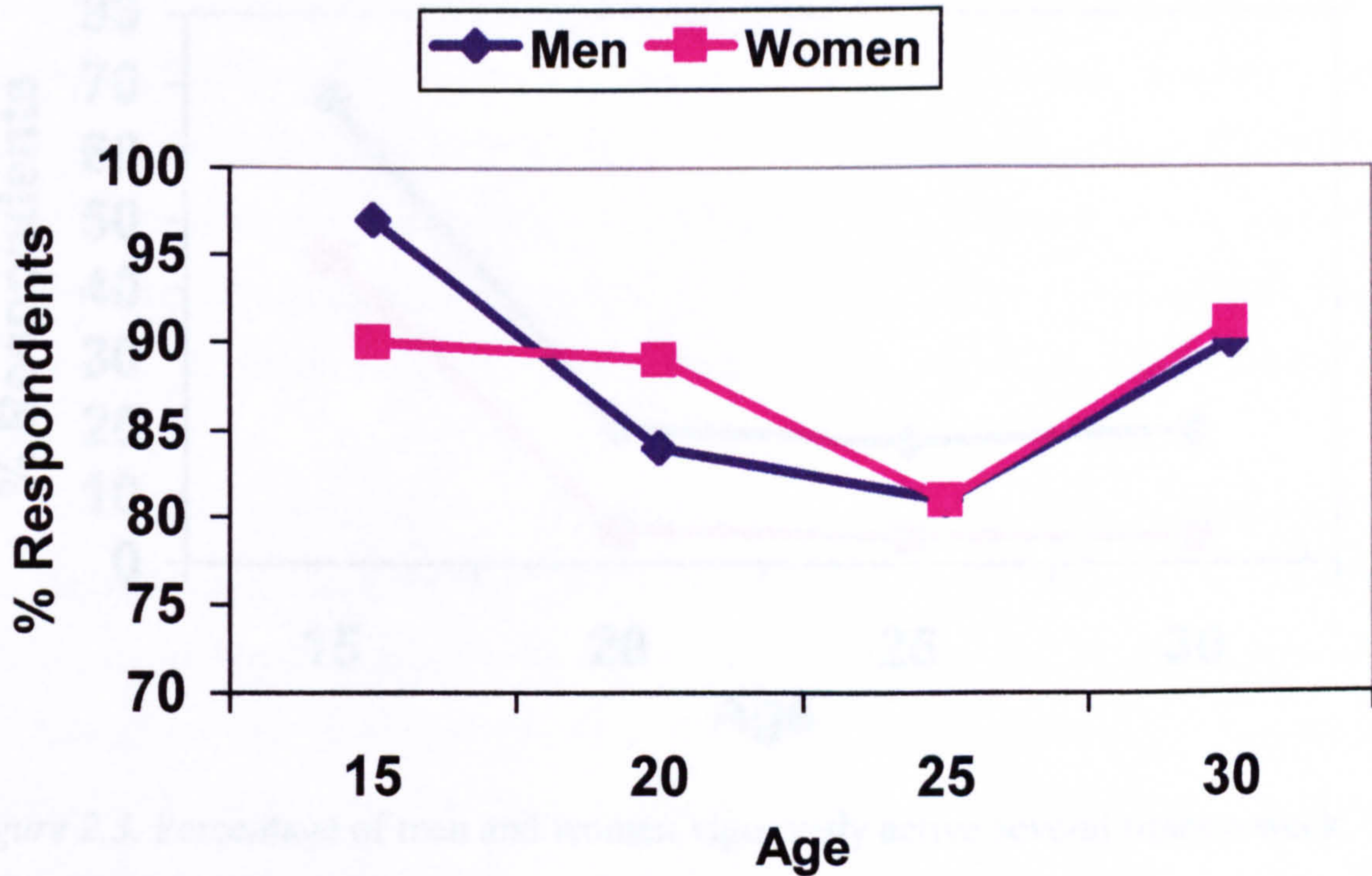


Figure 2.1. Percentage of men and women regularly active (e.g. gardening, walking) every week.

Figures 2.1-2.3 are adapted from “The process of socialisation into keep-fit activities” by L.M. Engstrom, 1987, *Scandinavian Journal of Sport Science*, 8, p. 92-93.

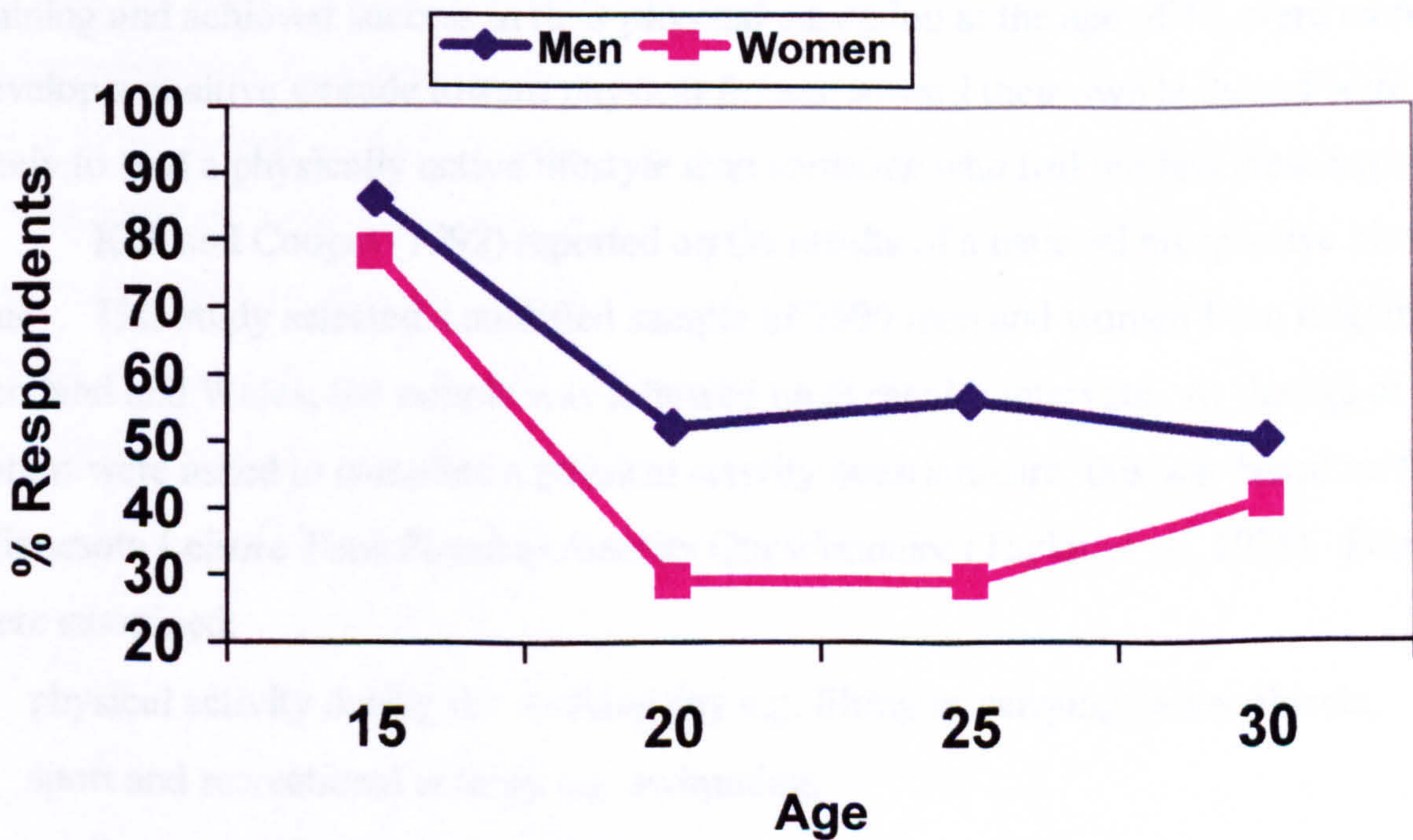


Figure 2.2. Percentage of men and women regularly active every week (e.g. jogging).

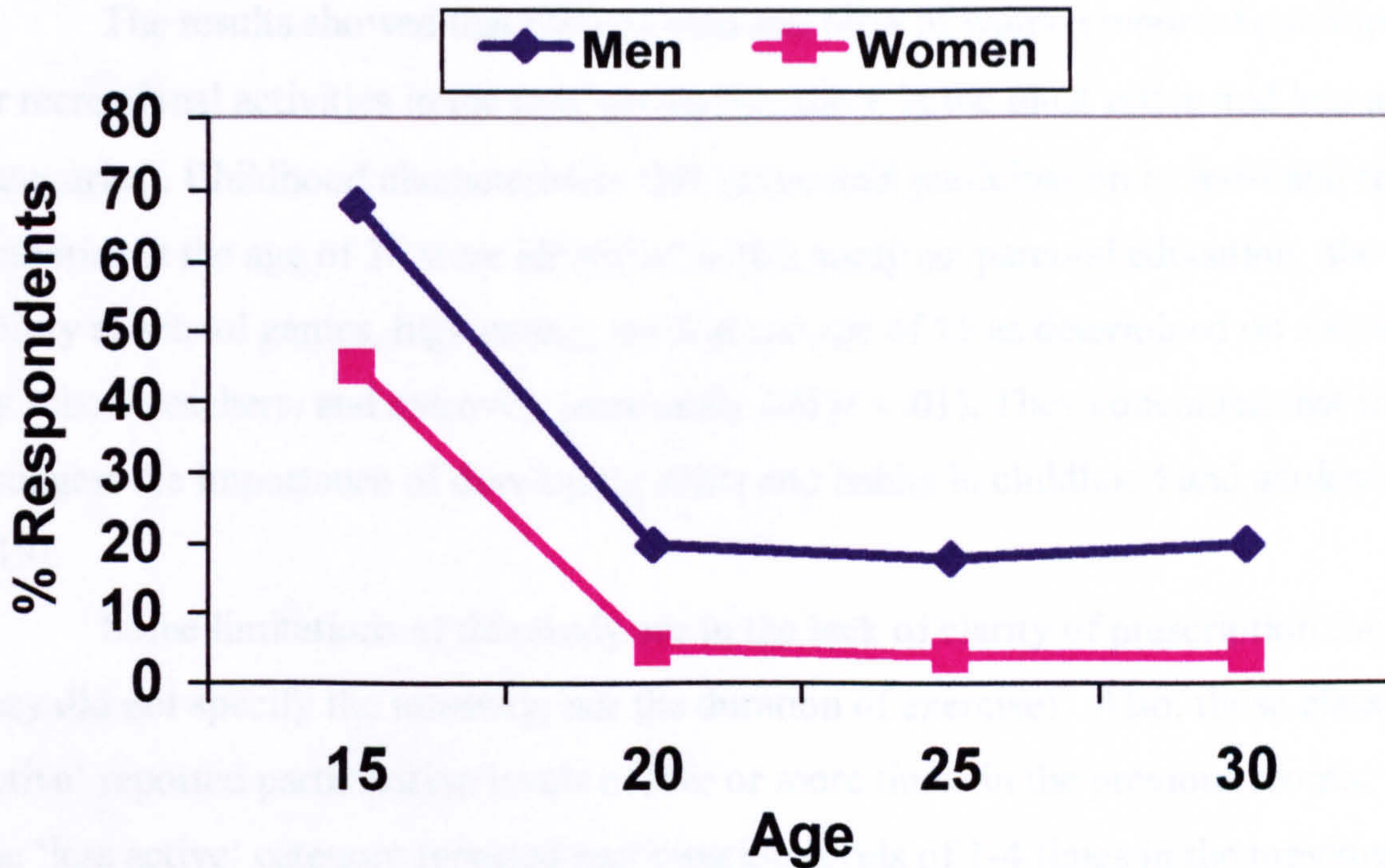


Figure 2.3. Percentage of men and women vigorously active several times a week.

As regards tracking exercise behaviour in 15-30 year olds, this study has some limitations. The definitions of physical activity/physical fitness are vague, the duration of bouts of physical activity are not clearly stated and the intensity of these bouts (though stated) are also unclear. Engstrom concludes that individuals who took part in organised physical training and achieved success in their physical education at the age of 15, were more likely to develop a positive attitude toward physical fitness, toward their own body and were more likely to lead a physically active lifestyle than someone who had not had these experiences.

Kuh and Cooper (1992) reported on the results of a national prospective birth cohort study. This study selected a stratified sample of 3500 men and women from England, Scotland and Wales; the sample was followed up at regular intervals. At the age of 36, the cohort were asked to complete a physical activity questionnaire, this was based on the Minnesota Leisure Time Physical Activity Questionnaire (Taylor et al., 1978). Four criteria were examined:

- physical activity during the working day e.g. lifting or carrying heavy objects,
- sport and recreational activity e.g. swimming,
- cycling and walking e.g. in commuting to work

- heavy gardening or do-it-yourself.

The results showed that 60% of men and 56% of women reported participating in sport or recreational activities in the past month (i.e. those in the most active and less active categories). Childhood characteristics that influenced participation in sport and recreational activities at the age of 36 were identified in this study as: parental education, above average ability at school games, high energy level at the age of 15 as determined on a three point scale by school teachers, and extrovert personality (all $p < .01$). They concluded that their findings “suggest the importance of developing skills and habits in childhood and adolescence” (p. 119).

Some limitations of this study are in the lack of clarity of prescription for exercise (i.e. they did not specify the intensity, nor the duration of exercise). Also, those classified as ‘most active’ reported participation levels of five or more times in the previous month, while those in the ‘less active’ category reported participation levels of 1-4 times in the previous month. This parallels once a week and compares to level 1 of both the (Health Education Authority & The Sports Council, 1992; Health Education Board for Scotland, 1997).

Barnekow-Bergkvist et al. (1996) conducted a study tracking physical activity patterns from adolescence to adulthood. In 1974, a randomly selected representative sample of Swedish students, mean age of 16.1 (+/- .33), (220 boys and 205 girls) completed a physical activity questionnaire. A follow-up questionnaire in 1992 yielded an 88% response rate. Detailed information on participation levels, type, frequency and duration of activity and information on attitudes and beliefs to physical activity was collected. Some changes were made to the follow-up questionnaire, including information on environmental and motivational variables that might have an influence on participation in physical activity. Results of the study show that self-reported levels of vigorous physical activity decreased among both men and women over the eighteen-year period, whereas light recreational activity increased over these years (Figure 2.4).

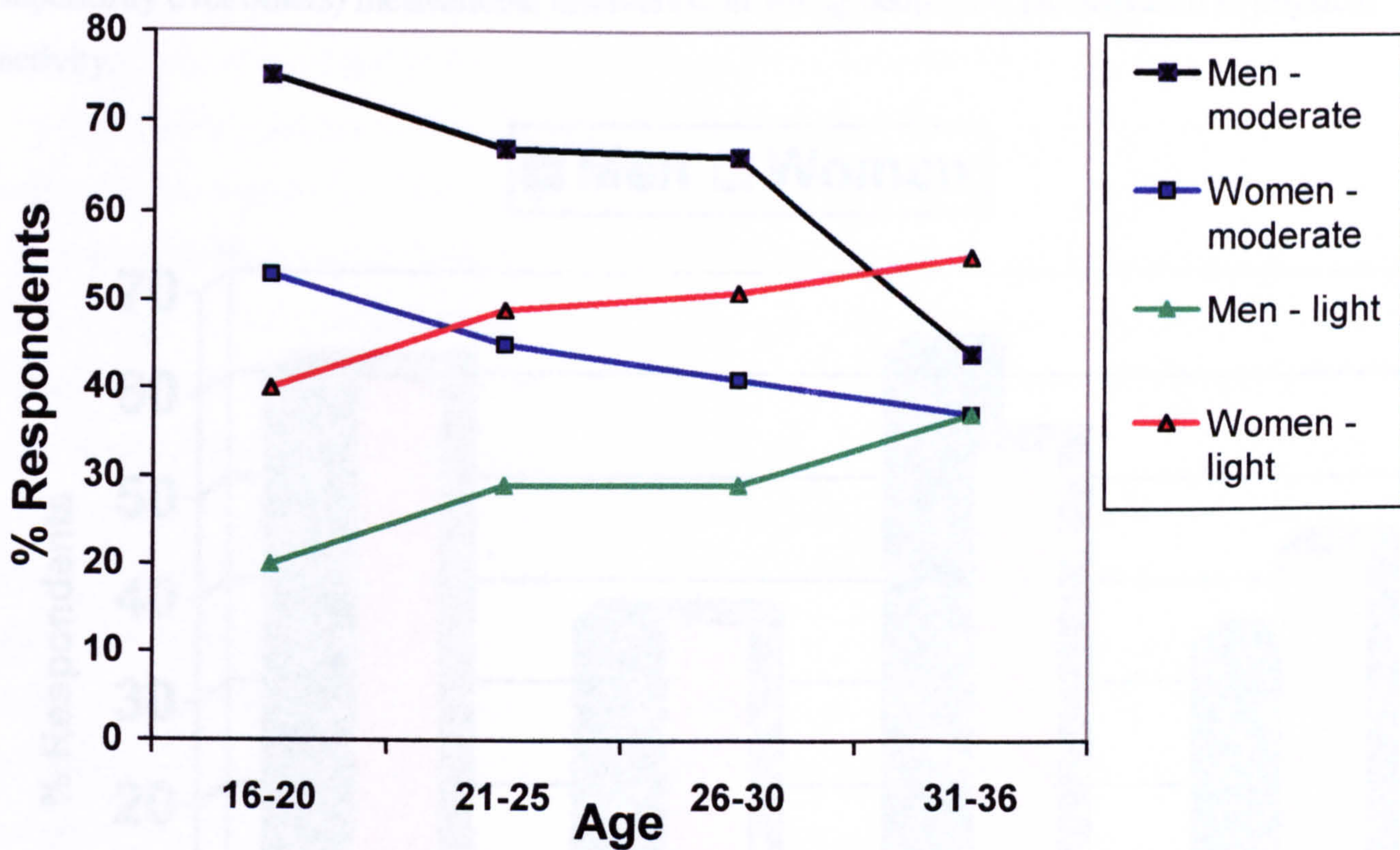


Figure 2.4. Percentage of individuals in different levels of physical activity at different ages. Figures 2.4 and 2.5 adapted from “Physical activity pattern in men and women at the ages of 16 and 34 and development of physical activity from adolescence to adulthood” by Barnekow-Bergkvist, M., Hedberg, M., Janlert, U. and Jansson, E., 1996, *Scandinavian Journal of Medicine and Science in Sports*, 6, p. 365-366

Note. Moderate activity compares to jogging/running ≥ 2 hours/week.

Light physical activity compares to gardening, walking, cycling ≥ 2 hours/week.

A higher percentage of women than men (44% versus 37%) changed their pattern of physical activity from inactivity at the age of 16 to activity at the age of 34. There was also evidence of a percentage of both men and women (approximately 37%) who had been active at the age of 16 becoming inactive by the age of 34 (Figure 2.5). In conclusion, the findings of the study revealed that participation in physical activity during leisure time in youth is more important for maintenance of an active lifestyle, than attitudes towards physical activity, or grades achieved in physical education. This lends support to fostering a task based (that is, competence in physical activity is based on learning and self-referenced goals for example) rather than an ego based (competence in physical activity defined by competitive success,

superiority over others) motivational orientation in young people for participation in physical activity.

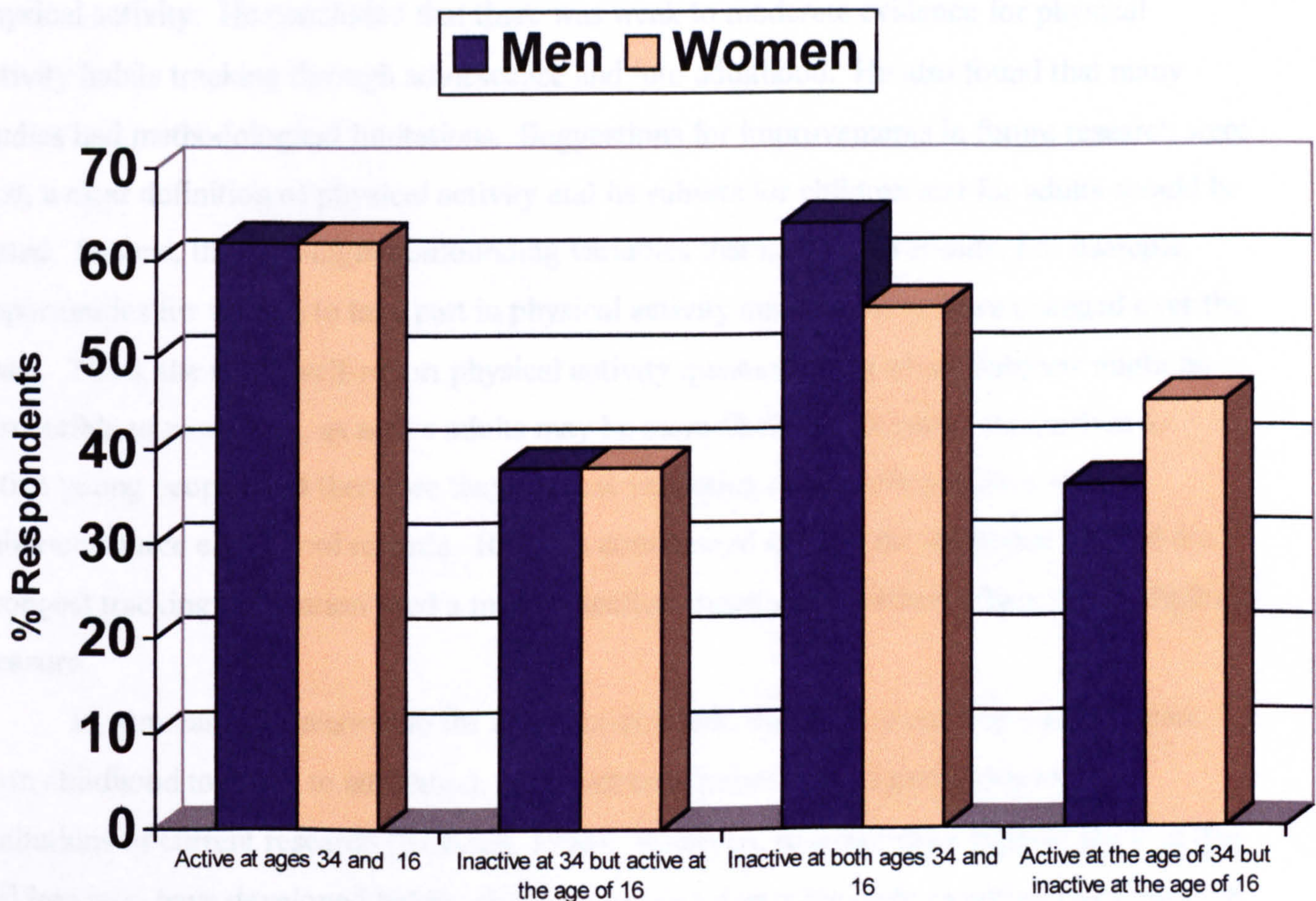


Figure 2.5. Changes in percentage of participants' physical activity status from the age of 16-34 among men (N=194) and women (N=179).

Telema et al. (1996) substantiate the importance of establishing lifetime physical activity among children and young adults. They state that there is a "significant correlation between the physical activity in childhood and that in adulthood" (p. 371). They claim that there is some degree of stability between maintenance of a physically active lifestyle if physical activity has been an independent variable as the child grows. Their research tracked the leisure-time physical activity and sport participation of individuals from 9 years of age to 30, at three-year intervals. They found that the stability of exercise behaviour within three-year intervals increased by age amongst boys but not amongst girls. The participation in sports club training sessions had the highest tracking correlation (0.28 to 0.64 among girls, and 0.4 to 0.78 among boys)

Riddoch (1998) carried out a literature review on studies analysing participation in organised school sport and physical education and physical activity as a precursor to adult physical activity. He concluded that there was weak to moderate evidence for physical activity habits tracking through adolescence and into adulthood. He also found that many studies had methodological limitations. Suggestions for improvements in future research were first, a clear definition of physical activity and its subsets for children and for adults should be stated. Second, they highlight confounding variables that may affect results. For example, opportunities for women to take part in physical activity and how these have changed over the years. Third, the use of self-report physical activity questionnaires where subjects might be susceptible to recall bias, as active adults may be more likely to remember themselves as active young people, and therefore they suggest validating data where possible with an unbiased source e.g. school records. Riddoch commented on how the study that yielded the strongest tracking correlation used a more objective –heart rate monitors- though not infallible measure.

In summary, the answer to the complex question, do physical activity patterns track from childhood to youth to adulthood, is not yet conclusive. This is partly due to the limitations of current research (Riddoch, 1998). Research, however does support the idea that children who have developed habits, skills, and enjoyed positive early experiences of physical activity are more likely to maintain physical activity throughout their lives (Barnekow-Bergkvist et al., 1996; Engstrom, 1986; Telema et al., 1996). The HEA (1997) in their review on young people and physical activity suggest that establishing active lifestyles from a young age is important, as “the modification of behaviours known to be related to physiological risk factors is best achieved before behavioural patterns are more fully established and resistant to change” (p. 13). This has been supported by other research (Health Education Authority, 1998b).

More research is needed to establish the main determinants of physical activity or inactivity among young adults. It has been shown that transitional periods in a person’s life (e.g. adolescence, retirement, pregnancy, college life etc.) have an influence on their exercise behaviour patterns (Marcus, 1995). This influence can serve to enhance their level of participation in physical activity or it can serve as a barrier. (King et al., 1992) recommended that research was conducted into identifying and describing how important developmental life stages (like leaving school) effect an individual’s readiness and ability to be regularly active.

Thus, further research needs to establish not only the determinants of change, but also the most successful ways of addressing behaviour change in young adults as they leave school and move on to other areas of life.

Models of Behaviour Change

Many psychological and social science approaches to the promotion of physical activity are tied to deductive models of inquiry (Baranowski, Anderson, & Carmack, 1998; Dishman, 1994a). This has led to the development of a wide range of techniques - some of which are based on theoretical models- for intervening with physical activity behaviours. Dishman (1994b) believed that there was “nothing as practical as a good theory” (p. 97). In this comment he was referring to the idea that research that is not theory-based, or does not conform to the use of deductive models, is considered inferior and less likely to yield new scientific knowledge. This view is supported by other researchers (Baranowski et al., 1998; Courneya, Bobick, & Schinke, 1999; Dishman, 1994a; Oldenburg, Glanz, & French, 1999). However, the concept that deductive theory-led research alone is sufficient to produce good research is questionable, as both inductive (empirical) and deductive (model testing) approaches can contribute to theory and consequently model building (Epstein, 1998). In fact, new approaches to exercise behaviour modification that may lead to a paradigm shift may not be accessible purely through deductive reasoning alone.

(Marcus, King, Pinto, & Bock, 1996a) reviewed ten different theories and techniques for promoting physical activity behaviours and conceded that ‘tremendous progress’ (p. 328) had been made in terms of understanding physical activity behaviour. However, they concluded that while some of the models they reviewed showed more promise than others, no model was sufficient to thoroughly explain exercise behaviours or how to best intervene. The remainder of this literature review examines several different theories and models for the promotion of physical activity. Its purpose is to identify the strengths and weaknesses of each theory or model reviewed and to explain why the transtheoretical model of behaviour change was chosen as the theoretical basis for this research.

Various theories and models have been developed to date; some examine the lifespan of an individual and interact with certain determinants on the action/behaviour of that individual over a given time. They can be classified broadly into two groups, the predictive models and the process theories and models. The predictive models manipulate their

constructs in order to anticipate individual involvement or likely avoidance of a particular behaviour. They predict behaviour change as movement along a single continuum of action, movement being predicted solely as a means to an end, a mathematical function of, for example attitudes and beliefs. These influencing factors and their interactions remain stable, and an individual is generally classed as either an exerciser or a non-exerciser and given a specific location on the model. An example of those in the predictive category include the health belief model and the theory of planned behaviour.

Those that focus on the process of behaviour change identify exercise as a behaviour that has many stages. It is not an all-or-none phenomenon, but rather people go through different stages during the change process. This means that the interventions needed to move people towards the desired behaviour vary stage by stage, that is, an individual who is beginning to exercise for the first time should be treated differently to an individual who has been exercising regularly for two months. Examples of those in the process category include the natural history model and the relapse prevention model. The following section will review the main predictive and process models in chronological order beginning with the health belief model.

The Health Belief Model (Maiman & Becker, 1974)

The Health Belief Model [HBM] was originally developed for medical research to determine why asymptomatic populations did not attend screening tests. It has been applied to a wide variety of health behaviours, including breast self-examination (Champion, 1985), asthma (Becker et al., 1978) and exercise (Biddle & Ashford, 1988; Lindsay-Reid & Osborn, 1980). The model lists four types of beliefs that can influence the adoption of a preventive health behaviour, these are susceptibility, severity, benefits and barriers (Figure 2.6). That is, the chances of an individual adopting a particular behaviour in order to prevent or control some disease depends on the individual's perception of how real that threat is to their personal health - both in terms of actually contracting the illness (susceptibility), and in terms of how damaging the illness would be to their current quality of life (severity). It also depends on their belief of how good the behaviour would be at reducing the threat, and on what the drawbacks to adopting the new behaviour might be.

Janz and Becker (1984) reviewed 46 studies which used the HBM. They concluded that the HBM was successful in explaining and predicting preventive health behaviours from

the point of an individual's understanding of how vulnerable they were to illness. They also highlighted barriers to adopting the new behaviour as being an important factor in determining behaviour change. Biddle and Ashford (1988) completed two studies on general population (study one N = 433, study two N = 468) analysing the health beliefs, knowledge and attributes of exercisers and non-exercisers to cardiovascular health. They concluded that exercisers did not perceive themselves as being vulnerable to illness, but scored higher on exercise intention, on the value they placed on exercise and they were more likely to have a higher health motivation for exercising. Non-exercisers in comparison perceived themselves as having a high susceptibility to ill health. This is in contradiction to the HBM which predicts that individuals who feel they are susceptible to ill health will adopt a positive health behaviour. This conclusion is supported by a study (N = 124 sedentary male fire fighters) carried out by Lindsay-Reid and Osborn (1980). They found that those who adhered to an exercise programme tended to have beliefs associated with reduced susceptibility of CHD and general illness, and that feelings associated with susceptibility to CHD and general illness were not determining factors of participation for this sample in terms of adopting physical activity contrary to the HBM. From these two studies, it can be seen that the HBM may have a role in predicting non-adherence to exercise rather than adoption of exercise.

Biddle & Mutrie (1991), in their critique of the HBM, list a number of points that question the applicability of this model to exercise. They question the "holistic nature of the model" (p. 71), asking, if the model is really just comprised of a number of variables (rather than an interactive framework), how then are the variables of the model linked ('Is it a linear combination or a multiplicative interaction?'). They also question the lack of standardisation in instruments used among the studies that served to validate the HBM, thereby compromising comparative reliability among studies to date.

In conclusion, the process of exercise adoption and adherence may be too complex to understand it in a single stage or an all-or-none phenomenon, there may be several stages in the change process and these may vary from individual to individual. The HBM highlighted the importance of beliefs as a variable of change, but it was originally developed to answer the question of why people don't attend medical screenings or avail of health checks. Its application therefore is directed more towards the avoidance of ill-health rather than the attainment of positive health, the extent to which this can be transferred to exercise is unclear.

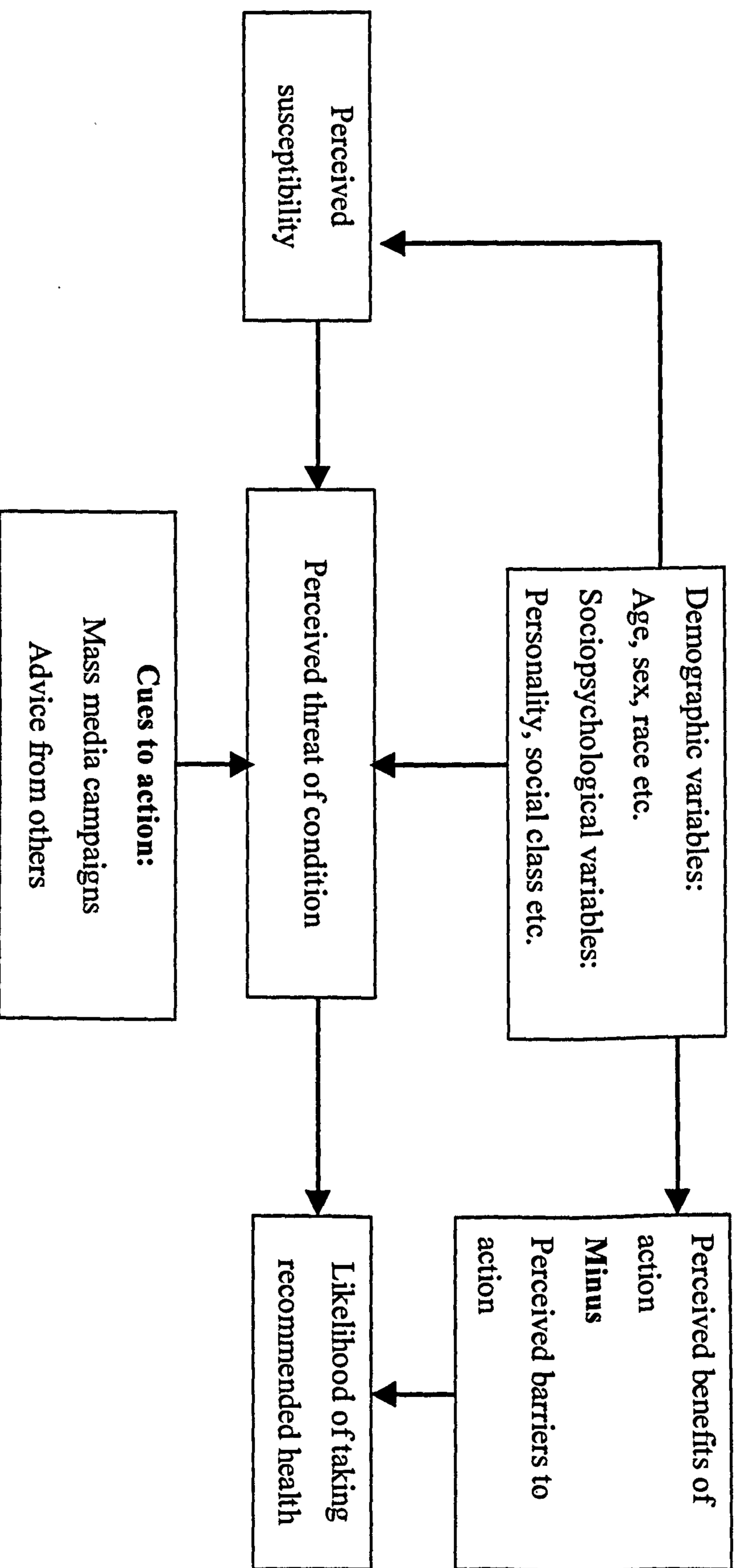


Figure 2.6. The Health Belief Model.

From "Compliance with a medical regimen for asthma: A test of the health belief model" by M.H. Becker, S.M. Radius, I.M. Rosenstock, R.H. Drachman, K.C. Schubert, and K.C. Teets, 1978, *Public Health Reports*, 93, p. 271

The Theory of Social Behaviour (Triandis, 1977)

The theory of social behaviour [TSB] states that the likelihood of adopting a given behaviour is a function of:

- the habit of performing the behaviour,
- the intention to perform the behaviour, and
- the conditions facilitating or discouraging performance of the behaviour (Godin, 1994).

If an individual intends to exercise, this intention, if paralleled with a previous history of physical activity (habit) and membership to the local gym (facilitating conditions), will become a behaviour. In comparison, if an individual is habitually sedentary, then the TSB suggests that influencing this person's intention to exercise is of paramount importance. The first experience of physical activity will only happen if intention influences habit, therefore moving an individual from no intention to exercise in the near future, to definitely intend to exercise in the near future is the first step.

Eventually (provided a positive exercise experience occurred) the 'new' behaviour will become routine and it will continue provided facilitating conditions apply. This is similar to the theory of reasoned action [TRA] (see pages 30-32), except that intention is shaped by four qualities in the TSB in comparison to only two in the TRA. The four qualities are:

1. A cognitive component (Pros and Cons)
2. An affective component (emotional response - fun versus boredom etc.)
3. A social component (opinion of relative others) (normative and role beliefs)
4. A personal normative belief (self-responsibility, what you think is expected of you)

It is clear that past exercise behaviour is an important determinant of current exercise behaviour (Engstrom, 1986; Godin, Valois, Shephard, & Desharnais, 1987). If the established habit is being sedentary, any plan for the promotion of exercise should begin with people who may not want to be active. Godin et al. aimed at understanding the process underlying regular physical activity participation. A random sample of university employees (N = 172) completed a 'behavioural questionnaire investigating beliefs, attitudes, intentions and past behaviour toward physical activity' (p150). Data was collected at baseline and at two-month follow up. From their results they concluded that the development of an exercise habit and a positive attitude (e.g. perceived enjoyment) to physical activity positively influenced an individual's intention to become more active. Therefore, exercise programmes should offer positive experiences to the individual, allowing them to choose what type of activity they would like to be involved in, and which level of intensity they would like to work at.

The TSB highlights the importance of intention, habit and facilitating conditions in altering a behaviour, however influencing these variables may be compounded by other factors. These factors could vary depending on the age, gender, socio-economic status, health etc. of the individual concerned. In order to understand exercise behaviour, the TSB may be too simplistic, as an understanding of other compounding factors is needed. However, this is the first model to suggest that an action-oriented intervention might not be suitable for everyone. It stresses that physical activity interventions should begin where the subjects are and not where they should be. It also stresses the importance of habit in having positive exercise behaviour; this has implications for getting children involved in routine regular physical activity from early on.

Protection Motivation Theory (Rogers, 1983)

The protection motivation theory [PMT] is shown on Figure 2.7. This is similar to the HBM. It is also a cognitive model where the value an individual places on what they expect will happen determines whether or not they change. It was originally developed to explain the effect of health threats on achieving change e.g. smoking kills campaign. The PMT proposes that one's intention to protect against illness depends upon four components, the perceived severity of the threat, the perceived probability of occurrence, the efficacy of the recommended preventive behaviour (how good is it?), and their own personal self-efficacy (how good am I?). A sedentary individual will change their behaviour (initiate activity) if they feel vulnerable to getting CHD, if they think by walking regularly this will prevent more damage being done and possibly redress some of the damage to date. They also need to feel confident in their ability to lead a physically active lifestyle.

The main difference between the PMT and the HBM is that it incorporates components of the self-efficacy theory (see the social cognitive approach to physical activity). This is an independent construct highlighted as a mediator of change in a number of studies (McAuley & Courneya, 1992; McAuley, Talbot, & Martinez, 1999). The PMT also distinguishes between threat appraisal and coping appraisal, this gives a definite framework to the model and helps in our understanding of the decision-making process involved in behaviour change.

(Courneya, 1995) examined 'perceived severity' of physical inactivity to see if it could discriminate across the stages of change and intention to exercise in older adults (N = 270). The stages of change are defined on Table 2.2. His study showed that perceived

severity separated those in the precontemplation stage (not active now and not intending to become physically active in the next 6 months) from those in the contemplation stage (not active now but thinking about becoming active in the next 6 months), however the contemplation stage was not further divided from the remaining stages of change (preparation, action or maintenance). Courneya deduced from his findings that the “main function of perceived severity of physical inactivity is to motivate people to seriously consider becoming physically active” (p. 453). He also revealed that the perceived severity was lower in the precontemplators than in the any of the other stages of change. This lends support to the belief that people who have ill health tend to protect or take care of themselves rather than exercise (Marcus et al., 1996a).

Wurtele and Maddux (1987) tested the PMT in an exercise setting. They got undergraduate women (N = 160) to read information aimed at increasing their activity levels. The information was varied to reflect the four components listed above. They found that health messages targeted to only perceived probability of occurrence and personal self-efficacy increased intention to exercise and increased self-reported exercise level. This model serves to highlight the influential role of self-efficacy in exercise participation and adherence. More research is needed into the role of PMT in exercise. The notion that messages with threats have a role to play in inducing and sustaining changes in behaviour also needs to be more fully researched.

Theory of Reasoned Action (Ajzen & Fishbein, 1980)

According to this theory, central to participation in a specific voluntary behaviour in a given situation is an individual's behavioural intention. This intention is based on two factors: personal attitude to the given behaviour and the influence of social norms towards performing the behaviour (Godin, 1994; Marcus et al., 1996a). Ajzen and Fishbein classify attitude as an individual's belief about a specific behaviour, their evaluation of the outcome of adopting this behaviour (the perceived consequences or benefits), and their perception of what significant others expect them to do (subjective social norm) (Figure 2.8).

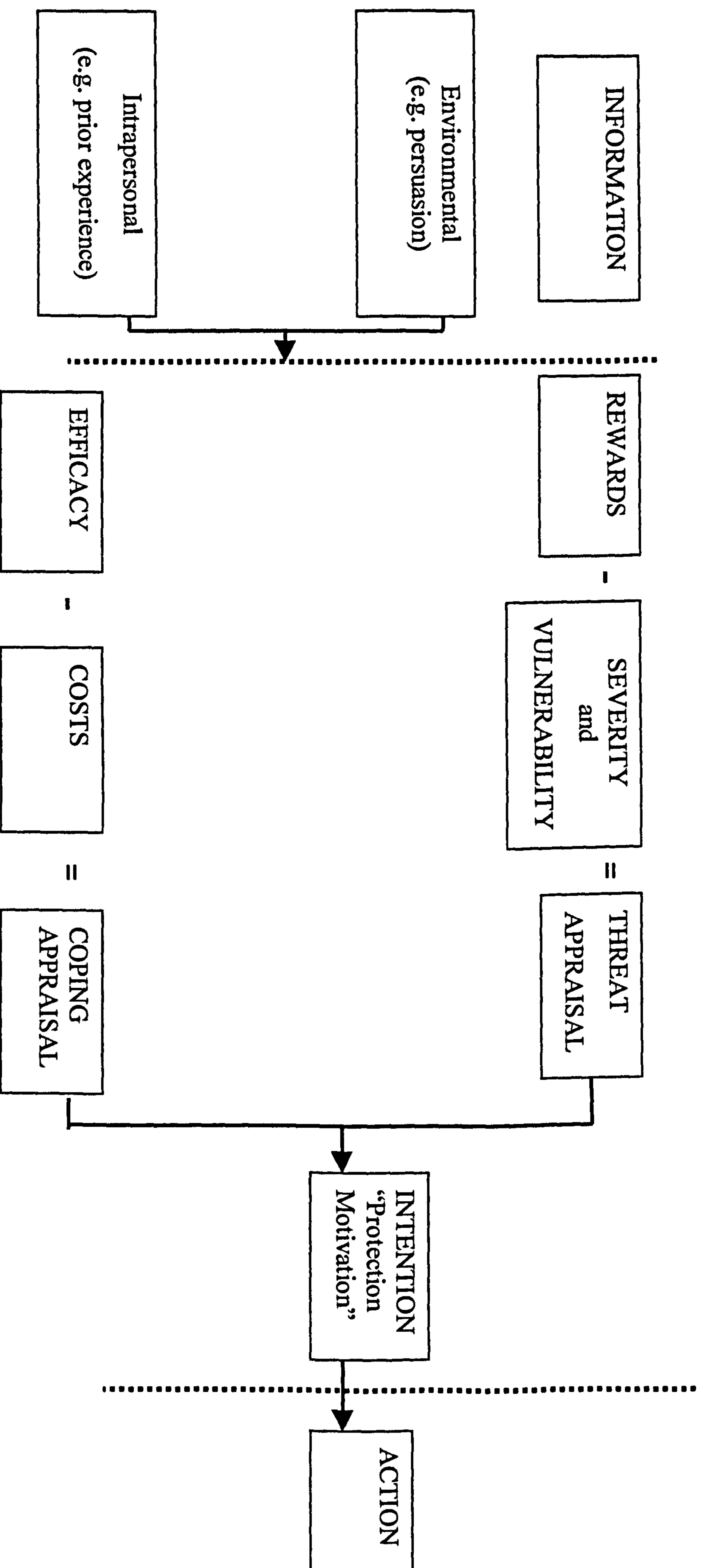


Figure 2.7. Protection Motivation Theory.

From ‘Psychology of Physical Activity and Exercise’ by S. Biddle and N. Mutrie, (1991), Springer-Verlag. London. p. 90.

The theory of reasoned action [TRA] has been used for research in a number of health behaviours (McCaul, O'Neill, & Glasgow, 1988). It has also been applied to exercise research (Ajzen & Driver, 1992; Dzewaltowski, 1994; Godin & Shephard, 1986; Riddle, 1980). Riddle (1980) used the model to predict exercise behaviour among joggers and non-exercisers (N = 296 adults). She found that intention to exercise (jog) was significantly predicted by both the attitudinal and the normative components of the model, although the attitudinal component was stronger. The beliefs of injury associated with beginning to jog were highly predictive of non-participation in the non-exercising group. The joggers held much more positive beliefs about the value of jogging. Godin and Shephard (1986) studied children's activity patterns (N = 698, aged 12-14). They found that boys were more active than girls, had a greater intention to exercise than girls, and scored higher on the attitudinal and normative components of the TRA. Similar to Riddle's study, the attitudinal component was found to be a better predictor of participation than the normative component.

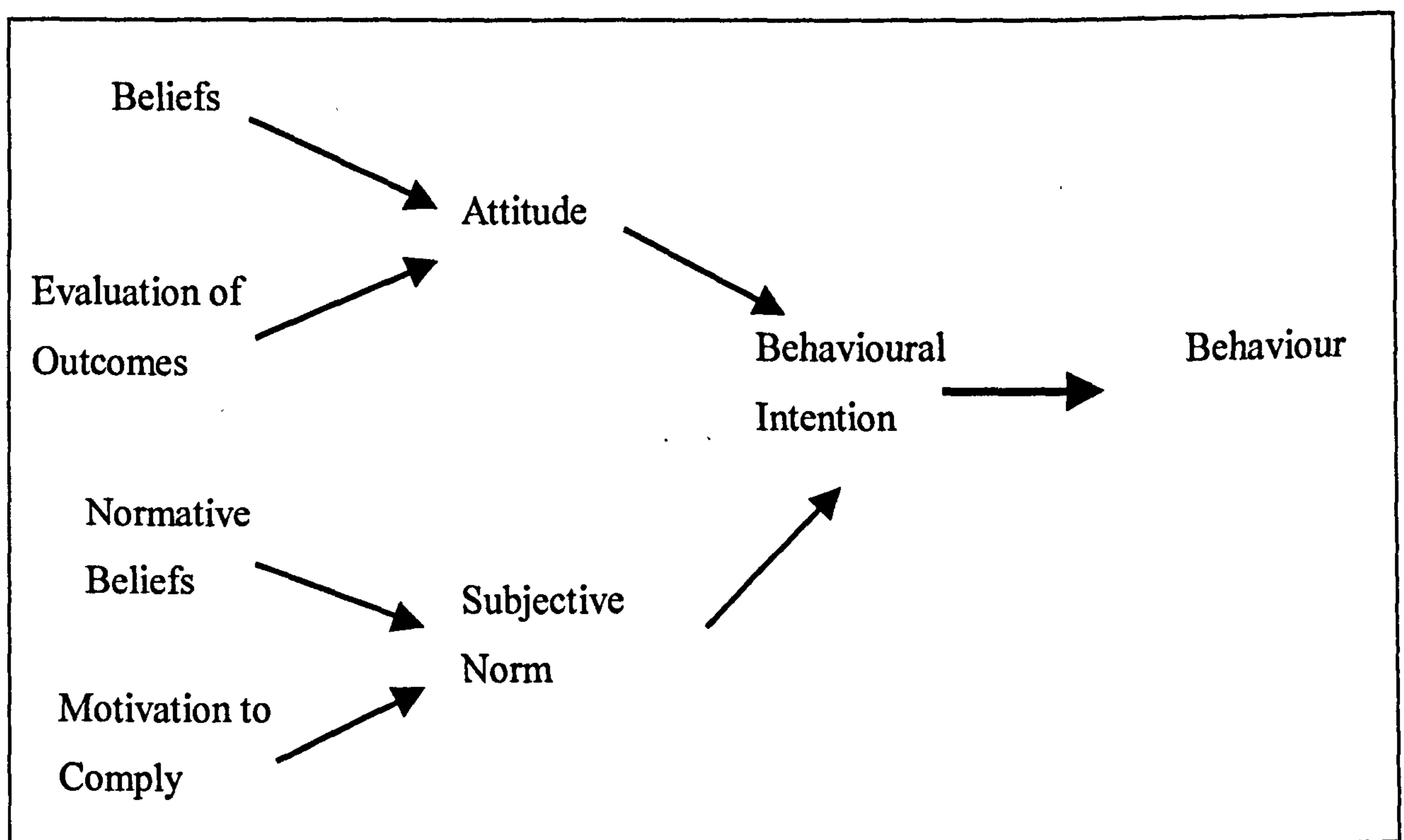


Figure 2.8. The Theory of Reasoned Action.

From "Attitudes, personality and behaviour" by I. Ajzen, 1988, Open University Press. Milton Keynes.

Godin (1994) reviewed twelve studies that investigated the relationship between intention to exercise and exercise behaviour. He concluded that approximately 30% of the variance in exercise behaviour (i.e. participation versus non-participation) could be

predicted from intention alone. He also found that the attitudinal variable had a much greater influence than the social variable on predicting variance in intention to exercise. This is important as it highlights a role for interventions in attempting to influence the beliefs and perceived consequences among the general public of adopting new health behaviours for example exercise.

Biddle and Mutrie (1991) in their critique of the TRA highlighted that it is a 'uni-directional model' (p. 84) and it does not take into account the fact that the variables listed could act in a reciprocal manner. The TRA does not take into account habitual behaviour and therefore is only useful in the prediction of new behaviours. Finally, the TRA was developed for the prediction of behaviours that are voluntary, specific and chosen by the individual. However, in reality, changing a job, costs of attending a local leisure centre or inclement weather are not always under personal control. To conclude, this model highlights the importance of attitudinal determinant and 'sociocultural variables' (normative determinant) in understanding the decision making process underlying exercise behaviour.

Theory of Planned Behaviour (Ajzen, 1988)

The TRA assumed that behaviour change was within the individual's control all of the time, while the Theory of Planned Behaviour [TPB] places control on a continuum, stating that according to the situation an individual may find themselves going from having complete control to having no control. Ajzen (1988), therefore extended the TRA to include behaviours that may not entirely be under an individual's control (Figure 2.9), the TPB contains an additional variable that of perceived behavioural control. Perceived behavioural control is defined by Ajzen (1988, p. 132) as "the perceived ease or difficulty of performing the behaviour". This perceived behaviour will reflect previous experience in relation to the new behaviour, as well as the anticipated barriers of adopting this new behaviour. This implies that an individual's confidence in adopting a given behaviour could depend on the opportunities, resources, or skills that are required of that individual and whether or not control of these variables is an option. According to the TPB, perceived behavioural control as well as the attitudinal and normative variables can influence intention and in turn influence behaviour.

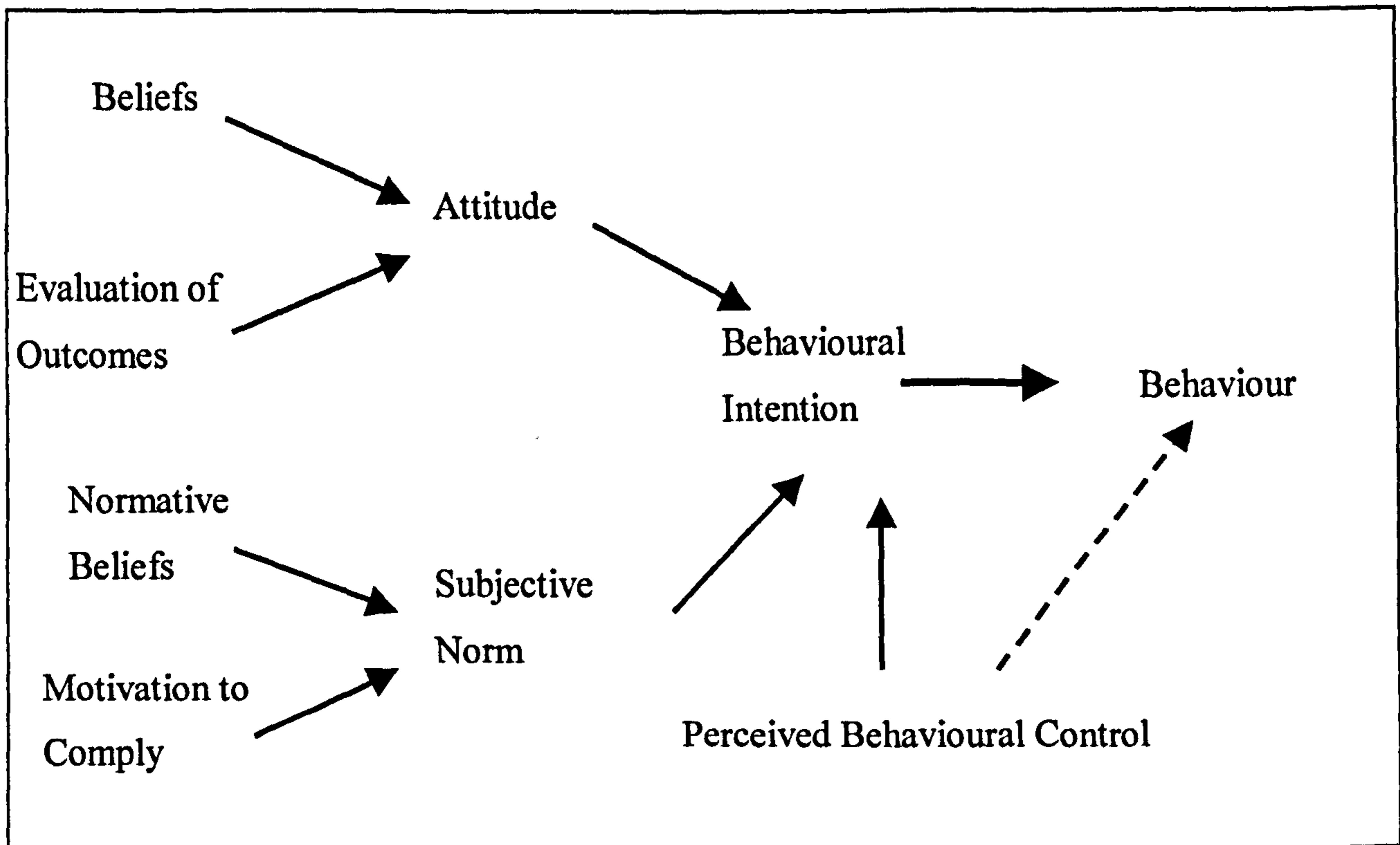


Figure 2.9. The Theory of Planned Behaviour.

From "Attitudes, personality and behaviour" by I. Ajzen, 1988, Open University Press, Milton Keynes.

This model builds on the previous model, and appears to improve on the predictability of the TRA. Some support for the TPB was evidenced in a review of seven studies by Godin (1994). He found that by using the TPB to predict behaviour an additional significant portion of variance in intention to exercise could be explained by the perceived behavioural control variable when compared to TRA. The average of additional gain was approximately 8%. However in predicting actual exercise behaviour the eight studies did not show quite such significant changes. Three out of six studies that attempted to predict behaviour showed insignificant contributions for the perceived control variables. Godin comments that "the usefulness of the theory of planned behaviour in exercise seems to be to further understand the formation of intention because, in addition to the attitudinal and normative components perceived limitations to exercise are also considered" (p. 1393).

Most of the studies reviewed by Godin (1994) in this paper were based on the ACSM (1990) vigorous continuous message for physical activity. Research now needs to examine how the moderate accumulative message (CDC/ACSM, 1995), which places control more firmly in the hands of the individual exerciser, effects predictability of the Theory of Planned Behaviour. This model, similar to the TRA, has the problem of being unidirectional when some of the variables could be reciprocal in nature. There is also no

reference to variables that could influence social norm. This is where the social cognitive theory may be influential.

Social Cognitive Approach to Physical Activity

The determinants of participation in physical activity are numerous (Biddle, 1995). Some theoretical approaches focus on specific determinants which can help positively influence health behaviour change, for example, the manipulation of environmental variables such as social support (Duncan, McAuley, Stoomiller, & Duncan, 1993). (Bandura, 1986; Bandura, 1989) felt that a combination of several determinants work together in order to facilitate behaviour change. He proposed that personal, environmental and behavioural factors combine and work together to determine participation or avoidance of a new behaviour (Figure 2.10).

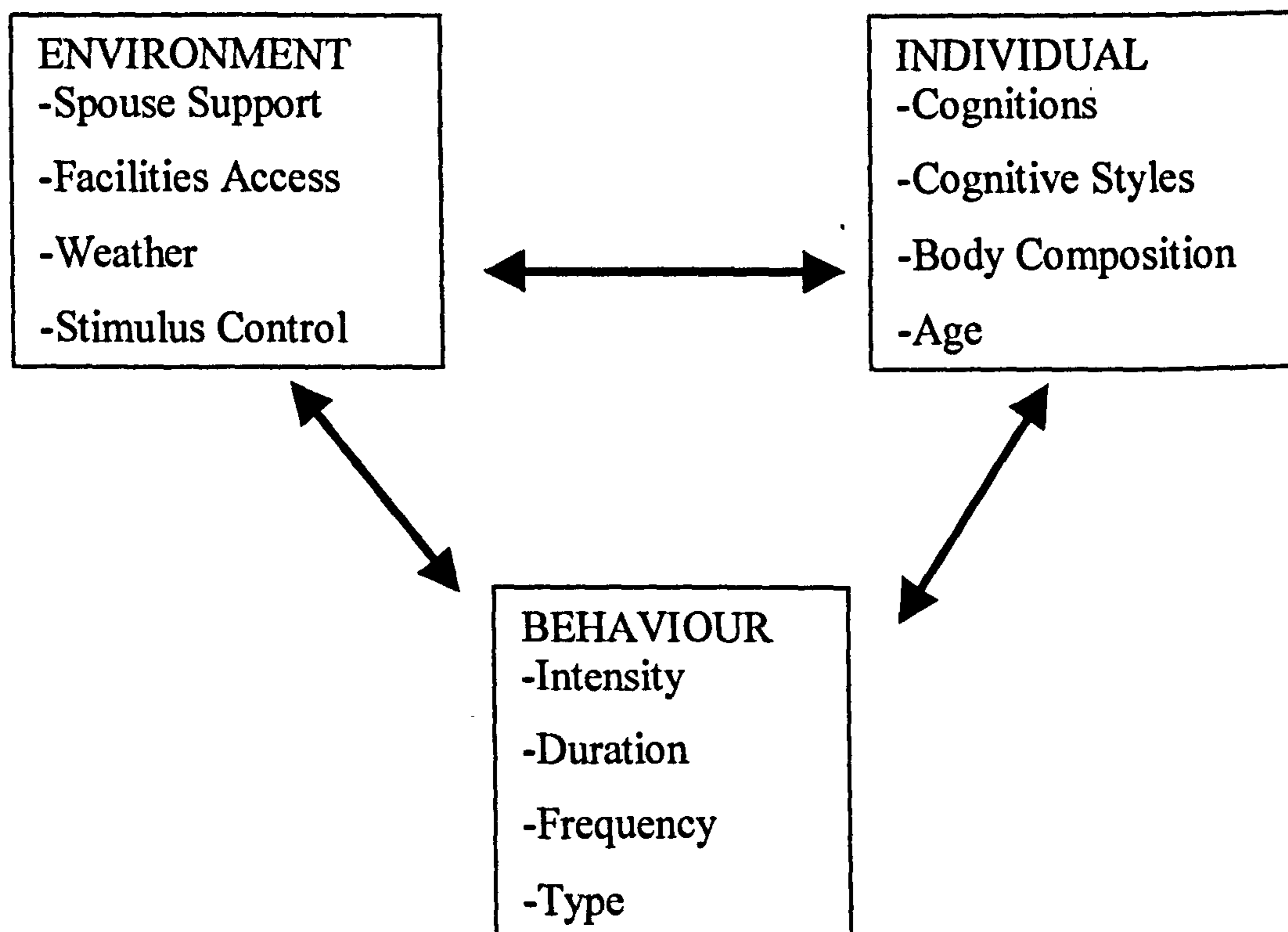


Figure 2.10. A Social Cognitive Approach: The relationship among the three classes of determinants in triadic reciprocal causation.

Adapted from "Physical activity determinants: a social cognitive approach" by D.A. Dzewaltowski, 1994, *Medicine and Science in Sport and Exercise*, 26, p. 1396.

Within this conceptual model, the cognitive processes are given priority. For example, an individual who is thinking about beginning an exercise regime for the first time in years would be encouraged to find an activity they liked and felt confident in doing

(exercise self-efficacy), to set realistic and achievable goals (that is to give them autonomy and control over their own behaviour change), and to regularly evaluate their progress towards achieving these goals (highlight what to expect). How one thinks about physical activity (cognitive processes), becomes a mediator for controlling the other determinants in the model (environmental and behavioural). Therefore each individual is autonomous, and as such is both the agent and the recipient of their behaviour (Marcus et al., 1996a).

Self-efficacy is a central concept within social cognitive theory and it implies that if a person feels confident in their abilities to perform a desired behaviour for a specific setting, then they are more likely to engage in that activity (Bandura, 1977; Bandura, 1986). Therefore, if a person feels confident of successfully adopting and maintaining a regular exercise routine, they are more likely to do it than a person who does not feel confident. Behaviours such as exercise adherence, weight loss, and addiction, where long-term change is possible but difficult, have been shown to be influenced by perceived self-efficacy (Duncan et al., 1993). Bandura (1977, 1986) comments that individuals with a high sense of self-efficacy tend to approach more challenging tasks, put forth more effort, and persist longer in the face of obstacles, barriers and aversive or stressful stimuli. Self-efficacy is developed through past performance, vicarious experience (i.e. learning from others), verbal persuasion and physiological feedback (Bandura, 1986; King et al., 1992). Recently two additional sources of self-efficacy have been identified as emotional states and imaginal experiences (Maddux, 1995). Emotional states implies the mood of the individual, in that happiness, stress or fear derived from involvement in physical activity might impact on the development of efficacy expectations. Imaginal experiences refer to the use of mental imagery and how those feelings influence one's self-efficacy, particularly in a performance situation (Vealey & Walter, 1993).

Dzewaltowski (1994) looked at the determinants for physical activity from a social cognitive approach. He agreed with the concept of individual autonomy, and in order to foster this autonomy put forward the concept of 'physical activity intelligence'. This implies that the cognitive processes necessary for coping with the determinants of physical activity (outlined above) are not innately effective. Cognitive processes like goal-setting, or analysing biofeedback are important in developing positive self-efficacy, or in maximising positive outcome expectations. They are skills that can be taught, learned and developed through experience (either guided or discovery). This highlights, according to Dzewaltowski (1994), an important role for health professionals (especially physical education teachers) in developing the physical activity intelligence of students.

King, Blair et al. (1992) reported on five studies that supported the effectiveness of interventions that include goal setting, feedback, self-monitoring and self-reinforcement (p. S225). They concluded that the social cognitive approach provides a strong foundation to guide intervention efforts. However, they highlighted that systematic testing of the components of the theory (apart from self-efficacy) is lacking. Further research into the role of the social cognitive approach in different population groups is needed.

The Natural History Model (Sallis & Hovell, 1990)

Biddle and Mutrie (1991) in their review of psychology of physical activity identified a “developmental approach” as important to determining the potential influences on participation that existed over an individual’s “life cycle”, for example during transitional periods like leaving formal education (p. 262). Sallis and Hovell (1990) developed a model that analysed transitional stages in exercise behaviour. The structure of the model is shown on Figure 2.11. These were the sedentary stage, the adoption stage, the maintenance or drop-out stage, and the resumption stage. They proposed that the determinants that influenced movement from one stage to another may not be the same for all stages, that is, an individual who begins exercising for the first time in a long time may have done so for entirely different reasons to the individual who resumes exercising after a short break.

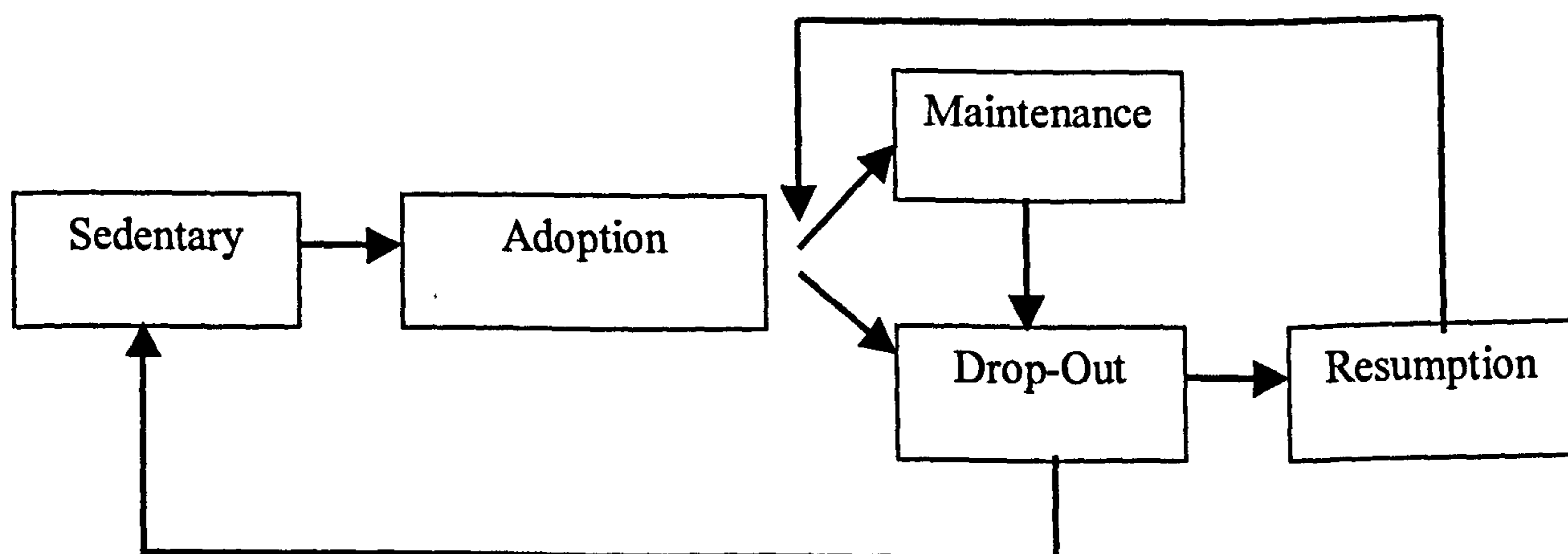


Figure 2.11. The Natural History of Exercise Model.

From “Determinants of Exercise” by J.F. Sallis and M.F. Hovell, 1990, *Exercise and Sports Sciences Reviews*, 18, p. 320.

Relapse Prevention Model (Marlatt, 1985)

The relapse prevention model [RPM] was originally designed to improve understanding of the breakdown in adherence to abstinence from addictive substances e.g. alcohol abuse, smoking and drug addiction. Marlatt identified a relapse as “a breakdown or set back in a person’s attempt to change or modify any target behaviour” (1985, p. 3), and his model aims at clarifying the meaning of relapse, identifying its determinants, and importantly highlighting relapse prevention strategies for behaviours that are under volitional control. The model as it applies to exercise is shown on Figure 2.12. Knapp (1988) highlights that understanding why an individual ceases doing something that is dangerous to health, but that they enjoy e.g. smoking, is different to understanding why an individual adopts physical activity, a “low frequency, desired behaviour” (p. 221). This raises questions about how applicable this model is to exercise behaviour.

The primary objective of the RPM is to prepare individuals for unavoidable lapses in a given behaviour. It begins with the individual identifying ‘high-risk situations’. These are situations where the individual is faced with disruptions to their regular routine. These disruptions are often perceived as being outside of their control and they challenge their maintenance of behaviour change. Marlatt (1985) identified negative emotional states, social pressure and interpersonal conflict as three primary high-risk situations to individuals with addiction problems. In the RPM, the individual is encouraged to identify barriers that might present themselves in an exercise situation. There are two possible choices for the individual once they have identified the high risk situation, (Knapp, 1988) refers to them as “the positive and the negative scenario” (p. 222). In the positive scenario, the aim is to develop appropriate behavioural and cognitive coping skills to prevent a high risk situation (e.g. changing jobs) which may lead to a lapse (e.g. a missed exercise session) becoming a complete relapse i.e. adopting a sedentary lifestyle. The coping skill needed might be time-management, this in turn will lead to increased self-efficacy for exercise and decrease the likelihood of relapsing.

The negative scenario however is where the individual does not develop the appropriate coping skills and therefore their confidence at still being able to exercise while starting a new job decreases, hence a reduction in exercise self-efficacy is experienced. According to the RPM, the individual may experience positive outcome expectations, i.e. they may have more time on their hands when not exercising, and inactivity commences. This in turn leads to ‘abstinence violation effect’ [AVE], where the individual feels a sense of conflict between wanting to exercise but having no perceived control over their

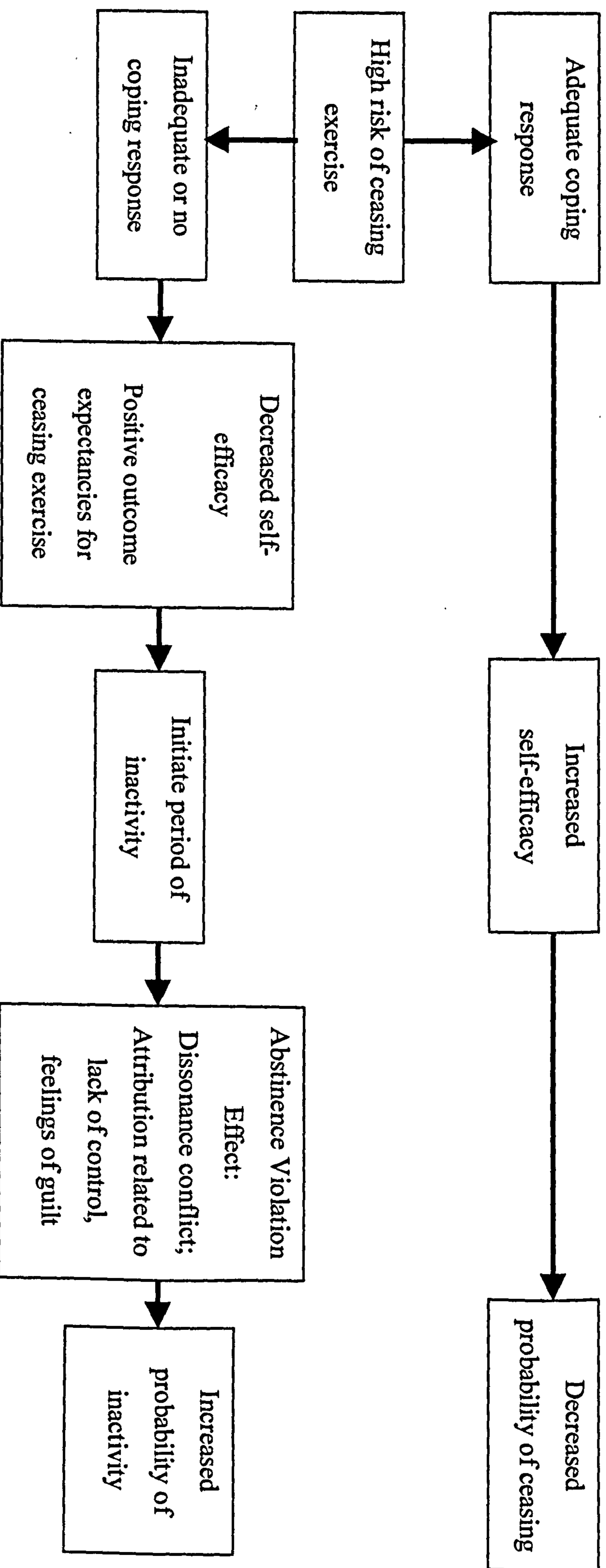


Figure 2.12. The Relapse Prevention Model.

From Relapse prevention: Theoretical rationale and overview of the model by G. A. Marlatt, 1985 in "Psychology of Physical Activity" Edited by S. Biddle and N. Mutrie, 1991, London, Springer-Verlag. p. 59

situation, or blaming themselves for not being able to adhere to the exercise programme, or feeling guilty because they have stopped exercising, all of which will contribute to a relapse from physical activity.

A review of studies conducted using the RPM by King, Blair et al. (1992) and Marcus, King et al. (1996a) reveal that teaching relapse prevention ideas e.g. goal setting, decision making skills etc. either in isolation or in combination with other cognitive strategies can lead to improved short-term and long-term goals. They concluded that more research is needed which applies this model to diverse populations in a variety of situations in order to clarify how useful the model is in predicting exercise adherence.

In summary, the models reviewed have various strengths and weaknesses. The health belief model highlighted the importance of individual beliefs in behaviour change, but it was developed to understand the avoidance of ill health and as such has limitations about how it can explain the adoption of a positive behaviour. The protection motivation theory has a similar problem as the health belief model. However, it did highlight the influential role of the social cognitive determinant self-efficacy. Both the theory of reasoned action and the theory of planned behaviour have furthered our understanding of behavioural intention in modifying behaviour, but they are unidirectional and the importance of social cognitive variables like self-efficacy are not accounted for in the model. The theory of social behaviour was the first model to stress the importance of interventions beginning where the individual is and not designing one intervention for all. However its weakness is its simplicity. The social cognitive theory emphasises the importance of individual autonomy when it comes to change, it recognises that individuals change because of cognitive, environmental and behavioural factors, however it does not tell us how to influence these factors. The process model the natural history model was the first to highlight that different stages might exist in exercise behaviour change, however its weakness is not identifying what predicts successful movement through these stages. Finally, the relapse prevention model was developed for health behaviour change. It is the first model to try to prevent an individual reverting back to the problem behaviour once the change has been made. More research that applies this model to wider populations and exercise behaviour specifically is needed.

In conclusion, (Dishman, Sallis, & Orenstein, 1985) listed nearly forty factors that may have an important influence on adult activity patterns. An inadequate understanding of these factors is a major barrier to the successful promotion of a physically active lifestyle. Further research into the efficacy of behaviour change theories and models in

guiding the design of effective interventions aimed at increasing physical activity is needed. The models should be adaptable to a wide range of behaviours, in order to explore the relationship between solving one problem, and the potential and actual impact this would have on other health behaviours. Research needs to broaden to include both the qualitative and quantitative methods to answer these research questions. One thing that prediction models do not cater for is the fact that physical activity by its very nature is a complex, dynamic behaviour. Individuals change their intention, their behaviour, their attitude, their reasons for exercising not once or twice but numerous times before a stable behaviour is established. The following section deals with the transtheoretical model of behaviour change.

The Transtheoretical Model of Behaviour Change

The transtheoretical model of behaviour change [TTM] has been described as an integrative and comprehensive model (Prochaska & Norcross, 1999). Its integrative nature is due to the fact that it relies not merely on one unique form of psychotherapy (e.g. psychoanalysis) but it draws from the entire spectrum of leading theories of psychotherapy and behaviour change. In his review 'Systems of Psychotherapy: A transtheoretical approach' (Prochaska, 1979) felt that all psychotherapy systems made a valuable contribution to the understanding of human behaviour change. However, he identified divergence between the different theories more in terms of what was to be changed rather than in how change should occur. He therefore began a process of integration. A summary of the major psychotherapies and the change processes extracted from them for use in the TTM can be seen on Table 2.1.

The comprehensiveness of the TTM is attributed to the extensive ways in which this model can help people change. First, it is a model of intentional behaviour change, which can address the fact that in some addictive behaviours people change entirely on their own, without professional intervention. The concept of intentional behaviour change evolved from research that identified individuals who intentionally modified addictive behaviours like smoking, obesity, alcohol abuse and opiate use (Prochaska, DiClemente, & Norcross, 1992). Second, it can cope with a range of interventions from minimum intervention (self-help material) to maximum intervention (more formal exercise consultation). Third, the TTM can cover the full course of change that is from the time someone becomes aware of the problem to the time that it no longer exists. Fourth, it is open to developments in behavioural psychology, and it has the potential to incorporate additional variables that are discovered to play important roles in how people change

addictive behaviours. Finally, the TTM has been shown to be applicable to a wide range of health behaviours especially in the addictions (Marcus, Simkin, Rossi, & Pinto, 1996b).

There are several core components to TTM, these are the stages of change, the processes of change, self-efficacy and decisional balance. The following section will describe each of these core components in relation to physical activity.

Table 2.1

Summary of the principal theories of psychotherapy

Theory	Notable Figures	Primary Process of Change	Representative Technique
Psychoanalytic	Sigmund Freud	Consciousness raising	Analysis of resistance
	Carl Jung	Dramatic relief	Free association
			Dream interpretation
Humanistic / Existential	Carl Rogers	Social liberation	Clarification and reflection
	Rollo May	Commitment	Empathy and warmth
		Helping relationships	Free experiencing.
Gestalt/ Experiential	Fritz Perls	Self-reevaluation	Choosing and feedback
	Arthur Janov	Dramatic relief	Confrontation
Cognitive			Focusing
	Albert Ellis	Counterconditioning	Education
	Aaron Beck	Self-reevaluation	Identifying dysfunctional thoughts
Behavioural			Cognitive restructuring
	B.F. Skinner	Environmental	Assertion
	Joseph Wolpe	Control	Relaxation training
		Reinforcement management	Managing reinforcements
			Self-control training

Note. Adapted from 'Changing for good: A revolutionary six-stage program for overcoming bad habits and moving your life positively forward' by James Prochaska, John Norcross and Carlo DiClemente (1994b, p. 26). New York: Avon Books.

Core ConstructsStages of Change

According to the TTM, change is a dynamic process that occurs over time. In order to explain this temporal component of the change equation, the stages of change [SOC] were identified and introduced to the model. The stages allow us to understand ‘when’ particular shifts in attitudes, intentions and behaviours are most likely to occur. They suggest that as an individual changes their behaviour, they progress through a series of five SOC; these are precontemplation, contemplation, preparation, action and maintenance. In original work by Prochaska and DiClemente, relapse was classified as a sixth stage however research has demonstrated that relapse is a form of regression, which is accounted for by a return to an earlier stage (Marcus & Simkin, 1993; Prochaska & Velicer, 1997b; Richards Reed, Velicer, Prochaska, Rossi, & Marcus, 1997). The definition of each SOC as it applies to physical activity is listed on Table 2.2.

Table 2.2

Names and definition of the stages of change for exercise

Stage	Definition
Precontemplation (PC)	There is no intention to become active in the foreseeable future. Many individuals in this stage are unaware of their problem. Resistance to recognise the problem is the hallmark of PC.
Contemplation (C)	Serious consideration of problem resolution is central to this stage. Individuals need to convince themselves to begin to take action to avoid a contemplative habit being established.
Preparation (P)	Individuals are intending to take action immediately and have initiated small changes in their behaviour.
Action (A)	Individuals modify their behaviour, experiences and/or environment in order to meet the minimum levels of physical activity required for leading an active lifestyle.
Maintenance (M)	Individuals work to prevent relapse and consolidate the gains attained during action. This is not a static stage, rather a continuation of change. Being able to remain free of the chronic problem and/or to consistently engage in a new incompatible behaviour for more than 6 months is the criterion for Maintenance

Each stage incorporates both behaviour and behavioural intention, as an individual indicates their current behaviour and their intentions about future behaviour change by categorising themselves into one of the five SOC. Originally progression through the stages was conceived as linear, as individuals were thought to progress from one stage to another in a simple discrete fashion (Prochaska et al., 1992). A linear progression –though possible- has been identified as extremely rare, especially in some chronic disorders (Prochaska & Norcross,1999). This led to the model evolving to a spiral pattern (Figure 2.13).

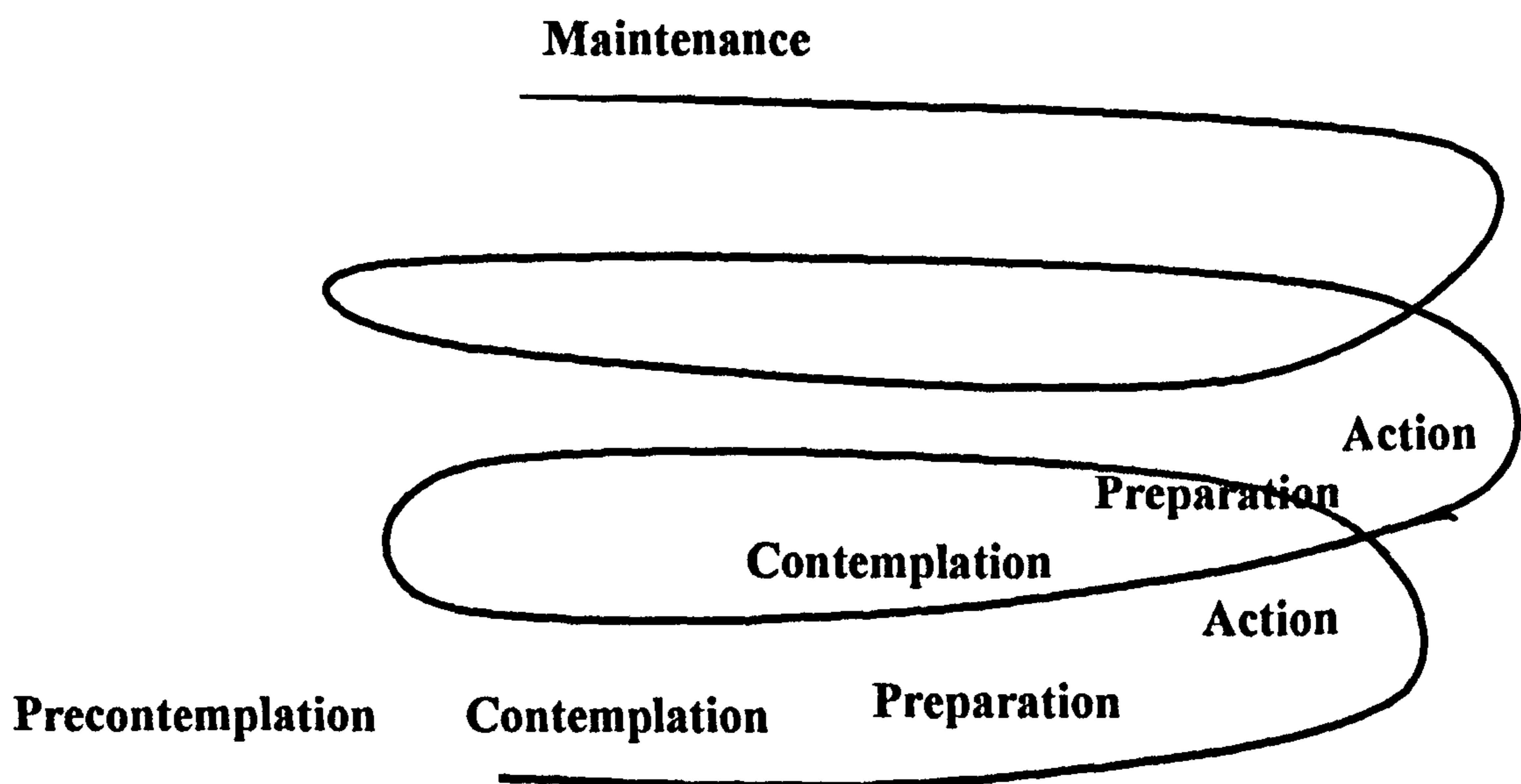


Figure 2.13. A Spiral Model depicting progression through the Stages of Exercise Behaviour Change.

In this pattern of change, each stage can be both stable and dynamic in nature depending on the individual concerned. For example, individuals are thought to progress through the SOC at different rates with some individuals getting stuck at certain stages and others relapsing and sliding back to earlier stages. The individuals that relapse (relapsers) may recycle into the model, or alternatively due to a variety of reasons e.g. guilt, embarrassment, may return to precontemplation. Research suggests that a high number of relapsers recycle back to the contemplation or preparation stage (Prochaska & Norcross, 1999). The spiral model suggests that most relapsers do not revolve endlessly in circles and that they do not regress all the way back to where they began. Instead, each time relapsers recycle through the stages, they potentially learn from their mistakes and can try

something different the next time around (DiClemente et al., 1991). Individuals are thought to progress through the SOC at different rates, and whereas the time to progress through the stages is variable, Prochaska and Norcross (1999) suggest that the 'set of tasks' which have to be accomplished at each SOC are less variable. An example of each item on an ordered categorical SOC instrument and the tasks to be accomplished in each SOC are listed on Table 2.3.

Table 2.3

Item wording for each Stage of Change [SOC] and a list of tasks to be completed in order to progress successfully on the SOC scale.

Stage	Questionnaire Item	Tasks to be completed ²
PC	I am not regularly physically active and do not intend to be so in the next 6 months ¹ .	PC need to acknowledge or take ownership of the problem, increase awareness of the negative aspects of the problem, and accurately evaluate self-regulation capacities
C	I am not regularly physically active but am thinking about starting to do so in the next 6 months.	C need to take a firm decision to take action, and engage in preliminary action to move to the next stage.
P	I do some physical activity but not enough to meet either the ACSM (1990) or the CDC/ACSM (1995) guidelines.	P need to set goals and priorities toward taking action. They are often already engaged in the processes which would increase self-regulation and initiate behaviour change
A	I am regularly physically active but only began in the last 6 months.	A have to develop effective strategies to prevent lapses or slips from becoming complete returns to sedentary behaviours.
M	I am regularly physically active and have been doing so for longer than 6 months.	M requires sustained behavioural change for periods of time from 6 months up to 3 or more years after the initial action.

Note.

¹ A six-month time frame was used because it was assumed that this is about as far in the future as most people plan a specific behaviour change (Marcus et al., 1993).

² The list of tasks are adapted from "Systems of Psychotherapy: A Transtheoretical Analysis" by J.O. Prochaska and J.C. Norcross' 1999a, Pacific Grove, CA: Brooks/Cole Publishing Company. p. 487-528.

Processes of Change

The processes of change component of the TTM involve understanding the 'how' part of the change equation. These processes include cognitive, affective, evaluative and behavioural strategies that an individual may use to modify problem behaviour. These processes have been used to understand a range of behaviours including smoking cessation and physical inactivity (Prochaska, Velicer, DiClemente, & Fava, 1988). The change processes were first identified in the comparative analysis of the leading psychotherapies mentioned above (Prochaska, 1979). Although many different psychotherapies exist (Karasu, 1986) and these are based on divergent theoretical assumptions, ten change processes were extracted during the comparative analysis. These basic processes of change were identified in retrospective, cross-sectional, and longitudinal studies of self-changers (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1985). They had received the most theoretical and empirical support in work on behaviour modification over a broad range of health behaviours (Prochaska et al., 1988). The ten processes of change represent two higher order constructs, the experiential and the behavioural processes. The experiential or cognitive processes are consciousness raising, dramatic relief, environmental reevaluation, social liberation, and self-reevaluation. The behavioural or action processes are self-liberation, counterconditioning, reinforcement management, helping relationships and stimulus control. The ten processes, their definitions as they apply to physical activity, and an example of assessment items used in the processes of change questionnaire are listed on Table 2.4.

Table 2.4

Definition and item examples of the processes of change.

Process Name	Definition	Question example
<i>Experiential</i>		
Consciousness raising	Efforts by the individual to seek new information and to gain understanding and feedback about physical activity	I read articles about exercise in an attempt to learn more about it.
Dramatic relief	Affective aspects of change, often involving intense emotional experiences related to the problem behaviour	Warnings about the health hazards of inactivity move me emotionally.
Environmental reevaluation	Consideration and assessment by the individual of how inactivity affects the physical and social environments	I wonder how my inactivity affects those people who are close to me
Self-reevaluation	Emotional and cognitive reappraisal of values by the individual with respect to inactivity	I get frustrated with my-self when I don't exercise
Social liberation	Awareness, availability, and acceptance by the individual of active lifestyles in society	I am aware of more and more people encouraging me to exercise these days.
<i>Behavioural</i>		
Self-liberation	The individual's choice and commitment to change the problem behaviour, including the belief that one <i>can</i> change	I tell myself that if I try hard enough I can keep exercising.
Reinforcement management	Changing the contingencies that control or maintain a sedentary lifestyle	I reward myself when I exercise
Counterconditioning	Substitution of alternative behaviours for the problem behaviour	Instead of remaining inactive I engage in some physical activity.
Stimulus control	Control of situations and other causes that support inactivity	I remove things that contribute to my inactivity.
Helping relationships	Trusting, accepting, and utilising the support of others during attempts to initiate physical activity.	I have someone who points out my rationalisations for not exercising.

Note. Adapted from "The Stages and Processes of Exercise Adoption and Maintenance in a Worksite Sample" by B.H. Marcus; J.S. Rossi; V.C. Selby; R.S. Niarua, and D.B. Abrams, 1992c, *Health Psychology*, 11 (6), p387.

A differential pattern of process use by SOC was established for smoking cessation (Prochaska et al., 1988), and further research supported this finding in physical activity (Bock, Marcus, Rossi, & Redding, 1998; Gorley & Gordon, 1995; Marcus, Rossi, Selby, Niaura, & Abrams, 1992c; Marcus et al., 1996b; Nigg & Courneya, 1998). The processes of change were shown to be used less frequently by those in the earlier SOC in comparison to those in the more advanced stages. Precontemplation used the processes the least while action and maintenance used the processes more frequently. From this finding, the concept of different stages having to complete different 'tasks' in order to move forward in the change process was identified (Prochaska, Norcross, & DiClemente, 1994a; Prochaska & Norcross, 1999). The list of tasks for each SOC are shown on Table 2.3. For example, in precontemplation it was thought that individuals had to acknowledge that sedentary living was a problem and detrimental to their health. This increased consciousness was thought to have been achieved through the use of the processes of change consciousness raising and dramatic relief. Table 2.5 shows the stages in which specific processes of change are used most frequently for smoking cessation (Prochaska & DiClemente, 1983; Prochaska, Norcross & DiClemente, 1994a; Prochaska & Norcross, 1999). This has important implications for behaviour change in physical activity. This knowledge provides the exercise consultant, health promoter or therapist with a systematic method of applying the processes of change emphasised in a particular SOC rather than in a haphazard fashion. Further longitudinal research is needed to examine the pattern of process use by individuals in varying SOC for physical activity.

Table 2.5

Processes of Change Listed under the SOC in Which They Are Emphasised Most

Precontemplation	Contemplation	Preparation	Action	Maintenance
Consciousness raising →				
	Social liberation →			
	Dramatic relief →			
	Self-reevaluation →			
		Self-liberation →		
			Reinforcement →	
			Management →	
			Counterconditioning →	
			Environmental reevaluation →	
			Helping relationships →	

Note. Processes were used the least in the precontemplation stage, processes emphasised in two stages are shown overlapping both stages.

From "Changing for good: A revolutionary six-stage programme for overcoming bad habits and moving your life positively forward" by J.O. Prochaska, J.C. Norcross and C.C. DiClemente, 1994a, Avon Books. New York. p. 54.

Decisional Balance

The evaluation of outcomes is nothing new in behaviour change theory. The theory of reasoned action (Ajzen & Fishbein, 1980) and the theory of planned behaviour (Ajzen, 1988) both incorporate the evaluation of outcome as a variable that influences the attitudinal component of their model. This attitude then has a direct influence on behavioural intention, which has a direct impact on whether or not the new behaviour is adopted. Originally, research suggested that decision making was a conflict model (Janis & Mann, 1977). This implies that when an individual is trying to decide whether to become more physically active or not, they will go through a process of weighing up the potential benefits against the comparative losses for changing. In an exercise consultation setting this process is applied when individuals are asked to complete a decisional balance sheet (Loughlan & Mutrie, 1995a). Janis and Mann (1977) believed that there were eight categories on which individuals made decisions. These categories included four positive elements; namely the benefits for oneself, and for others, self-approval and the approval of others. Four negative elements were also identified; these were the costs to oneself and others, self-disapproval and the disapproval of others.

Research in smoking cessation as part of the evolution of the TTM reduced the eight original decisional balance categories to two, namely the pros and the cons of smoking cessation (Prochaska & DiClemente, 1985; Velicer, DiClemente, Prochaska, & Brandenburg, 1985). These new categories were found to differentiate between the SOC for smoking cessation, and it was concluded in the research that a decisional balance construct could be a useful ally to the SOC model. Since then, decisional balance has become a core component of the TTM. Prochaska et al. (1994b) examined how decision making predicted placement across the SOC data for 12 problem behaviours (including exercise adoption). Their results supported the simpler two-factor decisional balance structure, and they revealed similarities in decisional balance pattern across stages. (Prochaska, 1994) examined the data further, and discovered two principles for progressing through the SOC component for all 12 behaviours. He identified a strong principle that involved an increase in the evaluation of the pros over cons for changing, and also a weak principle that involved a decrease in the cons for changing. This research has been adapted for physical activity (Ingledeew, Markland, & Medley, 1998; Marcus & Owen, 1992; Myers & Roth, 1997). In the early stages of precontemplation and contemplation, the cons were constantly found to outweigh the pros for becoming more active. In the preparation stage appeared to be a balance between the relative merits of the pro/con score, while in the more advanced stages of action and maintenance the pros outweighed the cons. This has important implications for intervention design, as if progress through the SOC is to be facilitated then the barriers and benefits that individuals face while changing behaviour will need to be alleviated and accentuated accordingly.

Self-Efficacy

The determinants that influence participation in physical activity are numerous. Some theoretical approaches focus on specific determinants, or specific classes of determinants for modification in order to positively influence health behaviour change, for example the manipulation of environmental variables such as the social support variable (Duncan et al., 1993). Bandura (1986, 1989) felt a combination of several classes of determinants work together in order to facilitate behaviour change. He proposed that personal, environmental and behavioural factors combine and work together to determine participation or avoidance of a new behaviour. This social cognitive approach to understanding behaviour change identified self-efficacy as a central concept. This implies that if a person feels confident in their abilities to perform a desired behaviour for a

specific setting, then they are more likely to engage in that activity (Bandura, 1977, 1986). Therefore, if a person feels confident of successfully adopting and maintaining a regular exercise routine, they are more likely to do it than a person who does not feel confident is. Behaviours such as exercise adherence, weight loss, and addiction, where long-term change is possible but difficult, have been shown to be influenced by perceived self-efficacy (Duncan et al., 1993). Bandura (1977, 1986) comments that individuals with a high sense of self-efficacy tend to approach more challenging tasks, put forth more effort, and persist longer in the face of obstacles, barriers and aversive or stressful stimuli. Self-Efficacy is developed through accomplishing a task and developing a sense of personal mastery, through vicarious experience (i.e. learning from others), verbal persuasion and physiological feedback (Bandura, 1977; King et al., 1992). Research has shown that self-efficacy is an important predictor of progress through the stages of change, as more efficacious individuals reach a stage when the behaviour becomes habitual in comparison to those who have lower self-efficacy (Bock et al., 1998; Gorley & Gordon, 1995; Marcus, Selby, Niaura, & Rossi, 1992d; Nigg & Courneya, 1998; Ommundsen & Aars, 1995).

Measurement issues

The core components of the TTM are typically measured by means of self-report instruments. Many of the original assessment instruments were developed for smoking cessation (DiClemente et al., 1991; Prochaska et al., 1988) and then adapted for physical activity. These instruments comprise of a range of ordered categorical, true/false and Likert scales. Numerous staging algorithms (Cardinal, 1995b; Marcus et al., 1994; Marcus & Simkin, 1993), self-efficacy (Marcus et al., 1992d; McAuley et al., 1999; Rodgers & Brawley, 1996; Ryckman, Robbins, Thornton, & Cantrell, 1982) and decisional balance (Marcus & Owen, 1992; Myers & Roth, 1997; Sechrist, Walker, & Pender, 1987) instruments exist that assess the use of these variables in physical activity. There has been less work completed on the development of instruments to examine the processes of change (Marcus et al., 1992c). The authors of the different studies have developed and validated the various instruments on different populations.

Research has recommended the use of a five-point ordered categorical measure as an accurate and expedient method of assessing exercise SOC (Cardinal, 1995a; 1995b; 1997b; Mutrie & Caddell, 1994; Richards Reed et al., 1997). Richards Reed et al. published a review, which compared the efficacy of all the existing staging algorithms. The results of this study can be seen on Table 2.6. In summary, their results imply that a

clear definition of each SOC, a complete definition of physical activity including reference to frequency (how often), intensity (how hard) duration of the activity (how long), and examples of activities increases the accuracy with which respondents classify themselves into different stages. The respondent should self-select what they think is the most appropriate SOC for them (Mutrie & Caddell, 1994; Richards Reed et al., 1997). The five-point ordered categorical staging-algorithm has numerous practical advantages in population-based studies: it is easy for respondents to follow, and understand, it is short standardised measurement tool, and its construct validity has been extensively tested across different ages and cultures in physical activity (Cardinal, 1995b; 1997a; Cardinal, Engels, & Zhu, 1998; Marcus & Simkin, 1993; Marcus et al., 1994; Wyse et al., 1995)

There is a need for empirical research to continuously develop staging algorithms used for different health behaviours in order to ensure accuracy of staging. Continuous rather than categorical measures have been developed in smoking (McConaughy, Prochaska, & Velicer, 1983; McConaughy, DiClemente, Prochaska, & Velicer, 1989) and are currently under development in physical activity (Richards Reed, 1999). The efficacy of these measures to adequately categorise people into a subtle psychological construct such as motivational stage needs extensive testing.

Table 2.6

Measurement issues in SOC for exercise behaviour

Author	Sample & Recruitment	Design	Measures	Results
(Richards- Reed <i>et al.</i> 1997)	Study 1: N = 936 Worksite sample 51% F Mean age = 41 years	Cross- sectional Survey	A. 5-item ladder; 3-item ladder (combined); B. 6-item Likert scale; C. 5-item Likert scale; D. 5-item true/false (long/vigorous) scale.	Scales A-C were subject to a % unable to be staged, being difficult to follow, and not having a clear definition of exercise. Scale D was easy to follow, and used a clear definition of exercise.
	Study 3: N=327 47% F Mean age = 48 year Convenience sample	Cross- sectional Survey Comparative study	E. 5-item true/false (long/vigorous) scale F. 5-item O/C ins. (ACSM, 1990) G. 5-item O/C instrument (CDC/ ACSM, 1995) H. 8-item decisional balance instrument I. 7-item self-efficacy instrument J. Hours of exercise (ACSM, 1990)	Scales E-G had clear, complete definitions of exercise. E & F had more people in earlier stages than G. The lifestyle definition of physical activity meant that more people were in maintenance (less barriers). Preparation was the most difficult to stage. True/false or 5-choice formats were comparable provided the same definition of exercise was used.
	Study 2: N=19,212 55% F Mean age = 42 years	Cross- sectional Survey	5-item O/C instrument (ACSM, 1990)	In order to ensure accurate staging of subjects: Describe SOC; Define exercise completely describing the frequency, intensity, time and type of activity to be included and allow self-assessment of SOC for exercise behaviour.

Note. O/C = Ordered Categorical. Adapted from "What makes a good staging algorithm: Examples from regular exercise" by G. Richards Reed, W.F. Velicer, J.O. Prochaska, J.S. Rossi, and B.H. Marcus, 1997, American Journal of Health Promotion, 12.

Critique of the TTM

The need for research into exercise adoption and adherence to move from an atheoretical base to the use of comprehensive behaviour change models and theories has been recommended (Baranowski et al., 1998; Courneya et al., 1999; Dishman, 1994b; Oldenburg et al., 1999). Over the last decade the number of research papers published that have applied the TTM has increased exponentially. The SOC component has been most studied whilst the processes of change were the least studied component of the model. Some conceptual, empirical and practical concerns have been raised about the model's applicability to behaviour modification. Most of these concerns revolve around the SOC component of the TTM. Prochaska and Velicer (1997a) commented on this problem and stated that more research is needed on the whole model, rather than focusing on the SOC in isolation. The following section provides a critique of the TTM; it highlights the weaknesses and the strengths of the model.

The debate between whether the TTM is atheoretical or transtheoretical is well-documented (Bandura, 1997; Bandura, 1998; Davidson, 1999; Rollnick, Mason, & Butler, 1999). Bandura (1997) questioned how theories that offer contradictory prescriptions on how people change can be integrated into one theory of behaviour change. He suggested that a model, which integrates the diverse systems of psychotherapy like psychoanalysis, behaviourism and humanism, and which advocates strategies that these systems would identify as incompatible is an atheoretical, rather than a transtheoretical theory of behaviour change.

However, numerous systems of psychotherapy exist; all have individual strengths and weaknesses, there is no one overall guiding theory which is completely comprehensive and correct. The concept of an integrative model, one that combined the strengths of the major psychotherapies led to the development of the TTM. Prochaska & Velicer (1997a) in response to Bandura's comments, suggested that the challenge of trying to establish an integrative model is that traditional boundaries have to be crossed in the search for "theoretical, empirical and practical approaches to integrate the best that behaviour change systems have to offer" (p. 11). For example, people who are attempting to adhere to an exercise programme may use a combination of processes that are incompatible to one particular system of psychotherapy. A preparer might use a combination reinforcement management (Behaviour therapy) and social-liberation (Adlerian therapy) to help them to move into the action SOC. This combination, though it may be contradictory to the proponents of Behavioural or Adlerian therapies, does not mean that it is incorrect, it has to

be analysed further to see what can be learned from it. The assumption that successful self-changers do not use processes that some specialists consider to be incompatible has yet to be proven. Meanwhile the TTM supports the view that apparently incompatible processes from competing theories can be integrated in the change process and applied at appropriate stages.

Human behaviour is thought to be too complex to be simplified into discrete phases, stages or categories. Critics of the TTM believe that its SOC component is not an accurate stage model in which an individual permanently evolves from one stage to a qualitatively different one (Bandura, 1998). Rather the TTM's stages are not grounded in transformational change, but the cut-off points are artificial divisions of a naturally occurring continuum (Bandura, 1997; Bandura, 1998; Davidson, 1999; Sutton, 1996). In physical activity, for example, precontemplation and contemplation differ only in degree of intention, and preparation, action and maintenance are arbitrary divisions on a behavioural continuum. Therefore, someone could evolve through some stages simply with the passage of time but with no real alteration in psychological state (Davidson, 1999; Bandura, 1998).

Two points of concern have been raised by the critique of the SOC component as an inadequate stage model. Initially, a common fault of research that evaluates the TTM is the isolation of the SOC component. A recent study tested the hypothesis that the SOC for smoking cessation were qualitatively different (Kraft, Sutton, & McCreath Reynolds, 1999). Over 1400 interviews of Norwegian adults (age range 16-79) were carried out. Individuals were questioned on their smoking SOC, behavioural intention, self-efficacy and decisional balance. Their results revealed that that 60.9% of their sample were in precontemplation, 30.3% were in contemplation and 8.7% were in preparation. These proportions were similar to smokers SOC distribution reported in previous studies (Fava, Velicer, & Prochaska, 1995; Pallonen, Fava, Salonen, & Prochaska, 1992; Prochaska, 1994). From these results, partial support for the idea that the SOC for smoking cessation are qualitatively different was established. Therefore the Bandura's hypothesis is questionable; however, further research is recommended to test this hypothesis in other health behaviours like physical activity for example. The second point is that the TTM is in fact a mixture of discrete and continuous variables of change. Prochaska and DiClemente (1999) believed that being forced to choose whether change is assessed best by discrete or continuous variables was not useful. They felt that in "the TTM [a researcher] can use both discrete variables such as the stages and continuous variables such as the pros and cons of change that have predictable patterns of relationships to the stages

of change” (p. 39). The question of whether discrete or continuous variables or a mixture of both best represents change is debatable, and discussion of these differing points will contribute to a more comprehensive understanding of behaviour change.

Individuals have to pass through each SOC and complete a set of tasks if they are to successfully maintain the new behaviour (Prochaska, DiClemente, Velicer, & Rossi, 1993). Questions have been raised about individuals who abruptly change their behaviour, and may not have passed through all of the SOC. Davidson (1999) believed that “we cannot substitute a categorical approach for a process model of human adaptation and change” (p. 29). His argument questions the internal validity of the model, asking what proportion of people who successfully change their behaviour do so by progressing in an orderly way through the stages. There are two arguments to this concern. First, research has shown that only a small minority of individuals change in a linear fashion and that most individuals follow a spiral pattern of change (Prochaska et al., 1992; Prochaska & DiClemente, 1999). The point made by Prochaska and DiClemente is concerned with successful maintenance of a new behaviour rather than an abrupt change which may not be sustained. The time that individuals spend in each SOC prior to getting to successful maintenance is variable depending on the individual, however the tasks that they need to complete at each SOC if behaviour change is to be maintained are less variable (Prochaska & Norcross, 1999). A list of the stages and tasks as they apply to physical activity are listed on Table 2.3. Second, the TTM does not claim to substitute a categorical approach for a dynamic process. The SOC component of the TTM is a temporal organisational structure that tells us something about when people change but nothing about how they change. It is categorising of dispositional states and it is at best descriptive rather than explanatory. In the TTM categories are not substituted for continuous processes, rather discrete stages are used as a method to integrate and match continuous processes. This criticism occurs when the stage variable is taken to equal the TTM.

There was concern over the predictive validity of the SOC model as evaluative research claimed that addiction variables, for example the number of cigarettes smoked, were better able to predict future behaviour than the SOC instrument (Farkas et al., 1996). This research claimed that stage alone was unable to add to the predictive power of the addiction variables. This has raised questions about the utility of stage membership as a stand alone, independent predictor of future smoking. Farkas and colleagues suggested that simple addiction variables could out perform the stage information in the prediction of smoking cessation in the relatively long term.

In response to this concern, there are limitations to the study carried out by Farkas et al. (1996). For example, the results might indicate that the staging algorithm they used was inaccurate rather than the SOC model having limited predictive validity. Second, were the same things being measured; in other words, is behavioural intention the same as past and current behavior? Third, the number of addiction variables that were compared to a single stage variable might have influenced the possibility for the addiction variables accounting for a greater proportion of outcome variance. Finally, tautological interpretation of stages as causes or predictors rather than descriptions of behaviour change have led to the model being misinterpreted and misunderstood. For example, Farkas and colleagues assumed that stage status could be a long-term outcome predictor. However, if you take current stage and try to predict outcomes over a two-year timeframe, this attempts to reduce the SOC model to a unidimensional framework. It fails to recognise that individuals can progress, regress, remain stable or recycle in the SOC model. Prochaska and DiClemente comment that “we must understand this movement and lack of movement rather than try to pit predictors against one another as Farkas and colleagues have done” (1999, p. 42).

The TTM advocates individual responsibility for behaviour change. In this sense, it perpetuates the ideology of individualism and does not account for other factors outside of an individual's control that might effect change. The TTM was designed to help clarify the concept of intentional behaviour change, and it does not examine societal, developmental or imposed change. This is a limitation of the model. However, research using this model in its entirety is relatively new; three studies (all cross-sectional) were found that reported on all the core components as they apply to physical activity (Nigg & Courneya, 1998; Bock et al., 1998; Gorely & Gordon 1995). The theory of reasoned action (Ajzen & Fishbein, 1980) was modified into the theory of planned behaviour (Ajzen, 1988) due to its lack of perceived behavioural control, this modification took eight years. The development of the TTM to include the social system, legislation or the environmental opportunities that are available to the individual is a recommendation for future research.

All stage models have an inherent ethical issue (Oldenburg, Glanz & Ffrench, 1999). This revolves around the concept of differentiating individuals into different categories and how this might effect treatment. There is potential for unethical practitioners to ignore individuals in a certain stages because they lack change potential. There is evidence which supports stage-matched interventions, however research needs also to examine the potential negative impact of categorising population groups. There is

also a danger that overzealous practitioners may not respect an individual's decision not to change their behaviour and to remain sedentary for example. This means that although proactive targeting is welcomed and a strength of the model, if it is used uncritically it is also a weakness. Future qualitative research needs to ask precontemplators what it is like to be targeted with health promotion interventions.

The TTM needs to identify what factors produce transitions between adjacent stages on its SOC component. There is a gap in the literature at the moment that tries to explain the specific strategies that cause people to move from one stage to the next, and that explore whether stage improvers employ different processes of change than those who remain static. Research has shown that, for example, contemplators may employ different processes than preparers. However it can not yet be concluded whether interventions should target the processes stable contemplators use, or if the contemplators who progress into preparation use different processes of change. The claim by Rollnick et al. (1999) who suggest that the TTM 'is merely a collection of different strategies for use in different situations...replicable methods simply do not exist' has yet to be proven or disproved. Research needs to address the temporal sequencing between the SOC and other variables measured.

Human behaviour is influenced by numerous determinants, some of which are cognitive, behavioural, social or environmental. Against such a background, it is difficult if not impossible to explain or predict behaviour. However, it is possible to uncover what helps promote and what might prevent behaviour change. The TTM is a process model; it aims to increase our understanding of how individuals change their behaviour and from this knowledge we can determine how to intervene to promote change and to remove barriers. The following section will review key studies that applied the TTM to the study of exercise behaviour change.

Review of the TTM

Search technique and results

The literature reviewed here is a collection of specific key studies that examine the applicability of the TTM to physical activity. The literature search was conducted using Social Citation Index and Embase via BIDS, Sport Discuss and Medline. Two decades of work from 1980-2000 were searched. Key words included TTM, stages of change, processes of change, self-efficacy, decisional balance, physical activity and exercise.

The number of physical activity studies that are based on the TTM has increased exponentially over the last decade. A total of 52 studies were identified. Out of this

number, 9 examined the structure of SOC component of the TTM, 16 reported on the population prevalence of the SOC across different ages, genders and cultures; 9 examined the remaining core components of the TTM, 4 studies reported on a range of health behaviours including physical activity and 14 were intervention studies.

SOC structure studies

A summary of the 9 studies that examined the construct validity of staging algorithms designed for use physical activity can be seen on Table 2.7. Two studies had young adult participants (Cardinal, 1995a; Wyse et al., 1995), one study was on children (Cardinal, 1998) and the remainder had adult subjects (Cardinal, 1995b; 1997a; Lowther et al., 1999; Marcus & Simkin, 1993; Marcus et al., 1994; Mutrie & Caddell, 1994). Six of the studies used an ordered categorical instrument to measure an individual's exercise SOC, where individuals self-assessed their individual SOC, one study used a true/false measure, and the algorithm designed for use with young children was simplified to a yes/no dichotomous scale. The process of validation of the SOC construct involved comparing the SOC distribution of individuals to other reliable, valid and more objective measures. Some studies used validated recall questionnaires such as the '7-day physical activity recall questionnaire' or the 'weekly leisure-time exercise questionnaire' (Cardinal, 1995b; 1995a; Marcus & Simkin, 1993; Marcus et al., 1994; Wyse et al., 1995). More recent work has combined recall questionnaires with more objective measures of physical activity like VO_{2max} , body mass index and CALTRAC (Cardinal, 1997a; 1998; Lowther et al., 1999). One study compared the data from a stage of change questionnaire to qualitative data collected in individual interviews for accuracy of the staging algorithm (Mutrie & Caddell, 1994). Eight studies reported support for the construct validity of the SOC model, as the different stages on the SOC instrument were shown to be significantly different from one another over the range of subjective and objective measures. The findings from the work on the children's population suggested that further research would need to be completed in the development of a SOC instrument for this population. All studies supported the applicability of the SOC model for the promotion of physical activity, especially in its ability to fragment the population into different levels of motivational readiness as regards physical activity. This was evidenced in the support that was indicated for the use of the TTM for the development, testing and delivery of stage-matched physical activity interventions to help in the promotion of physical activity (Cardinal, 1995b; 1995a; 1997a; Marcus & Simkin, 1993; Marcus et al., 1994).

Table 2.7

Construct validity studies of the Stages of Change [SOC] model as it relates to physical activity

Author	Sample & Recruitment	Design	Measures	Results
Lowther et al., 1999)	Adults			
	Study 1: N=34 (mean age=33)	Survey	5-item exercise SOC; Scottish Physical Activity	PC=10%, C=16%, P=14%, A=22%, M=38%.
	Study 2: N=94 (mean age=33)	Survey	Questionnaire (SPAQ).	Participants classified by SOC (PC/C/P; A/M) differed significantly on reported physical activity. Test-retest reliability of the SPAQ, and concurrent validity between SPAQ and SOC were established. An acceptable correlation coefficient between SPAQ and CALTRAC was evidenced.
	Study 3: N=34 (mean age=37)	Q.Exp. (QE)		1 & 2
	Community sample		* O/C instrument ** ACSM 1990, ACSM/CDC 1995	
(Cardinal et al., 1998)	Children			
	N=669	Cross-sectional	5-item Children's Stage of Exercise Algorithm; 8 physical fitness variables as described in the Prudential Fitnessgram National Fitness Test Battery; Exercise facts written test; 10-item beliefs about exercise.	PC=4.6%, C=4.9%, P=3.1%, A=36.5% and M=50.8%.
	Mean age = 8.2 years (5-11)	Survey	* Yes/No dichotomy scoring ** 3 per week, no time or intensity specified.	Stage of exercise was significantly related to gender, age and grade level. Girls were more likely to be in M than boys, while boys were more likely to be in PC than girls. Participants across SOC differed on one variable only – exercise belief. Further research warranted.
	49% Male			2
	Schools sample			
(Cardinal, 1995b)	Adults			
	N = 178	Survey	5-item exercise SOC; 7-day physical activity recall; Leisure Time Exercise Questionnaire.	PC=4.5%; C=21.9%; P=37.6%; A=12.9% and M=23%.
	Mean age = 38.64 (22-68)		* O/C ladder ** ACSM 1990	Participants classified by SOC differed significantly on exercise energy expenditure, physical activity energy expenditure and VO ₂ peak ml/kg/min.
	100% Female			1&2.
	Worksite Sample			

Author	Sample & Recruitment	Design	Measures	Results
(Cardinal, 1997a)	Adults N = 235 Mean age = 34.7 years 73.6% Female University Campus	Cross-sectional Survey	5-item exercise SOC; BMI using Quetlet Index; VO ₂ max-Bike-Test; Single item dichotomous question on exercise behaviour; Weekly Leisure Time Exercise Questionnaire; Single-item relapse measurement; Barriers to exercise questionnaire; Self-efficacy questionnaire; Social desirability questionnaire.	PC=4.3%, C=19.6%, P=35.7%, A=12.8% and M=27.7%. Participants classified by SOC differed significantly on seven reliable, valid and in some cases objective (i.e. BMI, VO ₂ max) outcome measures.
(Cardinal, 1995a)	Young Adults N = 80 Mean age = 21.1 years (18-36) Undergraduate college students	Cross-sectional Survey	5-item exercise SOC; Leisure Time Questionnaire; Body fat percentage; Physical activity rating scale; Relapse question; Non-exercise test VO ₂ peak ml/kg/min prediction measure.	P=32.5%; A=25% and M=42.5%, No subjects endorsed PC or C. Participants classified by SOC differed significantly on all but one variable (body fat).
(Wyse et al., 1995)	Young adults N=244 (sub sample n=97) Mean age = 18 (16-21) 58.6% Female College sample	Survey	5-item exercise SOC; Godin Leisure Time Physical Activity Questionnaire; Body Composition; 5-item self-efficacy measure; Physical self-perception profile (pspp); Rosenberg Global Self-Esteem Scale. *O/C ladder **ACSM 1990	PC=8.6%, C=11.35%, P=34.15%, A=16.5%, and M=29.4%. Participants classified by SOC (PC/C;P;A/M) differed significantly on the basis of self-report of exercise behaviour, self-efficacy, pspp sub-domains and global self-esteem scores. 1&2

Author	Sample & Recruitment	Design	Measures	Results
(Murtie & Caddell, 1994)	Adult sample N=424 61% Female Worksite sample	Cross-sectional Survey	6-item exercise SOC. * 5-point Likert scale ** Not specified	PC/C=16.8%, P=13.6%, A=21.9% and M=43.2%, R=4.5%. Recommendations suggested that classification would be more accurate if subjects selected the most appropriate description rather than respond on a Likert scale. 1
(Marcus et al., 1994)	Adults N=698 Mean age = 40.7 years 48.6% Female Worksite sample Health promotion campaign	Survey 2 Cross-sectional studies, 11 longitudinal study (baseline and 6 months).	5-item exercise SOC; 5-item self-efficacy; 6-item decisional balance; 7-day physical activity recall. * O/C ladder. ** ACSM 1990	Level of physical activity could be predicted by knowing exercise SOC, decisional balance and self-efficacy score. 43% of the variance in exercise SOC was explained by the independent constructs (DB and SE). Exercise SOC explained 24% variance in levels of vigorous and moderate physical activity. Strong support for the TTM as an integrative framework for understanding the relationship between SE, DB and physical activity through SOC. 1&2
(Marcus & Simkin, 1993)	Adults N=235 (219 completed) Mean age = 40.6 years 64% Female Worksite sample Health promotion project.	Cross-sectional Survey	5-item exercise SOC; 7-day physical activity recall questionnaire * T/F responses ** ACSM 1990	PC=22.4%, C=28.3%, P=17.8%, A=8.7%, and M=22.8% Participants classified by SOC (P/C/C; P;A/M) differed significantly on reported levels of physical activity. 1&2

Note. *The method of ascertaining SOC **Definition of regular physical activity used in the study. O/C = Ordered Categorical

1. Support for the construct validity of the SOC model was established.
2. Results support the applicability of the SOC model for the promotion of exercise behaviour change.

Application

Thirty-four empirical research papers were found that examined at least one core component of the TTM and its application to exercise behaviour change. A summary of these papers can be seen on Tables 2.7 and 2.8. The majority of studies used a descriptive cross-sectional design, three studies employed a longitudinal design (Ingledeu et al., 1998; Marcus et al., 1994; Marcus et al., 1996b) and two studies used a pretest-posttest design for instrument validation in self-efficacy measurement (McAuley & Courneya, 1992; Rodgers & Brawley, 1996). Four of the 33 studies reported on SOC distribution only, these studies targeted young (Pinto & Marcus, 1995), senior (Courneya, 1995) and adult populations (Booth et al., 1993; Mutrie & Caddell, 1994). Another thirteen studies examined the population prevalence of SOC, and its relationship with other core components of the TTM. These studies also targeted young (Goldberg et al., 1996; Myers & Roth, 1997; Nigg & Courneya, 1998), senior (Gorley & Gordon, 1995) and adult populations (Bock et al., 1998; Cardinal, 1998; Ingledeu et al., 1998; Marcus & Owen, 1992; Marcus et al., 1992d; Marcus, Rakowski, & Rossi, 1992b; Marcus et al., 1992c; Marcus et al., 1994; Marcus et al., 1996b; Myers & Roth, 1997; Ommundsen & Aars, 1995). The remaining nine studies on Table 2.8 examined the core components decisional balance and self-efficacy. These include a combination of studies that examined the influence of these social cognitive variables on behaviour modification in physical activity (Allison, Dwyer, & Makin, 1999; Booth, Bauman, Owen, & Gore, 1997; Duncan & McAuley, 1993; Duncan et al., 1993; McAuley & Courneya, 1992; McAuley et al., 1999; Rodgers & Brawley, 1996) and instrument validation studies (Duncan et al., 1993; McAuley & Courneya, 1992; Ryckman et al., 1982; Sechrist et al., 1987)

From the studies listed on Table 2.8, fifteen supported the applicability of the SOC model to the promotion of physical activity among adults (Bock et al., 1998; Booth et al., 1993; Cardinal, 1998; Ingledeu et al., 1998; Marcus & Owen, 1992; Marcus et al., 1992b; 1992d; 1996b; Mutrie & Caddell, 1994; Ommundsen & Aars, 1995), senior adults (Courneya, 1995; Gorley & Gordon, 1995) and young adult populations (Myers & Roth, 1997; Nigg & Courneya, 1998; Pinto & Marcus, 1995). The research recommendations from nine studies suggested that future research should focus on the development of stage-matched intervention designs to help these individuals adopt and adhere to physical activity (Bock et al., 1998; Booth et al., 1993; Courneya, 1995; Gorley & Gordon, 1995; Marcus & Owen, 1992; Marcus et al., 1992d; Marcus et al., 1996b; Nigg & Courneya, 1998; Pinto & Marcus, 1995). These findings were apparent across all ages, genders and

cultures examined. Three studies reported on all of the core components of the TTM were found (Bock et al., 1998; Gorley & Gordon, 1995; Nigg & Courneya, 1998). All three studies targeted different populations and each reported support for the use of the TTM in the understanding of behaviour modification in physical activity. Support was shown for the applicability of the social cognitive variable decisional balance (Allison et al., 1999; Booth et al., 1997; Cardinal, 1998; Marcus & Owen, 1992; Marcus et al., 1992b; Myers & Roth, 1997; Sechrist et al., 1987) to the understanding of physical activity adoption and adherence, and in the design of physical activity interventions. Self-efficacy was also shown to be influential in exercise behaviour modification, with research supporting its usefulness in helping people change (Duncan & McAuley, 1993; Duncan et al., 1993; Marcus et al., 1992d; McAuley & Courneya, 1992; McAuley et al., 1999; Ommundsen & Aars, 1995; Rodgers & Brawley, 1996; Ryckman et al., 1982). How each variable differed across SOC was established, and how this information could help to make interventions more specific to the individual rather than apply a global intervention to all, was explored.

Table 2.8

Empirical research that examines the population prevalence of the SOC model and its interaction with the other core components of the TTM (the processes of change (PCQ), decisional balance (DB), self-efficacy (SE) for physical activity.

Author	Sample & Recruitment	Design	Measures	Results
<u>Population Prevalence of SOC</u> (Pinto & Marcus, 1995)	Young adults N = 217 College students 51% female Postal return of questionnaire	Cross-sectional Survey	5-item exercise SOC. *Not specified ** ACSM 1990	46% identified as either inactive or insufficiently active to achieve health gains. 1 & 2
(Courneya, 1995)	Senior Adults N=1000 (288 completed) Mean age = 71.3 64% Female Promoting activity among senior citizens organisation.	Cross-sectional Surveys	5-item exercise SOC; 3-item perceived severity scale; * Ordered/categorical scale. ** ACSM (1990)	PC=10%; C=10%; P=17%; A=6%; M=58%. Findings suggested that the integration of the SOC model might provide additional insight into the motivational role of constructs from a variety of social cognitive theories (e.g. protection motivation or health belief model). 1&2
(Booth et al., 1993)	Adults N=4900 (4404 completed) Age range 20+ Heart Health Campaign	Cross-sectional Survey	5-item exercise SOC; Single-item exercise beliefs question. * O/C instrument ** Not specified	PC=13%, C=10%, P=23%, A/M=38%. Participants classified by SOC differed significantly on reported physical activity levels. 1&2

Author	Sample & Recruitment	Design	Measures	Results
Population Prevalence of SOC and interrelationship of all TTM components.				
(Nigg & Courneya, 1998)	Adolescence N = 819	Cross-sectional Survey	5-item exercise SOC; 40-item PCQ; 10-item self-efficacy; 6-item decisional balance.	PC = 2.1%; C = 4.2%; P = 28.7%; A = 15.7% and M = 49.3%. Sample found to be more active than in studies using older populations. A SOC effect was found for all three independent constructs with PC receiving the lowest scores. Preliminary support for the applicability of the TTM to adolescent exercise behaviour was established. Longitudinal studies recommended.
	Mean age = 15 years (13-19) 48.7% Females School sample		* O/C instrument ** Not specified	1, 2 and 3
(Bock et al., 1998)	Sedentary Adults N=216 (194 completed)	Cross-sectional Survey	5-Item exercise SOC; 7-day Physical Activity Recall questionnaire; 16-item decisional balance inventory; 5-item self-efficacy; 40-item PCQ; 5-item dietary SOC instrument; Smoking SOC instrument.	PC=1%, C=58%, P=32%. Significant exercise SOC effects were found for self-efficacy, decisional balance, time spent exercising each week, behavioural processes of change and cognitive processes of change. Exercise SOC was significantly and differentially associated with readiness to reduce dietary fat and healthy eating behaviours, but not with smoking status.
	Mean age = 44.4 years 76% Female Community sample Newspaper advertisement		* Yes/No dichotomy scoring ** ACSM/CDC (1995)	1, 2 and 3
(Gorley & Gordon, 1995)	Senior Adults N=1,058 (583 completed)	Cross-sectional Survey	5-item exercise SOC; 40-item PCQ; 5-item self-efficacy; 16-item decisional balance instrument.	PC=14.5%, C=9.5%, P=30%, A=9%, M=37%. Significant SOC effect was found for exercise frequencies and duration among the P/A/M. PC differed significantly for C in time since last exercised regularly. Eight of the core components (5 processes, SE and DB-pros & cons) emerged as significant discriminators between SOC. Different constructs were identified as are more or less important depending on SOC.
	Mean age = 56 years (50-65) 50.2% Female Community sample		* O/C instrument ** ACSM 1990	1, 2 and 3

Author	Sample & Recruitment	Design	Measures	Results
<u>Population prevalence of SOC, and PCQ/SOC relationship.</u>				
(Goldberg et al., 1996)	Adolescence & young people N=970 Mean age = 12.2 years and 17.3 years. 39% Female School sample	Cross-sectional Survey	5-item exercise SOC; 40-item PCQ. * O/C instrument ** Not specified	PC=2%, C=3%, P=27%, A=13%, M=48%. Frequency of use of all the processes of change increased incrementally across all five SOC. A significant SOC effect for process use was evident only between A/M and all other SOC. 3 with further research warranted.
(Marcus et al., 1996b)	Adults N=314 Mean age=41 years 66% Female Worksite sample	Longitudinal Survey (baseline, 6mths)	5-item exercise SOC; 40-item PCQ * * O/C instrument ** ACSM 1990	PC=24%, C=30%; P=11%; A=10%; M=25% Follow-up: 32% stayed inactive; 27% stayed active; 26% became active; 15% became inactive. Adopters displayed increases, relapsers displayed decreases, and stable profiles were found for the no change groups in the use of the processes of change. 1, 2 and 3
(Marcus et al., 1992c)	Adults N=1172 Mean age = 37.2 years 61% Female Worksite sample General health survey	Cross-sectional Survey	5-item exercise SOC; 65-item processes of change questionnaire. * * O/C instrument ** ACSM 1990	PC=24.4%, C=33.4%, P=9.5%, A=10.6% M=22%. A significant SOC effect for process use was found. Support for using the SOC and processes of exercise to understand exercise behaviour change was noted. 3

Author	Sample & Recruitment	Design	Measures	Results
<u>Population prevalence of SOC, and DB/SOC relationship.</u>				
(Inglelew et al., 1998)	Adults N=1000 (425 baseline; 247 follow-up) Mean age = 37.1 34% Female Worksite sample	Survey Longitudinal (baseline, 3 mths).	5-item exercise SOC; Exercise Motivations Inventory.	PC=19%; C=13%; P=11%; A=8%; M=48% Follow-up: 29% stayed inactive; 51% stayed active; 6% became active; 9% became inactive. Extrinsic motives were found to dominate during the early SOC, but intrinsic motives were found to be important for progression to and maintenance of physical activity.
			** O/C instrument ** ACSM 1990	1 & 3
(Cardinal, 1998)	Adults N=286 (258 complete) 73.8% Female Mean age = 35.4 years	Survey Cross-sectional	5-item exercise SOC; Dichotomous relapse statement; 15-item barriers to exercise questionnaire; Weekly Leisure Time Questionnaire; VO ₂ max.	53% who did not endorse relapse were distributed as: PC=1.5%, C=12.6%, P=13.3%, A=21.5% M=51.1% 47.7% had experienced relapse and endorsed the following stages: PC=5.7%, C=23.6%, P=61%, A=6.5%, M=3.3%. A significant SOC effect and a significant exercise SOC by relapse interaction was found. Relapse appears to be a factor influencing exercise SOC classification.
			** O/C instrument ** ACSM, 1990	1
(Myers & Roth, 1997)	College students N=432 58% Female Mean age = 19.7 years	Survey Cross-sectional	48-item benefits and barriers to exercise scale; Exercise participation questionnaire	PC=19%; C=22%; T=39%; M=19% 4 benefits and 4 barriers identified. Participants classified by SOC (PC/C; T/M) differed significantly on benefits/barriers scores. Benefits increased to T and decreased in M. Barriers decreased to T and increased at M. Intervention design should take into account the benefits and barrier of ex. participation.
			** ACSM, 1990).	1 & 4

Author	Sample & Recruitment	Design	Measures	Results
(Marcus & Owen, 1992)	Study 1: USA adults N=1093 Mean years = 41 52% Female Study 2: Australian adults N=801 Mean years = 42 12% Female Worksite health promotion campaign	Survey Cross-sectional	5-item SOC ladder; 5-item self-efficacy; 6-item decisional balance;	Study 1: PC=8%; C=30.8%; P=28.8%; A=13.2%; and M=19.2%. Study 2: PC=7.2%; C=35.9%; P=25.4%; A=6.8% and M=24.7%. In both studies PC scored lowest while M scored highest in self-efficacy and decisional balance scores. Scores on both self-efficacy and decisional balance significantly differentiated employees into extreme SOC.
(Marcus et al., 1992b)	Adults N=778 (717 completed) Mean years =41.7 66% Female Worksite sample Letter from CEO	Survey Cross-sectional	40-item decisional balance scale; 5-item Exercise SOC scale. * 11-point ladder SOC scale **ACSM, 1990.	PC=7%; C=34%; P=25%; A=14%; M=20%. Participants classified by SOC differed significantly on decisional balance scores. Support for the use of decisional balance information in intervention design. A 16-item decisional balance instrument emerged. 1 & 4
Population prevalence of DB.				
(Allison et al., 1999)	Adolescence N=1041 Mean age= 14.9 years 49% Female School sample	Survey	16-factor barriers scale; 20-item self-efficacy scale; Participation in vigorous physical activity instrument. **ACSM, 1990.	Time constraints were highlighted as important. Females had higher barriers than males. Self-efficacy was a significant predictor of overall physical activity, other school activity and outside of school activity. Programmes should be designed to increase self-efficacy and to decrease barriers to participation in physical activity among this population. 4

Author	Sample & Recruitment	Design	Measures	Results
(Booth et al., 1997)	Sedentary Adults N=2,298 (1,232 completed)	Survey Cross-sectional Random sampling procedure	Leisure-time physical activity; 19 reasons for not exercising instrument.	Most preferred activity was walking. Most frequently cited barriers were lack of time/motivation and childcare responsibilities for younger age groups. Exercising with a group was the most preferred source of support. Injury and poor health were the barriers cited most frequently by those over 60, and professional advice was preferred source of support. The use of DB knowledge was advised in intervention design. 4
(Sechrist et al., 1987)	Adults N=664 60% Female Mean age = 38.7 years Community sample	Survey	65-item barriers and benefits to exercise questionnaire. 4-point Likert scale (SA to SDA)	Factor analysis resulted in a 2 factor solution (barriers/benefits), and a 43-item decisional balance questionnaire 4
<u>Population prevalence, SE/SOC relationship.</u>				
(Ommundsen & Aars, 1995)	Adults N = 1455 Mean age = 38.5 years Nation wide Physical Activity Campaign	Survey Cross-sectional	5-item exercise SOC; Behavioural belief concerning exercise; self-efficacy for exercise; perceived social support for exercise; social modeling for exercise.	PC = 12.2%; C = 7.5%; P = 31.5%; A = 5.7% and M = 43.2%. Exercise SOC was found to be a highly significant predictor of all the four social cognitive correlates.
			* O/C instrument. ** ACSM 1990	1 & 5

Author	Sample & Recruitment	Design	Measures	Results
(Marcus et al., 1992d)	Adults Study 1: N=1,063 Mean age = 41 23% Female Study 2: N=429 Mean age =41 years 85% Female Worksite samples Health promotion campaigns	Survey Cross-sectional	Study 1: 4-item exercise SOC; 5-item SE instrument Study 2: 5-item exercise SOC; 5-item SE instrument.	S1: P=8%; C=21.1%; A=36.9%; M=34% S2: P=7.3%; C=23.1%; P=30.4%; A=16.6%; M=22.6% Participants classified by SOC differed significantly on SE scores. Reliability for both measures was established. Most relapsers endorsed another SOC, hence relapse was not conceptualised as a distinct SOC. PC were significantly different from all other SOC
Population prevalence of SE.				
(McAuley et al., 1999)	College Students N=46 Mean age = 20.4 (+/- 2.8) 100% Female	Randomised Group Design	8-item self efficacy measure, 11-item Feeling Scale, 12-item subjective exercise experience scale, body composition, RPE and Heart Rate.	Self-efficacy can be manipulated and these changes are related to the affective experiences associated with exercise. 5
(Rodgers & Brawley, 1996)	College Students N=53 60% Female Mean age = 22.5 years Participants had enrolled in an introductory weight-training course.	Pre-posttest (questionnaires distributed before and after participation in weights course).	7-item 100% SE for weight training scale; Incentive measure made up of 13 primary outcomes and 12 secondary outcomes; 5-item behavioural intention instrument.	Both SE and incentive influence strength of future intention when novice exercisers decide to initiate and start to adopt this form of exercise. Whether these social cognitions continue to jointly impact and/or change in influence as the person either maintains or relapses in their new behaviour was unclear. 5
(Duncan & McAuley, 1993)	Sedentary adults N=85 Mean age=53.98 51% Female local media advertising	Observational Questionnaire.	Two self-efficacy instruments; Social provision scale; Attendance at exercise classes logged by exercise instructors.	Self-efficacy operates as a cognitive mediator linking psychosocial influences to exercise. Social support failed to influence exercise behaviour directly but did so indirectly, supports the idea that self-efficacy is an important mediating variable.
	**ACSM (1990)			5

Author	Sample & Recruitment	Design	Measures	Results
(Duncan et al., 1993)	Sedentary adults N=85 Mean age=53.98 51% Female local media advertising	Observational Questionnaire	19-item self-efficacy instrument; Social provision scale; Attendance at exercise classes logged by exercise instructors.	Self-efficacy was not predictive of intra-individual change in attendance at exercise classes over time. Implications suggested that a temporal effect might have been in operation. More research was recommended that examined how to time the assessment of key constructs in order to observe the maximum effect of these variables in operation. 5
(McAuley & Courneya, 1992)	Sedentary Adults N=88 Mean age=53 53% female Local advertising campaign	Pre-post design	Submaximal graded exercise test; SE measure; RPE; Feeling Scale	Highly efficacious subjects had lower perceptions of effort expenditure and reported more positive affect during exercise than did less efficacious subjects. Affective responses during exercise were in turn significant predictors of post-test self-efficacy. 5
(Ryckman et al., 1982)	College students Study 1: N=363 Study 2: N=83 Study 3: N=90 / N=207 Study 4: N=96 Study 5: N=22 Study 6: N=89 Mean age =	Survey	90-item SE questionnaire; 22 item PSE scale; 13-item physical self-concept scale; A self-consciousness scale; The Texas Social Behaviour Inventory; 46-item Internal / External locus of control scale; 40-item sensation seeking scale; 50-item Taylor Manifest Anxiety Scale; Sports participation questionnaire and dart-throwing task. 5	From the 90-item SE questionnaire a 10-item perceived physical ability scale (PPA), and a 12-item Physical Self-Presentation Confidence scale (PSPC) emerged, and a combination of these yielded the Physical Self-Efficacy (PSE) instrument. Validation of PSE scale was shown. Subjects who had strong perceptions of the PSE were found to be higher on self-esteem, less self-conscious and anxious, higher on sensation seeking and higher on internal locus of control. The use of the scale in physical education, medical and clinical settings were recommended.

Note. *The method of ascertaining SOC **Definition of regular physical activity used in the study. O/C = Ordered Categorical

1. Support for the applicability of the SOC model for the promotion of exercise behaviour change was established.
2. Research recommendations suggest that future research should focus on the development of stage-matched exercise promotion interventions.
3. Support the applicability of the TTM to the study of behaviour modification in physical activity was found.
4. Support for the use of decisional balance information in intervention design.
5. Support for the use of self-efficacy information in intervention design in physical activity.

Health Behaviour Change

Four studies were identified that compared physical activity to other health behaviours using components of the TTM as outcome measures (Herrick, Stone, & Mettler, 1997; King, Marcus, Pinto, Emmons, & Abrams, 1996; LaForge, Velicer, Richmond, & Owen, 1999; Unger, 1996). The studies can be viewed on Table 2.9. These were mainly cross-sectional population surveys in which individuals SOC for a range of health behaviours were measured and compared. Results found preliminary evidence that stage specificity exists across numerous health behaviours (Herrick et al., 1997; LaForge et al., 1999). It was also identified that there was a relationship between levels of smoking cessation and participation in physical activity. Individuals who were in the active stages of smoking cessation were more likely to be in the active stages of exercise participation (King et al., 1996; Unger, 1996). Similarly, a significant positive correlation between exercise self-efficacy and smoking cessation self-efficacy suggested that individuals who were confident in their ability to exercise were also confident in their ability to refrain from smoking, while those less confident for changing one behaviour were also less confident for changing the other (King et al., 1996). In other words, the cognitive processes of change were identified as being associated with change in both smoking and exercise behaviour change. Results from these studies complemented the growing body of knowledge that supported the application of the TTM to a wide variety of health behaviours.

Table 2.9

The population prevalence of exercise SOC and its relationship with other health behaviours

Author	Sample & Recruitment	Design	Measures	Results
(LaForge et al., 1999)	5 Adult populations: 3 AUST samples (n = 591, 849 and 2,439), 2 USA samples (n = 19076, and 488).	Survey Cross-sectional	Single-item instrument to determine SOC for regular exercise, low fat diet, smoking, stress reduction and weight loss.	A similar and stable pattern of stage distribution was found across health risk factors, gender, county and sample.
(Herrick et al., 1997)	Adults N=760. Divided by participants (n=260) and non-participants (n=500) of a corporate wellness programme (393 completed). Mean age = 42.2 years 36% Female Worksite sample Health questionnaire	Cross-sectional	Single-item health behaviour question; 6-item decisional balance for exercise measure; 5-item exercise self-efficacy measure. * Single-item SOC identification ** Not specified	PC=3%, C=10%, PC=35%, A=9% and M=43%. Significant differences were found for decisional balance and self-efficacy scores across all five health behaviours. Preliminary evidence that stage specificity exists across multiple health behaviours was noted. 2 and 3.
(Unger, 1996)	Adults N=929 Mean age = 42.18 50% Female Community sample	Telephone interview	Smoking cessation SOC; Frequency of alcohol use in last month; Frequency of seat-belt use; Dichotomous item asking individuals if they had participated in any physical activity or exercise over the last month.	The percentage of individuals who engaged in physical activity increased incrementally over smoking cessation SOC: PC=70%, C=75%, P=77%, A=82%, M=84%. Subjects in the more advanced stages of smoking cessation showed more healthful levels of alcohol use and exercise than subjects in earlier SOC. 2 & 3

Author	Sample & Recruitment	Design	Measures	Results
(King et al., 1996)	Sedentary Adult smokers N = 332 38% Female Mean age = 40.15 years Worksite sample General Health Survey.	Cross-sectional	4-item exercise SOC*; 5-item exercise self-efficacy; 6-item decisional balance; readiness to quit smoking; smoking self-efficacy; smoking decisional balance. * 5-point Likert scale (A/M combined). ** ACSM 1990 (15 minutes +)	Exercise SOC revealed that PC/C=33%; P=37%; A/M=30%. Smoking SOC revealed that PC/C=55%; P=30%; A/M=15%. Significant differences recorded by stage on the cognitive variables for both exercise and smoking. The cognitive mechanisms associated with change in smoking behaviour are related to the cognitive variables which were shown to predict changes in exercise behaviour.

Note. *The method of ascertaining SOC **Definition of regular physical activity used in the study.

2. Research recommendations suggest that future research should focus on the development of stage-matched exercise promotion interventions.
3. Support the applicability of the TTM to the study of behaviour modification in physical activity was found.

Intervention Studies

A total of fourteen physical activity intervention studies that used the TTM as a theoretical basis for the intervention design or subject selection were identified. A summary of these studies and their main findings is listed on Table 2.10. Adult populations were used in all of the studies, and experimental, quasi-experimental and pre-experimental research designs were employed. All 13 studies, seven of which used an experimental design, yielded evidence for the applicability of the TTM as a useful framework for assisting in the understanding of behaviour modification in physical activity (Bull, Jamrozik, & Blanksby, 1999; Calfas, Sallis, Oldenburg, & French, 1997; Cardinal & Sachs, 1995; Cole, Leonard, Hammond, & Fridinger, 1998; Dunn et al., 1997; Lombard, Lombard, & Winett, 1995; Loughlan & Mutrie, 1995b; Marcus, Banspach, & Lefebvre, 1992a; Marcus, Goldstein, & Jette, 1997; Marcus, Emmons, & Simkin-Silverman, 1998b; Marcus et al., 1998a; Peterson & Aldana, 1999; Steptoe et al., 1999). This support was evidenced in four different ways. The most frequent support was shown in studies that recorded the positive effects of stage-matched intervention material over standard information or no information at all in increasing physical activity levels of the participants (Bull et al., 1999; Calfas et al., 1997; Dunn et al., 1997; Marcus et al., 1992a; 1997; 1998b; 1998a; Peterson & Aldana, 1999). The use of the SOC component of the TTM to assign individuals into appropriate stage-matched interventions was shown (Lombard et al., 1995; Loughlan & Mutrie, 1995b). Evidence was also established for the use of the SOC component of the TTM in evaluating the effectiveness of an intervention (Cole et al., 1998). The ability to identify how the processes of change differed among individuals who had improved their SOC post-intervention in comparison to those who had not improved was cited as important in learning how individuals change (Calfas et al., 1997).

Table 2.10

Intervention studies

Author	Subjects & Recruitment	Design & Theory	Activity Targets	Intervention	Results
(Dunn et al., 1999)	Sedentary adults N=235 Mean age=45 (35-60) 56% Female Community sample	RCT TTM	Structured group (ACSM, 1990) Lifestyle group (CDC/ACSM 1995)	2 (Structured Vs Lifestyle) X 3(baseline, 6mths, 24 mths) measures. Study participants randomised into either a lifestyle PA programme or a structured exercise programme. They received 6mths of intensive and 18 mths maintenance intervention. Lifestyle group received a stage-matched intervention designed using cognitive and behavioural change strategies.	Both intervention groups produced significant and comparable beneficial changes in physical activity, cardiorespiratory fitness, blood pressure and % body fat at 24 months. A stage-based lifestyle approach to increasing physical activity in sedentary populations is as effective over 24 months as more traditional structured exercise approaches.
(Septeoe et al., 1999)	Adults with one or more modifiable cardiovascular risk factors. N=2000 (883 completed). 54% Female Recruited from 20 GP practices	RCT TTM	ACSM (1990)	2 (exp. Vs control) X 3 (baseline, 4 mths, 12 mths) measures. Intervention group received three behavioural counselling sessions 20-minute duration), and follow-up phone calls. These were aimed at reducing fat intake, smoking and increasing physical activity, and were carried out by a practice nurse.	70% of patients completed 4 month assessment, and 60% completed 12 month. The intervention group showed greater reductions in dietary fat, smoking cessation, and increased amounts of physical activity than the control group at 4 and 12 months.
(Peterson & Aldana, 1999)	Employed adults 60.4% female N=784 (527 completed) Maximum age = 45 60.4% Female Worksite sample Postal return of questionnaire	RCT TTM	Not specified.	3 (Stage-matched intervention; generic intervention; control group) X 2 (baseline, 6-week) measures. Stage-matched material was designed using the processes of change specific to each SOC. All interventions were sent using interoffice mail.	The stage-based message group demonstrated a 13% increase in activity, the generic message group increased 1%; and the control group experienced an 8% decrease over the 6-week period. Stage-based tailored messages were more effective at increasing short-term activity levels than either generic messages or no information at all.

Author	Subjects & Recruitment	Design & Theory	Activity Targets	Intervention	Results
(Bull et al., 1999)	Sedentary Adults N=763 (416 completed) Mean age = 50 years 65% Female Community Sample	QE TTM/ SCT	CDC/ACSM (1995)	Balanced SOC assignment to one of three groups. 3 (tailored, standard or control) X 3 (baseline, 1-12 mths) measures. The intervention groups received advice from a family physician along with a standard pamphlet or a tailored pamphlet posted out to participants. Both pamphlets were based on the TTM; the tailored pamphlet used information obtained in the baseline questionnaire to make it unique for each individual.	Significantly more individuals who had received the intervention in comparison to control were 'now active' at follow-up. No significant difference in activity levels recorded between two intervention groups. Similar proportions of both study groups were likely to undertake the recommended sessions of activity at each follow-up.
(Marcus et al., 1998a)	Sedentary Adults N=194 (150 completed) Mean age = 44.3 years 78% Female Community sample	RCT TTM/ SCT	CDC/ACSM (1995)	2 (computer based stage-matched self-help intervention; standard self-help materials (control)) X 2 (baseline, 3 mths) measures.	Significantly greater percentage of individuals in the IT condition reported reaching CDC/ACSM 1995 criterion compared with standard condition.
(Marcus et al., 1998b)	Adults N=1,559 (903 completed) Mean age = 40.6 years 39% Female Worksite sample	RCT TTM/ SCT	CDC/ACSM (1995)	2 (stage-matched intervention; generic intervention (control)) X 2 (baseline, 3 mths) measures.	SOC was significantly associated with physical activity. Experimental group who received SOC matched intervention were more likely to increase SOC and less likely to regress than the generic group.
(Dunn et al., 1997)	Sedentary Adults N=235 Mean age = 45 (35-60) 50.6% Female Community sample	RCT TTM/ SCT	ASCM (1990) and CDC/ACSM (1995)	2 (Structured group (ACSM, 1990) Vs. lifestyle group (ACSM/CDC, 1995)) X 3 (baseline, 6-18 mths, 18-mths) measures. 6-month intervention based on incorporating mod/accumulative activity into one's lifestyle, stage-matched intervention material for lifestyle group.	Both groups significantly increased physical activity and cardiorespiratory fitness; improved blood pressure and body composition at 18 months.

Author	Subjects & Recruitment	Design & Theory	Activity Targets	Intervention	Results
(Cole et al., 1998)	Adults N=3,740 (1,192 completed) Mean age – Not given % Female – Not given Worksite sample	Pretest / post-test TTM	CDC/AACSM (1995)	1 (goal setting and monitoring) X 2 (baseline, 50-days). A 50-day, 3-level incentive programme, intervention period in which team captains encouraged participation and distributed/collected behavioural contracts before and after the intervention. Participants were eligible for prize drawings. Organisational centres that achieved 50% participation received a plaque. Managers endorsed and supported the programme.	Findings reinforced the notion that the SOC concept can serve as indicators of the change process which, in turn, can be used as evidence of the short-term effectiveness of interventions. More that one third of participants (n=423; 35.4%) progressed one or more stages during the intervention.
(Callas et al., 1997)	Sedentary Adults N=255 Mean age= 39 years 84% Female recruited from 17 physicians offices	QE TTM	CDC/AACSM (1995)	Nonrandomised, experimental Vs control pre-post-test. Physicians with an interest in physical activity promotion assigned to experimental group. Data collected at baseline via telephone and 4-6 weeks follow-up. Intervention physicians trained in PACE protocol. Control physicians trained in hepatitis B detection.	52% of intervention group Vs. 12% control group moved from PC to A. Intervention group increased walking more than control patients (+37 min/week Vs +7min/week). Both behavioural and experiential processes of change increased significantly more in the experimental group than the control group.
(Marcus et al., 1997)	Adults N=117 (44 completed) Mean age = 67 Recruited from a physician's surgery 75% Female recruited from 4 physicians offices	QE Pre/ Post-test comparison group design TTM	CDC/AACSM (1995)	2 (Exp. Vs. Con) X 2 (Baseline, 6 wks) measures. Convenience sample (4 male physicians), physicians paid for each follow-up visit (6wks). Intervention group's physician trained in exercise counselling and use of stage-matched messages and materials. Control group's GP no intervention provided.	No significant group differences were recorded on Physical Activity Scale for the Elderly.

Author	Subjects & Recruitment	Design & Theory	Activity Targets	Intervention	Results
(Cardinal & Sachs, 1995)	Adults N=113 Mean age = 36.9 years 100% Female Worksite sample	RCT TTM	ACSM (1990)	3 (Lifestyle; Structured or fitness (control)) stage-matched interventions X 2 (baseline; 1 month; 7 months) measures. Mail-delivered intervention	Lifestyle group had significantly improved SOC and adherence levels compared to the structured and control groups.
(Lombard et al., 1995)	Adults N=135 98% Female Worksite sample Local advertisement	RCT TTM	ACSM 1990	SOC random assignment to 3 (2 high/low frequency of prompts X 2 high feedback/low feedback structure of prompts or a control group) X 3 (12 weeks, 1wk-1month post intervention, 2wks-3months post-intervention). 24-week noontime walking intervention.	Significant effect for the experimental participants. Significant effect for the frequency of prompting; the more frequent the better adherence. No significant difference between the prompt structure conditions.
(Loughlan & Nutrie, 1995b)	Sedentary Adults N=2117 (1031 complt.) 179 selected for further study Mean age = 37.9 74% Female Worksite sample	Exper. Pretest -- post-test TTM	ACSM 1990	SOC random assignment to one of three groups. 3 (Fitness assessment; exercise consultation or information only (control)) X 4 (baseline, 4 weeks, 3 months, 6 months) measures. Research assistants on a 1-1 basis carried out all interventions.	All intervention groups revealed a significant increase in physical activity levels over time. Moderate evidence was found for exercise consultations helping individuals maintain initial improvements. Support for the use of the SOC model in selecting subjects and designing appropriate exercise interventions was evidenced.
(Marcus et al., 1992a)	Adults N = 610 Mean age = 41.8 years 80% Female Community Sample	Pretest -- posttest TTM	ACSM 1990	3 (C = What's in it for you?, P = Ready for Action; A = Keeping it Going) stage based packages X 2 (baseline, 6-week). A stratified random sample was followed-up based on participant's baseline SOC.	Post six-week, stage-matched intervention subjects were significantly more active than at baseline.

Note. QE = Quasi Experimental, RCT = Randomised Control Trial, TTM = Transtheoretical Model of Behaviour Change.

Limitations

In interpreting the findings of the studies presented on Tables 2.7-2.10, some caution is required when drawing conclusions. The definitions of regular physical activity used across all studies vary quite considerably. Some use the structured exercise message of three times per week, for at least twenty minutes of moderate to vigorous intensity (American College of Sports Medicine, 1990), whereas more recent studies use the moderate accumulative message (Bock et al., 1998; Calfas et al., 1997; Dunn et al., 1997; Lowther et al., 1999; Marcus et al., 1998b; 1998a; Pate et al., 1995). Research has shown that the definition of physical activity influences the SOC distribution of the respondents. For example, more people categorise themselves into the action and maintenance SOC when the moderate accumulative message is used (Richards Reed et al., 1997). This has important implications for the accurate targeting of individuals with stage-matched material.

The samples studied were mainly self-selected which has implications for the social desirability of responses given by volunteers. This effect was minimised by the anonymous responses given to questionnaires. Very often the studies tended to concentrate on convenience samples e.g. worksite samples. This has meant that there is an over representation of studies whose respondents were educated, employed adult Caucasians in the research to date. This has limitations in the under representing of a range of age groups, less educated individuals, ethnic minorities and the unemployed. Future studies should focus on more representative and diverse subjects in terms of education, income, ethnicity and type of worksite.

Numerous studies have used self-report physical activity recall questionnaires and the validity of such measures is questionable. A common problem is one of over-reporting minutes of actual activity (Lowther et al., 1999; Marcus, Pinto, Simkin, Audrain, & Taylor, 1994b). However, other more objective measures have also shown the reliability of self-report measures (Cardinal, 1997a; Lowther et al., 1999). In the absence of more accurate field measures for recording physical activity level self-report questionnaires have to be accepted. These limitations are partly necessitated by the very large sample sizes and the desire to examine the applicability of theoretical models (like the TTM) to develop our understanding of exercise adoption and adherence. Population-based interventions must rely on self-report to a large extent since there is frequently no direct contact between the subject and the intervention agent.

Most of the physical activity research using the TTM has used a cross-sectional design. The majority of studies were affirmative studies, which examined instrument design or the interaction between the various components of the model at a single time point. This has led to the model being criticised due to the highly repetitive nature of work published, as researchers passively replicate work or transfer existing work into new topic domains (Bunton, Baldwin, & Flynn, 2000). There is an absence of longitudinal designs that examine the interaction between the core components over time.

In the intervention studies listed on Table 2.10, three studies have limitations due to the short duration of their intervention (Cole et al., 1998; Marcus et al., 1997; Peterson & Aldana, 1999). Also, the problem of self-selection limits the generalisability of the findings, as self-selection possibly included people who were more likely to change their behaviour. The presence of this response bias was statistically controlled in some but not all studies. However, when dealing with population studies you can only request that people take part, an individual's wishes not to return a questionnaire must be respected. How to overcome the problem of self-selection is difficult.

Discussion

The TTM is not perfect. In fact, all behavioural models have limitations as to reduce human behaviour to a discrete number of measurable variables is difficult, if not impossible. A lot has been learned from the TTM about the adoption and adherence of exercise behaviour, and about how this knowledge can be of use in the promotion of physical activity among the general public.

The novel concept of a temporal dimension being applied to intentional behaviour change has been a watershed in behaviour change research, and as such has sparked much debate and discussion. This phenomenon is central and unique to the TTM. However, the phenomenon is not completely new to the study of exercise behaviour. The Natural History Model [NHM] identified four transitional stages in exercise behaviour (Sallis & Hovell, 1990). These were sedentary, adoption, maintenance and dropout, and it suggested that the determinants of transition between the stages could differ depending on an individual's current stage. Knowledge, self-efficacy, attitude, body image and perceived control were suggested as important determinants of change. The main difference between both models is that the NHM did not specify how the process of change might be accomplished.

The SOC variable combines with other psychological theories (self-efficacy and decisional balance) and a range of change strategies derived from a comparative study of psychotherapies (processes). This allows researchers to examine how the manipulation of these variables can enhance the adoption of physical activity amongst one SOC in comparison to another SOC. Thus, there is potential for the SOC model to provide additional insight into the motivational role of constructs from a variety of theories on behaviour change (Courneya, 1995).

The TTM has increased our understanding of intentional behaviour change. It has opened up the recruitment procedures in exercise behaviour modification. Research has identified that a high percentage of people categorise themselves as either precontemplators or contemplators. The ability of the TTM to identify sedentary individuals and to be inclusive rather than exclusive of this population is one of its strengths. This information provides the researcher with a practical and useful way of proactively targeting sedentary individuals who might not respond to traditional recruitment strategies. Thus, the TTM has recruitment benefits in that it increases the opportunity of recruiting sedentary individuals into physical activity interventions

The TTM has increased the realism applied to the study of health behaviour change. The high attrition rates from physical activity interventions within the first six months of their initiation are well documented (Dishman, 1994a). Physical activity interventions have been criticized for a number of reasons, including the fact that they are action-orientated (that is designed for individuals who are in the action SOC) (Bunton et al., 2000; Clarke & Eves, 1997; Marcus, 1995). Research has revealed that a high percentage of individuals are in the pre-action SOC, and are not yet ready 'to become regularly physically active'. The ability of the SOC model to fracture an entire population into different groups based on their current behaviour and behavioural intention as regards physical activity is a strength of the model. It permits the researcher to identify those who are inactive, and it reduces the likelihood of targeting these individuals with incompatible interventions that are action-orientated.

The differential application of the processes of change at specific stages of change is the cornerstone of the TTM. This is how the concept of stage-matched interventions arose. The use of stage-matched physical activity interventions over generic information or no information has been proved to be more successful in changing behaviour in physical activity (Table 2.10). Some work into the development of stage-matched interventions using

interactive computer based information has been completed in smoking cessation (Velicer, Prochaska, Fava, LaForge, & Rossi, 1999). This is where individuals online complete questionnaires relating the components of the TTM. Their data is then reviewed and each individual receives a stage-matched intervention, followed by unique feedback on their progress in the SOC and on the use of the processes of change. There is a need for research to examine the efficacy of these types of interventions in physical activity across all ages, cultures and socioeconomic backgrounds.

Recently, research has moved away from being disease or topic specific into examining the applicability of the TTM to a wide range of health behaviours in a single population. Empirical research (Table 2.8) has begun to shed light on our understanding of the hypothesised mediating mechanisms (SOC, self-efficacy, and decisional balance) that underlie multiple risk factor lifestyle change. Research reviewed has also been encouraging regarding the hypothesis that readiness to change has positive associations across different health behaviours. If supported by future research using different populations, it may provide an opportunity to identify common mechanisms underlying the process of behaviour change and assist in the development of interventions designed to influence multiple risk behaviours simultaneously. Additional work is needed to understand the common process of health behaviour change and the mechanisms that mediate successful changes.

The majority of studies used cross-sectional designs. This has limitations for defining the temporal sequencing between SOC and other variables measured. In other words does change in decisional balance, self-efficacy or the processes occur prior to, during, or after movement from one SOC to another SOC? Marcus (1995) believed that this limited the establishment of a causal relationship between the dependent and independent variables. This also implies that it is then difficult to prove or disprove other plausible causal hypotheses. There is a need for longitudinal studies to establish the integration between the different measures associated with the TTM. However, in order to identify the most favourable conditions for change, and to specify the extent and the direction of change, a correlation rather than a causal question needs to be examined. Caution needs to be advised as to prematurely closing the parameters of the TTM, as it was structured to encourage a continued development of behavioural science, and the integration of new constructs to the model if they were deemed important in determining exercise adoption or adherence.

In conclusion, the TTM has provided us with a theoretical model that helps us to understand how behaviour change happens in physical activity. It has also added a temporal dimension, in that it has mapped out when shifts in attitudes, intentions and behaviours are most likely to occur. This has advanced our understanding of how to recruit inactive individuals for physical activity interventions. It has informed how we target different groups depending on how ready they are to change, and it has positively affected the retention rates. There is further development of the scope of the model to deal with multiple risk behaviours rather than tackling them separately. However, the model has problems; the SOC component of the TTM describes a simple, categorical relationship between intention and behaviour. An individual's behavioural intention is central to our understanding of when an individual changes from leading a sedentary lifestyle to becoming more physically active. This readiness to change has been central to the design and delivery of stage-matched interventions. However, the simplistic nature in which the SOC model asks individuals to indicate their behavioural intention, in comparison with some more detailed models like the theory of planned behaviour implies that there is scope for the further development of the TTM.

This literature review has revealed that a high percentage of young adults in Scotland do not achieve the required minimum physical activity for health benefits. In an examination of a selection of models of behaviour change, the strengths and weaknesses of each model as they were applied to physical activity were discussed. The model chosen for the studies detailed in chapters two, three and four, is the transtheoretical model. It has been explained and critiqued, and a review of current research in physical activity that used this model as a basis has shown that its validity, generalisability and reliability are all well established. The availability of a theory-driven conceptual model, a set of reliable and valid instruments, and research based primarily on cross-sectional samples sets the stage for longitudinal and intervention studies needed to further test the value of this behaviour change approach to public health promotion of physical activity. This is the focus of the study in chapter two, where the findings of a longitudinal study of behaviour change and how the different components of the TTM interact with one another to effect change are reported. An examination of the efficacy of stage-matched interventions in a variety of populations and not just adults was also recommended from the literature review. This is the focus of chapter three. Finally in chapter four, the results of a qualitative research study undertaken to explore the phenomenon of behaviour change further are reported.

CHAPTER 3

A longitudinal study of exercise behaviour change, a profile of the processes of change, and implications for physical activity interventions in a young adult population.Introduction

Research suggests that activity patterns have their origins in childhood and tend to last through time (Health Education Authority & The Sports Council, 1992; Barnekow-Bergkvist et al., 1996; Telema et al., 1996). HEBS (1997) showed that 62% of 16-24 year olds in Scotland were not achieving the minimum requirements of physical activity for health (defined as at least 3 times per week for 20 minutes of moderate to vigorous physical activity). Additionally, a study of the health behaviours among adults in Glasgow 1988-1995, revealed that 58% of men and 75% of women aged 18-23 reported that they were not achieving these minimum requirements (Robertson et al., 1997). Numerous studies on college students have revealed that a high proportion of students are sedentary or irregularly active (Calfas, Sallis, Lovato, & Campbell, 1994; Leslie, Owen, Salmon, Bauman, & Kai Lo, 1999; Pinto & Marcus, 1995; Pinto et al., 1998). Therefore, there is a need for research into understanding how young people change their behaviour causing them either to adopt and/or maintain a physically active lifestyle.

This study used constructs from the transtheoretical model of behaviour change (Prochaska, 1979; Prochaska & DiClemente, 1983) to identify and track levels of physical activity, and to gain an understanding of the exercise behaviour of a student population. This model encompasses a stages of change [SOC] instrument which was adapted for exercise (Loughlan & Mutrie, 1995b; Marcus et al., 1992d; Marcus & Simkin, 1993). In this model, there are five SOC that a person moves through from being sedentary to regularly physically active. These stages are described on Table 2.2 and a list of items and tasks to be completed are listed on Table 2.3. Regular physical activity was defined using both the ACSM (1990) and the CDC/ACSM (1995) guidelines for health benefit.

In adopting a physically active lifestyle, any technique that helps individuals to initiate shift from one stage to another, or to modify their thinking, their feelings or their behaviour is termed a process of change. Marcus et al., (1992c) have suggested that there are ten processes of change for physical activity representing two constructs: the experiential processes (such as dramatic relief), and the behavioural processes (such as counter conditioning). These ten

processes are listed and defined in Table 2.4. The aims of this study were to track the self-reported exercise behaviour of a student population over a seven-month period, to identify any changes that occurred in this behaviour and to examine how the use of the processes of change varied with each SOC.

Method

Procedure

A team of four research assistants was employed to help with the data collection. This took place at two separate time points over a seven-month period. All first year students were asked to complete a short one-page physical activity questionnaire as they waited in line to matriculate (register) to the university. Seven months later, a follow-up questionnaire was distributed to a sub-sample of the same students as they waited to collect their grant cheques. No prior warning about the questionnaire was given to the students and completing the questionnaire was entirely voluntary, no reward was given. The students were informed that the research would help in the understanding of physical activity patterns among young people, and they were assured that their responses would be completely anonymous. The ethics committee at the University of Glasgow approved this study (Appendix one).

Measures

The baseline questionnaire was based on one used in a previous study (Carney & Mutrie, 2000). This questionnaire had to be short to facilitate completion by respondents as queuing time was limited in the matriculation procedure. An individual's current exercise behaviour was assessed using the ordered-categorical SOC instrument (Loughlan & Mutrie, 1995b). The construct validity, and test-retest reliability of the SOC instrument have been demonstrated in a number of studies (Table 2.7)(Lowther et al., 1999; Marcus et al., 1992d; Marcus & Simkin, 1993). Binary questions (Yes/No) on previous experience of physical activity, on student's knowledge of the Sport and Recreation Service at University, and a final section on qualitative comments made up the remainder of the baseline questionnaire. A copy of the baseline questionnaire is in Appendix two.

The follow-up questionnaire used the same SOC measure for comparative purposes. As no time restrictions applied a 40-item process of change measure was added (Marcus et al., 1992c). This measure used a likert scale for individuals to rate how frequently an event

(which was an example of using a particular process of change) occurred during the previous month. On this scale, 1 represented 'Never', in that the event never occurred in the previous month, and 5 represented 'Repeatedly' where the event occurred many times in the previous month. There were four questions for each process of change and individuals could score a total from 4-20 on each scale. In order to avoid social desirability bias, confidentiality and anonymity were guaranteed through the use of matriculation numbers rather than individual names and addresses. The follow-up questionnaire is in Appendix three.

Both the baseline (N = 46) and the follow-up (N = 32) questionnaires were piloted on students and staff in the university. All respondents were asked to comment on the appropriateness, clarity and interpretability of the questionnaire to the administrator (author) who was present. No changes were made to the layout or content of the questionnaires.

Data Analysis

Chi squared tests of association (χ^2) were used to examine relationships between SOC and other variables (gender, physical education, extra-curricular physical activity, and knowledge of the Sport and Recreation Service). Tests of marginal homogeneity and symmetry were used to determine the shift in SOC from baseline to follow up. Where significant effects were found, Bonferroni Intervals pinpointed in which category the change had occurred. Non parametric Kruskal Wallis ANOVAs were used to determine a SOC effect for process of change use, and where an effect was found, Mann-Whitney tests were used to determine significance between the stages. A linear discriminant analysis was used to determine the discriminatory power of the processes of change in differentiating between those who were likely to improve their SOC and those who were not from baseline to follow-up. A factor analysis was used to highlight underlying factors highly correlated with the processes of change.

Results

Sample

The population of interest was first year undergraduate students entering a large urban university in Scotland. The baseline questionnaire was returned by 74% (2, 943) of the entire first year intake in October 1996. Descriptive information on the respondents e.g. gender, date of birth etc. was obtained from the University's central records using the student's

matriculation number. Due to some of these numbers being incorrect, descriptive data were only available on 94% (N = 2, 807) of the completed questionnaires. Fifty four percent of the sample was female, average age was 19.6 years (+/-4.6), and 76% were Scottish. Seven months later, a follow-up study was conducted. This involved a convenience sample. Students were asked to complete a follow-up questionnaire as they waited in line to collect their grant cheques. It was felt that this would provide a higher response rate than mailing the 2,800 students who had given baseline information. This yielded a response rate of 93% (N = 1,058), or 35% of baseline. This represents a 27% sub-sample of the total first year intake in 1996. Seventy eight percent of the follow-up respondents were traceable from baseline (n = 831).

The baseline data from the individuals who responded to the follow-up study [R], and those who were not targeted [NT] at follow-up (n = 1885) was compared. Individuals who chose not to complete the questionnaire at follow-up (N = 79) are included in NT number. This revealed that a high percentage of both populations were Scottish (R = 96%; NT = 85%) and white Caucasian (R = 93%; NT = 92%). Both populations had been educated to university level, and approximately 54% of both groups were female. The responders were more likely to be from lower socio-economic groups than those who were not targeted at follow-up as they were receiving grants for attending university. The NT group was on average significantly older than the responders (NT = 20.5 years +/-5.5, range 16-76; R = 19.6 years +/- 4.6, range = 16-28; $p < .001$). Significantly more of the NT group indicated in the baseline questionnaire that they were in the regularly active stages of change (NT = 57%; R = 48%, $\chi^2 (4, N = 2943) = 74, p < .001$). While more of the NT group indicated that they were involved in extra-curricular physical activity (NT = 61%; R = 52%, $\chi^2 (1, N = 2943) = 23, p < .001$), no significant difference was recorded in participation in physical education during school (NT = 66%; NR = 63%).

Physical Activity Participation

Thirty five percent (n = 995) of the respondents had not taken part in physical education (PE), and 41% (n = 1169) had not taken part in extra-curricular physical activity or sport (EC) during their final two years in school. Those who had participated in PE and/or EC were more likely to be in active categories of SOC (PE $\chi^2 (4, N = 2853) = 79.86, p < .001$; EC

$\chi^2 (4, N = 2819) = 407.5, p < .001$) and to intend to exercise in the future (PE $\chi^2 (4, N = 2857) = 93.58, p < .001$, and EC $\chi^2 (4, N = 2821) = 347.49, p < .001$). This is shown on Figure 3.1.

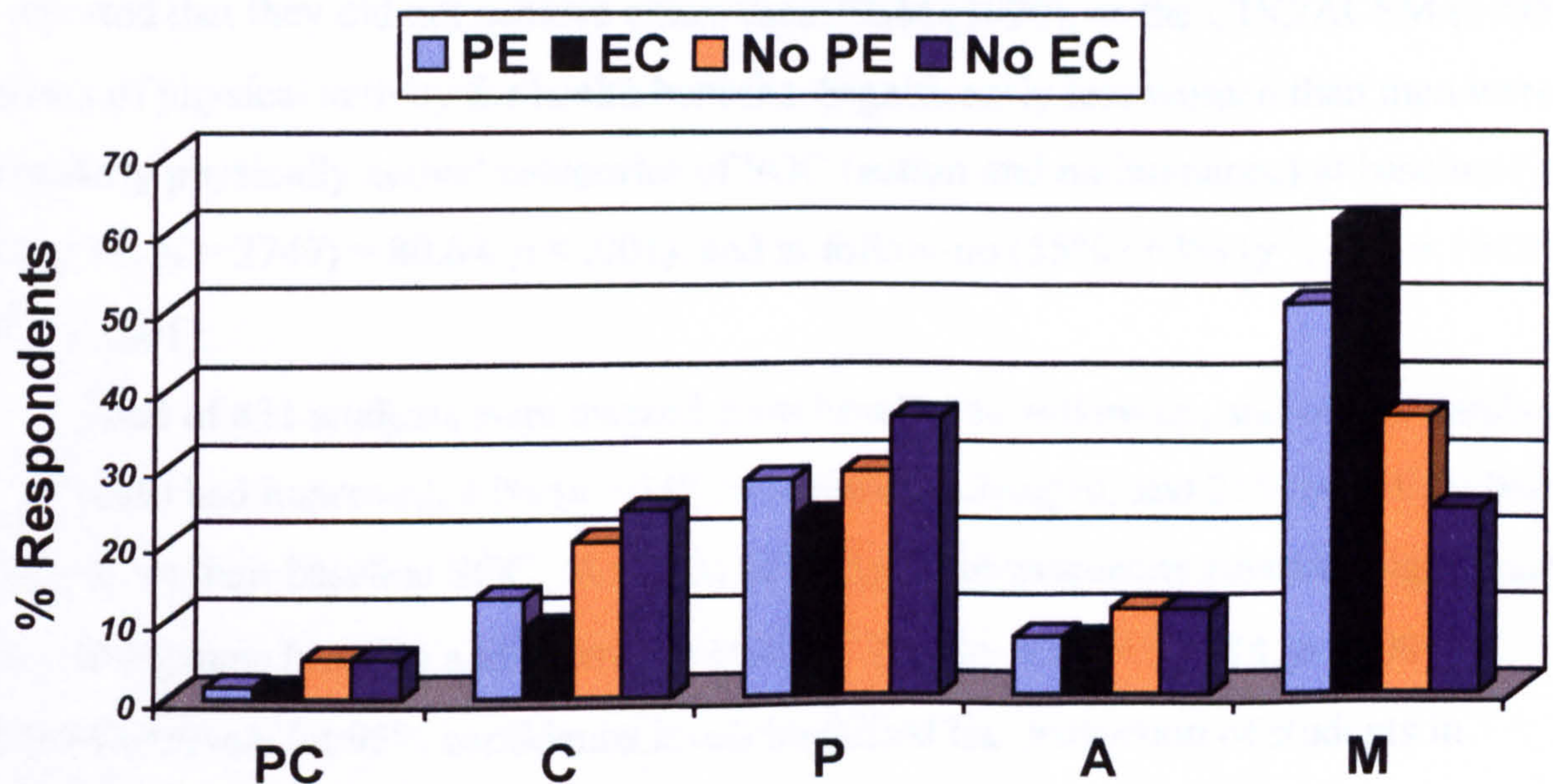


Figure 3.1. SOC distribution by participation or non-participation in physical education (PE) and extra-curricular physical activity (EC) during final two years in school.

Note. PC = precontemplation, C = contemplation, P = preparation, A = action and M = maintenance.

More males than females had taken part in PE (69%: 63%, $\chi^2 (1, N = 2678) = 9.38, p < .002$), and in EC (65%: 53%, $\chi^2 (= 1, N = 2643) = 37.78, p < .001$), and had heard about the University's Sport and Recreation Service (SRS) in school (28%: 23%, $\chi^2 (1, N = 2721) = 8.16, p < .004$). While 29% said that knowledge of the SRS had influenced their choice of which university to attend, there was no significant association between gender and this influence ($\chi^2 (1, N = 2690) = 2.37, p > .05$). At follow-up, 49% ($n = 511$) of the respondents indicated that they had become members of the SRS. The results showed that SOC was significantly associated with SRS membership, as, if a student was a member of the SRS they were more likely to be in the active categories of SOC ($\chi^2 (4, N = 1045) = 45.81, p < .001$). There were no gender differences associated with SRS membership, as approximately 56% of both men and women were members.

Stage of Exercise Change

From the data collected, students were categorised into one of five SOC based on their self-reported exercise behaviour. At baseline, 46% ($n = 1353$), and at follow-up 42% ($n = 441$) reported that they did not achieve either the ACSM (1990), or the CDC/ACSM (1995) guidelines of physical activity for health benefits. Significantly less women than men were in the 'regularly physically active' categories of SOC (action and maintenance) at baseline (47% : 61%, $\chi^2 (4, N = 2747) = 80.64, p < .001$), and at follow-up (55% : 64% ($\chi^2 (1, N = 1019) = 33.95, p < .001$)).

A total of 831 students were tracked from baseline to follow-up, and of this number 32% ($n = 266$) had improved, 47% ($n = 395$) remained unchanged, and 21% ($n = 170$) had regressed from their baseline SOC. A χ^2 test of marginal homogeneity revealed significant differences between baseline and follow up SOC ($\chi^2 (4, N = 831) = 109.14, p < .001$). Bonferroni intervals (at 95% confidence level) identified the proportion of students in contemplation had decreased (decrease likely to lie between 7.5% and 17%), and the proportion in action had increased (increase likely to lie between 9% and 18.6%). Figure 3.2 displays the proportions of students in each SOC tracked from baseline to follow-up.

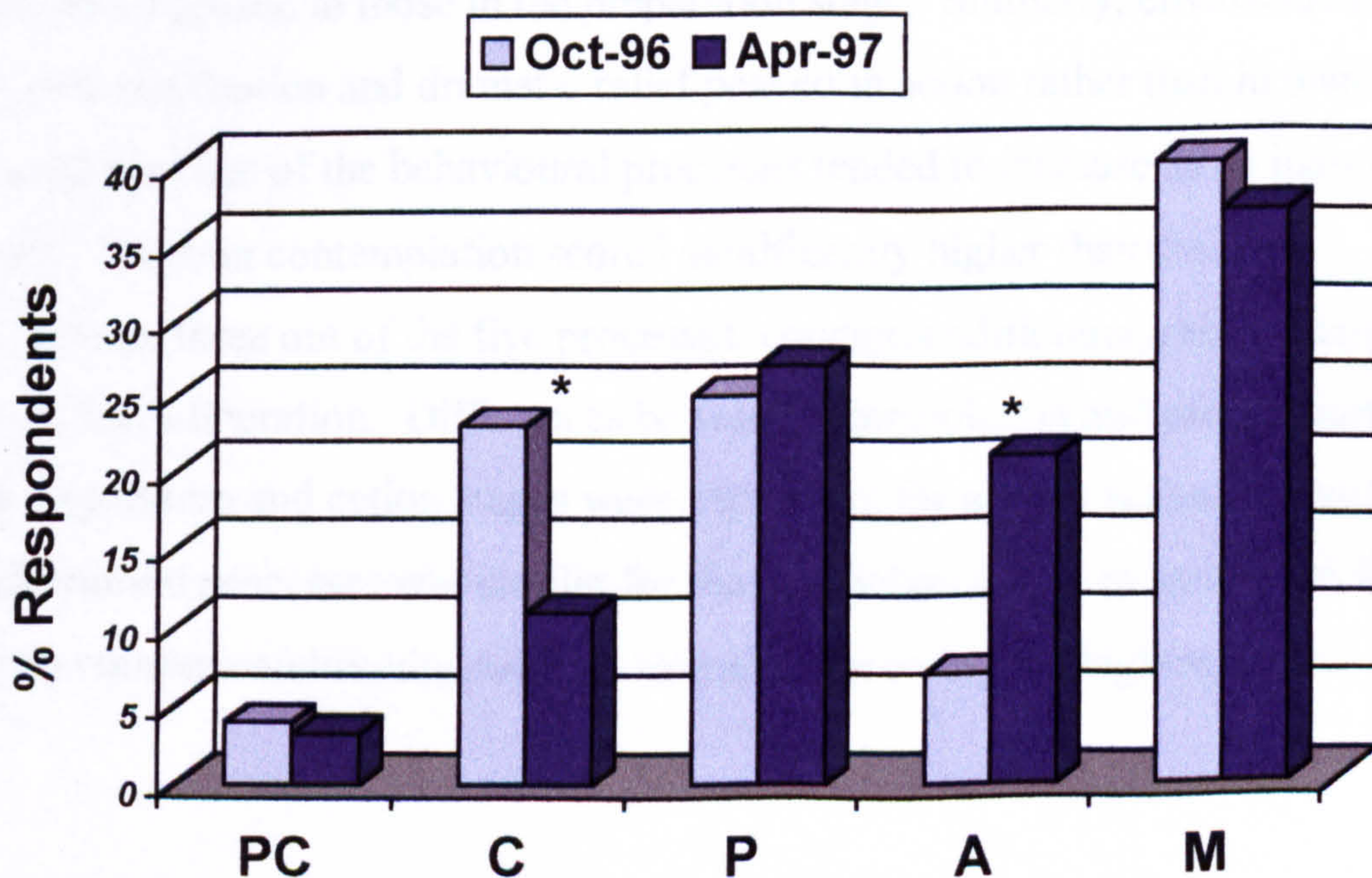


Figure 3.2. Stage of change of first year students in the University of Glasgow in October 1996, and in April 1997.

Note. * Denotes significant difference between both time points (Oct. and Apr.) ($p < .001$).

PC = precontemplation, C = contemplation, P = preparation, A = action and M = maintenance.

Process of Change

Table 3.1 presents the pattern of process use for each SOC. This is cross-sectional data and from this table the processes used the most, and the least can be identified. For example, across all SOC, self-liberation and self-reevaluation received the highest scores, whilst stimulus control received the lowest frequency score. Kruskal Wallis analysis of variance [ANOVA] revealed a significant SOC effect for process use across all ten of the processes of change. The processes were used least frequently by subjects in precontemplation, and tended to peak in the action or maintenance SOC.

Statistical analysis of each process of change as a function of SOC (classified as precontemplation, contemplation, preparation, action or maintenance) was conducted using Mann-Whitney tests (confidence level corrected to 99% for multiple comparisons). Contemplators scored significantly higher than precontemplators did in all the experiential processes, while the only significant difference found between contemplation and preparation was in consciousness raising, preparation scored highest. Use of the experiential processes tended to peak in action. Three out of the five experiential processes (consciousness raising, environmental reevaluation, and self-reevaluation) were used more frequently by the subjects in action stage as compared to those in the preparation stage. Similarly, environmental reevaluation, self-revaluation and dramatic relief peaked in action rather than in maintenance.

The pattern of use of the behavioural processes tended to increase as an individual's SOC increased. Those in contemplation scored significantly higher than those in precontemplation on three out of the five processes, counterconditioning, reinforcement management and self-liberation. Differences between contemplation and preparation stages, and between preparation and action stages were significant for all five scales. Frequency of use of the behavioural processes was similar for those in action and in maintenance, and differed only in counter conditioning with maintenance receiving the highest score.

Table 3.1

Median Comparisons for Processes of Change across Stage of Change

Process ^a	Stage of Change					Mann-Whitney ^b
	PC	C	P	A	M	
	(<i>n</i> = 30)	(<i>n</i> = 98)	(<i>n</i> = 263)	(<i>n</i> = 203)	(<i>n</i> = 350)	
	Median Scores					
<i>Experiential</i>						
S/reevaluation*	8.5	12	12	15	14	PC<C, P<A, M<A
Social liberation*	7.5	10	11	11	11	PC<C
E/reevaluation*	7.5	10	10	11	10	PC<C, P<A, M<A
C/raising*	5.5	9	10	11	11	PC<C<P<A
Dramatic relief*	6	9	10	10	9	PC<C, M<A
<i>Behavioural</i>						
Self-liberation*	9	11	12	14	15	PC<C<P<A
C/conditioning*	6.5	9	11	13	14	PC<C<P<A<M
R/Management*	6.5	10	11	13	12	PC<C<P<A
H/Relationships*	7	7.5	9	9	10	C<P<A
Stimulus control*	5	6	7	8	8	C<P<A

Note. PC = Precontemplation, C = Contemplation, P = Preparation, A = Action and M = Maintenance. S/reevaluation = Self-reevaluation, E/reevaluation = Environmental reevaluation, C/raising = Consciousness raising, C/conditioning = Counterconditioning, R/Management = Reinforcement management and H/Relationships = Helping relationships.

^aThe 10 processes of change were analysed first for stage effect of process use using a Kruskal Wallis analysis of variance procedure ($*p < .05$).

^bMann-Whitney comparisons that revealed a significant difference ($p < .01$) between two consecutive stages are shown by using a < symbol, non-significant findings are not shown.

An analysis of gender differences in pattern of process use was carried out using Mann Whitney tests (95% confidence level). These revealed a significant gender difference in the process scores for five out of ten of the processes of change. Women ($n = 534$) scored significantly higher than men ($n = 394$) on four experiential processes, namely consciousness raising ($p < .001$), dramatic relief ($p < .005$), social liberation ($p < .002$) and self-reevaluation ($p < .001$), and on the behavioural process reinforcement management ($p < .014$).

A rotated varimax Factor Analysis (FA) was used to explore the processes of change data further. This procedure was used to reduce the dimensionality of the processes of change data for each stage of exercise behaviour change. This was achieved by defining a small number of underlying factors that were linear combinations of highly correlated processes for each stage of change. A preliminary principal component analysis suggested a three-factor model, as each of the three factors explained more than 10% of the variance in the process data. A diagrammatic representation of this procedure is shown in Figure 3.3.

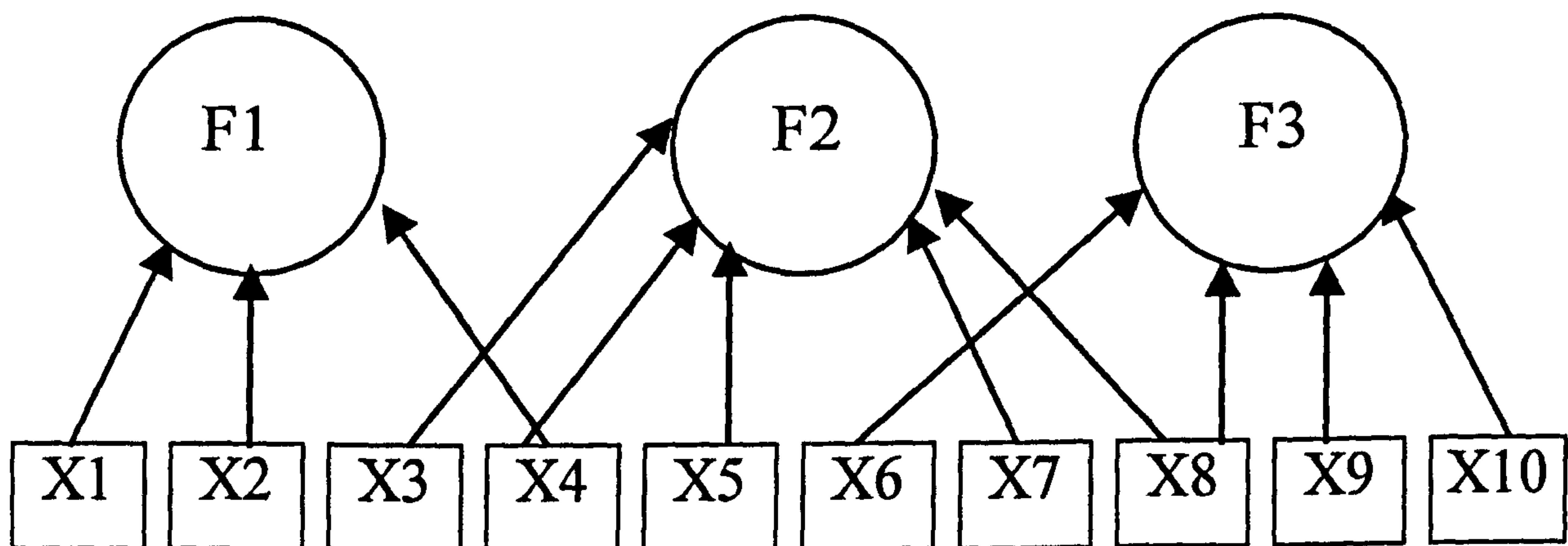


Figure 3.3. Arrow diagram of 10 variables (X1-X10) and 3 common factors (F1-F3).

The results of the FA are shown in Table 3.2. The variance in the process data explained by the three-factor model ranged from 63% in action to 80% in precontemplation. In precontemplation and maintenance, two out of the three underlying factors were experiential, while in all other SOC only one factor was experiential. In precontemplation the processes that correlated highly with Factor 1 were self-liberation, reinforcement management and stimulus control; in Factor 2 it was dramatic relief, self-reevaluation, and consciousness raising, while Factor 3 was dominated by social liberation alone. In contemplation, all the experiential processes were highly correlated with the first Factor. Counterconditioning and self-liberation were dominant in the second Factor, while Factor 3 was associated with helping relationships, stimulus control, and reinforcement management. In preparation, Factor 1 was dominated by self-liberation and reinforcement management. In Factor 2, it was dramatic relief, environmental reevaluation and self-reevaluation, and in Factor 3, it was stimulus control and helping relationships. Social liberation and environmental reevaluation in Factor 1, self-liberation and counterconditioning in Factor 2, and stimulus control, reinforcement

management and helping relationships in Factor 3 dominated the action stage. In maintenance, helping relationships, social liberation and environmental reevaluation loaded highly in Factor 1, self-liberation and counterconditioning in Factor 2, and dramatic relief alone in Factor 3.

Table 3.2

Results of a Varimax Rotated Factor Analysis of the Process of Change data for each SOC.

Processes	Stage of Change									
	PC		C		P		A		M	
	(n = 30)		(n = 98)		(n = 263)		(n = 203)		(n = 350)	
	Factor Number (Factor Loading) ^a									
<i>Experiential</i>										
C/raising	F2	(-.67)	F1	(0.69)	×		×		×	
Dramatic relief	F2	(-.90)	F1	(0.82)	F2	(0.80)	F1	(0.68)	F3	(0.91)
E/reevaluation	×		F1	(0.70)	F2	(0.67)	F1	(0.73)	F1	(0.62)
Self-reevaluation	F2	(-.82)	F1	(0.63)	F2	(0.77)	F1	(0.65)	F2	(0.61)
Social liberation	F3	(-.90)	F1	(0.62)	×		F1	(0.75)	F1	(0.80)
<i>Behavioural</i>										
Counterconditioning	×		F2	(-0.8)	×		F2	(-.77)	F2	(0.77)
H/relationships	×		F3	(0.87)	F3	(0.70)	F3	(-.65)	F1	(0.82)
R/management	F1	(0.87)	F3	(0.62)	F1	(0.76)	F3	(-.65)	×	
Self liberation	F1	(0.92)	F2	(-0.8)	F1	(0.80)	F2	(-.87)	F2	(0.87)
Stimulus control	F1	(0.64)	F3	(0.68)	F3	(0.85)	F3	(-.75)	×	
% Variance explained		80%		70%		65%		63.3%		68%

Note. PC = Precontemplation, C = Contemplation, P = Preparation, A = Action and M = Maintenance. C/raising = Consciousness raising, E/reevaluation = Environmental reevaluation, H/Relationships = Helping relationships and R/Management = Reinforcement management.

^a Process dominantly loaded on F1 = Factor 1, F2 = Factor 2 and F3 = Factor 3. × = Not dominantly loaded (< .60) (Kline, 1994).

Interaction between the longitudinal SOC and cross-sectional process data

In order to evaluate the discriminatory power of the processes of change in differentiating between students who had improved in SOC, and those who not improved in SOC from baseline, a Linear Discriminant Analysis (LDA) with cross validation was carried

Missing pages are unavailable

To understand the differences between SOC improvers and non-improvers (divided into stage stagnators and stage regressors) the median process scores were again examined. These scores revealed a similar pattern to those reported on Table 3.1, that is, self-liberation and self-reevaluation received the highest median frequency scores, whilst stimulus control received the lowest frequency score for SOC regressors, stagnators and improvers (Table 3.4). In order to establish if there was a significant effect for process use between SOC regressors, stagnators and improvers Kruskal Wallis ANOVAs were carried out. These revealed a significant difference in process median scores for four out of the ten processes of change, namely, self-reevaluation, self-liberation, counterconditioning, and reinforcement management.

Table 3.4

Ranked Median Comparisons for Processes of Change on Longitudinal SOC data

Processes ^a	1	2	3	Mann-Whitney ^b
	Stage Regressors (<i>n</i> = 151)	Stage Stagnators (<i>n</i> = 150)	Stage Improvers (<i>n</i> = 248)	
Self-liberation***	13	12	14	1<3*; 2<3***
Self-reevaluation**	12	13	14	1<3***; 2<3*
Counterconditioning***	11	10	12	2<1*; 1<3* ; 2<3***
R/management**	11	11	12	1<3*; 2<3**
Social Liberation	11	10	11	
Consciousness raising	10	10	10	
E/reevaluation	10	10	10	
Dramatic relief	9	9	10	
Helping relationships	9	9	9	
Stimulus control	7	8	8	

Note. R/Management = Reinforcement management, E/reevaluation = Environmental reev.
^a The 10 processes of change were analysed first for stage effect (regress, stagnate or improve) of process use using a Kruskal Wallis analysis of variance.

^b Mann-Whitney comparisons that revealed a significant difference between two stages are shown by using a < symbol, non-significant findings are not shown

p* < .05, *p* < .01, ****p* < .001.

Mann Whitney tests (confidence interval corrected to 98% for multiple comparisons) revealed that stage improvers scored significantly higher in frequency-of-use scores for the processes of change self-liberation, self-reevaluation, counterconditioning and reinforcement management than both stage stagnators and stage regressors. Stage stagnators scored significantly lower than stage regressors in counterconditioning. This is shown on Figure 3.4.

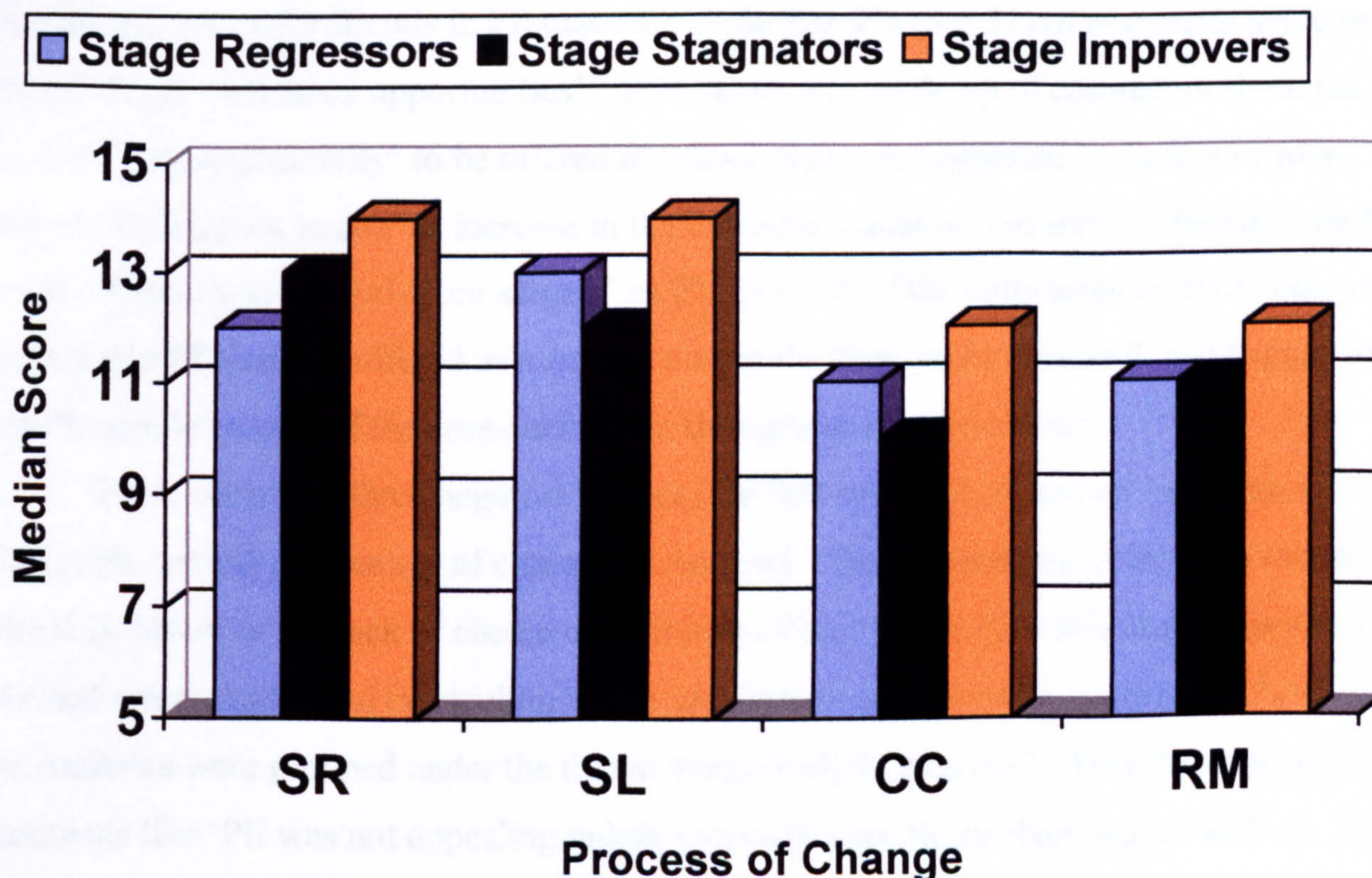


Figure 3.4 Median Frequency Score of Processes of Change for SOC regressors, stagnators and improvers.

Note. SR = Self-reevaluation, SL = Self-liberation, CC = Counterconditioning and RM = Reinforcement management

Qualitative Comments

Twelve percent ($N = 340$) of respondents recorded qualitative comments in response to the final question 'Any general comments you would like to make on your experience of physical activity in school or otherwise?' at the end of the baseline questionnaire. No comments were received from precontemplators, while the majority of the comments came from those in the maintenance SOC. Twenty nine percent ($n = 93$) of the comments were

positive, and 71% ($n = 250$) of the comments were negative. All comments were index-coded and through a process of constant comparison (Lincoln & Guba, 1985; Strauss & Corbin, 1998) six themes emerged from the data.

The first positive theme made up 13% ($n = 43$) of the qualitative comments. This theme was labeled 'enjoyable experience' as the comments included in this theme referred to experiences of physical activity at school as good, as encouraging, and sociable, for example "it was easier to make friends in PE classes". A further 9% ($n = 31$) of responses made up the second theme 'increased opportunities'. This theme was made up of comments about the need for more 'physical activity' to be offered at school; this was suggested by longer or more frequent PE classes, and/or an increase in the extra-curricular opportunities offered. The final positive theme was labeled 'core subject' as 7% ($n = 19$) of the comments received lamented the fact that PE was not offered as a subject during the final years in school, and suggested that PE should be part of the core curriculum throughout all school years.

There were also three negative themes, the first one 'lack of choice' made up 34% ($n = 120$) of the overall percentage of comments received. These comments referred to the lack of school facilities, or the lack of choice of activities offered in the PE curriculum as problematic "we had a very traditional curriculum which had little or no variety". A further 25% ($n = 89$) of comments were grouped under the theme 'perceived competence'. This theme included comments like 'PE was not appealing unless you were very fit' or there was a 'lack of encouragement from teachers unless you were good'. Finally, 12% ($n = 41$) of comments referred to the 'overly competitive' nature of physical activity in school; this sometimes led to the "PE lesson being too formal, too regimented".

Discussion

This study used constructs from the TTM to facilitate an understanding of the process of exercise behaviour change in a student population. Information obtained from this research can be used to increase the success level in designing interventions targeted at helping young people to adopt and/or maintain physically active lifestyles. This information is important as sedentary lifestyles are known to be high among young people of this age group in third level education (Calfas et al., 1994; Leslie et al., 1999; Pinto & Marcus, 1995; Pinto et al., 1998).

This investigation provided a number of useful results. It highlighted the importance of young people experiencing physical activity during their school years, as participation in

physical education and in extracurricular physical activity were both associated with higher levels of reported physical activity upon entering University. It revealed that more men than women tended to be in the regularly active categories of SOC, and were more aware of the sport and recreation facilities in their university prior to becoming a student. This suggests a need for more interventions aimed at encouraging young women to lead a physically active lifestyle, and confirms other research reports that show that women are less active than men are (HEBS, 1997). The transition period from school to university is a key point for introducing interventions aimed at increasing physical activity.

This study provided encouraging results for using the SOC construct to identify individuals who are at different levels of physical activity, or inactivity. Almost half of the students reported that they did not achieve either the ACSM (1990) or the CDC/ACSM (1995) recommendations of physical activity for health. However, a positive shift in SOC was recorded as more students reported that they were in action, while fewer students reported that they were in contemplation in April 1997, in comparison to the baseline findings (October 1996). This shift could have been partly due to some of the sedentary students (N = 125) receiving an intervention aimed at increasing physical activity (see study two, chapter four). However, the intervention could not fully explain the shift in SOC, as some of the students who improved their SOC were not targeted directly with the intervention. Other explanations could be the supportive environment that exists in the University for participation in physical activity (i.e. cheap exercise facilities located on campus which are open fifteen hours a day, seven days a week).

Implications for Intervention Design

In order to gain an insight into this process of self-change, data on process use from students in varying stages of exercise behaviour change were analysed. Initially, the median scores were examined for pattern of use by each SOC. The results supported previous research by identifying a stage effect for process use, with the precontemplators using the processes of change less frequently than all other stages (DiClemente et al., 1991; Marcus et al., 1992c; Marcus & Simkin, 1994; Prochaska & DiClemente, 1983; Prochaska, Velicer, Guadagnoli, & Rossi, 1991; Prochaska et al., 1994a). The preparers used all of the behavioural processes more frequently than the contemplators, but the only experiential process used more frequently by this stage was consciousness raising. Those in action used all

of the behavioural and three out of five of the experiential processes more frequently than preparation. When maintenance was compared to action, counterconditioning on the behavioural scale was significantly higher, however there was a general decrease in use of the experiential processes. These findings corroborate the research of Marcus et al., (1992c). They also recommend that stage specific experiential and/or behavioural processes of change are used in the design of physical activity interventions aimed at helping a young adult population to modify their exercise behaviour.

An interesting pattern emerged in the frequency scores for each process of change across all SOC. Self-reevaluation and self-liberation processes were found to be used most frequently by all processes of change, whereas stimulus control was the least used. The processes emphasised in each stage can be seen on Table 3.1. This pattern of emphasis is different to that highlighted by previous research (Prochaska & DiClemente, 1983; Prochaska et al., 1994a; Prochaska & Velicer, 1997a; Prochaska & Norcross, 1999). It suggests that interventions designed to facilitate the adoption of a positive behaviour (e.g. physical activity) should target different processes of change than has been previously recommended for interventions designed to help in the cessation of negative behaviours. A similar pattern of process use can be seen in the summary statistics of research in physical activity published by Marcus et al., (1992c), and by Nigg and Courneya (1998). Some slight differences could be due to the sample age variance among the three studies. More research is needed to clarify these findings.

An analysis of gender differences in the pattern of process use for physical activity revealed that women scored significantly higher than men did on the experiential processes of change, while the scores for the behavioural processes were similar for both genders. This suggests that across all stages of change women may be more aware than men of interventions using cognitive approaches to exercise behaviour change. Similar findings were reported by O'Connor, Carbonari and DiClemente (1996) for smoking cessation, but more research is needed to test this further in physical activity.

A further aim of this research was to simplify the complex set of data from the processes of change questionnaire. It was hypothesised that some processes might be highly correlated to each other, and that this correlation might be stage dependent. In order to test this hypothesis, a Varimax rotated exploratory principal factor analysis procedure was used. This method reduced the process of change data further, and identified underlying factors that

explained a high proportion of variance in the process results. A preliminary principle components analysis suggested a three-factor model, and the new underlying factors were a combination of processes that were highly correlated to one of the three factors. Figure 3.5 diagrammatically represents the new explanatory factors for each SOC.

The results showed that the underlying factors in precontemplation and maintenance were different to all other stages of change. In precontemplation, the processes of change loaded on one of three separate factors. Factor one was labeled subjectively as self-empowerment as the processes that were dominantly loaded in this factor were self liberation (commitment to change), environmental reevaluation (control of your environment), and reinforcement management (reward). Factor two was labeled self-knowledge (it loaded on the processes self-reevaluation, consciousness raising and dramatic relief), and an acceptance of the normality of physical activity appear to underlie the third Factor. In maintenance, establishing individual control did not appear to be an issue, as the Factors underlying this stage of change suggested uniformity, that is socialising with people who believe in, and/or lead active lifestyles (helping relationships, social liberation and environmental reevaluation); determination, that is a high level cognisance of the benefits to be gained from (self-reevaluation), and commitment needed to lead a physically active lifestyle (self-liberation); and a strong belief in the unhealthy nature of a sedentary lifestyle (dramatic relief).

In contemplation, preparation, and action similar underlying factors emerged. The order of the factors varied slightly, as did the percentage of variance in process data that they explained. However, this similarity highlights that in moving from being sedentary to leading an active lifestyle there may be quite a lot of potential overlap in the change strategies that underlie these stages. This has implications for intervention design. In contemplation, the first Factor highlights efforts by the individual to understand how a physically active lifestyle might be 'relevant' to them at that moment in time (all the experiential processes of change were dominantly loaded in this factor). The second Factor suggested commitment to change,

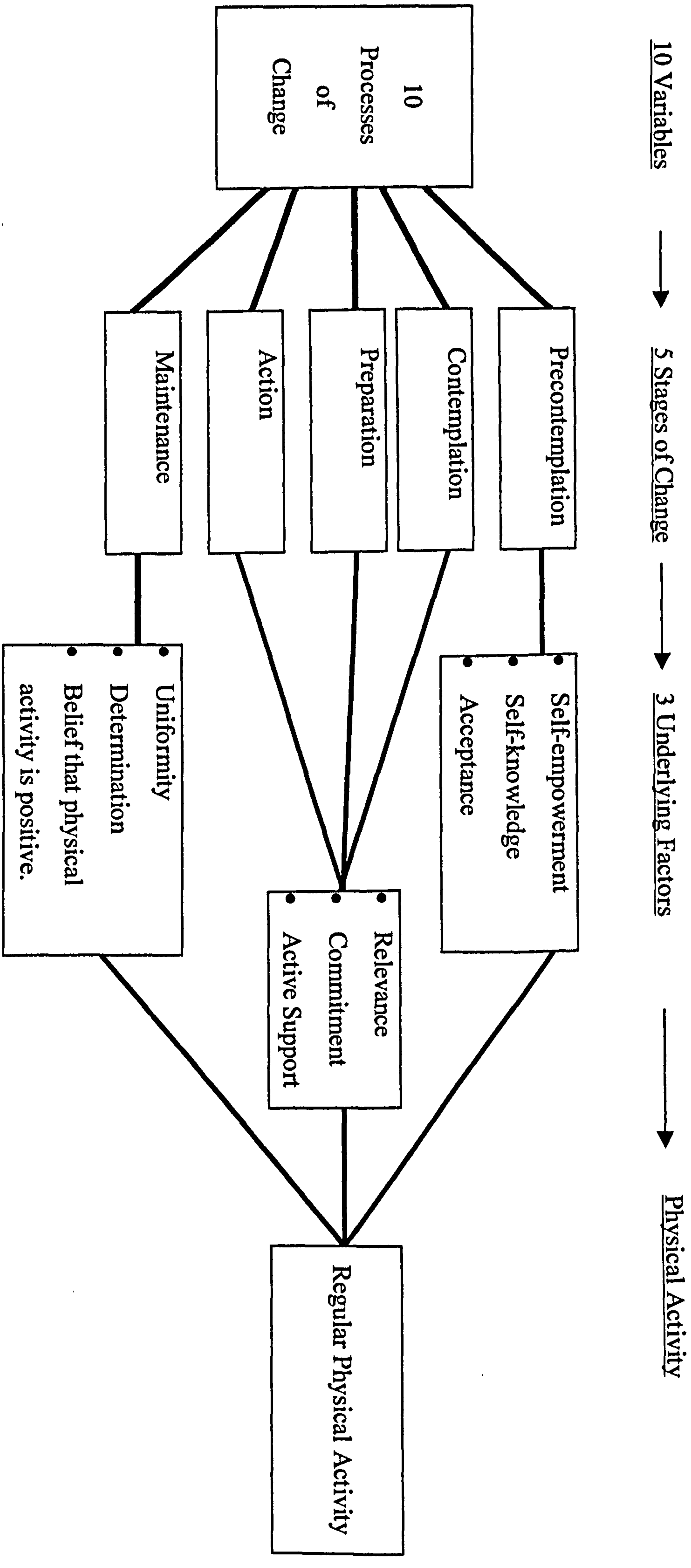


Figure 3.5. Diagrammatic representation of the stages of exercise behaviour change and the underlying factors that emerged from a Factor Analysis on the Processes of Change data.

making little changes often (self-liberation and counterconditioning); and the third hinted at support, i.e. actively seeking help from friends and surroundings to adopt a physically active lifestyle (helping relationships, reinforcement management and stimulus control). Similarly in preparation, commitment is emphasised, this time with rewards for exercise participation, rather than making little changes often, the concept of relevance and support are also indicated. Again, in action, the underlying factors were combinations of 'relevance', 'commitment' and 'active support'.

This has implications for intervention design in physical activity. The author accepts that a stage effect for process use is evident, however intervention design need not narrowly focus on using only specifically listed processes for each SOC based on descriptive information. While this information will advise us as to which processes appear to be used more frequently by each stage, when is the median (or mean) score high enough so that the process merits inclusion in an intervention? Or alternatively, when is the score low enough to merit exclusion from the intervention? The aim of this research was to reduce the process of change data accordingly; it is therefore suggested that in preparation for example ($n = 263$), in conjunction with focusing on specific processes of change like self-reevaluation and self-liberation ($mdn = 12$) to inform intervention design, the underlying motivational clusters highlighted in the factor analysis i.e. relevance, commitment and active support may also contribute to our understanding of progress through the stages of change. Further confirmatory research is needed.

This study aimed at modeling the longitudinal shift in SOC in terms of the processes of change data. It showed that the results from the process of change questionnaire could correctly differentiate – up to 70% - between those who were likely to improve their SOC and those who were not. This provides encouraging support for the use of data from the processes of change questionnaire to help in the design of physical activity interventions. The data also revealed that individual's who had improved their SOC from baseline to follow-up, a period of seven months, had a significantly higher frequency-of-use scores for the processes of change self-reevaluation, self-liberation, counterconditioning and reinforcement management, than individuals who had regressed or had remained in the same SOC. This pattern of process use by SOC improvers supports the earlier finding using only the cross-sectional SOC data. It adds further evidence, which suggests that the processes of change targeted in interventions

designed to promote a positive behaviour like physical activity are different to those suggested by in the cessation of a negative behaviour.

Twelve percent of the respondents wrote qualitative comments about their experience of physical activity at school at the end of the baseline questionnaire. A review of these comments revealed that the responders were distributed over the contemplation to maintenance stages of change, though individuals in the maintenance SOC recorded most comments. From all the qualitative comments recorded, the negative comments outnumbered the positive comments by three to one. This implies that among a first year undergraduate population, individuals were more motivated to write something negative about their experience of physical activity at school, than they were to write something positive. Negative experiences revolved around concepts like lack choice, low perceived competence and the perceived overly competitive nature of physical activity in school. Positive memories stressed the importance of physical education as a core subject, the fact that physical education was an enjoyable, social experience, and lamented the lack of time given to the subject in the curriculum. More research is needed to explain the reasons behind this unbalanced recounting of experiences of physical activity in school. Mutrie (1983) reported similar findings in her work on attitudes of female undergraduates in the University of Glasgow towards their secondary school physical education programmes. This suggests that the progress in addressing these concerns - lack of variety, overly competitive nature of curriculum - has been limited, as they are still evident among an undergraduate population almost twenty years later. The implications suggest that there is a need for physical education teachers and those involved in extra-curricular physical activity to encourage feelings of competence, choice and a self-selected level of competition. This approach fosters a mastery climate in which pupils are encouraged to adopt a task goal orientated approach to achievement within a physical activity setting (Ntoumanis & Biddle, 1999; Spray, Biddle, & Fox, 1999). The positive comments suggest that schools should reflect the enjoyment and social value that pupils get out of physical education by ensuring that the subject has adequate timetable space. The comments also stress the importance of providing opportunities to take part in both physical education and extra-curricular activity for all pupils throughout their junior and senior years in school.

The generalisability of these findings are limited as they are based on a student population, and the use of a sub-sample in the follow-up. However, the sub-sample was

chosen to reflect a more economically disadvantaged group. Research has suggested targeting this group with interventions to promote physical activity (The Scottish Office Department of Health, 1995). The use self-report data with no objective measures on actual exercise behaviour is also a limiting factor. In support of self-report, the results provide some evidence that a subject's level of exercise behaviour (i.e. stages of change) corresponds to past exercise behaviour (e.g. participation in physical education in school), and to process of change use for exercise. These self-report instruments have been shown in other studies to correspond favourably with more objective measures of physical activity (see Table 2.7). This study was limited by its outcome data, as due to time restrictions only cross-sectional data from the processes of change questionnaire was gathered. This was used in an attempt to explain the longitudinal shift in exercise stage of change amongst the subjects. Whilst this data is valuable in that it identifies differences that exist between stage improvers in comparison to stage regressors or stage stagnators in terms of process of change use at follow-up, future research needs to examine longitudinal data from both constructs of the TTM.

Levels of physical activity in young university students are low. Transitional periods in a person's life can have positive or negative influences on exercise behaviour (Marcus, 1995). For young people, the transition from school to university has the potential for the adoption, the maintenance or the cessation of a physically active lifestyle. It is an ideal opportunity for sport and recreation services in universities to promote physical activity to a captive audience. This research suggests that any promotional strategy would benefit from initially using a stage of change construct to identify target groups, and using these data, design interventions that encompass the underlying factors of change and highlight using specific stage appropriate processes of change.

CHAPTER 4

From Precontemplation to Action: The effect of a cognitive-behavioural intervention, designed using the transtheoretical model of behaviour change, to help young adults increase physical activity

Introduction

Regular physical activity is positively associated with physiological and psychological health benefits (U.S. Department of Health and Human Services et al., 1996). Levels of regular physical activity among young adults (16–24 year olds) in Scotland are low (Health Education Board for Scotland, 1997; Robertson et al., 1997; Woods, Mutrie, & Scott, 1999). This finding is also apparent in other cultures (Calfas et al., 1994; Douglas et al., 1997; Leslie et al., 1999; Pinto et al., 1998). Most exercise interventions are action-orientated (Calfas et al., 1994). They are designed for people who are ready to change their behaviour and become more physically active; however, a substantial number of people are not ready for action (Marcus et al., 1992c; Nigg & Courneya, 1998; Woods et al., 1999). There is a need for research to establish effective ways of helping sedentary individuals to become more active, and to establish how to recruit this 'high risk' group who are unlikely to respond proactively to traditional recruitment strategies. Research has suggested that interventions for increasing the uptake of active lifestyles from childhood to adulthood are needed (Dishman, 1994a). The transition from late adolescence to young adulthood has been identified as a key intervention period to help young adults to adopt and maintain an active lifestyle (Dishman, 1994a; Pinto et al., 1998).

The transtheoretical model [TTM] has been presented as an integrative and comprehensive model of behaviour change that has drawn from all major theories of psychotherapy (Prochaska & Norcross, 1999). Its original use was in research into negative addictive behaviours like smoking, and this research explored how self-changers were successful without professional intervention (Prochaska & DiClemente, 1983; Prochaska & Norcross, 1999). It has been used in numerous studies across as many as twelve-health behaviours (Prochaska et al., 1994b), and is cited as one of the most important theoretical health promotion developments of the decade (Samuelson, 1997). The TTM encompasses the processes of change, stages of change and several intermediate or dependent measures.

The first dimension of the TTM involves understanding 'how' an individual changes their behaviour. The processes of change include cognitive, affective, evaluative and behavioural strategies that an individual may use to modify the problem behaviour. Ten processes of change were identified which represented two constructs: the experiential and the behavioural processes (Prochaska et al., 1988). Table 2.4 defines each of the ten processes of change as they apply to physical activity. The stages of change [SOC] make up another dimension of the TTM; they are the temporal dimension identifying the 'when' part of the change equation. There are five stages of exercise behaviour change and these are explained on Table 2.3. Individuals are thought to progress through the SOC at different rates, and whereas the time to progress through the stages is variable, the 'set of tasks' which have to be accomplished at each SOC are less variable (Prochaska & Norcross, 1999).

The remaining dimensions of the TTM include self-efficacy and decisional balance. Bandura's self-efficacy theory purports that an individual's perceived confidence in their ability to exercise will significantly affect whether they actually engage in that behaviour or not (Bandura, 1977). Research has shown that exercise specific self-efficacy is directly related to SOC, as the more efficacious an individual is the more likely they are to be regularly active, thus precontemplators have lower scores than maintainers (Table 2.8). Decisional balance has been categorised into two major groups, the pros and the cons for changing (Marcus et al., 1992b). This decision making process was found to be strongly related to behaviour changes across SOC for a wide range of health behaviours (Prochaska et al., 1994b) as progress through SOC is assisted when there is an increase in the evaluation of the benefits over the barriers for exercise (Table 2.8).

The TTM has allowed researchers to identify and work with sedentary populations, as an individual does not need to be an exerciser to fit into the model. A SOC effect for process use has also been identified (Marcus & Simkin, 1993; Marcus et al., 1996b; Prochaska & DiClemente, 1983; Prochaska et al., 1991; Prochaska & Marcus, 1994). This suggested that in helping someone to modify a behaviour, initially their SOC would be established, then the processes of change most applicable to that SOC would be used to design an intervention. This provides the exercise consultant with an effective way of helping an individual to adopt a physically active lifestyle. Research has demonstrated that an integration of the stages and processes of change can provide a useful guide for physical activity (Peterson et al., 1999; Dunn et al., 1999; Marcus et al., 1998a; 1998b).

The literature review in chapter 2 identified numerous articles that applied at least some components of the TTM to exercise behaviour. The majority of these studies were on middle-aged adults or the elderly, and did not take place in Europe. Fourteen of these studies involved physical activity interventions and their results highlighted the importance of various constructs from the TTM in helping individuals to become more active (Table 2.10). Two studies were found that reported on all of the constructs of the TTM: one used an elderly sample, and the other used an adolescent sample (Gorley & Gordon, 1995; Nigg & Courneya, 1998). Both studies found that the TTM was applicable to different age groups and across different cultures, and they also supported its use in the design of interventions to encourage active lifestyles. Intervention studies that examine the impact of the TTM in its entirety on exercise behaviour are rare. A gap in the literature was also identified concerning the application of the TTM to a young adult population.

The purpose of this research was to determine the efficacy of a postal intervention designed as a strategy to help inactive young adults become more active. Inactive is defined as individuals who would categorise themselves into either exercise stage of change one or two. The intervention was designed using the stage appropriate processes of change. It was hypothesised that:

1. the intervention group's progress from one stage to a higher stage would constitute evidence of the intervention's effectiveness.
2. significantly more of the intervention group would meet the CDC/ACSM (1995) moderate accumulative criteria for regular activity post intervention compared to the control group. This would be indicated through their selection of a specific stage of change that was representative of their current level of physical activity.
3. significantly more individuals who received the intervention would progress in both motivational readiness for physical activity adoption and in the psychological constructs observed to accompany physical activity adoption compared with individuals who did not receive the intervention.

Method

Procedure

Sedentary students at a large urban university in Scotland were the population of interest. The baseline data was extracted from the larger survey on physical activity explained

in chapter three. Seven months later, a sub-sample of the baseline was asked to complete a follow-up questionnaire as they waited to collect their grant cheques, through post, email and a final distribution of questionnaires at halls of residence. This method was chosen as the most convenient way to get a good response. In order to encourage a good response rate, the postal questionnaire gave subjects the opportunity to win £30. Written mail surveys tend to give a low response rate (Hayes, 1997). Hayes comments that he has experienced response rate in postal surveys from as “low as 7% to as high as 50%” (p. 103). He concludes that due to a variety of reasons including apathy and low interest levels individuals may not complete or return surveys.

This study used a pre-post randomised control design. At baseline, the sedentary students were randomly assigned into an experimental or a control group. The statistical package minitab was used to randomly select fifty percent of the subjects as an experimental group. These individuals were targeted with an intervention during their first six months in university. The control group did not receive the intervention, although they had access to all the opportunities provided to the experimental group via the Sport and Recreation Service (SRS) at the university. No contact between the participants and the author happened during the study.

Completing the questionnaires was entirely voluntary, and all students were informed that the research would help in the understanding of physical activity patterns among young people. In order to avoid social desirability bias, anonymity and confidentiality were guaranteed through the use of matriculation numbers rather than individual names and addresses. The ethics committee at the University of Glasgow approved this study, see Appendix one.

Measures

The baseline questionnaire was based on one used in a previous study (Carney & Mutrie, 2000). This questionnaire had to be short to facilitate completion by respondents as queuing time was limited in the matriculation procedure. In both questionnaires regular physical activity was defined using the CDC/ACSM (1995) and the ACSM (1990) recommendations for health benefits. An individual's habitual exercise behaviour was assessed using an ordered-categorical SOC scale (Loughlan & Mutrie, 1995b; Marcus et al., 1992d). The construct validity and test-retest reliability of this measure had been demonstrated

by a number of studies (Table 2.7) (Marcus et al., 1992d; Mutrie & Caddell, 1994). A weakness of the SOC instrument was that it incorporated both behaviour and behavioural intention [BI] in one question. In order to address this, an individual's intention to exercise in the future was measured separately. This instrument consisted of one item 'Do you intend to be a regular exerciser over the next 6 months?' to which individual's completed a 5-point likert scale which ranged from 'no intention' (1) to 'definitely intend' (5). The seven day test-retest reliability of this measure was $r = .87$ as demonstrated by an intra-class correlation coefficient ($N = 15$). Binary questions (yes/no) on previous experience of physical activity in school and a section on qualitative comments made up the remainder of the baseline questionnaire. The baseline questionnaire is in Appendix two.

To allow for comparison the follow-up questionnaire used the same SOC and BI measures. As no time restrictions applied cross-sectional data on the processes of change, decisional balance and exercise self-efficacy were gathered. A process of change questionnaire (Marcus et al., 1992c), which used a 5-point Likert scale (never (1) to frequently (5), range 4-20) for individuals to rate how frequently they used a particular process of change during the last month. The instrument's validity and reliability have previously been demonstrated (Marcus et al., 1992c; Nigg & Courneya, 1998). A decisional balance measure adapted from Marcus et al. (1994a) asked individuals to rate how examples of barriers or benefits of exercising might apply to them. A 5-point Likert scale was used where individuals agreed or disagreed (strongly disagree (1) to strongly agree (5), range 5-25) with items like 'I would be healthier if I exercised regularly' or 'I would feel that I was wasting my time if I exercised regularly'. A seven-day test-retest reliability study amongst undergraduate students ($N = 15$) gave a reliability coefficient of $r = 0.81$, supporting the reliability of this instrument.

Both the baseline ($N = 46$) and the follow-up ($N=32$) questionnaires were piloted on students and staff in the university. All respondents were asked to comment on the appropriateness, clarity and interpretability of the questionnaire to the administrator (author) who was present. No changes were made to the baseline measure. The self-efficacy measure used in the follow-up study (Marcus et al., 1992d) was found to be inappropriate, as the respondents felt that an individual had to be an exerciser in order to be able to answer items like 'I am confident that I can exercise in the rain' accurately. This led to the development of a self-efficacy measure by the author.

Numerous self-efficacy measures exist (Duncan & McAuley, 1993; Fontaine & Shaw, 1995; Marcus & Owen, 1992; McAuley & Courneya, 1992; Ryckman et al., 1982). A review of these revealed that an individual had to be an exerciser in order to complete the questionnaire. The author (in consultation with two experts in the field of exercise psychology) developed an alternative exercise self-efficacy measure. Five items that represented the areas of knowledge about physically active lifestyle, accessibility to facilities, relative advantages over disadvantages for being active, and perceived personal capability to exercise were chosen. These are shown on Table 4.1. Participants responded on a 5-point Likert scale (strongly disagree (1) to strongly agree (5), range 5-25). A pilot test of the questionnaire was carried out to check for clarity and interpretability, and a seven-day test-retest reliability study (N = 15) gave a reliability coefficient of $r = 0.82$, indicating a very high reliability for this measure. The concurrent validity of the self-efficacy measure was tested by comparing it with the self-efficacy measure devised by Marcus and colleagues (1992a). This revealed a Spearman's correlation coefficient of $r_s = .6$ (N = 186). Questions on the intervention, the University's Sport and Recreation Service and a final section for qualitative comments concluded the questionnaire. The follow-up questionnaire is in Appendix three.

Table 4.1

A Self-Efficacy Measure for adopting physical activity

I am confident that:	Strongly Disagree					Strongly Agree				
I can explain to a sedentary person how they could adopt a more physically active lifestyle	1	2	3	4	5					
The advantages of participating in regular physical activity ¹ outweigh the disadvantages	1	2	3	4	5					
I can go into the SRS ² and take part in some form of physical activity I enjoy	1	2	3	4	5					
I can accumulate 30 minutes of moderate physical activity over the period of one day, 4 or 5 times a week	1	2	3	4	5					
I can participate in regular physical activity for at least 20 minutes, 2-3 times per week.	1	2	3	4	5					

Note. ¹ Regular physical activity was defined using both the ACSM (1990) and the CDC/ACSM (1995) guidelines.

²SRS = Sport and Recreation Service of the University of Glasgow.

Intervention

The TTM was used to guide the intervention design. For example, research suggests that interventions promoting physical activity for precontemplators and contemplators should focus on cognitive aspects of behaviour change (Marcus, Bock, & Pinto, 1997). This intervention was personalised, and it was made up of two packages on active living [PAL1 and PAL2]; a list of the processes targeted and examples of the strategies suggested are shown on Table 4.2. PAL1 was distributed in November, PAL2 the following January. Both PALs were reviewed by two experts in the field of exercise psychology and they were also piloted on student and staff members of the university (N = 12). Only items that were reviewed as *good* on quality of production, suitability of content, information and attractiveness were included in the intervention.

Table 4.2

A list of the processes of change targeted by the intervention and strategies used.

	Process of Change	Examples of Strategy Used.
		The intervention encouraged subjects to:
PAL 1	<ul style="list-style-type: none"> • Consciousness Raising • Social Liberation 	<p>Read the materials that they received in the post.</p> <p>Become aware of how physical activity was normal in their University environment.</p>
PAL 2	<ul style="list-style-type: none"> • Self-reevaluation • Self-liberation & Counterconditioning • Helping relationships • Reward management 	<p>Consider the benefits (to them) of adopting a physically active lifestyle.</p> <p>Commit to becoming active through small changes initially, and build from there.</p> <p>Do activity with friends (start a starter booklet).</p> <p>Use the rewards that were included in PAL 2, but also to give themselves praise for effort.</p>

Note. PAL refers to the physically active lifestyle intervention

PAL1 was cognitive; its aims were to get subjects thinking about physical activity in a positive way, to help them become aware that being active was acceptable in university, and that an active lifestyle was not only about structured exercise in a 'gymnasium' environment. It included a *Hassle Free Exercise Booklet* (Health Education Board for Scotland, 1994), information on the SRS, and a personalised letter that encouraged subjects to become more physically active through for example actively commuting to university, or taking the stairs rather than the lift. This intervention material can be seen in Appendix four.

PAL2 was more behavioural; it aimed at moving subjects from thinking to doing. It included invites to an exercise consultation (Loughlan & Mutrie, 1995a) and workshops on *Physical Activity - How do I begin?* Alternatively, subjects were encouraged to read and complete a worksheet on *Planning for Physical Activity*. This was made up of components of the exercise consultation e.g. a decisional balance sheet, and subjects were given motivational tips on how to overcome common barriers to exercise e.g. if time is tight substitute a walking break for a coffee break. Pal2 also included a *Start A Starter* booklet. This tailor-made

pocket-sized booklet included £8.50 worth of free offers e.g. free access to the SRS. A contract was printed at the back of the booklet and individuals were encouraged to use this as a motivating tool. This booklet was part of a campaign organised and run by the author in the SRS. The 'Start a Starter Campaign' was aimed at increasing activity levels among sedentary individuals in the University (not just the intervention group). It applied social persuasion and used *a buddy system* to encourage initiation of activity. Active individuals who were already members of the SRS, were encouraged to bring an inactive friend along with them to the SRS. Both parties were then given a reward booklet which gave the non-member free access to facilities etc. The campaign lasted for 8 weeks and at the end if the starter was still exercising, they could nominate their buddy for one of three prizes worth in total £500. Material from the second intervention package can be seen in Appendix five.

Data Analysis

In order to examine the relationship between SOC and other variables (physical education, extra curricular participation and gender) chi squared tests of association (χ^2) were used. Non-parametric Kruskal-Wallis ANOVAs were used to determine if there was a SOC effect for self-efficacy, decisional balance or process of change scores. Where an effect was evident, Mann-Whitney procedures (corrected to 99% confidence level for multiple comparisons) were used. Median scores identified the most frequently used processes of change. Discriminant analyses were used to determine the discriminatory power of the processes of change for categories of SOC improvement or non-improvement.

Results

Sample

The baseline questionnaire was completed by 74% of all first year undergraduate students (N = 2,943). Seventeen percent ($n = 519$) of the respondents categorised themselves as sedentary. Due to some of the information being incomplete, data was only usable from 88% ($n = 459$) of the returned questionnaires. These were selected as the target group for further study, and were randomly assigned into an experimental group (N = 229) or a control group (N = 230) group. Sixty two percent were female, the average age was 19 (+/- 4.5 years) and approximately 76% of the population were Scottish.

The follow-up data collection yielded a response rate of 40% ($n = 186$) at grant cheque distribution from the target group. This number was subsequently increased to 51% ($n = 223$) through other collection methods. In order to identify any differences between responders and non-responders, a statistical analysis was carried out. This revealed that the only difference between groups was that there were significantly more females in the responders group in comparison to the non-responders (68% versus 58%; $\chi^2(1, N = 426) = 4.3, p < .05$). No significant differences between both groups on any other variables measured at baseline (i.e. stage of change, behavioural intention, physical education participation and extra-curricular physical activity) was found.

In order to check the adequacy of the data it was necessary to verify that the experimental and control groups were not significantly different before the study began. Chi-squared tests of association were performed to ascertain whether any of the baseline variables were associated with group. However, none of the resulting p values suggested the presence of such an association for any of these variables. It was concluded that no notable dissimilarity existed between the groups pre-intervention.

Physical Activity Participation

The baseline data revealed that 53% ($n = 223$) had taken part in physical education (PE), and 31% ($n = 130$) had taken part in extra-curricular physical activity (EC) during their final two years in school. SOC was significantly associated with participation in PE ($\chi^2(1, N = 453) = 9.294, p < .005$), but not with EC. Twenty one percent ($n = 87$) of subjects had heard of the University's SRS in school, and from this number 25% ($n = 22$) said it had influenced their choice of which university to attend. At follow up, significantly more of the experimental group in contrast to the control group (62%:38%) were members of the SRS ($\chi^2(1, N = 222) = 13.139, p < .001$), and membership of the SRS was associated with an improvement in SOC from baseline for both the experimental ($\chi^2(1, N = 113) = 6.560, p < .01$) and the control ($\chi^2(1, N = 108) = 5.681, p < .05$) groups. Sixty percent of the experimental group said they found the intervention useful for adopting a physically active lifestyle. No significant gender differences were recorded.

Stage of Change and Behavioural Intention

At baseline, all of the subjects were categorised as sedentary; post intervention significantly more of the experimental group (80%, $n = 88$) in comparison to the control group (68%, $n = 72$) reported that they had improved their SOC from baseline ($\chi^2 (1, N = 223) = 4.243, p < 0.05$). The proportion of subjects in each SOC at follow-up is shown on Figure 4.1. Forty five percent ($n = 50$) of the experimental group in comparison to 33% ($n = 36$) of the control group were in the regularly active SOC (action and maintenance). This difference was approaching significance ($\chi^2 (1, N = 223) = 3.122, p = .077$). The only significant gender difference was that, at baseline, significantly more women than men intended to exercise in the future ($\chi^2 (4, N = 427) = 12.611, p < .001$). At follow-up, more men were likely to be in the active categories of SOC in the experimental group in comparison to the control group ($\chi^2 (4, N = 71) = 8.892, p = .06$). The SOC distribution of women in both groups was similar.

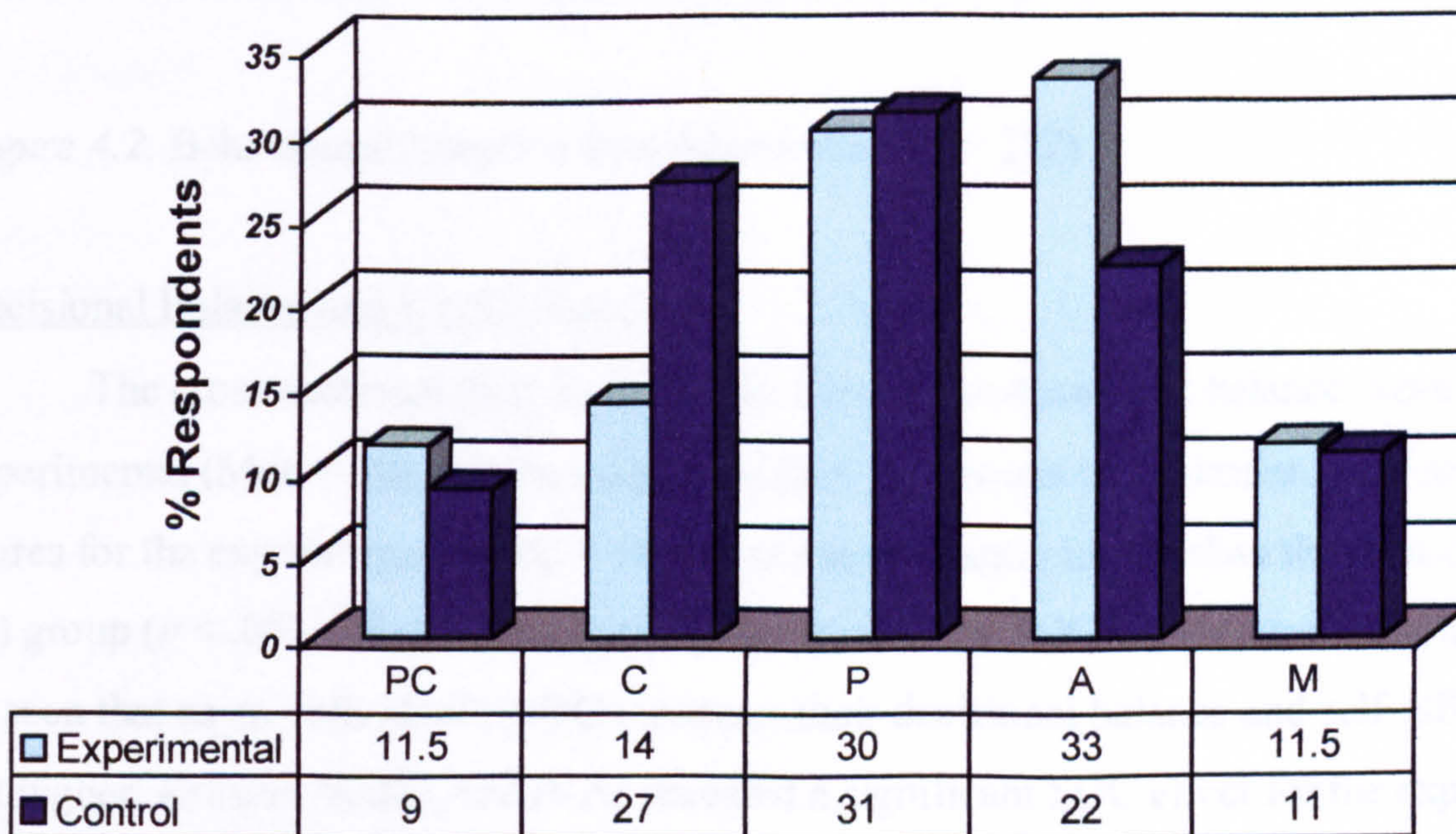


Figure 4.1. Stage of Change Post Intervention ($n = 223$)

At baseline, the proportion of subjects definitely intending to exercise in the future was similar for both groups (45%). Post intervention, significantly more of the experimental group (40%) than the control group (29%) intended to exercise in the future ($\chi^2 (4, N = 222) = 10.423, p = .034$). This can be seen on Figure 4.2. The only significant gender difference

revealed that at baseline significantly more women than men intended to exercise in the future ($\chi^2(4, N = 427) = 12.611, p < .001$).

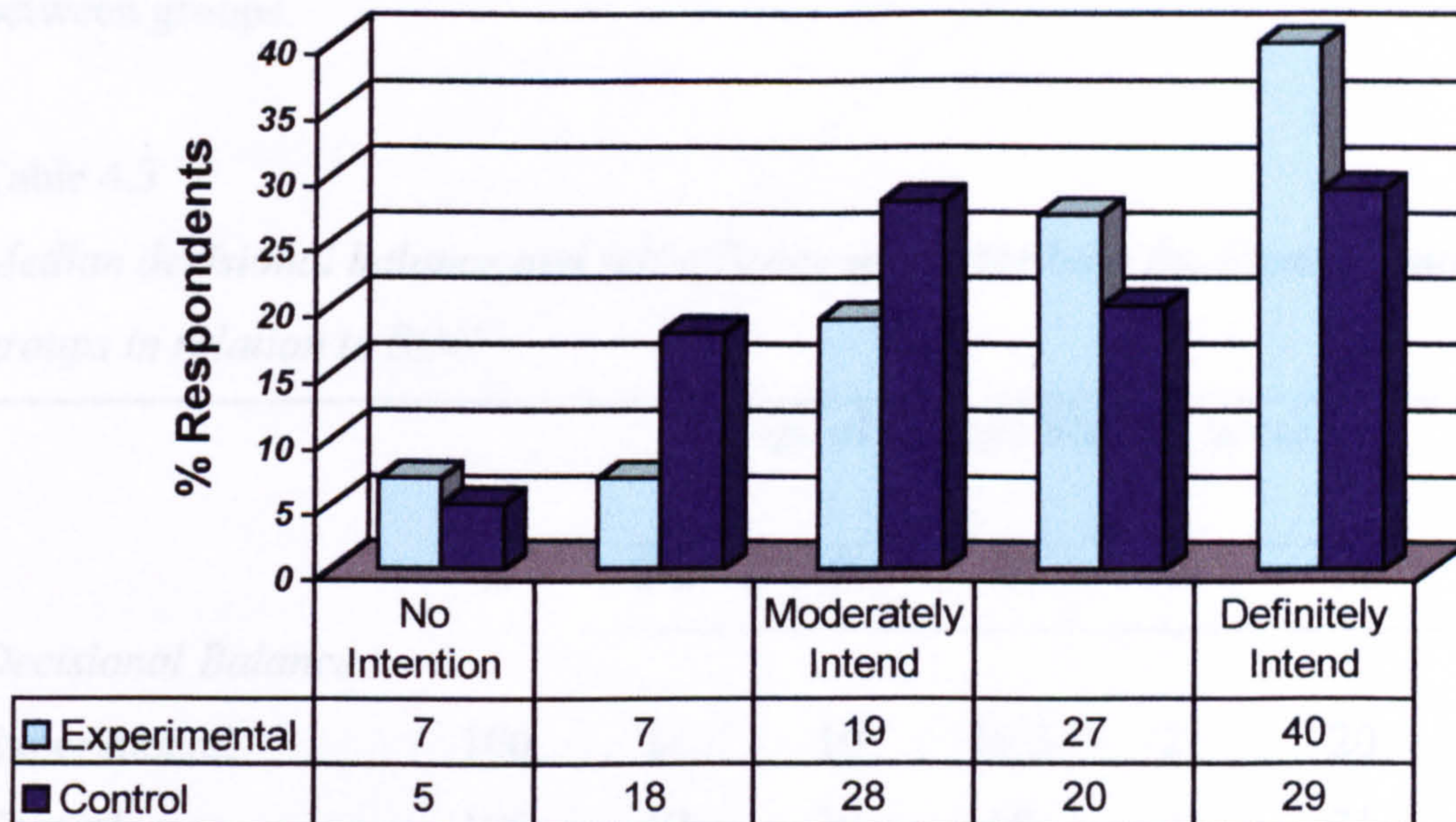


Figure 4.2. Behavioural Intention Post Intervention ($n = 222$)

Decisional Balance and Self Efficacy

The cross-sectional data revealed that the median decisional balance score for experimental (Mdn = 20) and the control (Mdn = 19) groups were similar. The self-efficacy scores for the experimental (Mdn = 18.5) were significantly higher than the control (Mdn = 17) group ($p < .05$). Median scores for both variables by SOC are shown on Table 4.3. It can be seen that as an individual's SOC increases their decisional balance and self-efficacy scores get higher. Kruskal Wallis ANOVAs revealed a significant SOC effect for the experimental group (decisional balance $H=19.62$ $df(N = 113) = 4$ $p < .001$, and self-efficacy $H = 24.45$ $df(N = 113) = 4$ $p < .001$) and the control group (decisional balance $H=23.20$ $df(N = 107) = 4$ $p < .001$, and self efficacy $H=30.12$ $df(N = 108) = 4$ $p < .001$). In order to pinpoint where this SOC effect occurred, Mann-Whitney tests were used. On the decisional balance measure, precontemplators scored significantly lower than contemplators in the experimental group ($U = 132, (-7.9, 0), p < .01$), and preparers scored significantly lower than actioners ($U = 791, (-4, 1), p < .001$) in the control group. For self-efficacy, contemplators scored lower than preparers in the experimental group ($U = 296.5, (-4.9, -0.001), p < .05$), whilst

precontemplators scored lower than contemplators ($U = 909.5, (-4.9, -0.001), p < .05$), and preparation scored lower than action ($U = 761.5, (-5, 1), p < .001$) in the control group. No significant gender differences were found for overall decisional balance or self-efficacy scores between groups.

Table 4.3

Median decisional balance and self-efficacy scores for both the Experimental and the Control groups in relation to SOC

	N	Stage of Change Median Score					Mann-Whitney
		PC	C	P	A	M	
<i>Decisional Balance</i>							
Experimental	100	14	19	19.5	21	20	PC<C**
Control	106	17	19	18	21	21	P<A***
<i>Self-Efficacy</i>							
Experimental	112	15	17	19	19.5	20	C<P*
Control	109	12	16	16	19.5	20.5	PC<C* P<A***

Note. PC = Precontemplation, C = Contemplation, P = Preparation, A = Action, M = Maintenance.

* $p < .05$, ** $p < .01$, *** $p < .001$.

A Binary Logistic Regression revealed that self efficacy, but not decisional balance, was useful as a predictor of the shift in SOC (determined by improvement versus no improvement) (log-likelihood = -117.38, $G = 25.462, p < .001$, Hosmer-Lemeshow goodness of fit: $\chi^2(6, N = 220) = 6.441, p > .05$). The estimated Odds-Ratio is 1.26, and may be expressed as follows, for a unit increase in an individual's self efficacy the odds of improving in SOC is likely to increase by 26% (95% confidence interval 14 - 39%). Figure 4.3 shows the logistic regression plot of the probability of improvement in SOC versus self-efficacy. The plot can be used to read off the interval estimates of the probability that an individual will improve in their SOC for a given self-efficacy score. For example, at a self efficacy score of 15, we obtain 0.55, so the probability that an individual whose self efficacy was 15 when they completed the questionnaire, is likely to have improved in their SOC is around 0.55 (or 55%).

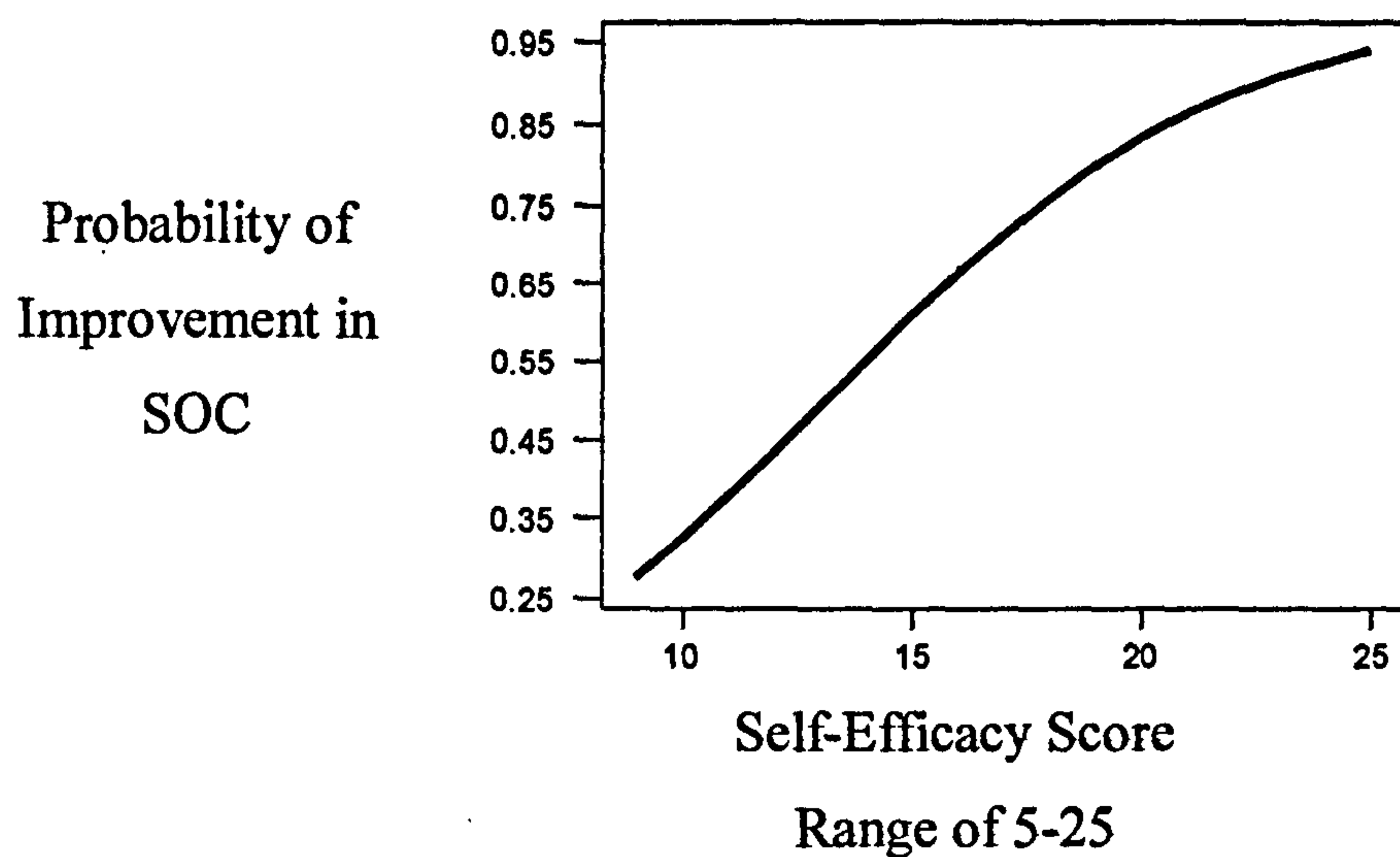


Figure 4.3. Logistic Regression Plot of Probability of Shift in Stage of Change by Self-Efficacy

The Processes of Change

In order to understand how subjects moved from sedentary stages to the more active stages, only the SOC improvers were examined for process use. The median process scores for those who had improved their SOC from baseline are shown on Table 4.4. These are listed in rank order and reveal a similar pattern of scoring for both groups, e.g. self-reevaluation received the highest whilst stimulus control had the lowest frequency score. Only one significant difference between groups was recorded. This revealed that the experimental group scored significantly higher than the control group on the experiential process social liberation ($U = 6609.5, (0,3), p < .05$).

Table 4.4

Ranked median process score for SOC improvers only by group.

	Experimental (N = 103)	Control (N = 98)
Process ^a		
Self reevaluation	13	14
Self-liberation	13	13
Reinforcement Management	12	11
Counter-conditioning	12	11
Social liberation*	11	9.5
Consciousness-raising	10	10
Dramatic Relief	10	9
Environmental Reevaluation	9	9
Helping Relationships	9	9
Stimulus Control	7	7

Note. Processes are listed from the most frequent (self-reevaluation) to the least frequent (stimulus control).

^a Mann-Whitney comparisons between the experimental and control group.

* $p < .05$

In order to establish if there was a significant SOC effect for process use, Kruskal Wallis ANOVAs were used. The results are displayed on Table 4.5. From this, a strong relationship can be seen, as when an individual has moved from contemplation into maintenance, they report more frequent use of certain processes. Four out of ten of the processes had a significant SOC effect, namely self-reevaluation ($H = 19.74$, $df(n = 148) = 3$, $p < .001$), self-liberation ($H = 25.93$, $df(n = 147) = 3$, $p < .001$), reinforcement management ($H = 13.05$, $df(n = 148) = 3$, $p < .005$) and counterconditioning ($H = 38.01$, $df(n = 148) = 3$, $p < .001$). Mann-Whitney procedures revealed that preparation scored significantly higher than contemplation in self-liberation ($U = 101.15$ (-5, -0.001) $p < .05$). While action scored significantly higher than preparation in self-liberation ($U = 4317.5$ (1.001, 4), $p < .05$), reinforcement management ($U = 4168.5$, (0.001, -4), $p < .05$), counterconditioning ($U = 4492$, (2,4.9), $p < .05$) and self-reevaluation ($U = 4181.5$ (1,5) $p < .05$).

Table 4.5

Median Processes of Change across Stage of Change for SOC improvers only

Processes ^a	Stage of Change				Mann-Whitney ^b
	C	P	A	M	
	(n = 6)	(n = 61)	(n = 59)	(n = 22)	
	Median Scores				
<i>Experiential Processes</i>					
Self-reevaluation*	9	12	15	16	P<A
Social liberation	8	11	10.5	10	
Consciousness raising	9	9	11	9.5	
E/reevaluatiion	7.5	9	10.5	9	
Dramatic relief	5.5	10	10	8.5	
<i>Behavioural Processes</i>					
Self-liberation*	9	12	14	14	C<P<A
R/ Management*	7.5	10	13	13	P<A
Counterconditioning*	7.5	9	13	12	P<A
Helping Relationships	6.5	9	9	9	
Stimulus control	4.5	7	7.5	6.5	
Experiential Processes ^c	7.5	10*	12	10	C<P<A
Behavioural Processes ^c	7	9*	12	11	C<P<A

Note. C = Contemplation, P = Preparation, A = Action and M = Maintenance. E/reevaluation = Environmental reevaluation and R/Management = Reinforcement management.

^aThe 10 processes of change were analysed first for SOC effect of process use using a Kruskal Wallis analysis of variance procedure.

^bMann-Whitney tests were used to pinpoint significant difference ($p < .01$) between two consecutive stages, a < symbol indicates significant stage effect.

^cMann-Whitney tests were used to examine the median experiential versus behavioural process score for each SOC.

* $p < .05$

An examination of the experiential construct involved adding all the five experiential processes together and getting their median score. The same was done for the behavioural processes. The results revealed that in contemplation and preparation the experiential median

was higher than the behavioural median, in action both constructs scored exactly the same and in maintenance the behavioural score was highest. However, only the preparation SOC used the experiential processes significantly more than the behavioural processes ($U = 97696.5$, $N = 305$, $p < .05$). Mann-Whitney analysis of process use across SOC revealed that action scored significantly higher than preparation, while preparation scored significantly higher than the contemplation for both constructs (Figure 4.4). Gender analysis revealed no significant differences.

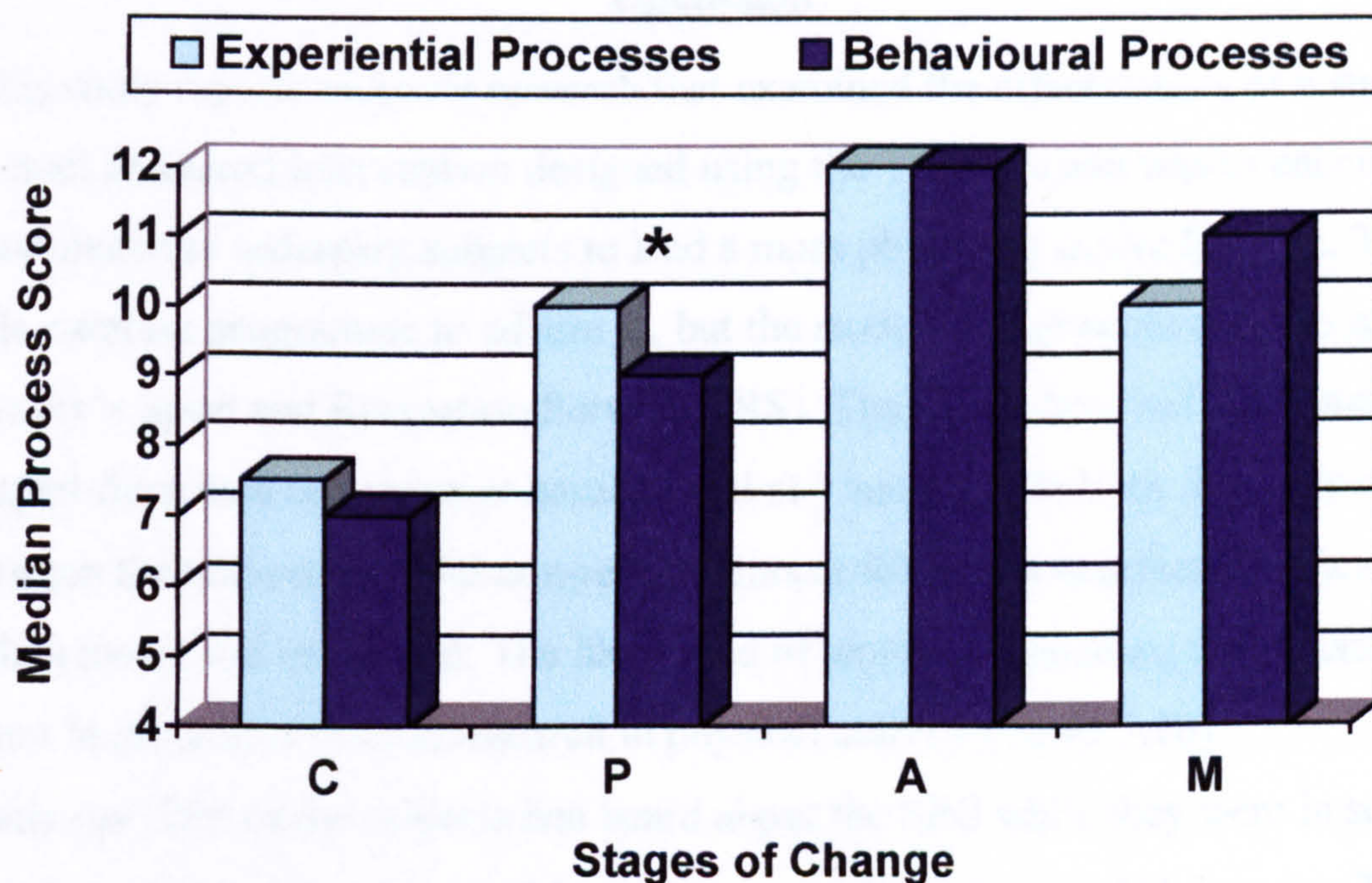


Figure 4.4. Experiential and behavioural processes of change by each SOC.

Note. * $p < .05$

This research has shown that post-intervention significantly more of the experimental group than the control group had improved their SOC from baseline. In evaluating the predictive validity of the shift in SOC (classified as improvement or no improvement, irrespective of group) as a function of process score a Linear Discriminant Analysis was carried out. Approximately 70% of respondents were correctly classified using only the processes of change as the explanatory variables. Subsequent step-wise discriminant analyses were performed using the processes of change data. Discrimination was possible between categories of SOC shift, approximately 70% (classified as improvement or non-improvement).

Two significant discriminant variables emerged from the analysis. These were counter conditioning and reinforcement management (Wilks' Lambda = .816, $\chi^2 = 39.94$, d.f. = 2, $p < .001$). For SOC improvers, only step-wise discriminant analysis revealed that from the processes of change, self-efficacy and decisional balance variables discrimination between the experimental or control groups was possible (approximately 55%). The only significant discriminant variable to emerge was social liberation (Wilks' Lambda = .961, $\chi^2 = 5.6$, d.f. 1, $p < .02$). Cross-validation was applied in all of these statistical procedures.

Discussion

This study reports on novel research that examined the effectiveness of a stage matched, mail delivered intervention designed using the TTM. Its aim was to encourage, support and motivate sedentary subjects to lead a more physically active lifestyle. There was no specific exercise programme to adhere to, but the students were encouraged to make use of the University's Sport and Recreation Service (SRS). The researchers had no contact with the subjects apart from data collection at baseline and at 7-month follow up. The only difference found between the respondents and non-respondents at follow-up was that significantly more females than males had responded. The likelihood of women responding more than men is also evident in other intervention research in physical activity (Table 2.10).

Only one fifth of the subjects had heard about the SRS while they were in school, and from this one in four said it had a positive influence on their choice of University. This impact on recruitment potential of new students could be a positive element of a University's marketing strategy. Similar findings were reported in a subsequent undergraduate survey in the University of Glasgow (Edwards, Simpson, Woods, & Mutrie, 2000). Almost twice as many of the experimental group, in comparison to the control group, were members of the SRS post intervention, and membership was significantly associated with an improvement in SOC from baseline. These results imply that sports facility administrators can increase the likelihood of sedentary students becoming members by sending them an intervention based on adopting a physically active lifestyle.

Post intervention, significantly more of the experimental group in contrast to the control group improved their SOC from baseline, and indicated that they intended to exercise in the future. The only difference between groups was that the experimental group received a stage matched physical activity intervention, the control group did not. This provides

encouraging results for intervention design based on the TTM of behaviour change.

DiClemente et al. (1991) found that helping people progress through just one stage can double their chances of successful behavioural change in the near future. A high percentage of the control group also improved their SOC from baseline; this is thought to have been due to the supportive environment for physical activity that exists in the University e.g. low cost access to an on-campus leisure centre. It could also have been because the control group had access to all the elements of the intervention through normal university life, or because they might have had contact with individuals in the experimental group. No gender differences were found with respect to shift in SOC or behavioural intention over the intervention period.

Both decisional balance and self-efficacy were found to be strongly related to SOC distribution. As an individual's SOC increased so did their decisional balance and self-efficacy score, this supports previous research (Marcus & Owen, 1992; Marcus et al., 1992d; Prochaska, 1994; Prochaska et al., 1994b). Decisional balance score was not a useful predictor of shift in SOC, and it could not account for the differences between the control and the experimental groups. However, significantly different self efficacy scores between both groups (the median self efficacy score of the experimental group being higher than that of the control group) could possibly account for the shift in SOC status post-intervention. Self efficacy was found to be a useful predictor of shift in SOC (determined as improvement or no improvement), suggesting that for an increase in self efficacy score the probability of improvement in SOC was approximately 26%. This compliments other research that found that decisional balance was not as strongly related to exercise readiness, as was self-efficacy (Marcus et al., 1994a).

This study has provided encouraging results for the use of data from the processes of change questionnaire to help in the design of physical activity interventions. This data was found to correctly classify seventy percent of the shift in SOC from baseline, categorised as 'improvement' or 'no improvement'. In order to examine which processes of change were key to movement along the SOC scale, data from individuals who had improved their SOC from baseline in both the experimental and the control groups was examined. Initially, summary statistics provided the main information. From median scores, it was found that the process social liberation (which the intervention encouraged subjects to use) was used significantly more by the experimental group in comparison to the control group. This implies that encouraging a vision of physical activity as something that is natural and socially acceptable

could be an influential aspect of physical activity interventions designed to help sedentary young adults to initiate activity.

The processes of change self-evaluation, self-liberation, counterconditioning and reward were given the highest frequency scores across all SOC. This is at odds with previous research that has suggested that the processes consciousness raising [CR] and dramatic relief [DR] are among the most frequently used in earlier SOC (Prochaska & DiClemente, 1983; Prochaska & Velicer, 1997b; Prochaska & Norcross, 1999). This may be due to the fact that this young, highly educated population may think they know enough about physical activity [CR], and that dying due to inactivity is unlikely [DR]. However, these findings have implications for the 'set of tasks' that each SOC has to achieve in order to progress along the SOC continuum. They suggest that the adoption of a positive behaviour may need to be treated differently to the cessation of a negative behaviour. A similar pattern of process use can be seen in the summary statistics of other research (Marcus et al., 1992c; Nigg & Courneya, 1998); some slight differences could be due to the sample age variance among the various studies. More research is needed to clarify these findings.

Similar to other research findings, a SOC effect was found for process use in both the experimental and the control groups (Cardinal, 1995b; DiClemente et al., 1991; Marcus & Simkin, 1993; Marcus et al., 1996b; Prochaska & DiClemente, 1983; Prochaska et al., 1991; Prochaska & Velicer, 1997b). Precontemplators were found to use the processes the least, while process use tended to peak in action or maintenance. The pattern of process use by both groups was very similar. Gender differences revealed that women tended to use the experiential processes more than men, but there was no significant difference in these scores. More research is needed which is specifically designed to examine gender influence on process use.

From step-wise discriminant analyses procedures, counterconditioning and reinforcement management emerged as the variables that could discriminate between individuals who had improved their SOC and those who had not post intervention. These processes were ranked third and fourth most frequently used by SOC improvers in both the experimental and control groups. These findings suggest that physical activity interventions aimed at encouraging sedentary individuals to become active should focus on the 'active living message' that promotes accumulation rather than bouts of structured exercise, and on encouraging proactive reward of positive change. Social liberation emerged as the variable

that could successfully discriminate between study group (i.e. experimental or control). This supports earlier findings, and it suggests that an increased awareness of physical activity as natural and socially acceptable by the experimental group in comparison to the control group may explain the greater shift in SOC by the experimental group post intervention.

The findings of this study are based on an undergraduate student population; this might have implications for the transferability of the findings to a wider population. The study is based on an individual's self-reported levels of exercise behaviour change and no actual level of physical activity (in minutes for example) was recorded. In support of self-report, the results provide some evidence that subject's level of exercise behaviour corresponds to process of change use, decisional balance and self-efficacy for exercise. These self-report instruments have been shown in other studies to correspond favourably with more objective measures of physical activity (Table 2.7). This study was limited by its outcome data, as due to time restrictions at data collection only cross-sectional data on the processes of change, self-efficacy and decisional balance were gathered. These data were used in an attempt to explain the longitudinal shift in exercise stage of change and behavioural intention amongst the subjects. Whilst this information is valuable as it identifies differences that exist between stage improvers in comparison to non-improvers in terms of these variables at follow-up, future research needs to examine longitudinal data from all constructs of the TTM.

To summarise, a relatively inexpensive, mail delivered, self-instructional intervention based on the 'active living message' is an effective method of assisting sedentary young adults to progress through the SOC construct of the TTM of behaviour change. The self-efficacy of these individuals, along with their use of the process social liberation was positively influenced by the intervention. This research also highlights the importance of targeting specific change strategies for assisting sedentary individuals to become more physically active. It suggests intervention design for the adoption of a positive behaviour should be based on different processes of change than have previously been advocated for the cessation of a negative addiction.

Chapter 5

A qualitative study on physical activity, its meaning and determinants in a young adult populationIntroduction

The aim of this research was to explore and develop an understanding of the reasons for inactivity among young adults, and to identify ways of helping this sedentary population to adopt a physically active lifestyle. Once the statistical analysis for the first two studies had been completed, it was obvious that there were certain research questions posed at the onset of the study that were still unanswered. These questions are listed below:

- What does the concept of 'physical activity' mean to a group of inactive young adults?
- What led to these young people to being inactive by the time they entered university?
- What could have helped them (in the past) to maintain a physically active lifestyle?
- What can be done to help them either adopt (or maintain) a physically active lifestyle in the future?
- What was thought of the intervention, how could it be improved?
- What can the Sport and Recreation Service of the University of Glasgow learn from these interviews?

The most appropriate research method for answering these questions was qualitative, as the questions required the illumination of subjective experiences. Qualitative research attempts to address the reality that the population of study lives in a complex, diverse and constantly changing world, a world that cannot be easily understood by a reductionist approach, which searches for causal or association relationships between isolated variables such as self-efficacy or decisional balance. This research has been driven by a gap in the physical activity literature to date. There are few studies published in physical activity that use qualitative research methodologies to ask or listen to individual experiences of physical activity (Chen, 1996; Dishman, 1994a; Thomas & Nelson, 1996). In general, qualitative studies in the physical domain have focused on topics like the role of sport as a socialising vehicle (Weiss, Smith, & Theeboom, 1996). The HEA did a qualitative study on young women (16-24 years) who were predominantly inactive or irregularly active. The aim was to explore the beliefs, perceptions, attitudes and behaviours of young women towards physical activity, and to use this

information to inform the 'ACTIVE for LIFE' campaign. Several themes emerged including barriers and motivation to physical activity, and suggestions on how the HEA could promote activity among young women (Health Education Authority, 1998a) The purpose of this study, therefore, was to analyse the reasons for inactivity among young adults through listening to their past experiences of physical activity, and how they felt these experiences might impact on their current and future exercise behaviour.

Methods

Focus Groups: Research Design

The statistical analysis of the data presented in chapter four identified the existence of social liberation as a significant predictor of improvement in stage of change over non-improvement. This suggests that if an individual accepts physical activity as a natural and acceptable part of society then they are more likely to become involved. In order to examine the relationship between physical activity and what participants' perceptions and attitudes to what was natural, and acceptable in 'their society', focus group research was used. This type of research was chosen over other forms of qualitative research because it permitted focused discussion on physical activity, and group dynamics enhanced the data generation process (Catterall & Maclaran, 1997; Morgan, 1997). This format provided an opportunity for the moderator to witness what some group members perceived as the 'norm', and how this was reinforced or rejected by other members of the group.

Focus group research is made up of individuals who are usually strangers, but possess certain common characteristics. The participants selected for this study were unknown to the researcher, and while it was not known at the start of the focus groups there were a few incidences of friends attending the same focus group (pilot one, and focus group six). This was not identified as a problem as there are legitimate reasons for having participants who are already acquainted in focus group discussions (Barbour & Kitzinger, 1999). Barbour and Kitzinger comment that "the 'naturally occurring' group is one of the most important contexts in which ideas are formed and decisions made" (p. 9).

Krueger (1994) believed that focus groups had a narrow purpose for which they work particularly well. He felt that they "determine the perceptions, feelings and manner of thinking of consumers regarding products, services or opportunities" (p. 19). Focus group research does not intend to develop a consensus of opinion, to arrive at an agreeable plan or to

make decisions about which course of action to take. It pays attention to the perceptions (as in attitudes and beliefs), feelings and experiences an individual may have had. As all of these individuals were sedentary by the age of nineteen, it was essential to examine how this behaviour had developed for them, and what their perceptions, feelings and manner of thinking was in relation to physical activity.

Other issues in focus group research include the moderator's skills at facilitating group discussions; and the impact of the moderators' persona (that is, how they present themselves) and how this can influence the groups' discussions. There is also the issue of group dynamics within the focus group, and how this can limit or enhance participant involvement; and ethical issues - such as participant confidentiality. To lower the impact of these issues in this study, pilot work was undertaken. This gave the moderator experience in facilitating focus group discussions, it also provided an opportunity for the moderator to explore the issues surrounding group dynamics and how to ensure that all participants had an opportunity to become involved in the discussions. The pilot groups were selected to reflect the actual focus groups, this gave the moderator an opportunity to clarify issues of self-presentation, and to ensure that ethical considerations of the study were adequate. In all of the pilot work an assistant moderator, who was an experienced focus group researcher, provided constructive feedback to the moderator on skill improvement.

Sample

The Selection of Participants

The aim of this research was to gain insight into inactivity amongst young adults. In order to obtain a sample that could answer this research question, all first year students in an urban university in Scotland were asked to complete a physical activity questionnaire. The results obtained in this baseline study have been detailed in chapter three. The students who said that they were completely sedentary when they entered the university were then selected for an intervention study (N = 459). The participants were randomly assigned to either an experimental or a control group. The experimental group received an intervention designed to help them adopt a more physically active lifestyle. The control group did not receive the intervention. This follow-up study has been reported in detail in chapter four. The quantitative research began in October 1996 and students were tracked until April 1998, when the qualitative study began.

Only participants who had responded to both of the quantitative studies were eligible for the qualitative study (N = 223). This meant that the focus groups were made up of participants from both the experimental group and the control group. Some of these individuals had reported that their exercise behaviour (stage of change) [SOC] had improved from the baseline study to the follow-up study, whilst others said that there had been no improvement. See Table 2.2 for a definition of each SOC. Each participant was placed into one of the eight homogeneous categories. This categorisation is shown on Table 5.1.

However, once the focus group discussions began it became clear that even though individuals were invited to specific focus groups based on exercise SOC improvement or non-improvement at six-month, eighteen months from baseline, individuals' exercise SOC had changed once more. This meant that the focus groups were a mixture of both heterogeneous and homogeneous groups. Focus groups three, four, five, six and eight were made up of a mixture of individuals who were regularly active (that is, in SOC four (action) or five (maintenance)) and others who were not regularly active (that is in SOC one (precontemplation), two (contemplation) or three (preparation)). Whereas, participants in focus group seven were all sedentary (that is, in SOC one and two only), and participants in focus group nine were not regularly active (that is, in SOC one to three only). It was not felt that the issue of group differences was a disadvantage to the study as all individuals were selected on the basis of a shared experience, they were all sedentary when they left school. Similar issues of homogeneity or heterogeneity among group participants have been identified in other research (Barbour & Kitzinger, 1999).

Each focus group was divided by gender as it was felt that mixed gender groups could inhibit responses to some questions; for example references to body image and how physical activity can change this. It was intended to have a single mixed gender group to test this hypothesis, however, the number of individuals who agreed to take part in the study did not allow this.

Table 5.1

Potential number of participants for each focus group.

	Experimental Participants (n)		Control Subject (n)	
	Male	Female	Male	Female
Improvers	28	59	23	49
Non-Improvers	8	17	15	24

Procedure

Recruitment

Once the participants eligible for the focus groups were identified the process of recruitment began. Up-to-date information on the subject, their current postal addresses and contact telephone numbers were obtained from the University's central records using the students' matriculation numbers. From this data, it was found that twenty-three individuals were no longer registered as students of the university (16 female, 7 male). These individuals had to be removed from the target group, as they could not be contacted. Thus the sample of potential recruits decreased ($n = 200$).

All potential participants were emailed using their student email accounts to advise them that a research study, which involved second year students, was currently taking place in the University. It was a short message that clarified the purpose of the research and how their input was important. It explained that individuals might receive a phone-call in the near future to ask for their assistance in the study. Two weeks prior to the focus group date, all the potential participants for a particular focus group were telephoned to establish if they would be willing to take part in the study. The aim of the telephone contact was to personally invite the potential participants to the focus group, to inform the individual of the research, answer any questions, and encourage them to come along.

If individuals agreed to participate in the study they were sent a personalised follow-up invitation. This invitation confirmed the location, time and date of the focus group. It also gave them more information regarding the purpose of the study, and it stressed how important each individual was to the study. A contact number was listed at the bottom of the invitation that individuals could use in the event of a cancellation. In order to increase the likelihood of attendance at the focus groups, the University's Sport and Recreation Service provided

refreshments at each meeting, and all participants received £5 cash to thank them for their time and effort in coming along. The number of individuals who accepted or declined the invitation to attend the focus groups shown on Table 5.2. The night prior to a focus group each individual who had accepted the invitation to attend was given a reminder phone call. This served to reinforce the importance of their attendance at the focus group, and to remind individuals about the meeting. Both the telephone scripts and letter of invitation are in Appendix 6.

Table 5.2

The breakdown of the number of participants willing or unwilling to take part in the focus groups

Focus Group	Accepted invitation	Declined invitation	Unable to establish contact due to:			Total
			A	B	C	
Experimental Improvers ¹ (F) (Focus Group 1 (Pilot 1)) (Focus Group 3)	22 (11) (11)	9	5	4	19	59
Experimental Non-Improve ² (F) (Focus Group 4)	10	3	1	1	2	17
Experimental Improvers (M)* (Focus Group 5)	10	5	5	4	4	28
Control Improvers (F) * (Focus Group 2 (Pilot 2)) (Focus Group 6)	21 (10) (11)	9	7	4	8	49
Control Non-Improvers (F) (Focus Group 7)	11	3	2	3	5	24
Control Improve (M) (Focus Group 8)	7	10	2	2	2	23
Experimental & Control Non-Improvers (M)** (Focus Group 9)	3 6	3 1	0 1	0 3	2 4	8 15
Total	90	41	23	21	46	223

Note. M = male and F = Female

* One student from each of these groups was recruited for help in script development.

**Male non-improvers, both control and experimental were put together due to low number
A – Left University, B – Incorrect contact information, C – Could not reach the individual by phone/email or post.

¹ Improvers means that these individuals had improved in their exercise SOC from baseline to follow-up.

² Non-improvers, these individuals did not improve in their exercise SOC from baseline to follow-up.

Location & Time

The research setting was a meeting room in the Sport and Recreation Service's administration facility. This location was chosen as it was easy to find, quiet, comfortable and located on campus to facilitate easy access for the participants. One reservation was that it was located opposite the Sport and Recreation Service's leisure centre. However, this issue was addressed during the telephone conversations with the participants, where it was explained that the meeting room would be used to facilitate the discussions.

Prior to the beginning of the focus groups, a timetable of tasks that needed to be completed was established (Appendix 7). The scheduled times were either at lunchtime or early evening to facilitate attendance by the participants. At the end of each focus group, all the participants were asked to complete a questionnaire on physical activity. This was based on the questionnaires used in studies one and two (Appendices 2 and 3). Each focus group lasted approximately ninety minutes. This time included welcoming individuals, having something to eat (sandwich buffet), the focus group discussion, and completion time during which individuals could ask any questions (Krueger, 1994).

Moderation

A moderator and an assistant moderator facilitated each focus group. The moderator (author) remained the same throughout the study, the assistant moderator changed. The tasks of the moderator included ordering the refreshments and making sure they were in place prior to each focus group. Making sure the room and technical equipment (tape recorder) were set up prior to the arrival of the participants. Once the participants began to arrive, the moderator welcomed them, helped them to relax and generally enjoy the session. Once the research began the moderator made a formal introduction, gave an overview of the study, set the ground rules, and got on with the questioning.

Two different individuals acted as assistant moderators for the pilot focus groups. Both were researchers in the University who were experienced in focus group research. Their role was a little different to the main assistant moderator, as they had the added duty of assessing the moderator's skills. They provided feedback on the effectiveness of the moderator, and suggested how to modify the moderating technique in order to facilitate discussion. One individual was the assistant moderator for the remaining focus groups. This was considered essential as it meant the assistant moderator had a high degree of familiarity

with the study and therefore could contribute substantially to the debriefing of each focus group. It also allowed for the assistant moderator to be able to compare different groups. The tasks of the assistant moderator were adapted from (Krueger, 1994). They had to ensure that the recording equipment was operational, all focus groups were tape-recorded using a flat mike that was unobtrusive. The assistant moderator welcomed the participants, and checked that they had enough refreshments. During the discussion they took notes, especially of gestures or non-verbal activity that would not be recorded on audiotape. They did not participate in the discussion until all of the questions were asked. They were then invited to join the group, to ask any questions they had thought of, and then give a summary of the discussion. Following the summary, all participants were asked to verify that it represented what was said. Participants were encouraged to change anything they perceived as different. Once the participants had left the room a debriefing session took place between the moderator and the assistant moderator. The assistant moderator also was involved in the production of the written report.

Script Development

The interviews were structured and followed an interview script in which all groups were asked the same questions. These questions were derived from the findings of studies one and two and a literature review, and then pilot tested. As the author was a regularly physically active individual, and a professional in the field, there was a danger of being biased towards physical activity. In order to control for this, a peer review group was established. This group consisted of fourteen individuals: two students who were eligible to be participants in the study, four exercise psychologists, three of whom had experience in qualitative research, three marketing professionals who specialise in the area of focus group research and two employees of the Sport and Recreation Service. The main function of this group was to comment on the appropriateness, interpretability and clarity of the telephone script and the letter of invitation that was sent to participants prior to attending the focus group. They also played a major role in reviewing the interview script developed for use in the focus groups. The researcher then met each reviewer separately and discussed their comments on how the content of the scripts could be improved.

Each script went through several drafts prior to the final script emerging (Appendix 6). The script included questions for discussion on current recommendations of physical activity

for health benefits, on physical education and extracurricular physical activity experiences, and on individual's transition from school to university and how this influenced their exercise habits. Constructs from the transtheoretical model of behaviour change like decisional balance, self-efficacy and the processes of change were discussed, and the intervention that was sent to the experimental group was also reviewed.

Pilot Focus Groups

There were two pilot focus group studies carried out. The aims of the pilot studies were to test the interview script and to give the moderator (author) an opportunity to work with the subject group. The data obtained from each pilot study was transcribed immediately after the focus group and analysed to stage two of the analysis procedure to see if the information given by the participants was relevant to the research questions (Figure 5.1). Each pilot study served as a run-through for the actual study, and had an assistant moderator who was experienced in focus group research. The methodology from each pilot group was assessed using the questions listed on Table 5.3.

Table 5.3

Questions on pilot studies.

-
- Was the introduction satisfactory?
 - Did the participants understand the ground rules?
 - Were the participants relaxed?
 - Did the questions get participants to talk?
 - Were the participants talking about the topic? or Were they distracted easily or put off the topic?
 - Were the verification procedures accurate?
 - Was the conclusion clear and to the point?
-

Note. Adapted from "Focus Groups: A practical guide for applied research" by R.A.Krueger, 1994, California, Sage Publications.

The first pilot study was made up of females from the experimental group (N = 9). All participants had reported improvements in their exercise stage of change post intervention. In the post-focus group debriefing, two recommendations were made by the assistant moderator

on how to improve moderating skills. These were to establish a more relaxed atmosphere as at times it was felt the pauses were too long. This was stressed as important to keep the conversation going ‘to keep the energy in the group’ (Dr. Claire Carney, personal communication, April 9th, 1998). Secondly, more use of techniques like paraphrasing and parroting skills were identified; for example, it was recommended that each key question was summed up and the group were given an opportunity to agree or disagree with the summary. The transcript of the first focus group was typed up immediately following the interview. The aim of the analysis was to ascertain if the questions were eliciting information that was relevant to the study. The analysis questions are included on Table 5.4. From the analysis, it was found that the wording of key question eight was unsuitable. The question originally read ‘Supposing you wanted to lead a more physically active lifestyle than you are right now, what would you do?’ It was changed to read ‘Supposing you did no physical activity at all, you were completely sedentary, and you decided you wanted to lead a more physically active lifestyle, what do you think would help you to begin being active?’ The aim here was to identify how individuals changed and/or thought about changing their behaviour. The remainder of the interview script was found to be suitable, as the questions were easily understood, unambiguous and were yielding information that was useful in answering the research questions.

Table 5.4

Questions to evaluate the usefulness of the data obtained

-
- Is the information produced relevant to the study?
 - What does the information obtained mean?
 - Is it clear what the participants were talking about, or do you need to probe further?
 - What can be learned about subject’s exercise behaviour, their feelings and their beliefs from the data?
 - What ideas does this suggest about solving the problem of inactivity?
 - Do the questions need to be revised?
-

Note. Adapted from “Focus Groups: A practical guide for applied research” by R.A. Krueger, 1994, California, Sage Publications.

Based on the assistant moderator's review of the first pilot group further research into focus group literature was required. This literature review yielded a list of 'remedies' that could be used to help the moderator relax and in turn elicit more information from the participants. Examples include 'Does anyone see it differently?' 'Would you give me an example of what you mean?' and so on. The second pilot study consisted of females from the control group (N = 10). All of these individuals had indicated an improvement in exercise stage of change post intervention. The assistant moderator was briefed on the report given to the moderator in the initial pilot study; this highlighted the areas suggested for improvement. After the focus group the feedback from the assistant moderator suggested that there had been an improvement in the moderating skills used. The group was conversing quite easily about the topic, giving examples of personal experiences both good and bad. An analysis of the transcript revealed that similar themes to those identified in pilot one were emerging. This again meant going back to the literature to establish how to get more in-depth knowledge. Examples of further probes that could be used in the remaining seven focus groups were 'In our earlier groups we've been hearing about... what do you think about it?' 'Let me share with you some comments that emerged from earlier groups...tell me your reactions' (Krueger, 1994). The aim of these probes was to clarify meanings of concepts that different individuals in different focus groups referred to. For example, if the statement 'not being any good at sport' was made, rather than accepting this at face value, individuals were asked what they meant by feeling they were 'not good', and where and when they thought this feeling arose.

Role of the Researcher

As the topic of discussion was physical activity, and all of the individuals within the groups did roughly the same amount of activity, the topic was not an overly sensitive one. Participants conversed easily on their experiences of physical activity. The role of the researcher followed a collaborative model, in that the participant/researcher are interdependent, as they were mutually involved in the research. However, in order to remain neutral to what was being said, and in the analysis procedure, the rule of bracketing was applied. Bracketing involves setting aside one's biases, assumptions and expectations (Smith, 1997). The researcher does not accept a description as a statement about the world, but simply as a statement about an individual's experience of the world. Bracketing is not the stance of objectivity and non-involvement of natural science, since empathising with participants is

essential (Pidgeon & Henwood, 1997). This implies that if the researcher is able to understand the participants' participation in physical activity (or otherwise), they must engage in close inspection of how the world of physical activity is perceived through the eyes of the participants' themselves, from their social and phenomenological perspectives. This involves insider knowledge, but at the same time bracketing one's own biases.

Access and Ethics

The ethics board of University of Glasgow approved this study (Appendix one). All participants were informed of the purpose of the study, and asked if they would like to participate. Participation was entirely optional, and they were assured of confidentiality and anonymity of information given. Refreshments were provided during the focus groups, and all participants were paid a sum of £5.00 to cover any expenses they had in attending the group.

Data Analysis

Replicability and Validity

If a study is to be considered reliable, then it is logical and highly probable to expect that different researchers, in different locations could replicate the study and obtain similar findings. This is relatively simple to achieve in quantitative methodologies as subjectivity is screened out of the process. However in qualitative studies the concept of replication is complex as the research exists in a social world that is constantly changing. It is difficult to systematically recreate an original research setting. It is also difficult to ensure that in the time that has lapsed between interviews, the participants have not changed their interpretation of the world, as this would ultimately change their answers to the original research questions. Thus, in order for reliability to be calculated in qualitative research, it is good practice for the researcher to document procedure. In this study, there has been systematic documentation of everything from the identification and wording of the interview script, to the recruitment of participants and the writing of the final report.

Internal validity deals with the question of how one's findings match reality, or the extent to which an account accurately represents the social phenomena it purports to represent (Hammersley, 1990). However, since reality is viewed as holistic, multidimensional and ever changing, the qualitative researcher is primarily interested in perspectives rather than truth per se (Taylor & Bogdon, 1984). External validity is to do with the generalisability of the research findings. Peshkin (1993) identified a concept of user generalisability, which implies that the

user (reader) evaluates the findings of the carefully described and interpreted study and asks what things apply to his or her situation. Thus, it is the consumer of the research, not the author, who does the generalising.

Banister et al. (1995) felt that the aim in qualitative research was not so much replicability as specificity. In other words, generalisability could be achieved only when the particular meanings of the research setting were explored and specified. These explorations had to be thorough and combined with participant verification. Participant verification provides a form of corrective feedback to the researcher (Krueger, 1998). Through peer examination and evaluation of one's findings, by involving the participants in all phases of the research and clarifying the researcher's own bias and theoretical orientation at the outset of the study the validity of the study is enhanced. (Thomas & Nelson, 1996) suggested that comparing different forms of data to substantiate conclusions could be used as a form of validation e.g. comparing questionnaire responses to focus group material. This form of validation is called triangulation, and it provides a means by which qualitative researchers can test the strength of their interpretations and increase confidence in their findings. However, Silverman (1993) suggests caution on relying too much on using triangulation that involves counterposing different contexts for establishing validity.

Participant verification was facilitated in three ways in this study. Initially, two potential participants were recruited as part of the 'review group' to help in the script development for the interview, the telephone conversations and the invitation letter. Second, at the end of each key question, and at the end of the interview the moderator and assistant moderator gave a summary of the comments made. The participants were asked if the summation was an accurate reflection of what had been said, and they were encouraged to change anything they disagreed with. All the focus groups were transcribed directly after the data was collected. Third, a copy of the transcript and a summary memo (Miles & Huberman, 1994) was mailed to each of the focus group participants who indicated that they would be interested in providing feedback (N = 17). All individuals were asked to comment on the preciseness of the data, and to suggest how the memo could be improved in order to reflect the discussion that had taken place. In order to increase the likelihood of the transcripts being returned a sum of £5 was offered to each individual who returned the script with comments within a four-week timeframe. Forty percent (N = 7) of the transcripts were returned, one per focus group.

Peer examination and evaluation was facilitated through the two different review groups. The initial review group examined the script development, and gave comments on how this could be improved. The second review group was set up to help validate the data analysis procedure. A group of five individuals (one social scientist, one marketing professional, and three educationalists) were each sent a copy of the third focus group and asked to index-code the transcript, and highlight any emerging themes. They then returned the transcripts to the researcher. The process of validation involved the researcher comparing her code list and emerging themes with those of the review group. If a discrepancy was found between codes allocated to text items by the researcher and those allocated by a reviewer, the reviewer was contacted. For example, the theme 'self-directed physical education', indicated by a reviewer replaced the theme 'autonomy', which had been indicated by the researcher, as a theme present in the answers given to key question one. It was felt that the context of the quotes referred to physical education and therefore the theme needed to be more specific. Also the concept 'self-directed physical education' encompassed the notion of autonomy within that phrase. Finally, one individual, who was familiar with the transcripts but not involved in the content analysis, served as a reliability check on the inductive analysis. Independently, this individual replicated the analysis from selected raw data themes to general dimensions.

Analysis Procedure

The data obtained from the focus groups were examined for participants' perceived meanings of physical activity, its determinants and influences. A content analysis procedure was used. The emphasis was on the emergence of ideas, themes and concepts from the words of the participants. Inductive analysis (Patton, 1990), constant comparison (Lincoln & Guba, 1985; Strauss & Corbin, 1998), and deviant case analysis (Frankland & Bloor, 1999) were used to analyse the interview data. A diagrammatic representation of the procedure can be seen in Figure 5.1. This procedure was based on analysing the 'snapshot', however coding the 'moving picture' can also reveal valuable information (Catterall & Maclaran, 1997). In other words, a content analysis was completed initially which was followed by an analysis of the group dynamics. In order to facilitate data analysis, the qualitative computer packages NUD*IST QSR and NVIVO were used for data management.

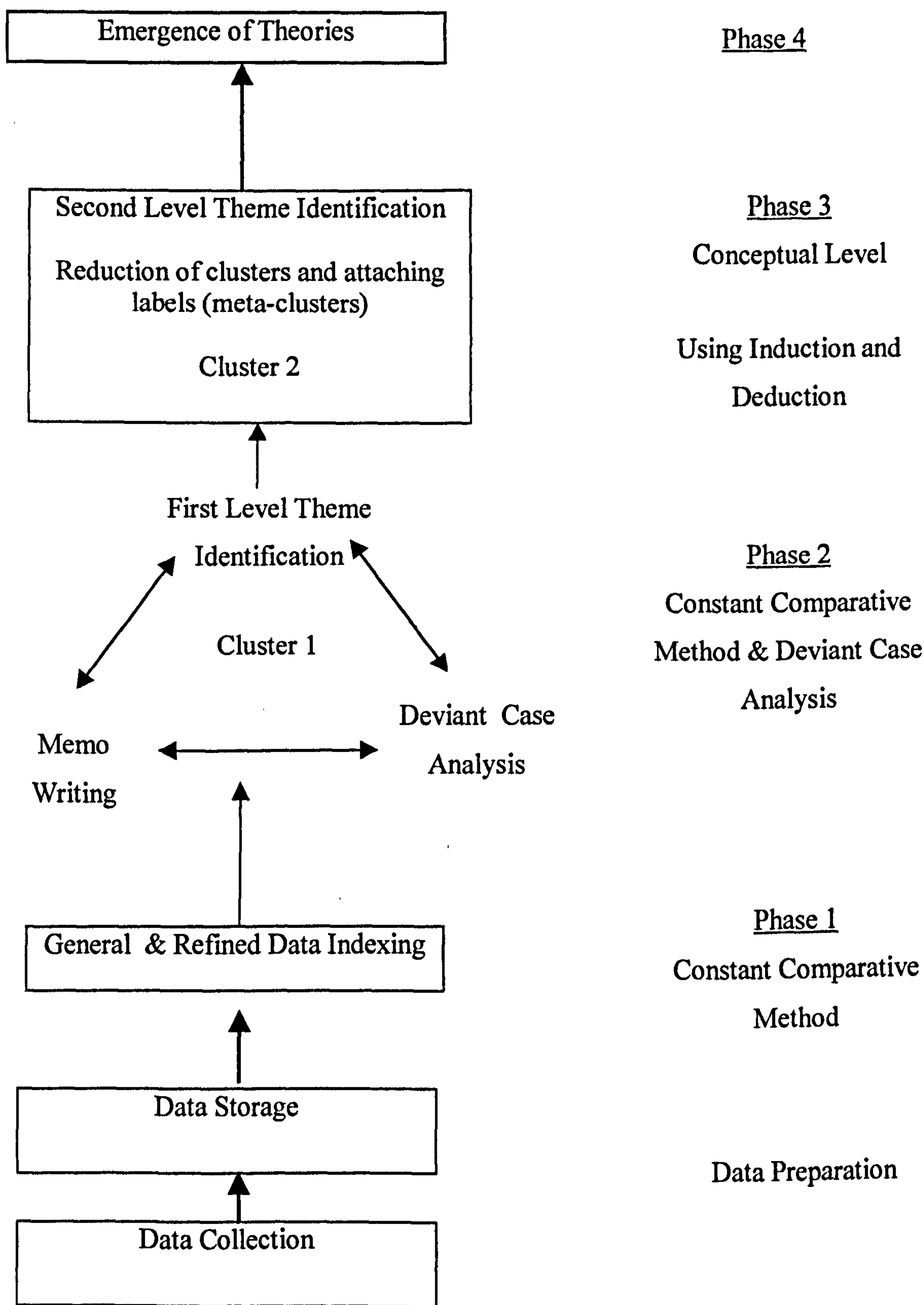


Figure 5.1. A schematic diagram of the analysis procedure

Content Analysis

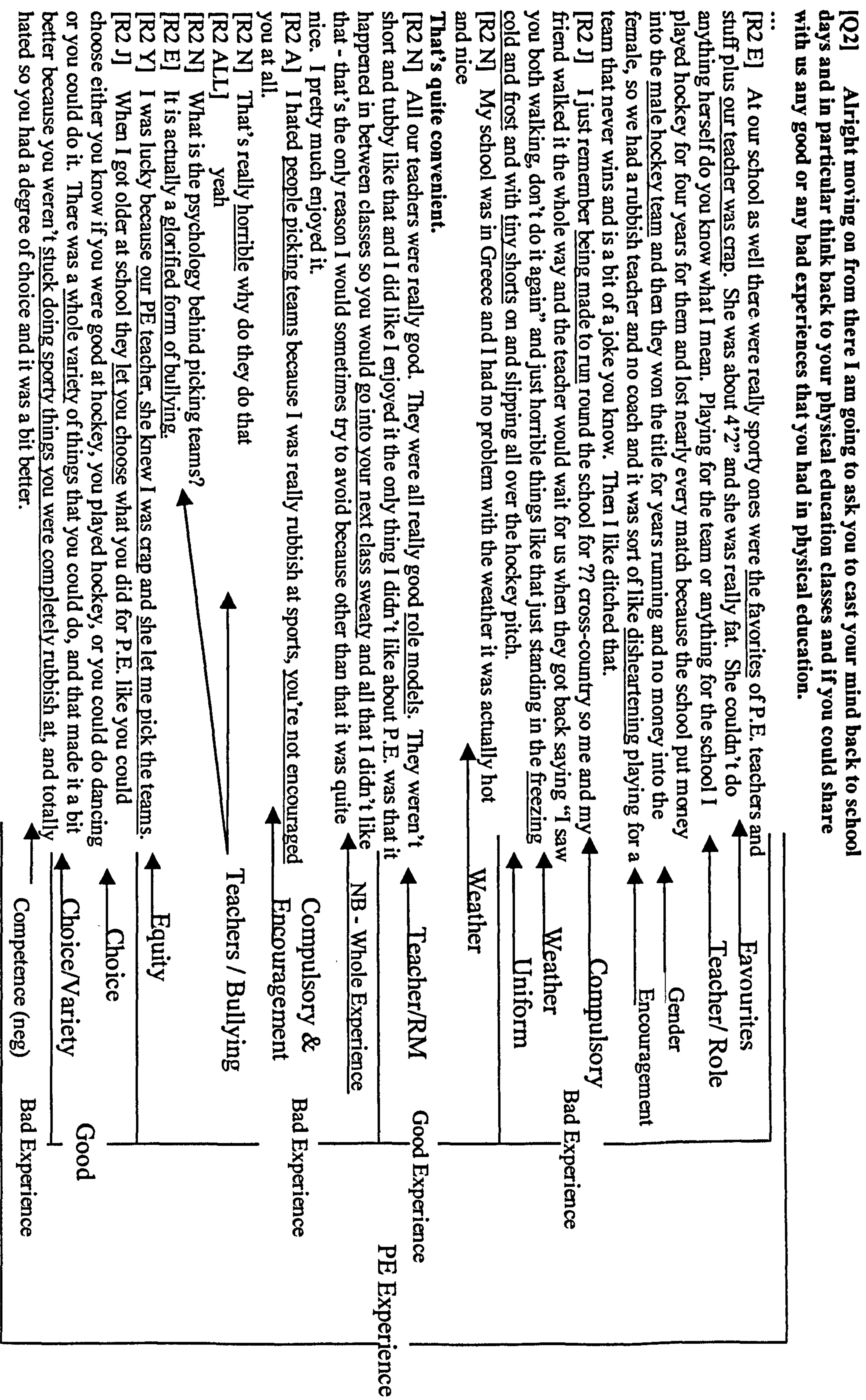
Phase 1: Raw-data codes

Each transcript was read through as a whole, and a note was made of any recurring patterns in the text that emerged. The data were then re-read, and raw-codes that related to the content of the text were noted in the transcript margins. Initially, the raw-codes were quite broad and general. On subsequent readings of the text, the general index codes were refined. An example of the coding process is on Table 5.5. This process was cyclical, as new codes emerged in later transcripts earlier texts were returned to, to add the new code to them or to modify the original list to be inclusive of the new code. Once this process was finished, the 'primary phase' of the analysis was complete. For example, the words 'positive experience' would have been initially recorded in the margin of a transcript beside a text item referring to a good experience of physical activity. On subsequent readings, this would then have been refined to 'positive experience/friends' and then eventually to 'positive experience/friends /encouragement or positive experience/friends/normalisation' depending on the specific text item. This is where the concept of themes began to emerge from the transcripts.

Phase 2: First Level Theme Identification & Description

In the second phase of the analysis, the data under each key question was analysed in turn. Initially, any of the fractured raw data that shared a common code was categorised to form a theme for example 'limited choice'. A theme is a collection of text items with common properties. In order to ensure that there was no selectivity by using some cases and ignoring others, Nudist*QSR was used to search each focus group for referenced text items with the same non-exclusive raw-code. Thus, any text item irrespective of which focus group it was in, or whether it was located in question 1 or 10 that was raw-coded 'physical education/bad experience/limited choice' was extracted and analysed as part of the theme 'limited choice'.

Table 5.5. An example of general (—) and refined (◀—) data indexing.



In order to ensure that the description of an emerging theme reflected what was said by the participants, the principles of analytic induction (Frankland & Bloor, 1999) were followed. These principles used the process of making systematic comparisons within the data. Initially, a provisional description of a theme was written using the data from a single focus group. This description was then compared with the facts (raw-coded references to the theme in other transcripts) and if a 'deviant case' was found alterations were made. A deviant case was an example of a text item that raw-coded to the theme, but contradicted the provisional description. These alterations involved either modifying the original description so that any new facts were accommodated, or the description was redefined so as to exclude the deviant case. The deviant case was then recoded into a more appropriate theme. This process, according to Frankland and Bloor, "guards against selective attention to data and provides a systematic means of extending analytic thinking" (1999, p. 151). For instance, the description for the theme 'physical education/bad experience/limited choice' was a two-stage process. From the data in the initial focus group, a theme description was written. It stated that 'the powerless feeling of limited *choice* as to what activities you could do in the physical education class was a negative experience'. The data from the remaining focus groups were then analysed and accounted for. Deviant cases were identified when 'limited choice' became problematic not only because of the lack of variety of activities, but also if normative targets were imposed in these activities irrespective of ability. The original hypothesis was modified to include the implication of perceived lack of ability. More than one hundred first level themes were identified and described through phases one and two of the analysis procedure. These are listed in Appendix 8.

The aim of this analytic procedure was to derive theme descriptions that applied generally across all the data to the entire universe of relevant cases or transcript items. This initial change has been referred to as 'working the hypothesis', and this method is similar to the idea of limiting the applicability of an explanatory hypothesis (Robinson, 1951). Analytic induction provides a systematic and formal method of altering the hypothesis (theme description) to develop a better one. The requirement to either accommodate or eliminate all deviant cases acts as a stimulus to extend the analysis, guarding against premature closure of the analytical task. By concentrating on the 'deviant case', this forces the analyst to review the description used in the analysis, thus guarding against the selective approach. Techniques

such as knowledge building, self-correction, and constant comparison of deviant cases are an important part of analytic induction.

Validity Check: Analytic Propositions

This phase of the analysis involved summarizing the data obtained for each key question. The aim of this analysis was to remain true to what the participants said, and provide a summary statement that answered each key question posed. The process of writing the proposition was the same as for writing each individual theme. Initially, the themes recorded for each key question were put together, then the process of combining the themes began. Once the statement was written, the researcher returned to each focus to examine the fit between the raw data and the summary of it that was presented in the analytic proposition. When deviant cases were identified, they were accommodated through the procedures described above. This process gave the researcher an idea of the thickness of the data on each theme, and the importance attached to it by the participants.

Phase Three: Second Level Theme Identification & Description

Phase three involved the combination of similar first level themes into clusters to facilitate the emergence of key concepts. This process involved establishing concepts that focused on the relationship between several themes and their sub-categories. A diagrammatic representation can be seen on Figure 5.2. The description of each second level theme was written using the same procedure highlighted in phase two. Seventeen themes emerged at this stage. A list of all the second-level themes, their descriptions and the first-level themes from which they emerged are listed in Appendix 9.

Phase Four: Theory Development

The final phase of the analysis involved a combining of the second level themes to examine their relationships and to establish mini-theories (Miles & Huberman, 1994). These mini-theories were an abstraction of the second level themes in the words of the author. Memos written during the analysis procedure were used at this stage to help formulate theories. Once these were established, there was an integration of minitheories into an explanatory framework. This phase is both inductive and deductive. It is inductive, as it was necessary to return to the raw data to ensure that the themes generated were accurate, and thus

the formation of theories had an accurate basis. In the deductive analysis, an insight into the data was developed through existing theories on behaviour modification and exercise adherence.

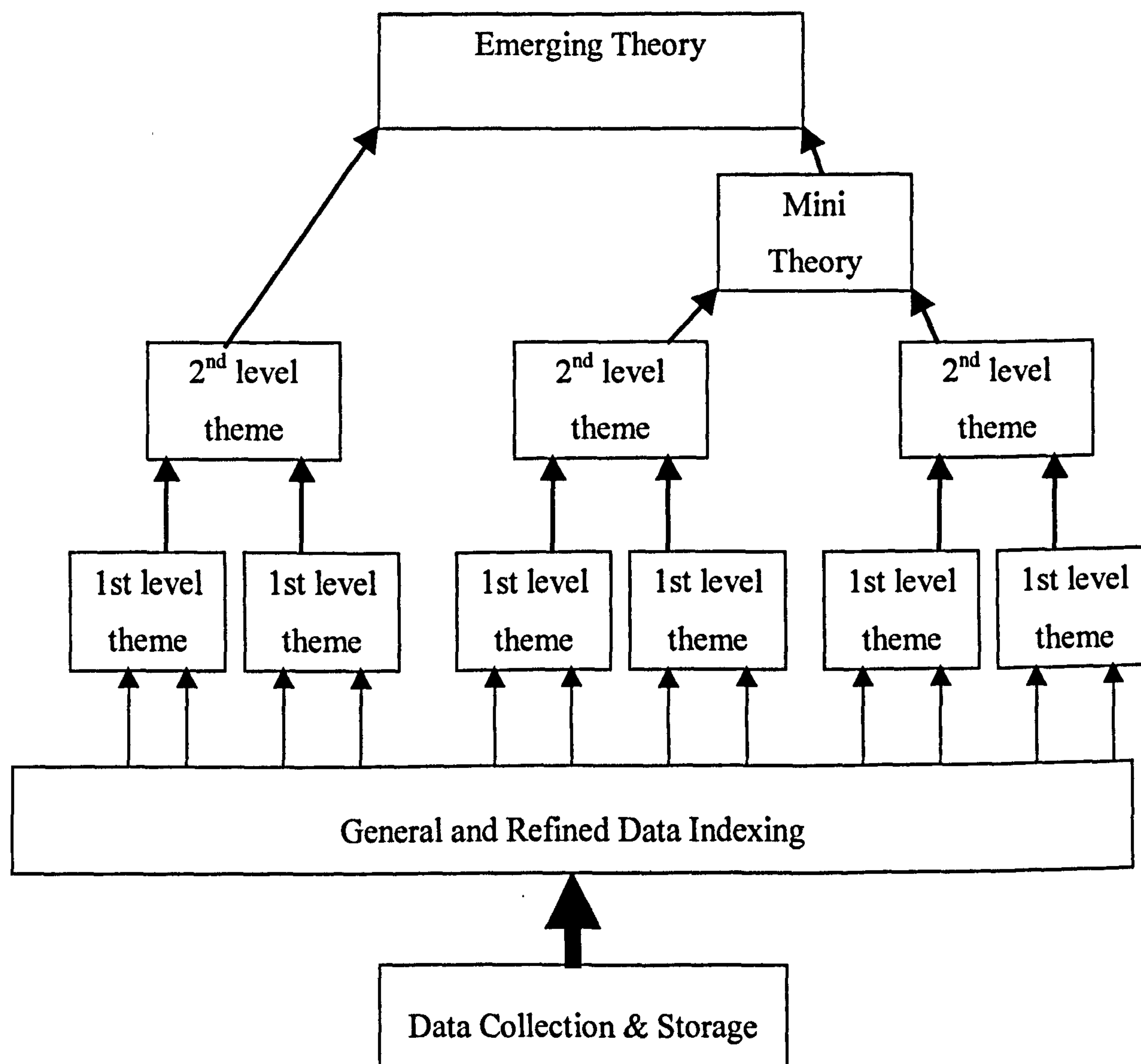


Figure 5.2. An example of a data tree outlining the data reduction process

Group Dynamics Analysis

Focus groups can provide insight into the experiences of the individual participants; however, the real value of group data can be found in analysing the interaction between the participants (Kitzinger, 1994). The interaction between the participants in focus groups and the interplay and modification of opinion that occurs may in fact provide data that is “more ecologically valid than methods that assess individual’s opinions in relatively asocial settings” (Albrecht, Johnson, & Walther, 1995, p. 54). However, the group dynamic element can have a

positive or negative influence on the data obtained, it can be a threat to the authenticity of individual participant's views and experiences; this is known as a groupthink phenomenon (Janis, 1982; Robson & Foster, 1989). This was guarded against by constantly checking individuals' responses, asking them if they agreed with the points raised, and assuring them that there were no right or wrong answers.

One of the primary benefits of conducting focus groups on this topic was that it provided valuable data on how people talk about physical activity, and how they responded in a situation where they are exposed to the views and experiences of others. How the topic of physical activity was discussed, accepted, argued or challenged by different participants yielded valuable information about sedentary and active lifestyles among young adults. The dialogue of individuals was also examined to establish if during the course of the interview their opinions had been modified as a result of interaction with other group members. Changing attitudes were documented for several respondents and proved to be a key finding from the research.

Results

Questionnaire data

At the end of each focus group, all the participants were asked to complete a questionnaire on physical activity. This was based on the questionnaires used in studies one and two (Appendices 2 and 3). The questionnaire gathered demographic information on the focus group participants, and it asked them to complete instruments measuring their exercise stage of change [SOC] (see Table 2. 2 for a definition of each SOC), decisional balance, self efficacy and process of change use (see Table 2. 4 for a definition of each process of change). The following section summarises the demographic and questionnaire information for each focus group. The stage of change distribution for each focus group can be seen on Table 5.6.

Experimental SOC Improvers (pilot focus group one)

Focus groups one was a pilot study, it was made up of nine female second year undergraduate students, whose average age was 19.4 years (range 19-31). All of these individuals were in the experimental group in study two (chapter four). They were sedentary at baseline, however at follow-up (six-months later) had indicated that they had improved their exercise SOC. This improvement was still evident eighteen months later (post focus group study) as four individuals were in the preparation SOC (i.e. they were doing some physical

activity but were not regularly physically active), and five were regularly active (i.e. in action or maintenance SOC).

Control SOC Improvers (pilot focus group two)

Focus group two was also a pilot study. It was made up of ten, female, second year undergraduate students, whose average age was 19.3 years (range 19-20). All of these individuals were in the control group in study two (chapter four). They were sedentary at baseline, but had indicated that they had improved their exercise SOC at the six-month follow-up. Eighteen months from baseline, six individuals were not regularly active (one individual had regressed into a sedentary lifestyle, while five individuals were in preparation SOC), and four individuals were regularly active (in action or maintenance SOC).

Experimental SOC Improvers Female [ESIF] (focus group three)

This focus group was made up of five female second year undergraduate students. Their average age was 19.8 years (range 19-20). All of these individuals were in the experimental group in study two (chapter four). They were all sedentary at baseline, but at 6-month follow-up had indicated that they had improved their exercise SOC. Eighteen months from baseline, three individuals indicated that they were regularly active (i.e. in the action SOC), while two individuals had regressed to sedentary living (i.e. in the contemplation SOC).

Experimental SOC Non-Improvers Female [ESNIF] (focus group four)

Focus group four was made up of four female second year undergraduate students, whose average age was 20 years (range 19-20). All of these individuals were in the experimental group in study two (chapter four). These individuals did not improve their exercise SOC over the intervention period. They were sedentary at both baseline and at the six-month follow-up. Eighteen months from baseline, two individuals were still sedentary (in the precontemplation SOC), while two individuals had improved their exercise SOC (one individual was in the preparation SOC, the second indicated that they were in the action SOC).

Experimental SOC Improvers Male [ESIM] (focus group five)

Focus group five was made up of five male second year undergraduate students. Their average age was 19 years (range 18-20). All of these individuals were in the experimental group in study two (chapter four). They were sedentary at baseline, but had indicated that they had improved their exercise SOC at the six-month follow-up. However, eighteen months from baseline, one individual had regressed into a sedentary lifestyle, two individuals were in preparation SOC, and two were regularly active.

Control SOC Improvers [CSIF] (focus group six)

Focus group six was made up of seven female second year undergraduate students, who were on average 19.3 years (range 19-20). All of these individuals were in the control group in study two (chapter four). They were sedentary at baseline, but indicated that they had improved their exercise SOC at the six-month follow-up. Eighteen months from baseline, five individuals indicated that they were regularly active, while two individuals indicated that they were in they were not regularly active, but were doing some physical activity (in preparation SOC).

Control SOC Non-Improvers [CSNIF] (focus group seven)

Focus group seven was made up of seven female undergraduate students, who were on average 19.3 years (range 19-20). All of these individuals were in the control group in study two (chapter four). They were sedentary at baseline, at six-month and at eighteen month follow-up. Three individuals were in precontemplation SOC and had no intention of becoming physically active in the next six months, whilst four individuals were in contemplation SOC, this means they were sedentary but were thinking about becoming active in the next six months.

Control SOC Improvers [CSIM] (focus group eight)

Focus group eight was made up of seven male undergraduate students, who were on average 19.6 years (range 19-21). They were in the control group in study two (chapter four). All individuals were sedentary at baseline, but had improved their exercise SOC at the six-month follow-up. Eighteen months from baseline, three individuals had regressed to a sedentary lifestyle, while four individuals indicated that they had begun to do some physical activity (i.e. they were in the preparation SOC).

Experimental and Control Non-Improvers [ECNIM] (focus group nine)

This focus group was made up of five male undergraduate students, whose average age was 21 (range 20-25). Individuals from both the experimental and control groups attended this focus group, as the number of potential participants in these categories was too small to hold separate focus groups. All individuals were sedentary at both baseline and at six-month follow-up. Eighteen months from baseline, four individuals were still sedentary, but one individual had progressed in to the preparation SOC.

Mann-Whitney confidence interval tests revealed that the self-efficacy scores of those who indicated that they were in the regularly active SOC (mdn. = 21) was significantly higher

($p < .0171$) than those in the not regularly active SOC (mdn. = 18). There was no significant difference in decisional balance scores obtained by either those who were regularly active, or those who were not ($p = .295$). The processes of change scores revealed that self-reevaluation (mdn. = 14) and self-liberation (mdn. 12.5) received the highest frequency score, while stimulus control (mdn. = 8) received the lowest frequency score. More of the experimental group reported that they were in the active stages of change (46%) in relation to the control group (26%) in April 1998, this difference was not significant. Similarly, no significant differences were found between the experimental and control groups for decisional balance, self-efficacy or process of change use.

Table 5.6

The number and demographics of participants who took part in each focus group.

	Focus Group Number								
	Pilot 1	Pilot 2	3	4	5	6	7*	8	9*
	Number of individuals in each category								
Precontemplation	0	0	0	2	1	0	3	0	1
Contemplation	0	1	2	0	0	0	4	3	3
Preparation	4	5	0	1	2	2	0	4	1
Action	2	2	3	1	2	3	0	0	0
Maintenance	3	2	0	0	0	2	0	0	0
Total	9	10	5	4	5	7	8	7	6

Note. * One participant from these groups did not complete the questionnaire.

Content Analysis

A content analysis of the focus group interviews provided evidence that the themes self-empowerment, social influence, and rationale for involvement in physical activity impacted on past and present exercise behaviours. The data also revealed that for physical activity the themes goal setting, inertia complex and guilt alleviation were potential extensions to the transtheoretical model. The intervention that was distributed to the experimental group was critiqued, from this data recommendations for the improvement of the intervention were established. Finally, the data gathered that related to the University's Sport and Recreation

Service combined to form a concept of a person-centered environment and the importance of this in the promotion of physical activity within this organisation.

Self-Empowerment

From the raw data three mini-theories evolved, these were identified as autonomy, motivational climate and a sense of self. Each mini-theory is explained below, and together they imply that if an individual feels that they can be autonomous, if they believe that they operate within an environment that fosters positive experiences in physical activity, and if they identify with physical activity then they are more likely to be active rather than sedentary. From the combination of these mini-theories emerged a theory called self-empowerment. The data tree in which you can trace the pattern of theme development is shown on Figure 5.3. Table 5.7 displays a selection of data from the focus groups. Each number in parenthesis corresponds to a specific quote; further examples of raw data from each theory are listed in Appendix 9.

Autonomy

Through a process of descriptive counting it was established that the predominant experience of physical education was negative for all focus groups. Each group recounted negative memories first, and these outnumbered positive memories by a ratio of four to one. The process of ascertaining why the memories were predominantly negative revealed two-second level themes, choice and control. A narrow or limited choice of experience (1) combined with an external locus of control (2) fueled negative memories (3). However, when choice was determined by the individual (4), and control was internally driven (5), this led to positive memories of physical activity experiences. This led to the development of a mini-theory of autonomy; in other words, there is a need for autonomy, where from a young age individuals are given the freedom (choice) to determine (control) their own actions and behaviours in relation to physical education. Positive experiences of physical activity at the time of the focus groups were few; it is hypothesised that reversing damage due to lack of autonomy is difficult.

Competence

The concept competence evolved as the second mini-theory for comprehending the lack of positive experiences of physical activity. This evolved from three second-level

themes, perceived competence, self-confidence and self-efficacy. These themes revolved around the individuals' concepts of feeling competent in physical activity and the need to produce the desired outcome, experience mastery and effectiveness. An individual with low levels of perceived competence (6) was more likely to be inactive than someone who was perceived as having high levels of perceived competence (7). The data revealed that the majority individuals recounted establishing how competent they were in physical activity based on normative rather than self-referenced experiences of success (8). Thus the dominant motivational climate from physical education experiences appeared to be performance or ego-orientated and competitive (9). Individuals recounted memories of peer comparison, and of trying to hide their incompetence rather than promote their mastery of specific tasks (10). If the climate was perceived as mastery orientated a more enjoyable experience was recounted (11).

This theory does not apply solely to the realm of physical education or past experience, as its influence was evident in contemporary behaviour patterns. Individuals were reluctant to become involved in physical activity once they entered university as the perceived motivational climate was again primarily ego rather than mastery orientated (12). This led to a lack of confidence in their ability to succeed in an exercise setting, this corresponds to exercise self-efficacy. Low levels of exercise self-efficacy were negative to participation (13), while high levels influenced participation positively (14).

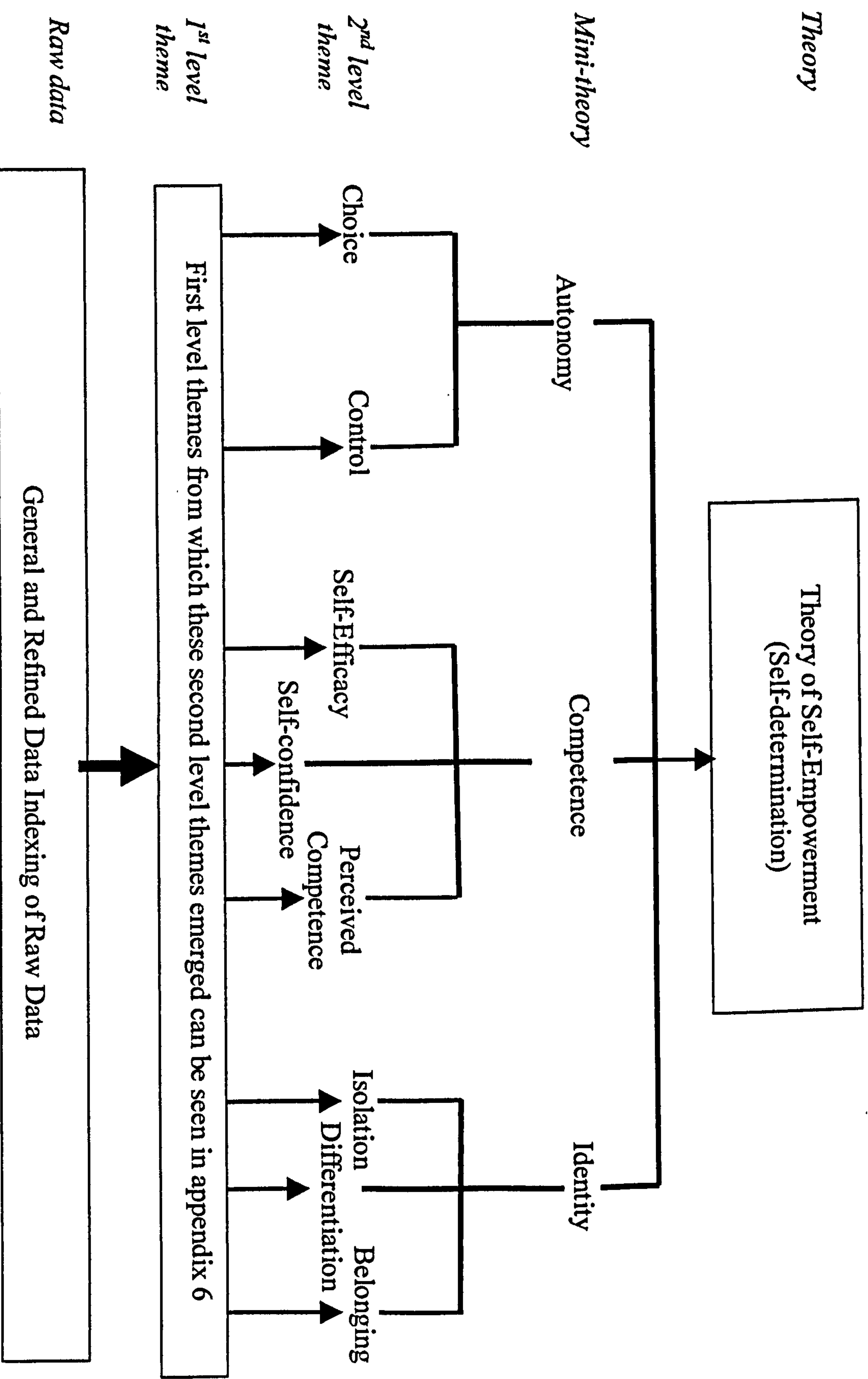


Figure 5.3. Data tree depicting the emergence of the theory of self-empowerment from the focus group raw data.

Identity

Focus group participants referred to bad experiences of physical activity when they felt alienated (15) or good experiences when they felt they 'fitted in'. These experiences refer to a second level theme identity, which implies that individuals have a sense of identity that links them to physical activity or alternatively alienates them from it. This theme was established through a clustering of first-level themes like isolation (16), differentiation (17), and belonging (18).

Table 5.7

Examples in the data that correspond to themes listed under self-empowerment theory.

Autonomy

1. **3:* K** Lack of choice I think. You had to do hockey in the winter and you had to do I can't remember what it was in the summer. You don't get much choice you just have to do what they tell you. So if you don't like hockey and you're not really going to get into it (FG4, ESNIF).
2. **19: K** If you weren't good at it, then being forced to show everyone how bad you were at a sport, before you got to change sport, is probably not the biggest confidence builder" (FG8, CSIM).
3. **10: A** I think having PE as a compulsory subject in school, you know you come to think of it as something you don't have an option, it's like the other subjects, where you dread coming to school, you dread going to the class just it becomes eh, a routine thing you're forced into it, you have to do it, it's not a part of enjoying something, its something that the teacher forces you to do, because if not there will be a penalty, a punishment' (FG1, ESIFP)
4. **18: LO** In our fifth year you actually had a choice you could choose what you wanted to do and had really good fun. I used to choose running because I felt motivated to do it and it was a goal that I worked on through out the whole year but like through other years you were just told to do this thing whether you liked it or whether you were good or bad you just had to do it and I think you know a sense of autonomy to enjoy sports. You get a lot more out of it [PE] if you really want to do something if you don't it's just pointless it just puts people off exercise I think (FG6, CSIF)
5. **24: P** I think like, because I have been forced to do like PE, so now I feel like you motivate your self and if you want to do it, then you would probably enjoy it more. (FG5, ESIM)

Competence

6. **13: A** We only had to do PE up to 4th year, but I was really bad at it, just all the group sports, and everything you know I am just not that sort of person, that goes for it you know, so I just stood around and let everyone else get on with it (FG7, CSNIF)
7. **19: S** You either really liked it, or you hated it, my friend, she would do the opposite, she would miss her french and her biology and go in for PE especially, and right now, that is what she does, like she trains 5/6 nights a week, she's running in competitions and representing Scotland, and all this kind of stuff, and me, I am her best friend and I am the exact opposite, she was good at it, she was always a very talented sports person. (FG7, CSNIF)
8. **54: S** I didn't like physical education either at all and avoided and skived off an awful lot of physical education because [some people] skive maths and would go to physical education, I would skive physical education and go to maths just because if you weren't good at it, it is the sort of thing you would be sort of like you would feel really stupid and feel humiliated at it. It was really obvious when you weren't good at it when everyone else was doing the hurdles and you couldn't do the hurdles and it was like a big NEON light on your head saying I cannot do hurdles (FG6, CSIF).

Table 5.7 continued

<p>9. 24: N The thing about sports in school is that they are really explicitly competitive, so if you are really not good, it's really obvious to everyone else. Whereas exams and things, people don't know what your marks are, and if you have done badly you are not embarrassed because people don't know, but if you are on the hockey team and you are the worst player it is easy for people to single you out as being the worst. And I think if maybe some of the sports in school weren't [as competitive], if they did PE that wasn't so competitive, you know if they did aerobics as a first year sport instead of hockey, then people might not mind it as much...</p> <p>25: Would everybody agree with that?</p> <p>26: S You tend not to get passed the ball so much, and if there is any other option, you know they kind of look around and 'oh no, it will have to go to X', and they are praying, you can see their face going, oh don't give it to the other team. (FG7, CSNIF)</p> <p>10. 3: Y I took PE at school and tried to get out of it as much as I could because it was all - it made you feel bad if you weren't very co-ordinated or you couldn't do - I mean I'm really bad at most physical activity there is not very much I like to do but if I tried and I couldn't do it I felt that the PE teachers at my school were like - you know they would look down on you and didn't give you any encouragement so I generally tried to get out of it as much as possible. I didn't like it - I didn't like it at all. (FG3, ESIF)</p> <p>11. 45: A I did marshal arts for a few years when I was in em, secondary school, I think the main reason for that was you see all these guys doing mad kicks on TV, and I thought why don't I do that. And it was good, it got me started, it was good, I really enjoyed that, and I used to look forward to it, I used to go twice a week. It was something I really wanted to learn to do and I enjoyed the feeling of knowing I suppose that I could do it. You know, knowing I had got a kick right or whatever, and I knew this and I would be practicing and all that. That's something I really enjoyed. (FG8, CSIM)</p> <p>12. 182: ... you just feel so bad that you wouldn't want to go again because you're just not good enough to be there...Gym is for fit people, it's not for people getting fit' (FG6, CSIF).</p> <p>13. 150: A It's all quite intimidating, and like going into the sports building as well, you don't want to put a foot wrong, especially in first year like if someone says do you want to join us for a game of football, and even though you know this guy is your friend you might not know the other people you are playing with, and they might be good. And you think if I go along and I am not good enough he is going to reject me, things like that (FG9, ECNIM).</p> <p>14. 119: A I don't think it is confidence especially by the way you look I don't know sometimes you just feel that if you can conquer the gym and you can conquer anything' (FG3, ESIF).</p>	<p><i>Identity</i></p> <p>15. 9: C It was fun sometimes, cause I did it up to 5th year when you don't technically have to, but we got to do a lot of basketball, it was more just having a laugh and just running about, and that was a lot of fun. But then you would do things like badminton, and I just couldn't get the hang of it at all, so we were all grouped at the bottom, by ourselves, and they'd pay attention to everyone else kind of thing...it was not very nice (FG2, CSIFP).</p> <p>16. 88: G Yeah, especially if you are starting a sport and you think if I go to the, play squash and there is like 50 folk there and I miss the ball and they are all watching me and I miss the ball I am going to look like a complete prat, so eh! It is quite intimidating that way. (FG8, CSIM)</p> <p>17. 184: K Just that there is always people in lycra always looking perfect and muscled and I just think ugh and compared to them and you feel out of place so in some way that is sort of confidence (FG4, ESNIF).</p> <p>18. 30: K In my first year I was in the netball team and that was great. If you were good and you were in with your friends and the team it's great fun it's just when you grow up that you get less interested and do worse that you start to feel... (FG4, ESNIF)</p>
---	--

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

ESIF = Experimental group, SOC improvers, female; ESIM = Experimental group, SOC improvers, male; ESNIF = Experimental group, SOC non-improvers female; CSIF = Control group, SOC improvers, female; CSNIF = Control group, SOC improvers, female; ECSNIM = Experimental and control group SOC non-improvers male.

Social Influence

A mini-theory called social influence emerged; this theory is a combination of two second-level themes namely social behaviour and image. It implies that if physical activity was perceived as being socially sanctioned and linked to a positive image then the social influence was interpreted as fostering a physically active lifestyle. Alternatively, if physical activity was rejected and its images were deemed as unacceptable, then the predominant social influence would foster sedentary lifestyles. Figure 5.4 is the data tree for the development of this theory. A selection of quotes that support the themes under this theory are listed on Table 5.8, further examples can be seen in Appendix 9. The numbers in parenthesis correspond to a specific quote.

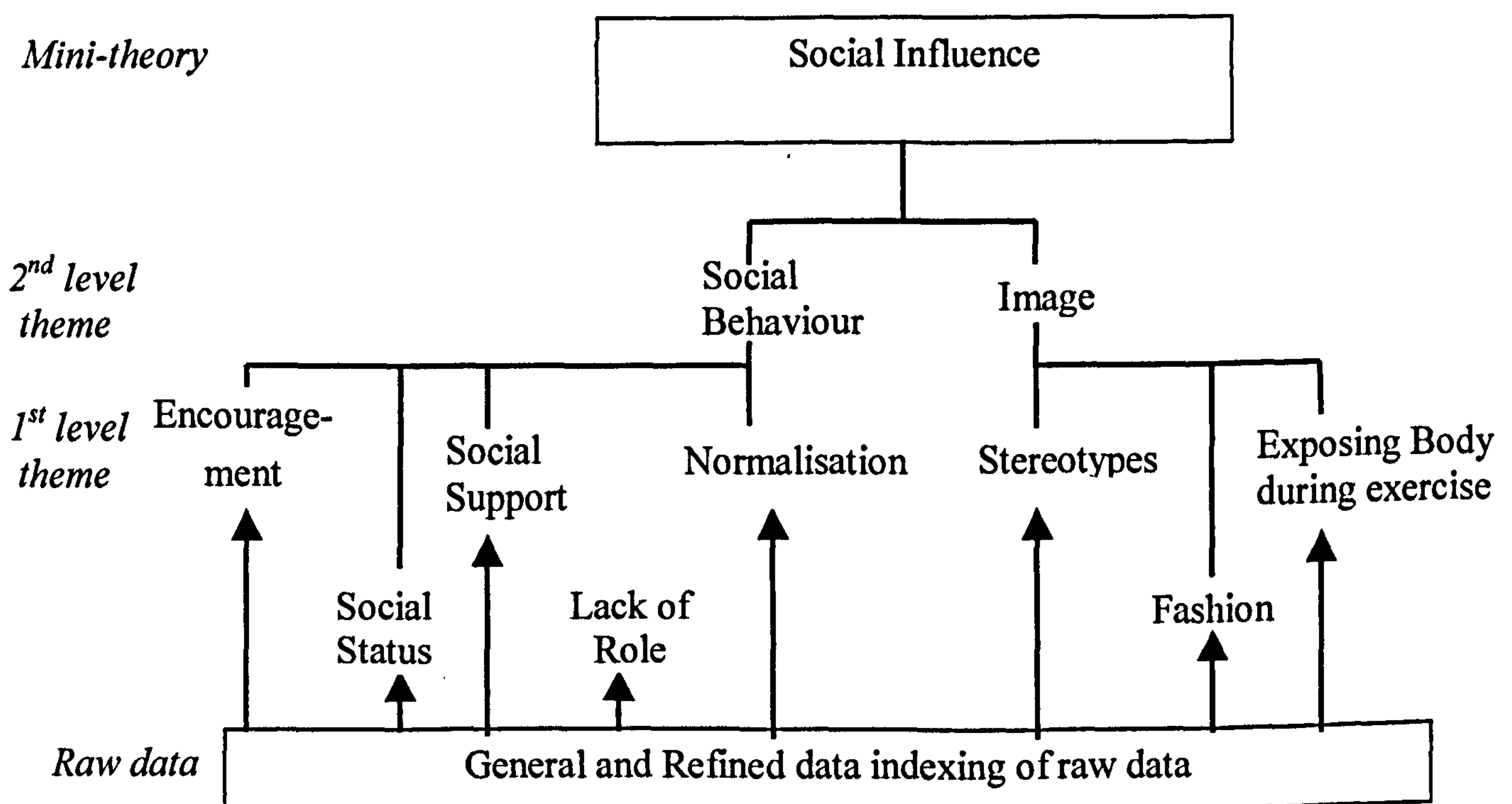


Figure 5.4. Data tree for the emergence of a social influence mini-theory

Social Behaviour

Social behaviour came out of the data that revealed physical activity as a behaviour that was influenced by significant others (19). If encouragement (20), support (21) and acceptance (22) of physical activity were the perceived norm among an individual's social circle, then there was an increased likelihood that this individual would be active. However, if an individual did not experience encouragement and support, and if alternative unhealthy

behaviours were perceived as socially acceptable, then there was an increased likelihood that this individual would be sedentary (23).

Image

Image is a socially determined construct. In the focus group data, it was influenced by stereotypes that participants attached to physically active individuals (24), and inactive individuals (25). Sedentary individuals expressed how they did not like the idea of having to expose their body while exercising (26). Finally, it was determined by how an individual perceived peer pressure to be fashionable or look the part when exercising (27). The combination of these different social influences could either hinder or help involvement in physical activity.

Table 5.8

Examples of data that correspond to themes listed under the mini-theory of social behaviour.

Social Climate

19. 36: N I used to love playing tennis and I got really good at it in Cyprus but I was really young. It was like from 9-13 that I was playing that and she was a really good coach and she kept on encouraging me and telling me that I should have dreams for the future... It was something that I enjoyed doing. I could see that I was good at it and like I heard from my coach she was also pleased with my sort of the way I played positive feedback I suppose. It's good hearing that you do things well even if you don't. I mean it sort of encourages you to try harder. (FG3, ESIF)
20. 46: Y I suppose it was recently we started exercising again because I thought people will laugh at me and I didn't do anything till this year again because it was just I thought will people laugh at me I'm not any good at this, why should I bother I've not been good at it before. The only thing that I enjoyed was swimming. I'm still a bit overweight. I recently lost a lot of weight and I wouldn't have gone in a pool in a swimming costume or anything. It's friends that encouraged me to go back and I'm so glad I did because I really enjoy it now but not beforehand. (FG3, ESIF)
21. 90: A Well you would do it [go to the gym] if your mates were into it, but like none of my flat mates are really active at all. Em, we went to the gym, what was it last term, just for a laugh, because one of my mates, he was really really into the gym, and he was showing us how to work all the machines and stuff, and it was all right, but, we keep saying ah! We should go again, we should go again, it would be a laugh, but we never really got around to it. We just never bothered about it.
- 91: C Did you think it was a laugh though? ...
- 92: All Yeah, yeah, [general agreement]
- 92: N It's a bit scary, because the 1st time I went, I went on the step machine and there were two men on either side of me, on the steps, and I didn't know how to work it and I couldn't get the steps to go down...
- 93: A Well that was why it was all right for us, because Graham was in there totally everyday, so he was like programming all the things, but I wouldn't go back in by myself, cause I wouldn't have a clue how to do it.
- 94: R Yeah, it does help if somebody shows you how to work them. The worst place is the gym downstairs, with the weights. (FG7, CSNIF)
22. 90: J If I have a very good friend who is really into sports and you enjoy the friendship by having sports together so like playing a game of badminton or something like that so you look forward to it at least you will do it. (FG9, ECSNIM)

Table 5.8 Continued

23. **48: E** ... then my friends changed to start smoking and drinking and stop doing sports and then I came here and my entire flat are lazy really lazy you know we do nothing and recently actually one of them started going go that Popmo and the step in the afternoons and I have been in a couple of times with her but it takes Charlotte to say right come on we're going get your stuff on and go before I do it because I don't like walking in, I get wild nervous if I walk into a room and you don't know anyone you know because there's a certain while in the exercise if you fall over of if you do something and you're friend is there it is not as embarrassing you know what I mean so I tend only to do it if there is a mate of mine there, that's maybe why. (FG3, ESIF)
- Image*
24. **104: S** I don't even know where all these rooms are, and what it is you are all talking about. I think I am actually too intimidated to actually go in, I mean like I joined, and that was a really big thing, but I have never actually been in past the doors, like I am really intimidated, I just really expect all these huge kind of guys with muscles 'this big', and really skinny women, who are just perfect, and they will be just laughing at me (FG7, CSNIF).
25. **101: A** Like we walked in [to the gym] everyone was totally laughing, and just looking at us 'cause we didn't have any proper trainers or anything, so we were walking around in converse trainers, and really crap T-shirts and Shorts and stuff, just looking a total mess, and there's loads of people in their lycra and stuff. (FG7, CSNIF)
26. **151: JO** Yeah I mean there is the point that you have got to be confident when you have got to walk out into a hall or something with a pair of shorts on, and you have wee skinny legs, fat legs or something like that, if you are that conscientious,
152: G Or even out into the swimming pool, just with a pair of shorts on or something like that, (FG8, CSIM)
27. **115: E** half the time you know uni's a fashion parade' (FG3, ESIF)

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

ESIF = Experimental group, SOC improvers, female; ESIM = Experimental group, SOC improvers, male; ESNIF = Experimental group, SOC non-improvers female; CSIF = Control group, SOC improvers, female; CSNIF = Control group, SOC improvers, female; ECSNIM = Experimental and control group SOC non-improvers male.

Rationale

The mini-theory rationale is a combination of several second level themes; each theme has an evaluative or an experience component that can potentially impact exercise behaviour. They are: individual assessment of physical activity (self-evaluation), how opportunities to be active are judged (environmental evaluation), the affect of past experiences (habit), and the level of structure imposed on the concept physical activity (level of structure). All components were felt to contribute to the development of an individual's rationale for being active or inactive. Figure 5.5 displays the data tree for this theory. Table 5.9 contains a selection of quotes that were included in the clusters from which the first level themes emerged. The numbers in parenthesis correspond to a specific quote, and further examples are listed in Appendix 9.

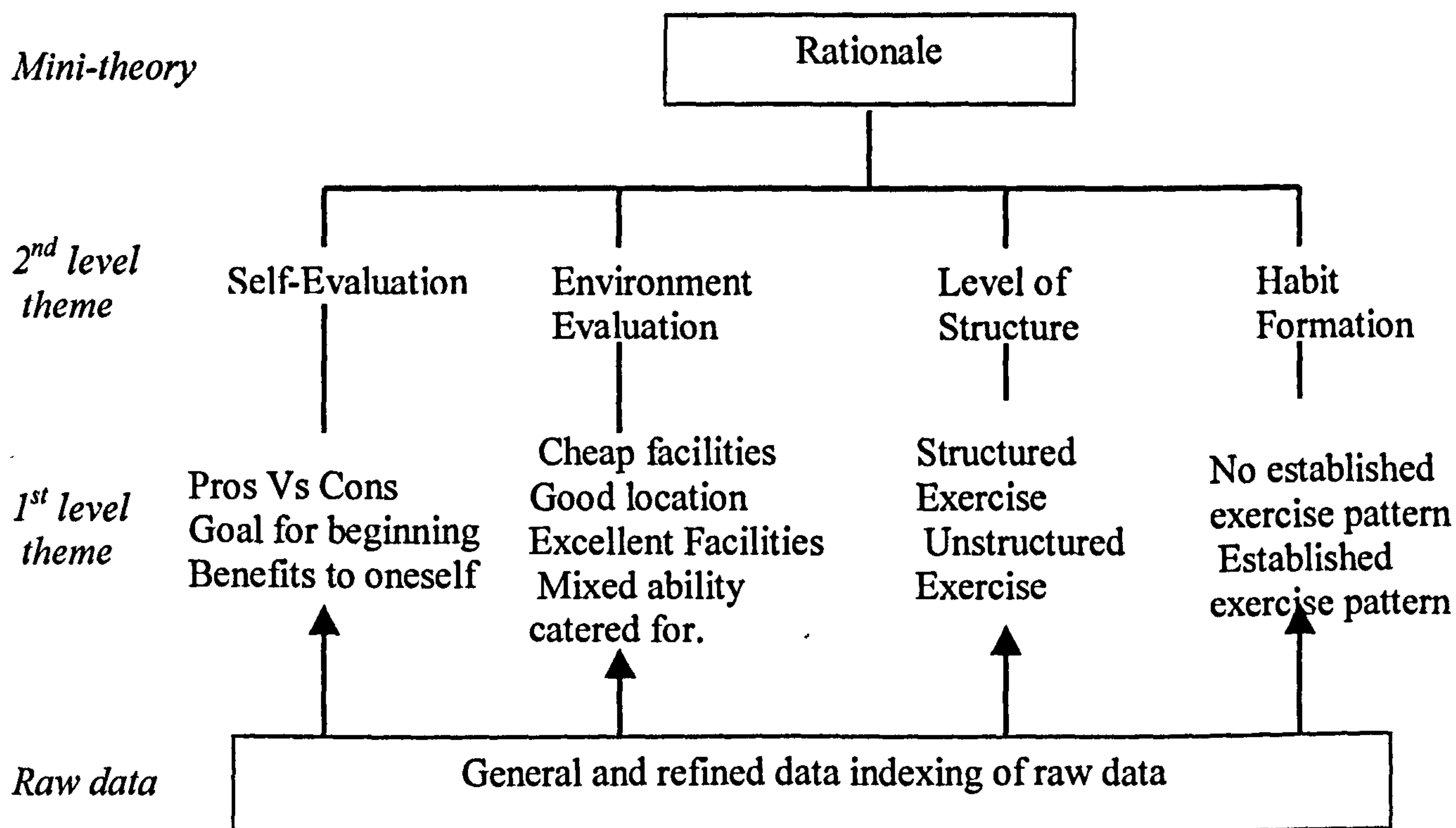


Figure 5.5. Data tree for the emergence of the mini-theory of rationale

Self-Evaluation

This second level theme emerged from the focus group data that clustered around discussions on the relative pros and cons of physically activity (28). The interpretation of whether physical activity was associated with leisure (29), or was solely a means to an end (30) also came under this theme. If respondents identified that the pros outweighed the cons of activity, if they enjoyed physical activity as a form of recreation, then they were more likely to be active than if they felt it was just a means to an end (31).

Environmental Evaluation

Individuals had a high awareness of the opportunities to participate in physical activity in university. They described the various locations within the Sport and Recreation Service, and they referred to the numerous clubs and societies that an individual could join. Overall the opportunities were perceived as very positive, they were described as 'cheap', an important factor when you wanted to experiment and find out if you liked things or not (32). There was a 'brilliant' range of activities on offer that were perceived to cater for different levels of ability; you could exercise on your own, in a class or in a club. The location was excellent, and seeing it every day served as a constant reminder to exercise. On the negative side, the

Stevenson Building was described as too popular at certain times, with queues to use equipment affecting the atmosphere in the building. A suggestion to alleviate this problem was to publicise peak usage times more widely.

The mini-theory environmental evaluation emerged from data collected on the opportunities to be active in university. First level themes clustered under positive or negative accounts primarily of the opportunities to exercise within the University's Sport and Recreation Service. Upon closer examination, the positive themes were found to revolve around a second-level theme facility emphasis (33); whereas the negative data clustered around a second level theme - personal emphasis (34). From this data, a mini-theory in relation to opportunities emerged; that is, if an individual identifies the opportunities positively on both a personal level and a structural level then they are more likely to use these facilities to become involved in physical activity in the future.

Habit Formation

This theme identified the importance of past behaviour in establishing a present habit. If past experience was positive and led to a familiarity with exercise in general then respondents indicated that this increased the likelihood of present participation (35). School was identified as a key influence on habit formation as participation in physical education increased the likelihood of present involvement in activity, whereas as years of actively avoiding getting involved in exercise increased likelihood of nonparticipation (36).

Level of Structure

The different ways an individual could lead a physically active lifestyle were discussed at the beginning of each focus group, and both the ACSM (1990) and CDC/ACSM (1995) guidelines were explained to ensure that the same definition of physical activity was used during the interviews. This second level theme evolved from a clustering of first level themes that explored the perceived level of structure required to be physically active. The words physical activity, sport and exercise appeared to be synonymous for the participants, this had implications as, for example, the idea that unless the activity was structured and organised it did not count as physical activity was evident (37). A few individuals referred to walking as a form of lifestyle activity (38), but in general, lifestyle activity was perceived as secondary to its actual purpose (39). Unless individual's considered themselves as sporty or capable of

using exercise facilities, there was a perceived lack of options on how they could lead a physically active lifestyle. This had the potential of excluding them from physical activity.

Table 5.9

Examples of data that support the themes listed under the mini-theory rationale

<i>Self-Evaluation</i>	
28. 201: K	We are standing here and we know everything that you have got to go through to get fit to go through all that torture I just think the disadvantages definitely outweigh the advantages. In the long term being rational about it you know the advantages are more but then you think I'm going to have to go to the gym and torture myself you think no, because if the advantages were so obvious then everyone would be fit so when people aren't... (FG4, ESNIF).
29. 74: N	I didn't consider it physical activity going swimming on the beach three times per week so that's why I [said I] wasn't involved in anything. I was lousy in the team sports so I wasn't in any team...it was a leisurely swim, it was not a fast sort of 100 meters thing' (FG3, ESIF).
30. 150: S	the only reason I think most people do exercise is to try and keep thin' (FG4, ESNIF).
31. 181:	Do you think the advantages outweigh the disadvantages, or vice versa?
182: All	Yeah
183: R	They probably do, yeah.
184: F	I think everybody knows you should be active because of your health and everything, but it's so much easier just to sit and watch telly. You know, and people our age, we have got better things to do than go to the gym. I mean, there's the pub, and whatever, you know. (FG7, CSNIF)
<i>Environmental Evaluation</i>	
32. 91: K	So you can be rubbish, or you can start learning so that's an opportunity; you can hire courts or you can do whatever, and it is not a huge outlay before you find out if you are not good' (FG8, CSIM)
33. 84: S	I think the Stevie* was easily accessible to everyone, £5.00 to join, most students live you know close to it and they are always you know when you start University 'join this club, do this, join the Stevie'. The University does encourage you to become athletic, you know work out and all that. (FG7, CSNIF).
34. 137: K	The Pop-mo [aerobics class in the SRS] places. The people in the gym can watch you which I hate. I don't think it is a very good idea because you're self conscious enough as it is when your prancing around doing some exercise you don't want someone staring down at you.
138: C	Yeh in the swimming pool they can watch from the café as well can't they. They have got the steam room and the sauna that is quite good. Yeh, they've got incentives to get you in there, that's the only reason I go. (FG7, CSNIF)
<i>Habit Formation</i>	
35. 33: F	I think sports as well, if you don't get into it when you are younger, then it doesn't become a habit and it is so easy just to say I'll ditch physical education today, and you do it again the next week. Which is what I did, I mean I played about the garden when I was a kid, but that is the only exercise I have ever done and I never went to physical education at school, never, I just I don't know how I got away with it actually, but I just didn't bother, I just don't do anything now. (FG7, CSNIF)
36. 23: A	I think probably because when you are at school you tend to develop most of your habits, like you might get into a sport like football or volleyball or whatever, and I think you tend to carry that on when you leave school. But if you have not got in to it, then there's not a lot available to just get up and start to do it, at a later age. (FG 5, ESIM)

Table 5.9 continued

Level of Structure

37. **55:** P I think if you haven't got the facilities to go, you can't really do anything. They also cost as well, you know like swimming pools are quite expensive, and stuff like that. Compared to the university anyway. (FG5, ESIM)
38. **92:** J I think it's helped me since I moved up to Glasgow. Normally I don't I mean I remember last year I went to the gym quite often but this year I haven't but I still know I'll walk and that's twenty minutes each way so I know that's you know a bit more active than it was. (FG3, ESIF)
39. **89:** S If I do any it was a kind of secondary to what I'm actually doing I don't do it on purpose I'll walk somewhere or walk upstairs or run somewhere it's just I'm in a hurry or because I've missed the bus or it's a nice day or something like that I don't every go out of my way to do any exercise. (FG4, ESNIF).

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

ESIF = Experimental group, SOC improvers, female; ESIM = Experimental group, SOC improvers, male; ESNIF = Experimental group, SOC non-improvers female; CSIF = Control group, SOC improvers, female; CSNIF = Control group, SOC improvers, female; ECSNIM = Experimental and control group SOC non-improvers male.

* Stevie Building or SB refers to the Stevenson Building, an on-campus Sport and Recreation Service Facility.

The Transtheoretical Model of Behaviour Change (TTM)

Individuals discussed what they thought might help an inactive individual adopt a physically active lifestyle, and also what might then assist this individual in the maintenance of that lifestyle. Data from the transcripts were classified into themes based on the constructs of the TTM. However, to ensure that the theory did not constrain the participant's perspectives additional themes were also generated to accommodate deviant cases. The data were then reread to ensure that the themes were accurate.

Strategies quoted that might help a sedentary person to initiate activity were clustered into thirteen first level themes. The data tree is displayed on Figure 5.6. Some of the themes involved clustering raw data codes that when analysed formed a process of change. These first level themes were clustered together under the second level themes experiential or behavioural processes of change, depending on whether they were cognitive or behavioural in content. A list of all of the processes and the data from which they emerged is included in Appendix 9. The process definitions are the same as those listed on Table 2.4.

All of the experiential processes were quoted, while stimulus control was the only behavioural process of change that did not emerge from the raw data on initiation strategies. Self-reevaluation was quoted the most often as an adoption strategy; it was followed closely by helping relationships and counterconditioning. Self-liberation, or commitment to change

was quoted the least frequently. In maintenance, all five experiential processes were quoted, while reinforcement management was the only behavioural process that did not emerge from the data. Similarly to the adoption data, self-reevaluation, helping relationships and counterconditioning were quoted the most frequently. Environmental reevaluation and stimulus control were least frequently quoted.

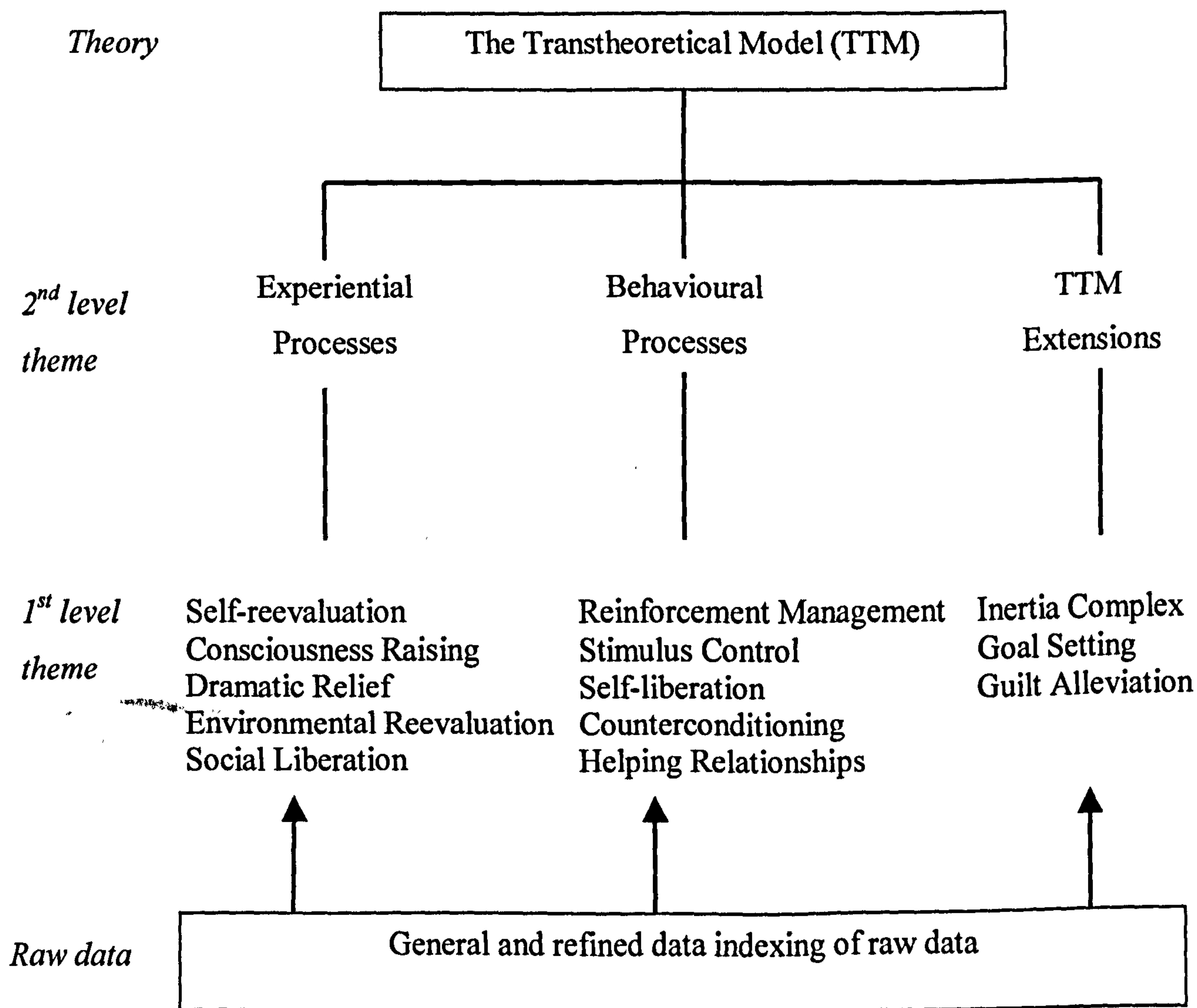


Figure 5.6. Data tree for the emergence of the processes of change highlighted in the transtheoretical model of behaviour change.

Table 5.10 displays a systematic comparison between the qualitative data gathered during the focus groups and the quantitative data collected at the end of each focus group. The analysis of the qualitative data involved counting the number of times a reference was made to a specific process of change during the focus group discussions on initiation and maintenance of a physically active lifestyle. For example, the following quotes were taken from focus group nine during a conversation about adopting physical activity, two individuals are talking David and Sam; D: "Maybe if a friend was going to start doing something [exercise] that would help" [memo: in reply] S: "Provided they weren't too far ahead of you, saying well 'come on push yourself', just encouraging rather than actually doing it along with you" (from focus group nine, experimental and control SOC non-improve males, lines 146 and 147 of transcript). These quotes are an example of the process of change *helping relationships* (defined as trusting, accepting and utilising the support of others during attempts to initiate physical activity), and are counted as one 'frequency of occurrence' on Table 5.10.

Table 5.10 also displays the median frequency-of-use score that was recorded for each process of change as part of the physical activity questionnaire. This questionnaire was completed by each focus group participant at the end of each focus group. The processes have been rank ordered in terms of frequency of occurrence. This allows for comparison between how often participants talked about a process of change as a strategy of change in the qualitative study, in relation to how frequently they said they might use the same process of change in the questionnaire. An analysis of table 5.10 reveals that the frequency of occurrence of the processes of change was similar to the median frequency scores recorded on the processes of change questionnaire. Two differences were noted, first, the processes of change *helping relationship* that was quoted quite frequently, and stressed as an important strategy of change in the qualitative data received a low frequency score in the quantitative data. Second, *reinforcement management*, which was quoted seldomly in the qualitative data received a high frequency score in the quantitative data.

Table 5.10

Descriptive counting of strategies of change and median processes of change score from physical activity questionnaire.

Strategy of Change	Frequency of occurrence in qualitative data*		Median score from the processes of change questionnaire.
	Adoption % (N)	Maintenance % (N)	Median Score
<i>Experiential</i>			
Self-reevaluation	19 (21)	25 (15)	14
Social liberation	9 (10)	10 (6)	10
Consciousness raising	8 (9)	3 (2)	10
Dramatic relief	6.5 (7)	3 (2)	10
Environmental reevaluation	3 (3)	2 (1)	9
<i>Behavioural</i>			
Helping relationships	15 (16)	16 (10)	8
Counterconditioning	14 (15)	15 (9)	10
Self-liberation	2 (2)	5 (3)	12
Reinforcement management	8 (9)	-	12
Stimulus control	-	2 (1)	7
<i>Extensions</i>			
Getting started (motivation)	9 (10)	2 (1)	-
Goal setting	6.5 (7)	11 (7)	-
Guilt	-	6 (4)	-
Total	100 % (N = 109)	100% (N = 61)	N = 58

Note

* Frequency of occurrence was established through counting the number of times a specific process of change was referred to during the focus group discussions on initiation or maintenance of physically active lifestyles.

TTM Extensions

Three additional themes also emerged from the content analysis. These were the inertia complex, goal setting and guilt alleviation. A selection of quotes that illustrate data from which these themes emerged can be viewed on Table 5.11. The numbers in parenthesis correspond to a specific quote.

During the focus groups, respondents referred to how getting over the inertia of inactivity was the most difficult barrier to changing their behaviour (40a, b). Strategies like the processes of change were quoted as possible mechanisms to help an individual to get over their inertia complex, however, this concept did present a real barrier, that if crossed the adherence to an exercise regime would be easier (41). The second theme is entitled goal setting, and it evolved out of data on previous failed attempts at exercising due to inaccurate goal setting (42), lack of confidence about how to set goals (43), or disappointment about not achieving goals (44). Both of these themes were apparent in both the adoption and in the maintenance data, which is testament to the intensity with which they were felt. The inertia complex was mentioned more often in the adoption data whereas the goal setting was more apparent in the maintenance data. These themes provide evidence for the potential extension of the TTM; however, their inclusion as strategies of change warrants further examination.

The third theme guilt alleviation emerged from data that referred to physical activity as something that one ought to be doing, or should get involved in (45). For some, this internalised guilt-related sense of ought or should was perceived as strong enough to keep an individual motivated to exercise (46). This is not a strategy to promote physical activity, but it is a psychological construct which it is suggested requires further study to understand its positive or negative impact in exercise adherence.

Table 5.11

Examples of data that supports the themes listed under the category TTM extension.

Inertia complex

40. A. 209: K You can get a consultation and something at the Stevie and stuff as well can't you. I think for our age group it is quite easy really well just like sort of at University
 210: S Yeah I think that if you wanted to there is definitely, there is a million and one ways you could start. Yeah I mean there really is. I am totally aware of that I think most people are. I think most people have a vague idea of how they start.
 211: R Like you said one of those twenty minutes three times per week - everybody knows that at the Stevie Building [SRS facility on campus] and there is a timetable up with all the stuff that is going on. Go and ask.

Table 5.11 continued

<p>212: K It's like there is no problem the opportunities it is just the motivation – 213: All yeah (FG 4, ESNIF). B. 137:C I think the advantages probably outweigh the disadvantages. I don't think we have identified that many disadvantages, it is just overcoming the initial inertia of a sedentary lifestyle, actually getting out and doing something (FG9, ECSNIM).</p> <p>41. 203: JO I still don't think maintaining is the hard part, I think getting started is the problem. I think if I was physically active I would stay that way, it is just getting started. It just seems to be a really big psychological step to put your mind to, that's the part which stops me. (FG8, CSIM)</p>
<p><i>Goal Setting</i></p> <p>42. 172: A When I go to a step class at a certain time on a step machine so that if you miss a time it's a nightmare to catch up the next time you just feel exhausted so you have to go on a regular basis (FG3, ESIF)</p> <p>43. 152: C That brings us back to what Sam said a while ago about having an aim 153: S To prove to both yourself and other people. 154: C Some sort of goal that you are actually trying to do something. At some point you are going to achieve that, and that will give you further encouragement to achieve other things basically to carry on. (FG9, ECSNIM).</p> <p>44. 132: E You can feel miserable as well because you'll sit down and say I'm going to go to the Popmo for every day for half an hour and then you don't and then the next time you check your weight it's gone up again... you get really sort of disheartened by it you know it's true that if you set yourself goals that are too high then you get disheartened and then you just sort of blank them. (FG3, ESIF)</p>
<p><i>Guilt Alleviation</i></p> <p>45. 105: J ...The last two to three years of my life that I'm going to use it the gym for as cheap as that so I should use it and... when I get a job, I won't be able to do as much. (FG3, ESIF) 182: K It's just because it's just such a bad thing if you are not fit and everyone disapproves and everyone knows that they should be fit and they should be healthy and they should be strong and if this is your first day at Pop-mo [aerobic class in the SRS] for instance you can't do the moves or they are going so fast and you are sweating within five minutes and everyone else is just like bouncing about wonderfully then you just get your audience you just feel so bad that you wouldn't want to go again because you're just not good enough to be there the same for the gym. Gym is for fit people it's not for people getting fit. It's an embarrassment I suppose. (FG6, CSIF)</p> <p>46. 250: R Just because it's there for you [SRS] you're not going to have an opportunity like that again. Just have a gym down the road from you that you can just go and use whenever. £5 per year, you should go and use it really... You should make an attempt to be more healthy that is the right thing to do. The right way to lead you life. That type of thing really. (FG4, ESNIF)</p>

Note. The numbers in bold print are reference numbers attached to each line of the transcript. Stevie Building or SB refers to the Stevenson Building, an on-campus Sport and Recreation Service Facility by the computer package NVIVO.

ESIF = Experimental group, SOC improvers, female; ESIM = Experimental group, SOC improvers, male; ESNIF = Experimental group, SOC non-improvers female; CSIF = Control group, SOC improvers, female; CSNIF = Control group, SOC improvers, female; ECSNIM = Experimental and control group SOC non-improvers male.

Intervention Critique

In each focus group interview the participants were shown the intervention material and were asked to discuss each item separately and comment on its usefulness for adopting a physically active lifestyle, its presentation and to suggest ideas for improvement. The intervention material can be seen in Appendices 4 and 5. It consisted of a Hassle Free Exercise Booklet [HFE] (Health Education Board for Scotland, 1994), a Start a Starter Booklet [SAS], two A-4 leaflets one on the exercise consultation service available in the SRS, the second an interactive worksheet, and some general information on the service offered within the SRS. Table 5.12 displays a selection of quotes extracted from the focus groups to illustrate the critique of the intervention. Each number in parenthesis corresponds to a specific quote, and a further list of examples are shown in Appendix 9.

The efficacy of the intervention for changing exercise behaviour was discussed initially. The data collected hinted towards the mini-theory rationale for becoming involved in physical activity, as two of the second-level themes which clustered to form the mini-theory rationale were evident in the data. Participants in the focus groups had mixed reactions to the intervention; some felt that it was good to be targeted with an intervention while others were not so sure (47). They all felt that in order to change your behaviour and maintain a new behaviour it would have to be something you were thinking about prior to receiving the intervention material (48). This concept ties in with the second level theme self-evaluation, as an individual would have to consider why they would want to adopt a physically active lifestyle prior to making the change. This theme has already been discussed on page 16. Participant's discussed how the intervention served to highlight alternative forms of physical activity rather than just structured exercise or sport (49). It also appeared to increase their awareness of how much activity they were actually doing through actively commuting to university each day. This corresponds to the theme level of structure which has already been discussed as part of the mini-theory rationale.

The discussion then evaluated each part of the intervention separately. The results revealed that both the HFE and the SAS were identified as being the most useful for adopting a physically active lifestyle. The HFE was identified as the best presented material; this was attributed to its colour print, its scarcity of words, the fact that it was targeted at beginners (50) and its 'health value' on the different forms of physical activity listed (51). However, it was

criticised for being targeted to an older audience and for being similar to mainstream health promotion literature that would have been seen in school (52a).

The SAS booklet was identified as useful because of its application to the University's Sport and Recreation Service (SRS). The novelty of having free offers, and the information on the services available in the SRS was highlighted by all groups as particularly appealing (53). It was suggested that the presentation of the SAS could have been improved with colour printing and more general information on, for example, the benefits, the guidelines and the current statistics on participation levels among undergraduate students in the University (54).

Finally, the exercise consultation leaflet was criticised for having too much information, and being too formal (55). The interactive work sheet was compared to a 'homework sheet', and even though the '10-tips on how to get active' were identified as interesting, it was rated (along with the exercise consultation leaflet) as the least useful of the intervention material (56). It was suggested that the presentation of both materials could be vastly improved through colour printing, reducing the amount of information given and making the content less formal.

Table 5.12

Examples of data that correspond to the themes under intervention critique

- | | |
|------------|---|
| 47. 176: Y | I remember thinking oh no not more people trying to make me exercise. At that time I started on a diet to lose weight and it wasn't in a hall of residence, it was a big student flat it was like a 11 of us in a flat, and everyone was like telling me to exercise, you know everyone was and because I hated exercise when I was younger it was like I thought I was being victimised or something everyone at the one time was trying to make me go exercise. So I wasn't impressed at that time. |
| 177: A | I think I was quite glad when I got it because when I was at school or at college they weren't really caring about you. (FG3, ESIF) |
| 48. 283: S | I didn't even read it. |
| 284: K | Well you got the idea in your head and you are willing to do it it would help but if it just came out of the blue and you had no intention before you probably would just go through it and then forget about it, it's just if the germs stay in your head. I think. |
| ... | |
| 293: R | I don't think you could change it. If you are interested you are interested and if you are not it's not going to change your mind you know. [No, yeah] I mean maybe if you were thinking. I don't think there is that many people that still do because there is millions of information about it but you know if people didn't realise that if they just walked instead of taking the bus then that would help them I mean they might plan what to do and they might find that helpful if they thought that was a big ?? or something and they were interested. (FG4, ESNIF) |
| 49. (Memo: | During a conversation on the different types of activity that are shown in the Hassle Free Exercise Booklet). |
| 306: S | Because you don't really [think of] walking and dancing and climbing stairs [as activities] because it's not exercising on purpose it's just you just happen to be doing them because that is what you are doing at the time and that is just that's just a by product. |

Table 5.12 continued

	307: L	And golf I guess it is walking, yeah, but you don't do it as a brisk walking pace.
	308: S	Yeh I mean bowling and golf it's not like well it's like you don't break into a sweat or anything like that it's not kind of making you out of breath it's just like leisurely type of thing and you wouldn't feel at the time like it was doing you any good it's just something you happen to be doing. (FG4, ESNIF)
50.	314: K	Going back what's quite good about this [HFE], is that it's totally aimed at people like me who do nothing and need convincing, sort of it's at your level, instead of doing very very hyper exercise doing forty minutes a day sort of thing (FG4)
51.	222: A	I like the way it tells what each thing does e.g. dancing. I think that was quite good in it. I think everybody knows that they don't exercise enough, but I mean it is quite useful, it is an eye opener in that you do, do exercise but you don't really think you are doing anything.
	223:	Why do you think, just in ZZZ term's that something like that is an eye-opener?
	224: A	In the way that I am exercising but I never thought about it? Because if you are walking to Uni. or something you don't really think that you are doing yourself good, you are just bored and you are walking about, you know what I mean. (FG5)
52.	182: A	This is trying to get away from the text book thing you can go to the Library and read that but it is pretty boring and I think that what they are trying to do here is like give you something that is clearly accessible, sort of trying to show you that you don't need to know sort of different aerobic exercises and stuff to get into shape and you can just do simple basic stuff and it is a simple basic kind of guide how to do it
	183: S	It is presented in a way that at school you got things like that on smoking on drugs on drink and you basically all have the same message the same sort of layout question with the answers and things and sometimes you do feel it almost patronising sort of you look at it after a couple of days and you say oh turns you off a bit. (FG9)
	288: R	It is like you have to put a lot of time and effort into it.
53.	A. 216:	Do you honestly think that if I sent this out to you in the post you would read it?
	217: ?	Yes.
	218: ?	Yeh, I would give it a bash.
	219: L	Yes, it might make you think, oh, I'll go for a consultation.
	220: S	Yeh, I'd probably look at it, even though I would do something totally different. I think it is good when you see 'FREE'
	221: H	Yeah, something for nothing, get it. (FG6)
54.		Because it is full of healthy and fit things, it should be good but it's probably bad, it should have statistics like an 85% of people are at your fitness level, that's going to make you feel ...not everybody is mega fit, more people are in the same boat. (FG1)
55.	228: N	You see I didn't like the formal idea and I went and she was so encouraging and friendly and you know it's complete just chat with somebody who knew a bit more about sport than I did and yet the way that 'Exercise, Sport and Muscle Conditioning Consultation Services' makes it sound very sort of makes it sound very formal which it really wasn't and she just told me the stuff that I was doing - she asked me where I wanted to lose and what I wanted to lose you know what I wasn't happy with all that you have said it was not at all formal. (FG3)
56.	270: ?	It looks quite like an exam paper...

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

Stevie Building or SB refers to the Stevenson Building, an on-campus Sport and Recreation Service Facility.

ESIF = Experimental group, SOC improvers, female; ESIM = Experimental group, SOC improvers, male; ESNIF = Experimental group, SOC non-improvers female; CSIF = Control group, SOC improvers, female; CSNIF = Control group, SOC improvers, female; ECSNIM = Experimental and control group SOC non-improvers male.

What can the Sport and Recreation Service learn from the focus group data?

Following the findings that clustered under the theme environment evaluation, the focus group data was analysed to establish if the Sport and Recreation Service [SRS] could learn anything specific to the improvement of its service from the participants of the focus groups. In addition to the themes already mentioned that relate to the promotion of physical activity in general, several second level themes that the SRS could use to improve its service were identified. These were social persuasion, encouragement and the development of a relaxed atmosphere. These themes clustered together to suggest that a person-centered environment would be beneficial in improving the service within the SRS. This approach implies that an interest in the individual and how they are progressing in their use of the facilities would be central to the service. This would be especially in relation to first year students, who may be sedentary and would be using leisure facilities for the first time. Figure 5.7 displays the data tree for the theme pattern that emerged. Table 5.13 contains a selection of quotes that were included in the clusters from which the first level themes emerged. The numbers in parenthesis correspond to a specific quote, and further examples are listed in Appendix 9.

Social Persuasion

The majority of focus group participants stated that exercising with friends in the SRS facilities was preferable to exercising alone (57). This supports the idea that physical activity is a social behaviour, subject to social influence a theme that has already been discussed. Hence, from the perspective of the SRS, the concept of modifying to become more sociable and to employ a social persuasion strategy like targeting groups rather than individuals with promotional messages is a key finding of this research (58). In other words, the SRS should aim to encourage individuals to exercise in a social, fun atmosphere (59), rather than to feel isolated and as if 'spectators' and 'audiences' are watching them in an austere atmosphere (60). This finding was particularly strong among individuals who identified themselves as not regularly active.

Encouragement

Individuals frequently referred to the importance of feeling encouraged and how if they thought they were doing well in an activity it made them feel good (61). This data applies not

only to past experiences but also to the SRS facilities. Encouragement by a teacher either through an exercise consultation (62), a phone-call or just a general comment in a class (63) was cited as an important element in helping an individual to adhere to an exercise regime.

More Relaxed Atmosphere

The feelings of being under pressure to perform (64), to not make a fool of yourself (65) and to know what you were doing (66) in the SRS facilities were evident in the focus group data. These feelings were referred to in every location from the cardio-vascular suite to the swimming pool. Thus it was perceived that a serious, formal atmosphere existed in the SRS facilities, and it was a place for professional people (67). It was suggested that a more relaxed atmosphere would be beneficial to encouraging new exercisers to begin being active, and to encourage other exercisers to maintain activity.

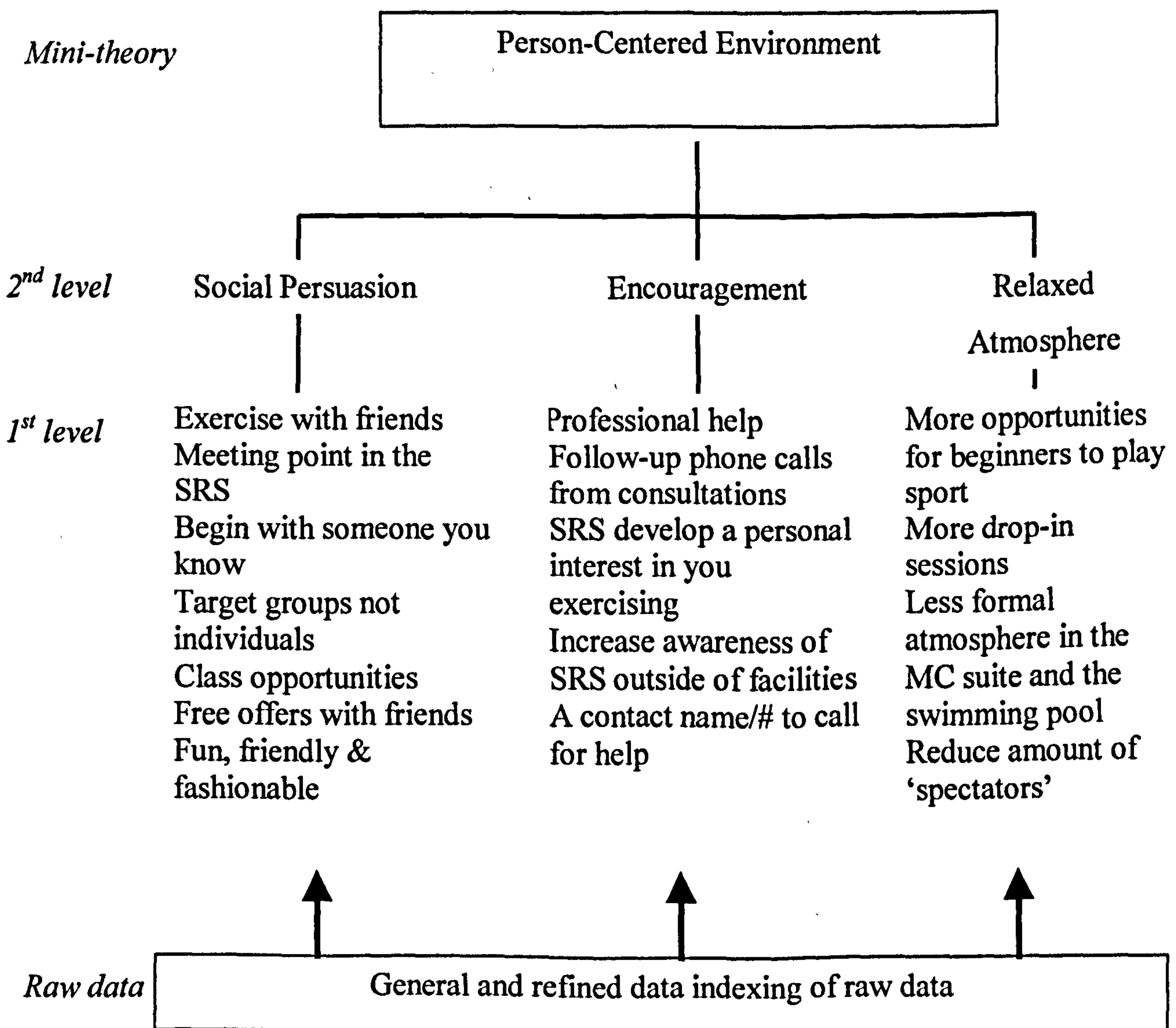


Figure 5.7. Data tree for the emergence of the concept of a person-centered environment

Table 5.13

An example of quotes listed under the theme of a person-centered environment in the SRS

<i>Social Persuasion</i>	
57. 119:JP	I think you would be put off, you would think like they are all very professional players would be going along.
120:A	Yeah I think you would feel very intimidated, even if you don't know anyone, so you don't know what level they are going to be at, and you think ah, you know, I will probably make a fool of myself or whatever. But if you go along with a couple of friends or whatever, if you know they are at the same level as you, you wouldn't feel bad going along. (FG5, ESIM)
58. 309:A	Instead of targeting the individual, you should target groups of friends. You are more likely to go and try something new in groups of friends, rather than try something new yourself. Because it is very intimidating by yourself, cause I know when they are targeting you know it should be with friends kind of thing. (FG5, ESIM)
59. 141:K	It's much more fun when you are not alone, it's like really funny em, you can laugh at each other, like I went once and I knew I looked ridiculous but I kept laughing at myself and my mate because like we were there.
142:J	If you go swimming with a friend it's more enjoyable if you are by yourself, then everyone looks at you and says she by herself? it is not as if you can go and talk to your friend if you are by yourself it makes you feel uneasy, don't look at me kind of (FG6, CSIF).
60. 174:K	It's just embarrassment because when you're all doing popmo together you can all look silly together and you don't really mind, but if I know my mates are going to be in the gym and I'm going to popmo and I go I will either not go or make sure that I'm always where they can't see me.
175:LA	The spectators. (FG6, CSIF)
<i>Encouragement</i>	
61. 168: E	It is the same sort of thing if you were really a friend or something then it would be harder to stop where even I suppose if you were in an aerobics class and you're on your own and you met someone there then if you didn't go and if they phoned you up to go it would encourage you to come back again because if you are sort of isolated you know a lot of exercises you can do on your own and isolated and the instructor doesn't know your name and no-one else knows your name so nobody notices if you're not there so it's not a big issue if you know whereas if the instructor if you didn't go for three weeks and then you came back and the instructor said where were you, you know what I mean, you'd maybe psychologically sort of thing that you had been missed if you are not there or something
169: N	It's the whole encouragement thing. (FG3, ESIF)
62. 385: S	I thought, you see, it says the consultation involves only 30 minutes, at the beginning I might like someone to be round a little bit longer, or like available, I don't whether or not they will be, like available for any questions I might have, or just general, like if I am doing exercises for an hour, are they going to be there every time I do my, but then that's like a personal trainer, isn't it? OK, who do I think I am?
386: E	Maybe a follow-up situation, maybe two weeks later,
387: R	Maybe three months later,
388: N	At each time period on here [2 weeks, 3 months, 6 months]. (FG7, CSNIF)
63. 222: N	More time to actually have more personal contact. I know that whenever I have gone to any of these consultations I don't know who it was but she was really I can't remember who it was but she was really nice and really encouraged me and took down everything that we had discussed and all the details and all that and told me that we should sort of keep on you know maybe sending things in the post and she didn't send anything in the end but if she had and if I had felt that somebody was actually interested in whether I was you know continuing or not it would definitely encourage me to do more. I would continue doing things more. So I think this whole thing like Lynn was saying if you missed aerobics classes lets say for two weeks and then go back again and somebody actually noticed a teacher actually noticed that you hadn't been there I mean that's impossible there's like one hundred people in these classes as it is but these consulting things like if you were to I don't know if it is this way now but when I went I didn't get much contact. If they were to keep in contact with the person they had consulted through the post or whatever I think that would help. (FG3, ESIF)

Table 5.13 Continued

More relaxed atmosphere

64. **100**: A I find the swimming pool very inhospitable, unsociable and a completely depressing atmosphere, because everyone is there, they have to be there because that is their allocated time and they are all so depressed about it, and I just hate it.
101: E I think in the lane where you have to keep going,
102: F I have gone in with my friends before, and we have just stood and you feel awful, you start to feel really guilty, because you have maybe done one length and you've gone back and talked a little bit more. But people are just going up and down,
103: C Yes if I went I would hope to have a laugh, if I went, but the swimming pool looks like quite a serious place,
104: F You have to take someone with you, and you do get a lot of looks like 'shssh we are trying to swim here'...
105: C 'Stop being so childish!' (FG1, ESIFPilot)
65. **170**: A I think it is all about image [exercising in the SRS], and not wanting to make a fool of yourself in front of anybody else. And it is more so at our age, we are a really bad age group for that, it is so much easier not to do sport and to try and retain a bit of image than to go to a sport and make a fool of yourself, and have people laugh at you. (FG5, ESIM)
66. **177**: A Well I don't have the confidence to go to the gym or anything you have to be superfit in there so once I'm perhaps a little bit fit I'll go in there... I think it's confidence to use the equipment in the gym...like it'll be for arms and I'm using it for legs or something and I'll feel really silly and that.
178: H The room with the weights as well. It's quite scary.
179: LA I booked in a consultation actually to go there, I had to get shown how to use this, I had to cancel it because of exams. I don't think I ever went in because I didn't know what to do (FG6, CSIF).
67. **269**: K The fact that it's, well I suppose the kind of desk and the things, and the fact that everybody in there is exercising, and the fact that you have to be EXERCISING to go into the Stevie building, that's the building where people are fit, and everywhere else is where people are, you know. so yeah! I think most of the people are probably worried about the fact that there's loads of stuff that you just haven't seen and how do you do it. I mean how do you go down to the swimming pool and get in, do you just walk down to the door? People don't know how things are run, how things are operated. I think if people actually had a knowledge about what to do, and they wouldn't feel so intimidated walking in.
270: JA 'Cause even when you are going in, you see all these fit people running about, running about the streets. And even then there's some mad bloke doing pull-ups in the Stevie, the whole time. And you know you are no where near that [as fit] so it's not enticing. (FG8, CSIM)

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

Stevie Building or SB refers to the Stevenson Building, an on-campus Sport and Recreation Service Facility.

ESIF = Experimental group, SOC improvers, female; ESIM = Experimental group, SOC improvers, male; ESNIF = Experimental group, SOC non-improvers female; CSIF = Control group, SOC improvers, female; CSNIF = Control group, SOC improvers, female; ECSNIM = Experimental and control group SOC non-improvers male.

Group Dynamics analysis

Data from the transcripts were analysed to see if the group dynamics yielded additional insights into the understanding of inactivity amongst young adults. Three findings emerged from the group interaction. First, it was revealed that participants' comments on physical

activity or inactivity were similar or different to each other based on how active they were at the time of the interviews. Second, the theme 'indifference' emerged when it was evident that dismissive comments about physical activity were used to hide other underlying reasons for not exercising. Third, the theme 'vanity complex', a phenomenon that centered on how individuals accepted unquestionably a particular body image, and how physical activity was useful only if it contributed to this image emerged as a strong justification argument for inactivity.

Activity status

Participants identified with each other when they described their experiences of physical activity; this was irrespective of their current activity levels. This was established by a snowballing effect of past experiences. In other words, participants not only agreed with each other's experiences, an experience was used to trigger the memory of other similar experiences. Negative language was more frequently used than positive language when participants recounted past experiences, and when positive examples were given they were either dismissed by the group or counter-balanced with a similar negative experience. This finding revealed the strength of past experiences and also the similarity of memories for individuals who were sedentary when they left school. An example of snowballing in past experiences can be seen on Table 5.14, and further examples are listed in Appendix 9.

Table 5.14

An example of snowballing as participants recount past experiences of physical education and physical activity.

Focus Group 7, Control group, SOC non-improvers, female:

[Memo: individuals were asked to recount experiences of physical education.]

14: E I used to prefer doing team things like volleyball... but I hated athletics because it was kind of on your own, but any team games like rounders or something like that, I really enjoyed but I was never really very good at it and I was always picked last for the teams, but I enjoyed it once I started playing.

15: S Yeah, I think that is the same with a lot of people once you had to pick teams and if you were one of the last ones you just ended up hating the sport and hating, dreading going to the gym, because it is always...

16: N Gym was always so embarrassing,

17: E Yeah, it was...

18: N it was awful, there was always people who were naturally elastic and could just bounce over things, but I just wasn't one of them, and I was just so ?. and it was because our gym class was mixed as well, cause when you are like 14 and you fancy some of the guys in your class, it is not very attractive to be bouncing about, you just, no I avoided it quite a lot.

Table 5.14 continued

19:	S	You either really liked it, or you hated it, my friend, she would do the opposite, she would miss her French and her biology and go in for PHYSICAL EDUCATION especially, and right now, that is what she does, like she trains 5/6 nights a week, she's running in competitions and representing Scotland, and all this kind of stuff, and me, I am her best friend and I am the exact opposite. Why do you think she might have liked it, whereas other people wouldn't?
21:	S	She was good at it, she was always a very talented, artistically, sports wise, music wise and was not into education at all, really she could not pass her exams... and em I think people focus on things that they are good at, they try and you know, if they are good at something and people praise them for something, then they do better at it.
22:	N	The thing about sports in school is that they are really explicitly competitive, so if you are really not good, it's really obvious to everyone else, whereas exams and things, people don't know what your marks are, and if you have done badly you are not embarrassed because people don't know, but if you are on the hockey team and you are the worst player it is easy for people to single you out as being the worst. Would everybody agree with that?
23:	S	You tend not to get passed the ball so much, and if there is any other option, you know they kind of look around and 'oh no, it will have to go to X', and they are praying, you can see their face going, oh don't give it to the other team.
24:	A	PE teachers, they are always kind of nasty, and they are not really encouraging,
25:	N	Were any of your PE teachers fat? My PE teacher was huge and she was trying to make me run around the field.

Note. The numbers in **bold** print are reference numbers attached to each line of the transcript by the computer package NVIVO.

As the discussion progressed from past experience into current opportunities, the effect of snowballing was still evident, but an individual's activity status was more influential on how the current opportunities to be active were described. In similar groups (e.g. sedentary individuals) the justification arguments for not using available opportunities were reinforced by the group. In mixed groups (e.g. some active, some inactive), there were examples of individual's contradicting or dismissing each other's comments. Inactive individuals tended to be more skeptical, interspersing positive comments with negative justifications for not using the opportunities. Active individuals tended to be positive when describing the opportunities to be active in university. Thus the concept of activity status implied that how active an individual was had implications on how they interpreted the opportunities to be active in university. Extracts from a focus group transcript that shows this interaction can be seen on Table 5.15.

Table 5.15

An example of how activity status was influential on how participants interpreted and described the opportunities to be active in university.

Focus Group 7, Control group, SOC non-improvers, female.

[MEMO: An example of snowballing amongst sedentary individuals as they discuss physical activity opportunities in the university.]

[R7.1 R] I think you need a lot of confidence to run on those running machines, with the mirrors right in front of you, and you can see your face,

[R7.1 C] Yeah, what is the deal? Why are they there? Who wants to see themselves?

[R7.1 R] Yeah, like in every gym have mirrors, it's like oh there's me I'm fat, why? I mean it is pretty off-putting, I have been to the Stevie building

[R7.1 N] It is probably just to make the gym look bigger

[R7.1 R] Yeah, but I mean it is not a nice sight when you see yourself all hot and sweaty.

Focus Group 4, experimental group, SOC non-improvers, female.

[MEMO: An example of individuals of different activity status discussing the opportunities to be physically active in the university.]

[R6 S] The gym scared me. The Lycra people.

[R6 R] Yeh the Lycra people they have very little bum tissue.

[R6 S] I have never set foot in the gym; I'm too scared to anywhere near it.

[R6 R] I did it once in first year, and I have never been back

[R6 ?] Is the gym, where they do the weights?

[R6 L] Yeah, I just call it the gym [pause] I go swimming. I don't mind swimming.

[R6 K] The Pop-mo places, the people in the gym can watch you, which I hate. I don't think it is a very good idea because you are self-conscious enough as it is when your prancing around doing some exercise you don't want someone staring down at you.

Note. Stevie Building or SB refers to the Stevenson Building, an on-campus Sport and Recreation Service Facility.

Categories

Following the emergence of the concept of activity status, it was hypothesised that participants could be categorised into groups based on their comments. Tracking individual comments throughout a transcript tested this hypothesis. These comments were examined to identify the predominant attitude to physical activity for a specific individual. The results revealed that individuals could be categorised into three distinct groups based on their comments; stable sedentary, not regularly active and regularly active. The groups emerged from the arguments that individuals used to justify their acceptance of or their challenges to an inactive or an active lifestyle. The individuals who were labeled stable sedentary were found to be more forceful in justification of an inactive lifestyle. They used more frequent negative comments when referring to physical activity, and actively contradicted positive comments made by others in the group. An example of a stable sedentary personality is shown on Table 5.16. The second group that emerged were participants who actively promoted physical

activity; this was evidenced through frequency of positive comments and the intensity of the comments made. These individuals came under the regularly active category, and an example of a regularly active personality is shown on Table 5.17. The majority and remainder of individuals gave mixed comments about both active and inactive lifestyles; they were categorised as the not regularly active category. Following this analysis, the quantitative data were then compared to the qualitative results, it was found that stable sedentary corresponded to precontemplation, while action and maintenance corresponded to the regularly active category. Individuals whose opinions were not very definite either way corresponded mainly to contemplation and preparation.

Table 5.16

An example of a stable sedentary individual.

Focus Group 4, Experimental group, SOC non-improvers, female.

[MEMO: During a discussion about memories of physical education]

8: [R2 S] I hated PE most of the time that I was there. I absolutely hated PE... The PE teachers at our school were always really strict though so it sort of put everybody off and nobody wanted to go to it you know because they were very strict... They don't tend to encourage you if you're not good at a sport they will just kind of ignore you and be kind of harsh towards you or whatever because they don't like you very much if you're not good at sport. That's kind of

[MEMO: As the conversation moved on to talk about activity outside of school, and the idea of an active lifestyle]

89: [R4 S] If I do any [physical activity] it was a kind of secondary to what I'm actually doing I don't do it on purpose I'll walk somewhere or walk upstairs or run somewhere it's just I'm in a hurry or because I've missed the bus or it's a nice day or something like that I don't ever go out of my way to do any exercise.

[MEMO: In response to a question asking the participants if there was anything that could have helped them to be active during the transition from school to university]

102: [R5 S] No because I didn't want to. If I had wanted to maybe somebody could have encouraged me but I didn't, it was my choice.

[MEMO: During a discussion on the opportunities to be physically active at university].

131: [R6 S] The gym scared me. The Lycra people... I have never set foot in the gym; I'm too scared to anywhere near it.

[MEMO: In response to a comment by another participant that being healthy was one of the advantages of being regularly physically active].

153: [R7 S] I can't remember the last time I felt really really healthy but I don't feel unhealthy or anything like that but it's not like I've got anything to compare it to that I think oh I wish I felt like that you know like I feel so energetic or anything like that because I don't remember what it would be like so

[MEMO: During a discussion on the disadvantages of physical activity]

167: [R7 S] Definitely. It does seem like it is a big effort to make yourself do, especially if it is not something you want to do you know... It does seem kind of a torturous thing to do to yourself you know when you are doing it you just think why am I doing this to myself.

[MEMO: Justification argument for being inactive, given during a discussion on confidence and its relationship to physical activity]

191: [R7.1 S] Yeah it's not like I hang about with a big load of sporty people that will make me feel guilty about it or anything I mean pretty much all my friends are at as lazy as I am so I... I think you gravitate to people who don't

Table 5.15 continued

[MEMO: Response to a justification argument for inactivity given by another participant]
202: [R7 R] Is being fit and healthy being such a big - so what if you are. But I like the way I live.
203: [R7 S] Yeh exactly... It's the sort of thing you dread doing - hanging over your head that you have to go to the gym... It's not like this thing in my life that I feel so unfit and wished I was different or anything like that or think oh I'm really going to have to do something about this. Because I don't. It's not as if I feel
[MEMO: In conclusion to the discussion of physical activity]
239: [R8 S] It's really difficult to explain to people what it is like being totally lazy and not caring about exercise - its' quite difficult. If you are at the opposite end you just don't get it - the person at the other side you just don't get it ... It's hard for people who are really fit to comprehend the levels of unfitness that people can stoop to really.
[MEMO: 'you' refers to me, as it was perceived that I was a fit individual].

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

Table 5.17

An example of a regularly active individual

Focus group 6, control group, SOC improvers, female.

[Memo: During a discussion about physical education]
36: K I didn't like it [physical education] in High School I avoided it at all costs. Just it was always boys running around being mad and the girls in the corner being bitchy.
[Memo: During this conversation on past experiences, individual explains current level of participation]
49: K I think I am more physically active [now], different factors sort of like, looking at health, swimming and walking and I do it for myself, I look forward to doing things when you have got choice.
[Memo: Conversation moves on to discussing activity outside of school]
53: K I was part of the swimming club which I was quite good at because I had been doing it since I was six and so long as they didn't make me compete I loved it because you know proper training and workout.
59: What do you think makes these things positive that you remember?
60: K I was quite good at them.
61: Being good at something.
62: K Yeh, just enjoyed those things.
[Memo: During a discussion on the opportunities to be physically active at University]
81: K I think they [the opportunities] are really good. There is things like Pop-mo [aerobic exercise class in the SRS] when you are not competitive and swimming just go into the pool because it's right by the Uni. it's not like you have to get on a bus and get there and all the rest of the hassle and join the club if you don't have friends who know about it it's difficult but if there is someone that you vaguely know then I think the opportunities are really good.
85: K There is the gym and there is Garscube there is always people around with frisbys and stuff. There are a lot of clubs and they cater for most interests, it's just plucking up the courage to turn up.
Memo: During a discussion on the advantages of being physically active]
96: K It [physical activity] definitely clears my head. At exam time I get a lot fitter just because it gets me out of the library and just makes me feel a lot free. I couldn't cope with stress all the time and exams and all that kind of thing so I do a pop-mo [aerobic exercise class in the SRS] or a swim sorts it out.
[Memo: During a discussion when individual's were asked to discuss what might help them to adopt a physically active lifestyle?]
127: K I actually did that a few months ago totally I was just me and a friend decided because we had had enough of our lives being such lazy slob and we just went overboard. We took up dancing. We went to Pop-mo, we took up mountaineering club, it was just ridiculous. Pop-mo has been kept on but nothing else has.
128: What made you think oh right okay let's change?

Table 5.17 continued

129: K We were all seriously depressed and you just had a week where we were all depressed and we felt that we had no friends, we had no lives, and we were getting fat and ugly and disgusting boring and so we just decided to do something about it.

[Memo: During a discussion on maintenance strategies]

141: K It's much more fun when you are not alone, it's like really funny em, you can laugh at each other, like I went once and I knew I looked ridiculous but I kept laughing at myself and my mate because like we were there.

[Memo: In conclusion to the discussion of physical activity, a justification argument given for being active]

182: K It's just because it's just such a bad thing if you are not fit, everyone disapproves and everyone knows that they should be fit and they should be healthy and they should be strong.

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

Indifference

This finding emerged from tracking individuals' comments to see if they modified their opinions at any stage during the focus groups, and then establishing the reasons for this. Extracts from a transcript that shows how one individual's opinion of physical activity participation changed during the group's discussion (initial R, focus group 5) is shown on Table 5.18. What was initially an indifferent or dismissive attitude towards being physically active changed subtly to reveal an individual who lacked the confidence and skill perceived as necessary to become involved. This lack of ability was counteracted by an attitude that physical activity was unimportant and therefore it was disregarded. The group interaction in this instance was particularly important as different experiences challenged R's opinions leading to more personal disclosures of why inactivity was preferred over activity.

Each focus group was examined from the basis that group dynamics could contribute to the emergence of themes in this way, and changing attitudes were documented for several respondents (Appendix 9). The theme indifference was a key finding of the study, and it implies that indifferent attitudes to physical activity were used to hide underlying self-protection motivations for not exercising.

Table 5.18

An example of the theme Indifference

Focus group eight, Control group, SOC improvers, male

MEMO: (In response to a general discussion on physical education and physical activity.)

7: R You shouldn't be made to do any physical exercise at school. I mean yeh like a little bit but you get enough running up and down the fucking stairs between classes what more do you need.

MEMO: (As the group talked about physical education memories both positively and negatively, it was dismissed as unimportant. There was the feeling of trying to be cool.)

10: R I liked PE classes because I could get out of the class and no one would know. Just feel free to do whatever you like.

MEMO: (Sometime later he comments on an extremely humiliating experience in class).

31: R You just get picked on by the teachers if you were crap at sports. He was really just a sarcastic bastard who would shred you if you didn't do good or if you did something really stupid or just couldn't be arsed he would just stand you in front of the class and shred you in front of them but it was showing off at sports or whatever you would be like a wobbly jelly on the floor wishing to disappear by the end of it because he would just stand there and constantly take the piss out of you. I ended thinking I want to die I am not here any more.

MEMO: (There was an element of indifference to physical activity during the transitional period from school to university).

52: R I couldn't be bothered, frankly. If there was brilliant weather outside why do you want to go and run around kicking a ball or jogging and staggering home in the blazing sun when everybody else is just lying on the grass having a bottle of juice.

MEMO: (Participants suggested that being good at a sport would help you to remain active during the transition from school to university, but this takes effort. R begins to reveal a lack of confidence in his own ability, and a reluctance to make a 'fool' of himself).

63: R I agree yeah. It takes a real desire to be good at something or you could make a real fool of yourself in front of a load of people who are probably all strangers and whether they are or not you are always going to end up thinking that they think I am a fucking arsehole, I am fucking shite at sport and unless you are really bothered about it you're not going to try.

MEMO: (The participants begin to discuss the current opportunities available to them in University, R refrains from joining in through humour).

72: R Well you can always run away from the bouncers!

89: S If you open it up to like one side which is basically people that are taking it seriously and having an A and a B team or something like that just to the emphasis is on mucking about because the people that are serious about are going to play with the clubs anyway and they don't want to get injured by playing some idiot.

90: R It's what Rugby's for!

MEMO: (Sometime later as participants begin to relax R again refers to his lack of confidence in his skills and his paranoia at the idea of being watched doing something he is not good at).

105: R Because people are watching and if you are really bad at sport, I'm completely crap at sport and if you don't want to go into the Stevenson Building where people are going to be watching you, [you] go to the park or something and that's it. You can't exactly play football in the middle of the road and as you go into the park especially in the summer you are going to be like wondering about people seeing you and stuff and apart from that people complain about being hit with the football and stuff.

MEMO: (The risk involved in playing sport is also detrimental to participation).

116: R Like in Rugby and Football if you are really bad at it you are going to get mashed I mean I am really bad at all sports and if I was in the same Rugby field as Sam and in the opposite team I think he's going to tackle me and not be thinking right I'm enjoying life right now. You're not a lot of people want to go out and think wait I'm going to get all fit and healthy and come back with one leg dragging behind and a few million cuts and bruises about two inches shorter

MEMO: (Humour is used to address that fact that exercise can be embarrassing, and anyway why would you do it? There is no need if you're not fat.)

129: R Get to wear embarrassing bright green lycra shorts!

Table 5.18 Continued

136: R I think you go to the question of need. How physically fit you need to be, presumably if you enjoy sport or something then fair enough but if you're not particularly fussed about enjoying sport or whatever I mean none of us are particularly fat or anything none of us are overweight so we don't need to go and work out and loose weight or we don't need to have a bigger lung capacity to be able to run faster or longer or whatever we are living in Glasgow you have got the buses and the tubes where the hell do you need to run to.

MEMO: (Finally, participants were asked to think of how the SRS could help to promote physical activity, humour was again used to justify inactivity).

210: R How about a reward system or competition or something...

214: R Do like fifteen lengths and you get ten free points or something. A pint each end! A discount in John Smith's bookshop.

Note. The numbers in bold print are reference numbers attached to each line of the transcript by the computer package NVIVO.

Vanity Culture

The quotes on Table 5.19 are excerpts from a focus group transcript that traces the sources of information that participants called upon to justify individuals' opinions regarding physical activity. As the group interacted there was an unquestioned acceptance of 'thin' being good while 'fat' was perceived as bad, and while a fit toned body was acceptable, having muscles for some was not. Exercise was only useful if it could contribute to making you look good. Arguments put forward that exercise was engaged in for weight gain, or that the reality of exercise making you 'beautiful' was unrealistic, were dismissed. From this data, the theme vanity culture emerged. This example serves to show how strong the culture of vanity was in this data; this was also found in other focus groups, but particularly amongst young women. This group of individuals was sedentary which suggests that vanity was not a strong enough motivation to become active, however it highlights that a vicious circle was also in operation as individuals did not take part in organised physical activity because they were too fat, and it was unflattering. This theme is part of the mini-theory social influence that was mentioned earlier.

Table 5.19

An example of justification arguments put forward by sedentary participants during a focus group discussion on physical activity.

Focus group 7, Control group, SOC non-improvers, female

MEMO: (During a discussion on confidence, and what it might mean in relation to physical activity).

[R7.1 S] Not intimidated, which is a bit of a negative thing.

[R7.1 R] I suppose kind of happy with yourself. Kind of not intimidated by other things.

[R7.1 A] Not afraid, well if you don't do exercise not afraid to start doing it, not afraid to walk into a room with people who are all toned, not caring about the flabby bits.

Table 5.19 continued

- [R7.1 N] Like I don't think that all of us here are necessarily not confident people, it's just that we are not confident around sports... doing fitness things, so
- [R7.1 S] I wouldn't say that we are justified in being intimidated by the sports because I don't think any of us have a reason not to put on a pair of shorts, or you know, like look at all of us, but we are, 'cause that is like human psychological aspects but, well women are always ah, how do I look in this, and if I get all sweaty my make-up will come off and my mascara will run you know.
- Where do you think this comes from?
- [R7.1 R] Society, magazines and models and all that.... yeah, cause you are always like thinking, my body would be just perfect if I could just chop off these little fat bits here. Things like that and all these what ifs...and that's it. Ryvita adverts on TV at the moment, it's like what is that all about, we don't need to see her.
- [R7.1 S] You see them [models] in all their sporty clothes and they all look fantastic, cause you see the thing is they have got all their people behind them, like doing their hair and stuff, and constantly for that advert touching up their make-up, and you know when you actually think about it. But when you are actually just watching the advert, you think if only I could look like that, you know, when I have got on a pair of shorts and a T-shirt.
- [R7.1 N] But I mean at the same time a really toned body does look amazing.
- [R7.1 S] Yeah that is true, like my friend Joanne, she just looks absolutely amazing and I hate introducing her to any of my boyfriends, like any boyfriend I have ever had in the last 3 years has just gone 'oh right that's your best friend is it?' You know, it is kind of yes, uh-huh, why? And em, yeah she has a good toned body, but she has got muscles on her bust, see you don't want that. That's a disadvantage.
- [R7.1 R] I don't think I do [exercise] to like lose weight or anything, as you see I don't need to lose weight I have never had a problem with it, so you see that's never been like an advantage to do exercise for me.
- [R7.1 N] You're lucky then, because that's the only reason I would do it, to like tone up and lose weight.
- [R7.1 R] Well, no...
- [R7.1 N] You practically have no motivation to do it
- [R7.1 C] That as well, yeah I only go in the swimming pool when I know I am going to see my boyfriend at the weekend, so I have to look a bit better than I did [after exercise]... I mean then I feel a lot better and then you forget.
- [R7.1 ALL] Yeah!!
- [R7.1 S] Well I think gradually, I'm sure that this time last year I was a size smaller, because I just keep putting it on and on, and over the past 6 months I have gained about 9lbs, and for me that is quite a bit, and if I don't start doing exercise fairly soon it is just going to keep going up and up and up.
- [R7.1 R] I try to put on weight, but I have been like 7 stone for the last years,
- [R7.1 ALL] 7lb stone, that is unbelievable.
- MEMO: (Again later on in the discussion this time in relation to the adoption of a physically active lifestyle, all these individuals were sedentary at the time of the interview).**
- WHAT MIGHT INFLUENCE YOU TO CHANGE, IF YOU WANTED TO ADOPT A PHYSICALLY ACTIVE LIFESTYLE?**
- [R8 N] Summertime coming up, bikinis... and I am watching my two flat mates get slimmer and slimmer and get more and more toned up, and I mean I am just going ah! And they are going around in their little shorts and their crop tops and they are looking fantastic, it's just like I want to be like that, but they have done it, they've done work for it, you know and that's why yeah, I can see going to the gym does have results, so maybe that is going to make me want to go a bit more.
- [R8 S] Yeah, vanity aspects. Everything comes down to vanity, and it will be, if I do start going to the gym, it will be because I have gone up a size, because my clothes aren't fitting anymore, and I look a bit flabby and I want to go out in the summertime, and I want to keep my boyfriend. [R8 F] Exercise especially for our sort of age is geared towards making us look better, rather than getting fit. I don't know anybody who would go to the gym to get fit, they go to fit into their jeans and stuff like that.
- [R8?] Yeah it is to look better
- [R8 C] People seem to think if you go to the gym and you do everything then you are going to come out with like a model, and that is just never going to happen for most people, I mean
- [R8 S] You can always hope.
- [R8 C] Fair enough it is still pretty unlikely, like I don't know.
- [R8 N] But you get really nice and toned though, which isn't a bad thing... It's better than nothing.

Table 5.19 continued

[R8 C]	Yeah, but how long does that take?
[R8?]	Yeah!
[R8 N]	Not as long as you would think
[R8 C]	A week? Imagine, after going to the first session. Could you imagine going to the gym every week...
[R8 S]	I think it takes about 6-9 months, I think, is that
[R8 C]	That would be the end of August!
[R8 N]	No I think after a couple of months you start to see a difference.
[R8 S]	Is that what happened to your flat mate? This is starting to motivate me.
[R8 N]	Yeah, her bum is gradually going in, she has quite a big bum, yeah, and seriously it is shrinking, I mean, it is, it seriously is, it's amazing, it is just getting smaller and smaller, it's getting narrower and narrower...she has always been sort of a 'gym person' on and off, but like she totally went at it from the start of this term, and even from the start of this term until now, there is a big difference, and she still eats loads but she is just doing exercise most days and there is a big difference.
[R8 S]	When I hear that, that makes me want to do something.
[R8 E]	Yeah.

Note. The numbers in **bold** print are reference numbers attached to each line of the transcript by the computer package NVIVO.

Discussion

Understanding the determinants of physical activity participation in youth has been identified as a research priority (Sallis et al., 1992). This study used a qualitative research method to explore the meaning of physical activity and its determinants amongst a young adult population. Previous research has tended to focus on isolated variables, this study sought to analyse how young adults talk about their past and current experiences of physical activity, and from this information develop an understanding of exercise behaviour modification in this population. To simplify the discussion of the results, headings will be used in the next section to identify the main theories that emerged from the qualitative data. The findings of this research suggest that in order to prevent sedentary lifestyles, and encourage active lifestyles in a young adult population psychological, social, cultural and physical variables determine adherence or avoidance.

Motivational Theory

From the qualitative data the first finding to emerge was a motivational theory initially labeled self-empowerment [SET]. This theory confirmed the motivational theory of self-determination [SDT] developed by (Deci, Vallerand, Pelletier, & Ryan, 1991), and (Ryan &

Deci, 2000). Three psychological needs were identified as part of the SET; these were autonomy, competence and identity. If met, these needs could lead to a positive development of the self, and an increased participation in physical activity. Autonomy was a combination of choice and control; for example if an individual felt in charge of their own behaviour this could positively effect their participation in physical activity. Identity implied that by entering a physically active environment like the University's Sport and Recreation Service, the focus group participants felt that their individual sense of self could be either confirmed or denied by significant others, who it was perceived, would judge them on their physical activity ability. Finally, the competence component was influential in deciding the perceived motivational climate, which in turn was an important determinant of whether this individual would initiate behaviour change or not. The focus group data revealed that if a young student felt they could succeed in achieving the desired outcomes in an exercise setting (irrespective of past experiences), then the likelihood of them becoming more active increased, thus for this population exercise self-efficacy was emphasised in the competence component of the SDT/SET.

These findings have broad implications for the prevention of sedentary lifestyles and the promotion of active lifestyles among the target population. They highlight major shortcomings in the experiences of physical activity recounted by these young people, and they reveal the importance of providing opportunities for the development of competence, autonomy and a sense of identity that promotes physical activity rather than alienates individuals from it. The development of an individual's sense of autonomy, competence and identity in relation to physical activity is central to establishing true intrinsic motivation according to the theory of self-determination (Whitehead & Corbin, 1997). Physical education teachers, coaches and parents play an important role in the development or destruction of this process. This research has shown that good experiences are remembered positively, whereas negative memories have detrimental effects on physical activity involvement years after the experience. There is a greater chance that good experiences, rather than bad experiences, during the formative years will lead to a self-determined approach to physical activity in adult life. However, instances were recorded where bad experiences, even though they did not help, did not prevent individuals from adopting physically active lifestyles once they entered university. Thus facility managers in higher education Sport and Recreation institutions need to actively encourage sedentary first year students to become more active. This can be

achieved through postal interventions, the provision of open-days, drop in sessions, and 'lazy-people's days'. These are situations where neophyte exercisers are encouraged to participate in physical activity in a non-threatening, relaxed atmosphere, and encourage them to become self-determined in their new environment.

Rationale

A second finding that suggests reasons as to why these individuals were inactive by such a young age, and how some of them are now leading active lifestyles is to do with a mini-theory called rationale. This mini-theory suggests that if individuals are to be encouraged to change their behaviour and to adhere to a new behaviour, then they should develop their own rationale for becoming physically active. This mini-theory includes both experiential and evaluative components. The experiential component centers on previous experience (habit formation) and the interpretation of this experience (level of structure). Past experiences can be important indicators of current behaviour (Aarts, Paulussen, & Schaalma, 1997; Dishman, 1994b). These individuals identified those who were active in school as leading active lifestyles now, whilst avoidance of activity in the past was interpreted as contributing to their own inactive lifestyles. In conjunction with this, physical activity was described as something that you could not engage in outside of a sporting arena or an exercise facility, in other words it was interpreted as having a high level of structure. A similar finding was also reported in the ADNFS (Health Education Authority & The Sports Council, 1992), this has negative implications as it increases the barriers to participation. This finding highlights the need to promote an active living approach to physical activity as opposed to sport or structured exercise. The evaluative components of the theory, self and environmental evaluation suggests that each individual should debate the relative merits of their current behaviour, and examine how the environment can contribute to helping them change. These concepts are similar to the processes of change self-reevaluation and environmental reevaluation identified in the transtheoretical model of behaviour change (Marcus et al., 1992d; Prochaska & DiClemente, 1983). All four components combine to influence an individual's rationale to be active or not. The promotion of a physical activity among this population should be inclusive of these determinants, individuals should be encouraged to develop a rationale that is based not on past experiences per se, but on the evaluation of these experiences in the light of current opportunities.

Social and Cultural Influences

Participants in the study recounted how the transition from school to university was challenging, and how there was a pressure 'not make a fool of yourself' (focus group 5) and to establish some 'street cred' (focus group 1). In this transition, both social and cultural influences were identified as determinants of participation or non-participation in physical activity. The role of significant others was apparent in both past experiences, but also in current experience. In university, friends were identified by all groups as extremely influential, if physical activity was condoned or rejected, then this influenced whether individuals got involved or not. This supports the finding of the intervention study in chapter three, where the process of change social liberation (or the acceptance of physical activity as a socially acceptable behaviour in society) was identified as indicative of stage of change improvement. Friends were also identified as important sources of encouragement and social support to change behaviour. This is similar to other research findings (Duncan et al., 1993; Sallis, Grossman, Pinski, Patterson, & Nader, 1987; Treiber et al., 1991). Secondly, image emerged as a concept that was a culmination of stereotypes and social physique anxiety (Hart, Leary, & Rejeski, 1989). Finally, by analysing the group dynamics the theme vanity culture emerged. These findings suggest that these young adults might participate in physical activity if they deem it as acceptable to their social circles, if it is appropriate to enhancing their sense of vanity, and if it contributes to the development of a positive body image.

Indifference

In the group dynamics analysis, the theme 'indifference' emerged. Research has shown that individuals are 'absorbed in a life long project to validate their sense of self' (Fox, 1997, p. 113). This 'project' appears to intensify around the time of adolescence, as a critical task that faces young people during their years in secondary school is to establish a 'consistent and coherent self-theory' (Whitehead & Corbin, 1997, p. 180). The results of this research show that a relationship existed between an individual's sense of self (their self-system) and their physical activity involvement. Experiences that evoked memories of isolation and alienation contradicted the development of this sense of self, and led to the emergence of a theme called indifference. This is similar to the concept of discounting, a self-enhancement strategy developed by Harter (1993; 1996). This strategy implies that individuals attach low importance to those domains where low competence is perceived, and, in effect, it prevents a

perceived lack of ability from impacting on self-esteem. This can be seen from the focus group analysis when individuals refer to physical education as boring or not really relevant, while avoiding physical education provided opportunities to socialise, to be defiant of the school system and in some instances to get ahead with academic work. Thus individuals begin to discount the importance of physical education. As they are establishing their consistent and coherent sense of identity, they begin to disassociate themselves from anything to do with physical activity. The direction of their motivation becomes set, and they begin to identify themselves as 'not sporty', or 'not that type of person [someone who is physically active]'. This concept is reinforced by the number of times the theme of differentiation or alienation from other exercisers was identified in the results section.

Activity Status

The snowballing of similar past experiences supports the notion of different stages within the change process. Snowballing is a concept where participants use each other's experiences to trigger and report on similar memories and experiences of their own. The data revealed that individuals who were in a stable sedentary category (precontemplation) talked differently to those in the more active stages of change. However, the focus group participants could relate to each other's past experiences of physical activity. This was irrespective of current level of activity. This finding has implications for how individuals are taught physical education, as apart from teaching in a mixed ability class, individuals would need to be given the opportunity to progress through different stages of change.

Kraft et al. (1999) have published some novel research into establishing that the stages of change are qualitatively different in smoking behaviour. More research is needed to see if the stages of change are qualitatively different in physical activity. This study provides some preliminary findings to suggest that they are. Focus group participants were found to differ from each other in their perceptions about and attitudes towards physical activity, this was found to correspond to exercise stage of change. For example, those in precontemplation were more negative than those in action in their description of the opportunities to be active in University. This finding also suggests that precontemplation may need to be further fractured to include stable precontemplators, and unstable precontemplators. This supports the research of Richards Reed (1999) who has analysed this research question from a quantitative perspective.

The Transtheoretical Model

All the processes of change identified in the TTM were mentioned during the focus group discussions on how to initiate and maintain behaviour change in physical activity. The frequency of occurrence of the processes of change was similar to the median frequency scores recorded on the processes of change questionnaire. Two differences were noted, first, the processes of change *helping relationship* that was quoted quite frequently, and stressed as an important strategy of change in the qualitative data received a low frequency score in the quantitative data. Second, *reinforcement management*, which was quoted seldomly in the qualitative data received a high frequency score in the quantitative data. Further research is needed to establish if there is a difference between frequency and importance scores, and how this could influence our understanding of behaviour change in physical activity. A greater understanding is also needed of how the processes of change like *reinforcement management*, or rewarding yourself for positive change, are interpreted by neophyte exercisers who might not have enough experience of the behaviour to use a particular strategy without being given ideas by others.

Three possible extensions to the TTM were also identified in the data on initiation and adoption of physical activity. These were the goal setting, inertia complex and guilt alleviation. Goal setting is a skill that the participants revealed they had little experience of. The inertia complex referred to the problems with initiating behaviour change, and was identified as a barrier to change. Finally, guilt alleviation is a concept similar to the idea of introjected regulation that is a motivational threshold outlined by the theory of self-determination (Deci & Ryan, 1985; Deci et al., 1991; Ryan & Deci, 2000). This again comes back to the notion of intrinsic motivation and the fact that getting involved in physical activity for fun, or enjoyment was absent in all of the focus group discussions. In order to prevent young people dropping out of physical activity at a young age, experiences need to be facilitated that encourage and foster intrinsic motivation.

Intervention

The intervention was identified as useful. In summary, the participants concluded that the intervention material should be more realistic to young adults, for example the statistics on levels of inactivity should refer only to young adults and preferably to those at university. They also suggested that the best bits of each intervention should be combined in the design of

one booklet. For example, have four pages of information followed by a page with free vouchers and so on. Future research into the production of intervention materials in physical activity should examine not only the effect of tailoring material on a stage of change basis, but also on an age or population specific basis.

Sport and Recreation Service

The data revealed that the focus group participants were highly aware of the opportunities provided by the University to encourage participation in physical activity. The data were analysed to establish potential strategies for improving the service of the SRS. The results suggested a more person-centered environment should be established. Key themes such as social persuasion, encouragement and a relaxed atmosphere emerged. Facility managers need to be aware of this, providing informal exercise opportunities that emphasize fun, and cater for different levels of ability; establishing a meeting point for friends to meet each other prior to exercising; having exercise consultations where individuals 'drop-in' without an appointment to discuss exercise adoption or adherence; providing a service that permits new members access to a staff member who would become their 'buddy' could be provided. This buddy would show the new member around, be available to answer questions and someone that could be contacted if advice was needed on physical activity. These services would be particularly useful during the first term of every year, and specifically for first year undergraduate students, many of whom have not used leisure centre facilities prior to coming to university.

In conclusion, the employment of focus groups as a research method is increasing in the social sciences (Catterall & Maclaran, 1997). This method provides the researcher with an ideal opportunity to explore people's experiences, opinions, wishes and concerns (Barbour & Kitzinger, 1999). However, it is not without its limitations. For example, this method has restricted generalisability and complex verification and analysis procedures. This study used focus groups to establish and analyse the determinants of participation in physical activity among young adults. This was achieved through listening to groups of young adults at different stages of exercise behaviour change discuss physical activity, its meaning and its influences. The results provided encouraging insights into the understanding of physical inactivity, and how to initiate and sustain behaviour change. The evidence suggested that the exercise stages of change are qualitatively different to each other. Further research is needed

to clarify this finding. The key findings suggest that a behavioural change theory alone may be inadequate to help us to fully understand the complex process of adopting and adhering to a physically active lifestyle. Several results emerged that revealed that the determinants of physical activity are a mixture of psychological, social, cultural, physical and structural variables.

Chapter 6

Conclusions and recommendations for future research

Although regular physical activity has well-documented health benefits, high proportions of individuals are sedentary or are not regularly active enough to achieve these health benefits. The literature review in chapter two, involved a detailed analysis of theories and models of behaviour change and their application to physical activity. From this review, the transtheoretical model of behaviour change [TTM] (Prochaska & DiClemente, 1983) was chosen as the theoretical basis for this study. This model has proven beneficial for understanding a wide range of health behaviours in a variety of populations, including physical activity (Marcus et al., 1992c). The TTM is a comprehensive and integrative model of behaviour change, which permitted the identification of a sedentary population, and suggested a systematic way of designing interventions aimed at developing active lifestyles. Its theoretical constructs are derived from a combination of several psychotherapies (DiClemente et al., 1991; Prochaska & DiClemente, 1983), from social cognitive theory (Bandura, 1986) and decision-making theory (Janis & Mann, 1977).

The primary aim of this research was a theory-led deductive analysis of the applicability of the TTM to increasing our knowledge about exercise behaviour modification in a young adult population. In addition, an examination of the usefulness of this model in assisting in the design of a motivationally tailored intervention, and in assessing the efficacy of this intervention in helping individuals to progress in their motivational readiness for physical activity adoption was undertaken. Finally, a qualitative examination of the determinants of physical activity participation and exercise behaviour change amongst the target group completed the study.

The Studies

Three separate studies, that led to a combination of both inductive and deductive research methods, were undertaken in this research. This guarded against premature closure in determining the usefulness of the TTM in exercise behaviour change, and permitted the identification of determinants of participation in physical activity that were not in the variables examined as part of the TTM. Each study was similar in its relevance to the aim of the research, and each was unique as to the specific research question to be answered.

The first study was reported in chapter three. It was a longitudinal study that involved tracking first year undergraduate students over a seven-month period. Baseline and follow-up questionnaires examined the students' movement on the stages of change construct of the TTM. Cross-sectional data on process of change use was also obtained in this study. The second study was reported in chapter four. It was an intervention study that involved the selection of all the sedentary students from the baseline information in study one. These students were then assigned to a randomised-controlled trial of a stage-matched intervention based on the TTM. This intervention was designed to promote physically active lifestyles amongst sedentary young adults. The third study was reported in chapter five; it was a qualitative study in which individuals from the previous two studies were invited to attend focus group discussions. In each group, individuals discussed their past experiences of physical activity, their current activity status and what they thought might influence their potential future participation in physical activity. The core components of the TTM were also discussed.

Conclusions of the Thesis

Several findings contribute to answering the questions set out in the aims of this thesis. In order to simplify the reporting of these findings, the following section will discuss the TTM and the findings from all three studies that either supported or questioned the efficacy of this model in informing exercise behaviour modification. Each component part of the TTM will be reported on separately for reasons of clarity. In the second section, the findings from all three studies and how they contributed to advancing knowledge of the determinants of physical activity participation amongst this young adult population will be discussed. Where appropriate, the findings will be supported by extant literature, and advancements for the development of the TTM or rethinking the determinants of exercise behaviour will be suggested. Recommendations for further research into exercise behaviour modification will form the final part of the chapter.

Physical Activity Associations

A high number of young people (46%) indicated that they were sedentary or not active enough to meet the level of physical activity specified in the current CDC/ACSM guidelines. This reinforced the need for research into exercise behaviour modification amongst this high-

risk group, a finding that has also been reported by many other researchers (Calfas et al., 1994; Leslie et al., 1999; Pinto & Marcus, 1995; Pinto et al., 1998).

A small percentage had knowledge of the Sport and Recreation Service [SRS] at the University of Glasgow prior to entry. This knowledge was positively associated with University choice. Following the intervention study, more of the sedentary individuals in the experimental group, compared to those in the control group were members of the SRS. This finding highlighted a proactive role for similar facility managers in encouraging active lifestyles amongst sedentary undergraduate students.

Exercise Stage of Change

In each of the three studies, the participants self-selected an exercise stage of change, which described their current level of physical activity and their behavioural intention for a six-month period. Descriptive statistics were used to identify and report on exercise stage distribution across all three studies. The ability of the SOC model to fracture an entire population into different groups based on their current behaviour and behavioural intention as regards physical activity is a strength of the model. This permits the researcher to identify those who are inactive. It also reduces the likelihood of targeting these individuals with incompatible interventions that are action-orientated. This finding is supported by other research (Cardinal & Sachs, 1995; Cardinal, 1995b; 1997b; 1998; Lowther et al., 1999; Marcus & Simkin, 1993; Marcus et al., 1994; Wyse et al., 1995).

A stage of change effect was established for the different variables measured in the questionnaire (that is process of change use, behavioural intention, self-efficacy and decisional balance score). In general, this result found that the degree to which an individual endorsed the psychological constructs measured varied systematically with motivational and behavioural readiness for physical activity adoption. More active individuals scored higher on all measures of the questionnaire in relation to their less active counterparts. This finding was evident in the quantitative data from all three studies in this thesis, and it is also supported by other research (Goldberg et al., 1996; Gorley & Gordon, 1995; Marcus et al., 1994; 1996b; Myers & Roth, 1997; Nigg & Courneya, 1998).

Bandura (1998) and Davidson (1999) believed that the SOC component of the TTM is not an accurate stage model in which an individual evolves from one stage into a qualitatively different one. In the qualitative study, a content analysis provided some initial evidence for the

stages of change being qualitatively different. That is, sedentary individuals were found to use negative terms when describing physical activity, and to contradict positive examples of physical activity given by other participants in the focus group. In contrast, more active individuals were found to be generally more positive in their reference to physical activity. This concept was described as 'activity status' and is explained in detail in chapter four.

Self-Efficacy

In this research, individuals in maintenance reported the highest exercise adoption self-efficacy scores, and participants in precontemplation reported the lowest scores. In other words, participants who had not yet begun to exercise, in contrast with those who exercised regularly, had little confidence in their ability to exercise (Marcus et al., 1992d; Wyse et al., 1995). This finding was supported by the qualitative study where self-efficacy emerged as one of the three second-level themes that comprised the mini-theory motivational climate. Focus group participants frequently commented on how, in relation to an exercise setting, they lacked the confidence to enter a facility, never mind participate in an exercise environment. Thus, the importance of self-efficacy as a cognitive change strategy for assisting in exercise behaviour modification was identified. This supports the other research (Marcus et al., 1992d).

Marcus et al. (1994) and Bandura (1977; 1986) commented that individuals with a high sense of self-efficacy tended to approach challenging tasks, to try hard and to persist longer in the face of obstacles or stressful stimuli. Lack of exercise self-efficacy therefore, will impact negatively upon an individual's decision to initiate 'challenging' activities. According to the qualitative data, the level of structure attached to physical activity by the focus group participants was high. That is, unless an individual was involved in structured or organised exercise/sport, they did not perceive themselves to be physically active. Thus, a relationship between exercise self-efficacy and level of structure exists. If exercise self-efficacy is high, then participation in physical activity is high, and vice versa for low levels of efficacy. If level of structure is high, then a high level of exercise self-efficacy is needed to meet this challenging form of activity. In contrast, if level of structure is low (or optional), then the likelihood of an individual participating due to increased levels of efficacy is enhanced. This finding has implications for the inclusion of a broad curriculum in physical education in schools. It highlights the importance of enhancing exercise self-efficacy, but also of

broadening the definition of what constitutes regular physical activity amongst sedentary or irregularly active populations. Thus, the use of 'active living' recommendations to promote physically active lifestyles is necessary.

Decisional Balance

An individual's decisional balance score was found to increase as motivational and behavioural readiness for physical activity adoption increased. Individual's in the more active stages of change had higher decision balance scores in favour of exercising than those in the non-active stages. This finding has been reported by others (Ingledeew et al., 1998; Marcus & Owen, 1992; Marcus et al., 1992b; Myers & Roth, 1997).

The results of the qualitative study support the concept of a decisional balance theory in assisting an individual to initiate and/or maintain physical activity. This was shown in the emergence of a mini-theory called rationale. This mini-theory comprised of four second level themes, two of which were self-evaluation and environmental evaluation. These themes emerged from data in which the focus group participants discussed the relative costs and benefits to them of adopting a physically active lifestyle; and the relative good and bad points of their structured exercise environment (that is, the University's Sport and Recreation Service) and how it contributed to or hindered involvement in physical activity. These themes were present in all focus group discussions, and are discussed in detail in chapter five. This finding highlights the importance of decisional balance theory and consequently decisional balance measures taking into account not only the personal benefits and barriers for exercising, but also an individual's perception of how the environment contributes to or places barriers in the way of a physically active lifestyle. Thus, in planning research and intervention efforts, researchers need to consider not only personal but also environmental and structural forces.

Processes of Change

The quantitative data revealed a differential pattern for process of change use for the adoption of a positive behaviour (i.e. physical activity) in relation to the cessation of a negative behaviour (i.e. smoking). This finding has implications for future intervention design in physical activity. It suggests that *self-reevaluation*, *self-liberation*, *counterconditioning* and *reward management* rather than *consciousness raising* or *dramatic relief* are the change

strategies used most often by this population for improving exercise stage of change. This finding was supported by longitudinal SOC data, as stage improvers were found to use the evaluation, commitment, substitution and reward processes listed above significantly more than either those who regressed in SOC, or those who remained in the same SOC over a seven month period. This finding is supported by the descriptive statistics published in other research (Nigg & Courneya, 1998).

It was hypothesised that some of the processes of change might be highly correlated to each other, and that this correlation might be stage dependent. In order to test this hypothesis, a factor analysis procedure was used. This method identified underlying factors that could explain the majority of variance in the process results. A three-factor model emerged, and the new underlying factors were a combination of processes that were highly correlated to one of the three factors. The results are discussed in detail in chapter three. This finding has two implications; first, it suggests that though descriptive statistics are useful for designing stage-matched interventions, an examination of underlying motivational factors might also inform intervention design. Second, the underlying factors that emerged for precontemplation and maintenance stages of change were different to all the other stages, while those for contemplation, preparation and action were similar to each other. This suggests that specific stage-matched interventions may be more appropriately designed for individuals at the extremes of the stage model, while for those progressing from a sedentary lifestyle into a more active lifestyle there may be considerable overlap in the change strategies employed.

Gender differences in the longitudinal study found that women had significantly higher frequency of use scores for the cognitive processes of change. A similar finding was reported by O'Connor, Carbonari, and DiClemente (1996) for smoking cessation, but no study that examined gender differences in process of change use was identified for physical activity adoption and maintenance. No significant difference in scores obtained was established for the behavioural processes. This finding suggests that women might be more aware than men of interventions that use cognitive approaches to exercise behaviour modification. The implications of this finding need to be examined in relation to intervention design and its impact on behaviour change over a wide range of health behaviour.

In the qualitative study, two key questions asked focus group participants what strategies they would use to initiate or maintain an active lifestyle. From this data, all of the processes of change listed in the TTM were mentioned. The frequency of occurrence of a

process of change in the qualitative data was similar to the median frequency scores recorded on the processes of change questionnaire (completed at the end of each focus group). Two differences were noted; first, the process of change *helping relationships* that was quoted quite frequently, and stressed as an important strategy of change in the qualitative data received a low frequency score in the quantitative data. Second, *reinforcement management* that was quoted seldomly in the qualitative data received a high frequency score in the quantitative data. Further research is needed to establish if there is a difference between frequency of use and importance scores, and how this could influence our understanding of behaviour change in physical activity. A greater understanding is also needed of how the processes of change like 'reinforcement management' or rewarding yourself for positive change, are interpreted by neophyte exercisers who might not have enough experience of the behaviour to use a particular strategy without being given ideas by others.

Three additional strategies for change were also mentioned during this discussion. They were labeled TTM extensions. These extensions were goal setting, inertia complex and guilt alleviation. Goal setting was a skill that the participants revealed they had little experience of. The inertia complex referred to the problems of initiating behaviour change, and was identified as a barrier to change. Guilt alleviation was a concept similar to the idea of introjected regulation that is a motivational threshold outlined by the theory of self-determination (Deci & Ryan, 1985; Deci et al., 1991; Ryan & Deci, 2000).

This data highlighted the absence amongst the participants of engaging in physical activity for fun. The lack of intrinsic motivation was evident in all of the focus group discussions, and is thought to have been a considerable influence in the choice of sedentary lifestyles by these young adults as they entered University. This highlights a shortcoming of the TTM. This model draws a relationship between change over time, and it identifies how an individual may change their behaviour. It does not describe why an individual may be sedentary or active in the first place. The determinants of physical activity participation are the focus of the next section that suggests how the TTM could develop further.

Intervention

This research found that an experimental group who received a mail-delivered physical activity intervention improved their exercise stage of change significantly more than a control group who did not receive the intervention. Thus, a relatively inexpensive, mail delivered,

self-instructional intervention based on the 'active living message' is an effective method of assisting sedentary young adults to progress through the SOC put forward by the TTM of behaviour change.

The employment of stage specific processes of change in the design of physical activity interventions to promote active lifestyles is shown in this study (Table 4.2). Other work have established the efficacy of this method over generic intervention material (Table 2.10) (Calfas et al., 1997; Cardinal, 1995b; Cole et al., 1998; Dunn et al., 1997; Marcus et al., 1998b; 1998a). Post-intervention the experimental group scored significantly higher than the control group on their frequency-of-use score for the process of change *social liberation*. This difference could have been due to the intervention encouraging a vision of physical activity as something that was natural and socially acceptable amongst the experimental group. The qualitative research also supported a concept of social liberation as a change strategy. A second level theme normalisation was part of the mini-theory Social Behaviour that emerged from the data. This theme identified friends as contributing to making physical activity normal and enjoyable. They could do this by preventing embarrassment, by providing encouragement and by neutralising stressful situations in exercise. This finding suggests that the promotion of physically active lifestyles amongst this age group should consider the impact of proactively targeting social liberation in the future.

Exercise self-efficacy was found to be significantly higher in the experimental group post intervention in comparison to the control group. It is thought that a possible explanation for these improvements could have been due to the intervention broadening an individual's definitions of what regular physical activity involved. The intervention was based on the active living message, and it outlined the moderate accumulative message of physical activity for health. In the qualitative data a perceived high level of structure was identified as a barrier to becoming involved in physical activity. This led to low levels of exercise self-efficacy as individual's believed that 'Gym is for fit people, it's not for people getting fit' (Focus Group 6, transcript reference 182). This in turn led to low levels of participation in physical activity.

Determinants of physical activity

In order to examine the determinants of physical activity or inactivity amongst the target group in more detail, it was felt that the isolation and study of selected variables identified as part of the TTM, though useful, would be insufficient to answer the aims of the

research fully. Hence, a qualitative analysis was undertaken to explore reasons behind inactivity, and identify the participants' self-selected strategies for change, and for maintenance of a physically active lifestyle.

A motivational theory, originally labeled by the author as the Theory of Self-Empowerment, identified three psychological needs (autonomy, competence and identity) that if met could lead to a positive development of the self, and an increased participation in physical activity. This label was later changed to The Theory of Self-Determination (Deci & Ryan, 1985; Deci et al., 1991; Ryan & Deci, 2000) as it paralleled closely, and was found to confirm this theory. This finding has implications for the promotion of active lifestyles amongst the target population and for the development of the TTM. It introduces a concept of combining a motivational theory with psychological and behavioural constructs to assist in behaviour modification. The etiology of change may prove to be as important as understanding how an individual changes, in other words the motivation behind the move needs to be explored further. It is a recommendation from this research that the TTM could combine with the Theory of Self-Determination as a comprehensive development.

Two evaluative and two experiential themes combined to form a mini-theory called rationale. Each theme influenced an individual's reason for choosing to be active or not. The evaluative components of the theory, self and environmental evaluation suggests that each individual should debate the relative merits of their current behaviour, and examine how the environment can contribute to helping them change. These have already been discussed in relation to the quantitative data, as their application was conducive to development of decision-making theory. The experiential components of the mini-theory rationale focused on previous experience (habit formation) of physical activity and the interpretation of this experience (level of structure). The qualitative data revealed that past experiences could be important predictors of current behaviour (Dishman, 1994b); if positive experiences were remembered they help in the process of habit formation, if negative they provided justification arguments for sedentary as opposed to active lifestyles. This supports previous research (Aarts et al., 1997), and highlights habit formation as a possible variable in models of exercise behaviour change. Currently there is a lack of studies that control for past physical activity habits or experiences. This limits one's confidence about how much of the observed relationship between cognitive determinants and behaviour is causal and how much reflects a selection effect. In physical activity, for example, an individual who is regularly physically

active may report positive attitudes towards physical activity, and high levels of both exercise self-efficacy and behavioural intentions due to past successes, but their past successes may have been caused by factors other than attitudes, self-efficacy, and intention.

Physical activity was described as having a high level of structure, and was something that happened only in a sporting arena or an exercise facility. The negative implications of this were discussed in relation to exercise self-efficacy. In relation to staging an individual there are also implications. A detailed definition of what regular physical activity involves, and broad range of activities that could be undertaken to become regularly active would need to be explained especially to the population who may have little experience of activity other than formal physical education or extra-curricular sport.

Social influences were identified as determinants of participation or non-participation in physical activity. Friends, parents and significant others were constantly referred to in the qualitative data as a source of normalisation, encouragement and social support. These findings also supported those of the intervention study as previously mentioned. Similarly, the data collected on opportunities to be active in the University identified a more person-centered environment with key themes like social persuasion, encouragement and a relaxed atmosphere being suggested as potential strategies for improving the service of the University's Sport and Recreation Service.

Image emerged as a concept that was a culmination of stereotypes and social physique anxiety (Hart et al., 1989). The theme vanity culture emerged where justification arguments for inactivity focused on the correct type of body, and the correct type of image. These findings suggest that these young adults might participate in physical activity if they deem it as acceptable to their social circles, if it is appropriate to enhancing their sense of vanity, and if it contributes to the development of a positive body image. Elements of the social learning theory are evident here. This theory states that significant others influence behaviour by providing models to imitate and by expressing favourable or unfavourable attitudes toward the specific behaviour. Similar findings have been reported by others (Duncan et al., 1993; Sallis et al., 1987; Treiber et al., 1991). Thus, in planning research and intervention efforts, researchers need to consider not only individual, microlevel factors, but influential psychological, environment and social forces that act in concert on individuals who are part of groups.

Focus group participants identified the intervention as useful for the adoption of a physically active lifestyle (see chapter five for details). However, they concluded that the intervention material should be more realistic to young adults; for example the statistics on levels of inactivity should refer only to young adults and preferably to those at the University. They also suggested that the best bits of each intervention should be combined in the design of one booklet, for examples have four pages of information followed by a page with free vouchers. Future research into the production of intervention materials in physical activity should examine the effect of not only tailoring material on a stage of change basis, but also on an age or population specific basis. This finding is supported by the recent developments in the design of physical activity interventions. These suggest that a motivationally tailored or stage-matched intervention is more effective than a standard self-help intervention for exercise adoption. However, the efficacy intervention can be further improved if individual tailoring to promote participation in physical activity is used in conjunction with motivational tailoring (e.g. Marcus et al., 1998b; 1998a).

It was hoped that by combining the results of the qualitative study and the quantitative information from studies one and two a new model for understanding exercise behaviour in a young adult population emerged. This is discussed in the concluding chapter.

Future Research

Within the science of behaviour change, there is a constant conception, evaluation, re-conception, and abandonment of theories and models so that many competing explanations of behaviour modification exist. This constant search can sometimes lead to the frustrating reality that final conclusions in psychology are elusive, and often research tends to raise more questions that provide answers. The conclusions that can be drawn are usually tentative and almost always accompanied with a call for further research. This study supports this notion, and below is a list of topics for further research.

- In the literature review in chapter three, the concept of the stages of change component in the TTM being discrete stages phases or categories was questioned. More research is needed to see if the stages of change are qualitatively different in physical activity. This study provides some preliminary findings to suggest that they are.

- This research provided novel evidence of the factors that produced transitions between exercise stages of change. More research is needed to explain the specific strategies that are associated with people moving from one stage to the next, and that explore whether stage improvers employ different processes of change than stage regressors or stage stagnators (i.e. those who remain static).
- The majority of studies in the literature review used a cross-sectional design. This has limitations for defining the temporal sequencing between SOC and other variables measured. Study one used longitudinal SOC data to develop an understanding of process of change use by individuals who had improved, regressed or remained in the same SOC over a seven month period. It found that the processes of change *self-revaluation*, *self-liberation*, *counterconditioning* and *reinforcement management* received a significantly higher frequency-of-use score than either SOC stagnators (those who did not change) or SOC regressors (those who regressed). Future research needs to identify not only the most favourable conditions for change, but to specify the extent and the direction of change. There is a need for longitudinal studies to establish the integration between the different measures associated with the TTM.
- A differential pattern of frequency-of-use scores was established between smoking cessation and physical activity adoption. More research is needed to test this finding further, and to establish if a different set of processes should be used in the adoption of a positive behaviour in relation to the cessation of negative behaviour. This may have implications for the 'set of tasks' an individual needs to complete in order to progress through the exercise stages of change.
- It has been suggested that stage-matched interventions should not be based solely on descriptive statistics of frequency of use. A factor analysis was used to reduce the processes of change data, this was done by identifying three underlying motivational constructs (factors) that may also be influential in change. This finding requires further study, and is a recommended area for future research. It also suggests that change strategies could be composed of underlying determinants of change.

- Further research is needed to establish if in the processes of change there is a difference between frequency of use and importance scores, and how this could influence our understanding of behaviour change in physical activity. A greater understanding is also needed of how the processes of change are interpreted by neophyte exercisers who might not have enough experience of the behaviour to use a particular strategy without being given ideas by others.
- It has been established that the 'level of structure' an individual places on physical activity has a potential negative impact on participation levels amongst young adults (see chapter five). Further research is needed to establish how this concept influences exercise self-efficacy and if this impact is age dependent.
- In the focus group data, the predominant absence of participating in physical activity for fun, or enjoyment and the lack of intrinsic motivation was axiomatic in all of the focus group discussions. Further research should address the concept of intrinsic motivation amongst sedentary and active young people to ascertain the determinants of inactive lifestyles.
- An individual's behavioural intention is central to our understanding of when an individual changes from leading a sedentary lifestyle to becoming more physically active. The simplistic nature in which the SOC model asks individuals to indicate their behavioural intention, in comparison with some more detailed models like the theory of planned behaviour implies that there is scope for the further development of the TTM.
- The TTM advocates individual responsibility for behaviour change. It was designed to help clarify the concept of intentional behaviour change, and it does not examine societal, developmental or imposed change. This is a limitation of the model. The development of the TTM to include the social system, legislation or the environmental opportunities that are available to the individual as they exercise is a recommendation for future research.
- All stage models have an inherent ethical issue (Oldenburg et al., 1999). This revolves around the concept of differentiating individuals into different categories and how this

might effect treatment. Although proactive targeting is welcomed and a strength of the model, if it is used uncritically, it is also a weakness. Future qualitative research needs to ask precontemplators what it is like to be targeted with health promotion interventions.

The key finding of this research suggests that the transtheoretical model of behaviour change as it currently stands may be inadequate to fully understand the complex process of adopting and adhering to a physically active lifestyle. This finding challenges the description of the TTM as a comprehensive model of behaviour change (Prochaska et al., 1992). This referred to the model's openness to developments in behavioural psychology, as it was structured to encourage a continued development of behavioural science and the integration of new constructs to the model if they were deemed important in determining exercise adoption or adherence. This research suggests that the TTM could develop further by combining with a motivational theory similar to the Theory of Self-Determination [SDT]. It also suggests that the TTM could develop by accounting for four classes of determinants, namely environmental (i.e. social and cultural influences), personal (i.e. how an individual thinks about physical, e.g. their rationale being), behavioural (i.e. type of activity) and practical (i.e. skills and knowledge necessary to take part in physical activity). This proposed development of the TTM is outlined in Figure 5.8 (see overleaf). This model expands the concept of a 'transtheoretical model' as it suggests that the combination a behavioural change theory (TTM) and a motivational theory (SDT), in conjunction with four classes of determinants environmental, behavioural, personal and practical a greater understanding of how to promote physically active lifestyles amongst a young adult population may be achieved. Future research needs to test the efficacy of this model further. It is hoped that this thesis in addition to informing behavioural scientists' of how to promote physically active lifestyles amongst sedentary populations more effectively than has been previously achieved, will also inspire future research.

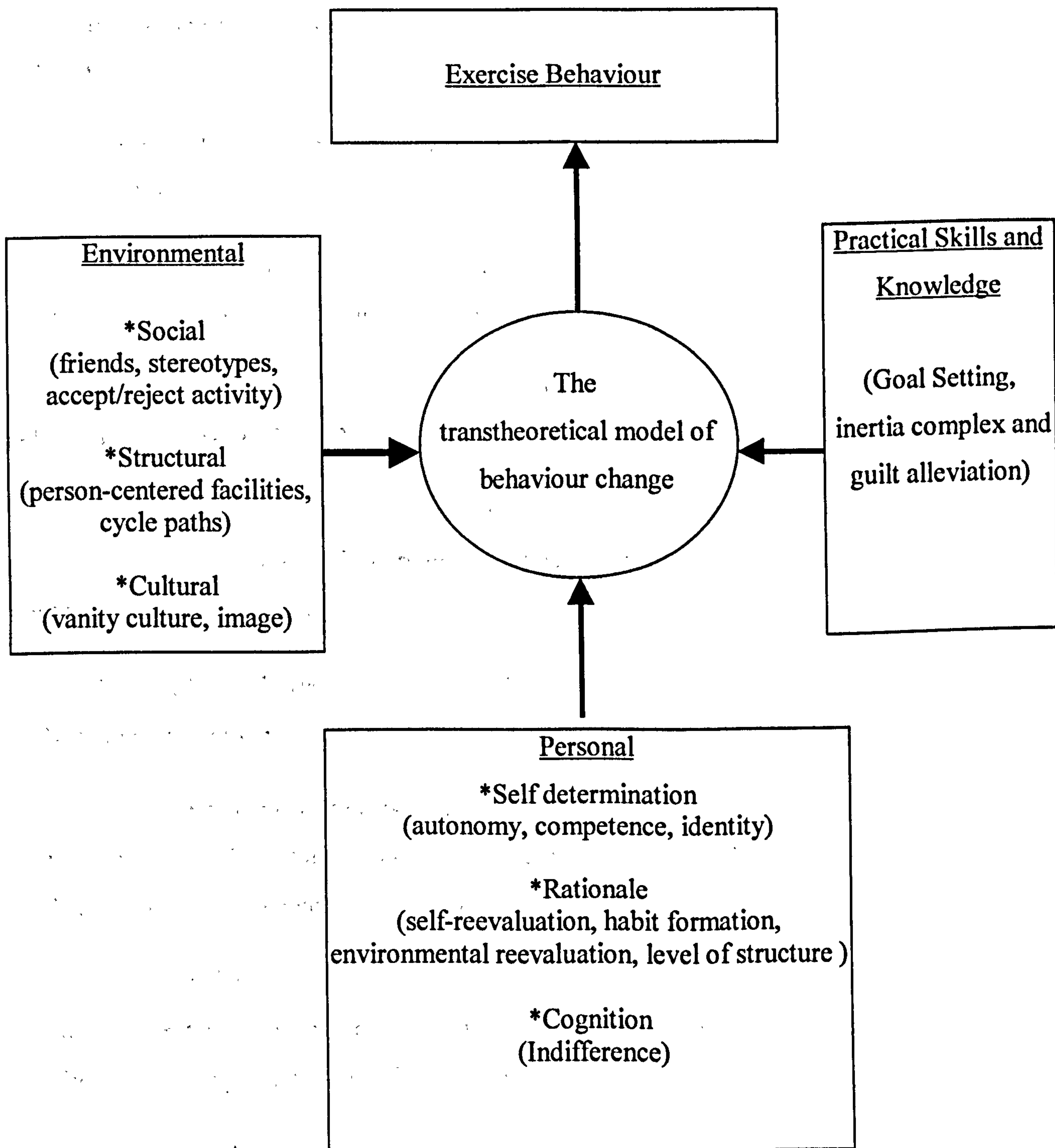


Figure 5.8. The proposed development of the TTM for physical activity

Reference List

- Aarts, H., Paulussen, T., & Schaalma, H. (1997). Physical exercise habit: on the conceptualization and formation of habitual health behaviours. Health Education Research, 12, 363-374.
- Ajzen, I. (1988). Attitudes, personality and behaviour. Milton Keynes: Open University Press.
- Ajzen, I. & Driver, B. (1992). Application of the theory of planned behaviour to leisure choice. Journal of Leisure Research, 24, 207-224.
- Ajzen, I. & Fishbein, M. (1980). Understanding attitudes and predicting social behaviour. Englewood Cliffs, NJ: Prentice-Hall.
- Albrecht, T., Johnson, G., & Walther, J. (1995). Understanding communication in processes in focus groups. In D.Morgan (Ed.), Successful focus groups: advancing the state of the art (Newbury Park, CA: Sage.
- Allison, K. R., Dwyer, J. J. M., & Makin, S. (1999). Perceived barriers to physical activity among high school students. Preventive Medicine, 28, 608-615.
- American College of Sports Medicine (1990). The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. Medicine and Science in Sports and Exercise, 2, 265-274.
- American College of Sports Medicine (1998). The recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness, and flexibility in healthy adults. Medicine and Science in Sports and Exercise, 30, 975-991.
- Armstrong, N. (1995). The challenge of promoting physical activity. Journal of Royal Society of Health 187-192.
- Armstrong, N. & Van Mechelen, W. (1998). Are young people fit and active? In S.Biddle, J. Sallis, & N. Cavill (Eds.), Young and active: young people and health-enhancing

physical activity - evidence and implications (1 ed., pp. 69-97). London: Health Education Authority.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.

Bandura, A. (1986). Social foundations of thought and action: a social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A. (1989). Perceived self-efficacy in the exercise of personal agency. The Psychologist: Bulletin of the British Psychological Society, 10, 411-424.

Bandura, A. (1997). The anatomy of stages of change. American Journal of Health Promotion, 12, 8-10.

Bandura, A. (1998). Health promotion for the perspective of a social cognitive theory. Psychology and Health, 13, 4.

Banister, P., Burman, E., Parker, I., Taylor, M., & Tindall, C. (1995). Qualitative methods in psychology. (1 ed.) Philadelphia: Open University Press.

Baranowski, T. (1988). Validity and reliability of self report measures of physical activity: an information-processing perspective. Research Quarterly for Exercise and Sport, 59, 314-327.

Baranowski, T., Anderson, C., & Carmack, C. (1998). Mediating variable framework in physical activity interventions - how are we doing? how might we do better? American Journal of Preventive Medicine, 15, 266-297.

Barbour, R. S. (1999). The case for combining qualitative and quantitative approaches in health services research. Journal of Health Service, Research and Policy, 4, 39-43.

Barbour, R. S. & Kitzinger, J. (1999). Developing focus group research. (1 ed.) London: Sage Publications.

Barnekow-Bergkvist, M., Hedberg, M., Janlert, U., & Jansson, E. (1996). Physical activity pattern in men and women at the ages of 16 and 34 and development of physical

activity from adolescence to adulthood. Scandinavian Journal of Medicine and Science in Sports, 6, 359-370.

Becker, M., Radius, S., Rosenstock, I., Drachman, R., Schuberth, K., & Teets, K. (1978). Compliance with a medical regimen for asthma: a test of the health belief model. Public Health Reports, 93, 268-277.

Biddle, S. (1995). European perspectives on exercise and sport psychology. (1 ed.) Leeds, UK: Human Kinetics.

Biddle, S. & Ashford, B. (1988). Cognitions and perceptions of health and exercise. British Journal of Sports Medicine, 22, 135-140.

Biddle, S., Cavill, N., & Sallis, J. F. (1998). Policy framework for young people and health-enhancing physical activity. In S. Biddle, N. Cavill, & J. F. Sallis (Eds.), Young and active? Young people and health-enhancing physical activity - evidence and implications (1 ed., pp. 3-16). London: Health Education Authority.

Blair, S. N. & Connelly, J. C. (1996). How much physical activity should we do? The case for moderate amounts and intensities of physical activity. Research Quarterly for Exercise and Sport, 67, 193-205.

Blair, S. N., Haskell, W. L., Ho, P., Paffenbarger, R. S., Vranizan, K., Farquhar, J. W., & Wood, P. (1985). Assessment of habitual physical activity by a seven-day recall in a community survey and controlled experiments. American Journal of Epidemiology, 120, 818-824.

Blair, S. N., Kohl, H. W., Paffenbarger, R. S., Clark, D., & Cooper, K. G. L. (1989). Physical fitness and all-cause mortality: a prospective study of healthy men and women. Journal of American Medical Association, 262, 2395-2401.

Bock, B. C., Marcus, B. H., Rossi, J. S., & Redding, C. A. (1998). Motivational readiness for change: diet, exercise and smoking. American Journal of Health Behavior, 22, 248-258.

- Booth, M., Macaskill, P., Owen, N., Oldenbury, B., Marcus, B. H., & Bauman, A. (1993). Population prevalence and correlates of stages of change in physical activity. Health Education Quarterly, 20, 431-440.
- Booth, M. L., Bauman, A., Owen, N., & Gore, C. J. (1997). Physical activity preferences, preferred sources of assistance, and perceived barriers to increased activity among physically inactive Australians. Preventive Medicine, 26, 131-137.
- Brochaus (1987). Entrepreneurial research - are we playing the right game? American Journal of Small Business, 11, 43-49.
- Bull, F. C., Jamrozik, K., & Blanksby, B. A. (1999). Tailored advice on exercise - does it make a difference? American Journal of Preventive Medicine, 16, 230-239.
- Bunton, R., Baldwin, S., & Flynn, D. The stages of change model and its uses in health promotion: A critical review. Health Education Board for Scotland. 2000.
Ref Type: Unpublished Work
- Calfas, K. J., Sallis, J. F., Lovato, C. Y., & Campbell, J. (1994). Physical activity and its determinants before and after college graduation. Medicine, Exercise, Nutrition and Health, 2, 323-334.
- Calfas, K. J., Sallis, J. F., Oldenburg, B., & French, M. (1997). Mediators of change in physical activity following an intervention in primary care: PACE. Preventive Medicine, 26, 297-304.
- Cardinal, B. J. (1995a). Behavioural and biometric comparisons of the preparation, action and maintenance stages of exercise. Wellness Perspectives: Research, Theory, and Practice, 11, 36-43.
- Cardinal, B. J. (1995b). The stages of exercise scale and stages of exercise behavior in female adults. Journal of Sports Medicine and Physical Fitness, 35, 87-92.
- Cardinal, B. J. (1997a). Construct validity of stages of change for exercise behavior. American Journal of Health Promotion, 12, 68-74.

Cardinal, B. J. (1997b). Predicting exercise behaviour using components of the transtheoretical model of behaviour change. Journal of Sport Behaviour, 20, 272-283.

Cardinal, B. J. (1998). Interaction between stage of exercise and history of exercise relapse. Journal of Human Movement Studies, 34, 175-185.

Cardinal, B. J., Engels, H. J., & Zhu, W. (1998). Application of the transtheoretical model of behaviour change to preadolescents' physical activity and exercise behavior. Pediatric Exercise Science, 10, 69-80.

Cardinal, B. J. & Sachs, M. L. (1995). Prospective analysis of stage-of-exercise movement following mail-delivered self-instructional exercise packets. American Journal of Health Promotion, 9, 430-432.

Carney, C. & Mutrie, N. The impact on transition from university on physically active students. Journal of the Institute of Health Education (in press).

Caspersen, C., Powell, K. E., & Christenson, G. (1985). Physical activity, exercise and physical fitness: definitions and distinctions for health-related research. Public Health Reports, 100, 126-131.

Catterall, M. & Maclaran, P. (1997). Focus group data and qualitative analysis programs: coding the moving picture as well as the snapshots. Sociological Research Online, 2, 1-10.

Champion, V. (1985). Use of the health belief model in determining frequency of breast self-examination. Research in Nursing & Health, 8, 373-379.

Chen, A. (1996). Student interest in activities in a secondary physical education curriculum: An analysis of student subjectivity. Research Quarterly for Exercise and Sport, 67, 424-432.

Clarke, P. & Eves, F. (1997). Applying the transtheoretical model to the study of exercise on prescription. Journal of Health Psychology, 2, 195-207.

- Cole, G., Leonard, B., Hammond, S., & Fridinger, F. (1998). Using 'stages of behavioral change' constructs to measure the short-term effects of a worksite-based intervention to increase moderate physical activity. Psychological Reports, 82, 615-618.
- Courneya, K. S. (1995). Perceived severity of the consequences of physical inactivity across the stages of change in older adults. Journal of Sport and Exercise Psychology, 17, 447-457.
- Courneya, K. S., Bobick, T., & Schinke, R. (1999). Does the theory of planned behavior mediate the relation between personality and exercise behaviour? Basic and Applied Social Psychology, 21, 317.
- Currie, C. E., Todd, J., & Thomson, C. (1997). Health behaviours of Scottish schoolchildren: report 5: comparisons of national patterns in 1990 and 1994. (5 ed.) University of Edinburgh: Health Education Board for Scotland and Research Unit in Health and Behavioural Change.
- Davidson, R. (1999). The transtheoretical model: a critical overview. In W.R. Miller & N. Heather (Eds.), Treating addictive behaviors (2 ed., pp. 25-38). London: Plenum Press.
- Deci, E. & Ryan, R. (1985). Intrinsic motivation and self-determination. New York: Plenum Press.
- Deci, E., Vallerand, R., Pelletier, L., & Ryan, R. (1991). Motivation and education: The self-determination perspective. Educational Psychologist, 26, 325-346.
- DiClemente, C. C. & Prochaska, J. O. (1982). Self-change and therapy change of smoking behaviour: a comparison of processes of change in cessation and maintenance. Addictive Behaviors, 7, 133-142.
- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M., & Rossi, J. S. (1991). The process of smoking cessation: an analysis of precontemplation, contemplation, and preparation stages of change. Journal of Consulting and Clinical Psychology, 59, 295-304.

- DiLorenzo, T. M., Bargman, E. P., Stucky-Ropp, R., Brassington, G. S., Frensch, P. A., & LaFontaine, T. (1999). Long-term effects of aerobic exercise on psychological outcomes. Preventive Medicine, 28, 75-85.
- Dishman, R. K. (1982). Compliance/ adherence in health-related exercise. Health Psychology, 1, 237-267.
- Dishman, R. K. (1988). Exercise adherence: its impact on public health. In R.K.Dishman (Ed.), Exercise adherence: its impact on public health. (1 ed., pp. 1-9). Champaign, IL: Human Kinetics.
- Dishman, R. K. (1994a). Advances in exercise adherence. (1 ed.) Champaign, IL: Human Kinetics.
- Dishman, R. K. (1994b). Predicting and changing exercise and physical activity: what's practical and what's not? In H.A.Quinney, L. Gauvin, & A. E. T. Wall (Eds.), Toward active living: proceedings of the international conference on physical activity, fitness and health (1 ed., pp. 97-106). Champaign, IL.: Human Kinetic Publishers.
- Dishman, R. K., Sallis, J. F., & Orenstein, D. (1985). The determinants of physical activity and exercise. Public Health Reports, 100, 158-171.
- Douglas, K. A., Collins, J. L., Warren, C., Kann, L., Gold, R., Clayton, S., Ross, J. G., & Kolbe, L. J. (1997). Results from the 1995 National College health risk behaviour survey. Journal of American College Health, 46, 55-66.
- Duncan, T. E. & McAuley, E. (1993). Social support and efficacy cognitions in exercise adherence: a latent growth curve analysis. Journal of Behavioral Medicine, 16, 199-218.
- Duncan, T. E., McAuley, E., Stoomiller, M., & Duncan, S. (1993). Serial fluctuations in exercise behavior as a function of social support and efficacy cognitions. Journal of Applied Social Psychology, 23, 1498-1522.

- Dunn, A. L., Marcus, B. H., Kampert, J. B., Garcia, M. E., Kohl, H. W., & Blair, S. N. (1997). Reduction in cardiovascular disease risk factors: 6-month results from project active. Preventive Medicine, 26, 883-892.
- Dunn, A. L., Marcus, B. H., Kampert, J. B., Garcia, M. E., Kohl, H. W., & Blair, S. N. (1999). Comparison of lifestyle and structured interventions to increase physical activity and cardiorespiratory fitness. Journal of the American Medical Society, 281, 327-334.
- Dzewaltowski, D. A. (1994). Physical activity determinants: a social cognitive approach. Medicine and Science in Sports and Exercise, 26, 1395-1399.
- Edwards, P., Simpson, C., Woods, C. B., & Mutrie, N. A transtheoretical study of exercise, smoking and eating in an undergraduate population. 2000.
Ref Type: Unpublished Work
- Engstrom, L. M. (1986). The process of socialization into keep-fit activities. Scandinavian Journal of Sports Science, 8, 89-97.
- Epstein, L. H. (1998). Integrating theoretical approaches to promote physical activity. American Journal of Preventive Medicine, 15, 257-265.
- Farkas, A., Pierce, J., Zhu, S., Rosbrook, B., Gilpin, E., Berry, C., & Kaplan, R. (1996). Addiction versus stages of change models in predicting smoking cessation. Addiction, 91, 1271-1280.
- Fava, J., Velicer, W. F., & Prochaska, J. O. (1995). Applying the transtheoretical model to a representative sample of smokers. Addictive Behaviors, 2, 203.
- Filstedd, W. (1979). Qualitative methods: a needed perspective in evaluation research. In T. Cook & C. Reichardt (Eds.), Qualitative and quantitative methods in evaluation research (1 ed., pp. 33-48). Beverly Hills, California: Sage.
- Fontaine, K. R. & Shaw, D. F. (1995). Effects of self-efficacy and dispositional optimism on adherence to step aerobics classes. Perceptual and Motor Skills, 81, 251-255.

- Fox, K. (1997). The physical self: from motivation to well-being, (1 ed.) Champaign, IL: Human Kinetics.
- Frankland, J. & Bloor, M. (1999). Some issues arising in the systematic analysis of focus group materials. In R.S.Barbour & J. Kitzinger (Eds.), Developing focus group research (1 ed., pp. 144-155). London: Sage Publications.
- Godin, G. (1994). Theories of reasoned action and planned behavior: usefulness for exercise promotion. Medicine and Science in Sports and Exercise, 26, 1391-1394.
- Godin, G. & Shephard, R. J. (1986). Psychosocial factors influencing intentions to exercise of young students from grades 7 to 9. Research Quarterly for Exercise and Sport, 57, 41-52.
- Godin, G., Valois, P., Shephard, R. J., & Desharnais, R. (1987). Prediction of leisure time exercise behaviour: a path analysis (LISREL V) model. Journal of Behavioral Medicine, 10, 145-158.
- Goldberg, J., Christopher, M., Aznar, S., Barnes, J., Simmonds, G., McKenna, J., Page, A., & Naylor, P.-J. (1996). The processes of exercise behaviour change used by Years 7 and 12 adolescents. Journal of Sports Sciences, 14, 30.
- Gorley, T. & Gordon, S. (1995). An examination of the transtheoretical model and exercise behavior in older adults. Journal of Sport and Exercise Psychology, 17, 312-324.
- Hammersley, M. (1990). Classroom ethnography: empirical and methodological essays. Milton Keynes, Philadelphia: Open University Press.
- Hart, E., Leary, M., & Rejeski, J. (1989). The measurement of social physique anxiety. Journal of Sport and Exercise Psychology, 11, 94-104.
- Harter, S. (1993). Causes and consequences of low self-esteem in children and adolescents. In R.Baumeister (Ed.), Self-esteem: the puzzle of low self-regard (pp. 87-116). New York: Plenum Press.

- Harter, S. (1996). Historical roots and contemporary issues involving the self-concept. In B.Bracken (Ed.), Handbook of self-concept: developmental, social and clinical considerations (pp. 1-37). New York: Wiley.
- Haskell, W. L. Health consequences of physical activity: Understanding and challenges regarding dose-response. *Medicine and Science in Sports and Exercise* 26, 649-660. 1994.
Ref Type: Journal (Full)
- Hayes, B. (1997). Sampling methods. In Measuring customer satisfaction: Survey design, use and statistical analysis methods (2 ed., pp. 83-106). Milwaukee, Wisconsin: ASQ Quality Press.
- Health Education Authority (1997). Young people and physical activity : a literature review. (1 ed.) London: Health Education Authority.
- Health Education Authority (1998a). Physical activity 'what we think': Qualitative research among women aged 16 to 24. (1 ed.) London: Health Education Authority.
- Health Education Authority (1998b). Young and active? Young people and health-enhancing physical activity - evidence and implications. (1 ed.) London: Health Education Authority.
- Health Education Authority & The Sports Council (1992). The Allied Dunbar national fitness survey: a report on activity patterns and fitness levels. London: The Sports Council.
- Health Education Board for Scotland (1994). Hassle free exercise. Edinburgh: Health Education Board for Scotland.
- Health Education Board for Scotland (1997). The promotion of physical activity in Scotland: a strategic statement. (ISBN 1873452977 ed.) Edinburgh: Health Education Board for Scotland.
- Henwood, K. & Pidgeon, N. (1992). Qualitative research and psychological theorizing. British Journal of Psychology, 83, 97-111.

- Herrick, A. B., Stone, W. J., & Mettler, M. M. (1997). Stages of change, decisional balance, and self-efficacy across four health behaviors in a worksite environment. American Journal of Health Promotion, 12, 49-56.
- Ingledeu, D., Markland, D., & Medley, A. (1998). Exercise motives and stages of change. Journal of Health Psychology, 3, 477-489.
- Janis, I. L. & Mann, L. (1977). Decision making: a psychological analysis of conflict, choice and commitment. (1 ed.) New York: Collier Macmillan.
- Janis, I. (1982). Groupthink: psychological studies of policy decisions and fiascoes. (2 ed.) Boston: Houghton Mifflin.
- Janz, N. & Becker, M. (1984). The health belief model: a decade later. Health Education Quarterly, 11, 1-47.
- Johnson, M., Nichols, J., Sallis, J. F., Calfas, K. J., & Hovell, M. (1998). Interrelationships between physical activity and other health behaviors among university men and women. Preventive Medicine, 27, 536-544.
- Karasu, T. (1986). The specificity versus nonspecificity dilemma: toward identifying therapeutic change agents. Journal of Psychiatry, 143, 687-695.
- King, A. C., Blair, S. N., Bild, D. E., Dishman, R. K., Dubbert, P. M., Marcus, B. H., Oldridge, N. B., Paffenbarger, R. S., Powell, K. E., & Yeager, K. K. (1992). Determinants of physical activity and interventions in adults. Medicine and Science in Sports and Exercise, 24, S221-S235.
- King, T. K., Marcus, B. H., Pinto, B. M., Emmons, K. M., & Abrams, D. B. (1996). Cognitive-behavioral mediators of changing multiple behaviors: smoking and sedentary lifestyle. Preventive Medicine, 25, 684-691.
- Kitzinger, J. (1994). The methodology of focus groups: the importance of interaction between participants. Sociology of Health and Illness, 16, 103-121.

- Knapp, D. N. (1988). Behavioral management techniques and exercise promotion. In R.K.Dishman (Ed.), Exercise adherence: its impact on public health (pp. 203-236). Champaign, IL: Human Kinetics.
- Kraft, P., Sutton, S. R., & McCreath Reynolds, H. (1999). The transtheoretical model of behaviour change: are the stages qualitatively different? Psychology and Health, *14*, 433-450.
- Krueger, R. A. (1994). Focus groups: a practical guide for applied research. (2 ed.) California: Sage Publications.
- Krueger, R. A. (1998). Analyzing & reporting focus group results. (1 ed.) London: Sage Publications.
- Kuh, D. J. L. & Cooper, C. (1992). Physical activity at 36 years: patterns and childhood predictors in a longitudinal study. Journal of Epidemiology and Community Health, *46*, 114-119.
- LaForge, R. G., Velicer, W. F., Richmond, R. L., & Owen, N. (1999). Stage distribution for five health behaviors in the United States and Australia. Preventive Medicine, *28*, 61-74.
- Lee, I. M., Hsieh, C., & Paffenbarger, R. S. (1995). Exercise intensity and longevity in men: the Harvard alumni health study. Journal of American Medical Association, *273*, 1179-1184.
- Lee, I. M. & Paffenbarger, R. S. (1996). How much physical activity is optimal for health? Methodological considerations. Research Quarterly for Exercise and Sport, *67*, 206-208.
- Leon, A. S., Connett, J., Jacobs, D., & Rauramaa, R. (1987). Leisure-time physical activity levels and risk of coronary heart disease and death. Journal of American Medical Association, *258*, 2388-2395.

- Leslie, E., Owen, N., Salmon, J., Bauman, A., & Kai Lo, S. (1999). Insufficiently active Australian college students: perceived personal, social and environmental influences. Preventive Medicine, 28, 20-27.
- Lincoln, Y. S. & Guba, E. G. (1985). Naturalistic inquiry, Beverly Hills, CA: Sage.
- Lindsay-Reid, E. & Osborn, R. (1980). Readiness for exercise adoption. Social Science and Medicine, 14, 139-146.
- Litwin, M. S. (1995). How to measure survey reliability and validity, (1 ed.) Thousand Oaks, California: SAGE Publications, Inc.
- Lombard, D., Lombard, T., & Winett, R. A. (1995). Walking to meet health guidelines: the effect of prompting frequency and prompt structure. Health Psychology, 14, 164-170.
- Loughlan, C. & Mutrie, N. (1995a). Conducting an exercise consultation: guidelines for health professionals. Journal of the Institute of Health Education, 33, 78-82.
- Loughlan, C. & Mutrie, N. (1995b). Recruitment of sedentary NHS staff for a workplace exercise programme using an adapted 'stages of change' exercise questionnaire. Journal of Sports Sciences, 13, 63-64.
- Lowther, M., Mutrie, N., Loughlan, C., & McFarlane, C. (1999). Development of a Scottish physical activity questionnaire: a tool for use in physical activity interventions. British Journal of Sports Medicine, 33, 244-249.
- Maddux, J. E. (1995). Self-efficacy theory: an introduction. In J.E.Maddux (Ed.), Self-efficacy, adaptation and adjustment: theory, research and application (pp. 3-27). New York: Plenum Press.
- Maiman, L. & Becker, M. (1974). The health belief model: origins and correlates in psychological theory. Health Education Monographs, 2, 353.
- Marcus, B. H. (1995). Exercise behaviour and strategies for intervention. Research Quarterly for Exercise and Sport, 66, 319-323.

- Marcus, B. H., Banspach, S., & Lefebvre, R. (1992a). Using the stages of change model to increase the adoption of physical activity among community participants. American Journal of Health Promotion, 6, 424-429.
- Marcus, B. H., Bock, B. C., & Pinto, B. M. (1997). Initiation and maintenance of exercise behavior. In D.S.Gochman (Ed.), Handbook of health behavior research II (2 ed., pp. 335-352). New York: Plenum Press.
- Marcus, B. H., Bock, B. C., Pinto, B. M., Forsyth, L. H., Roberts, M., & Traficante, R. (1998a). Efficacy of an individualised, motivationally-tailored physical activity intervention. Annals of Behavioural Medicine.
- Marcus, B. H., Eaton, C. A., Rossi, J. S., & Harlow, L. L. (1994a). Self-efficacy, decision-making, and stages of change: an integrative model of physical exercise. Journal of Applied Social Psychology, 24, 489-508.
- Marcus, B. H., Emmons, K. M., & Simkin-Silverman, L. (1998b). Evaluation of motivationally tailored vs. standard self-help physical activity interventions at the workplace. American Journal of Health Promotion, 12, 246-253.
- Marcus, B. H., Goldstein, M. G., & Jette, A. (1997). Training physicians to conduct physical activity counseling. Preventive Medicine, 26, 382-388.
- Marcus, B. H., King, A. C., Pinto, B. M., & Bock, B. C. (1996a). Theories and techniques for promoting physical activity behaviors. Sports Medicine, 22, 321-331.
- Marcus, B. H. & Owen, N. (1992). Motivational readiness, self-efficacy and decision-making for exercise. Journal of Applied Social Psychology, 1, 3-16.
- Marcus, B. H., Pinto, B. M., Simkin, L. R., Audrain, J. E., & Taylor, E. R. (1994b). Application of theoretical models to exercise behavior among employed women. American Journal of Health Promotion, 9, 49-55.
- Marcus, B. H., Rakowski, W., & Rossi, J. S. (1992b). Assessing motivational readiness and decision making for exercise. Health Psychology, 11, 257-261.

- Marcus, B. H., Rossi, J. S., Selby, V. C., Niaura, R. S., & Abrams, D. B. (1992c). The stages and processes of exercise adoption and maintenance in a worksite sample. Health Psychology, 11, 386-395.
- Marcus, B. H., Selby, V. C., Niaura, R. S., & Rossi, J. S. (1992d). Self-efficacy and the stages of exercise behavior change. Research Quarterly for Exercise and Sport, 63, 60-66.
- Marcus, B. H. & Simkin, L. R. (1993). The stages of exercise behaviour. Journal of Sports Medicine and Physical Fitness, 33, 83-88.
- Marcus, B. H. & Simkin, L. R. (1994). The transtheoretical model: applications to exercise behavior. Medicine and Science in Sports and Exercise, 26, 1400-1404.
- Marcus, B. H., Simkin, L. R., Rossi, J. S., & Pinto, B. M. (1996b). Longitudinal shifts in employees' stages and processes of exercise behavior change. American Journal of Health Promotion, 10, 195-200.
- Marlatt, G. (1985). Relapse prevention: theoretical rationale and overview of the model. In G. Marlatt & J. Gordon (Eds.), Relapse prevention: maintenance strategies in the treatment of addictive behaviours (1 ed., New York: Guilford Press.
- McAuley, E. & Courneya, K. S. (1992). Self-efficacy relationships with affective and exertion responses to exercise. Journal of Applied Social Psychology, 22, 312-326.
- McAuley, E., Talbot, H., & Martinez, S. (1999). Manipulating self-efficacy in the exercise environment in women: influences on affective responses. Health Psychology, 18, 288-294.
- McCaul, K., O'Neill, H., & Glasgow, R. (1988). Predicting performance of dental hygiene behaviours; An examination of the Fishbein and Ajzen model and self-efficacy expectations. Journal of Applied Social Psychology, 18, 114-128.
- McConaughy, E., DiClemente, C. C., Prochaska, J. O., & Velicer, W. F. (1989). Stages of change in psychotherapy: a follow-up report. Journal of Applied Social Psychology, 24, 489-508.

- McConaughy, E., Prochaska, J. O., & Velicer, W. F. (1983). Stages of change in psychotherapy: measurement and sample profiles. Psychotherapy: Theory, Research and Practice, 20, 368-375.
- McDowell, I. & MacLean, L. (1998). Blending qualitative and quantitative study methods in health services research. Health Information Journal, 4, 15-22.
- Miles, M. B. & Huberman, A. M. (1994). Qualitative data analysis: an expanded sourcebook. (2 ed.) Thousand Oaks, California: Sage Publications.
- Morgan, D. L. (1997). Focus groups as qualitative research. Thousand Oaks, CA.: Sage.
- Morris, J. N. (1996). Exercise versus heart attack: Questioning the consensus? Research Quarterly for Exercise and Sport, 67, 216-220.
- Morris, J. N. (1999). Physical activity and the public's health: a symposium in honor of Dr. Ralph S. Paffenbarger's 70th birthday - exercise in the prevention of coronary heart disease: today's best buy in public health. Medicine and Science in Sports and Exercise, 26, 807-814.
- Morris, J. N., Chave, S., Adam, C., Sirrey, C., Epstein, L. H., & Sheehan, D. (1973). Vigorous exercise in leisure-time and the incidence of coronary heart disease. Lancet, 1, 333-339.
- Morris, J. N., Clayton, D., Everitt, M., Semmence, A., & Burgess, E. (1990). Exercise in leisure time: coronary attack and death rates. British Heart Journal, 63, 325-334.
- Morrow, J. j., Jackson, A., Bazzarre, T., Milne, D., & Blair, S. N. (1999). A one-year follow-up to physical activity and health. A report of the Surgeon General. American Journal of Preventive Medicine, 17, 24-30.
- Mutrie, N. (1983). Room for improvement. Secondary school physical education for girls. Scottish Journal of Physical Education, 11, 22-29.

Mutrie, N. & Caddell, C. Stages of exercise behaviour change in corporate employees. Journal of Sports Sciences 12[2], 202-203. 1994.

Ref Type: Abstract

Myers, R. S. & Roth, D. L. (1997). Perceived benefits and barriers to exercise and stage of exercise adoption in young adults. Health Psychology, 16, 277-283.

Nigg, C. R. & Courneya, K. S. (1998). Transtheoretical model: examining adolescent exercise behaviour. Journal of Adolescent Health, 22, 214-224.

Ntoumanis, N. & Biddle, S. (1999). A review of motivational climate in physical activity. Journal of Sports Sciences, 17, 643-665.

O'Connor, E., Carbonari, J., & DiClemente, C. C. (1996). Gender and smoking cessation: A factor structure comparison of processes of change. Journal of Consulting and Clinical Psychology, 64, 130-138.

Oldenburg, B., Glanz, K., & Ffrench, M. (1999). The application of staging models to the understanding of health behaviour change and the promotion of health. Psychology and Health, 14, 503-516.

Ommundsen, Y. & Aars, L. E. (1995). Stages of change from exercise behavior: social-cognitive and demographic correlates. Corpus, Psyche et Societas, 2, 41-60.

Paffenbarger, R. S., Hyde, R., Wing, A., & Hsieh, C. (1986). Physical activity, all-cause mortality and longevity of college alumni. New England Journal of Medicine, 314, 605-613.

Pallonen, U. E., Fava, J., Salonen, J. T., & Prochaska, J. O. (1992). Readiness for smoking change among middle-aged Finnish men. Addictive Behaviors, 17, 415-423.

Pate, R. R., Pratt, M., Blair, S. N., Haskell, W. L., Macera, C. A., Bouchard, C., Buchner, D., Ettinger, W. H., Heath, G. W., King, A. C., Kriska, A., Leon, A. S., Marcus, B. H., Morris, J. N., Paffenbarger, R. S., Patrick, K., Pollock, M. L., Rippe, J. M., Sallis, J. F., & Wilmore, J. H. (1995). Physical activity and public health: a recommendation from the

Centres for Disease Control and Prevention and the American College of Sports Medicine. Journal of the American Medical Association, 273, 402-407.

Patton, M. Q. (1990). Qualitative evaluation and research method, (2nd ed.) Newbury Park, CA: Sage.

Peshkin, A. (1993). The goodness of qualitative research. Educational Researcher, 22, 23-29.

Peterson, T. R. & Aldana, S. G. (1999). Improving exercise behavior: an application of the stages of change model in a worksite setting. American Journal of Health Promotion, 13, 229-232.

Phillips, W., Pruitt, L., & King, A. C. (1996). Lifestyle activity. Sports Medicine, 22, 1-7.

Pidgeon, N. & Henwood, K. (1997). Using grounded theory in psychological research. In N.Hayes (Ed.), Doing qualitative analysis in psychology (1 ed., pp. 245-273). East Sussex, UK: Psychology Press.

Pinto, B. M., Cherico, N. P., Szymanski, L., & Marcus, B. H. (1998). Longitudinal changes in college students' exercise participation. College Health, 47, 23-27.

Pinto, B. M. & Marcus, B. H. (1995). A stages of change approach to understanding college students' physical activity. Journal of American College Health, 44, 27-31.

Powell, K. E. & Blair, S. N. (1994). The public health burdens of sedentary living habits: theoretical but realistic estimates. Medicine and Science in Sports and Exercise, 26, 851-856.

Prochaska, J. O. (1979). Systems of psychotherapy: a transtheoretical analysis. (1 ed.) Chicago: Dorsey.

Prochaska, J. O. (1994). Strong and weak principles for progressing from precontemplation to action based on twelve problem behaviours. Health Psychology, 13, 39-46.

Prochaska, J. O. & DiClemente, C. C. (1983). Stages and processes of self-change of smoking : toward and integrative model of change. Journal of Consulting and Clinical Psychology, 51, 390-395.

Prochaska, J. O. & DiClemente, C. C. (1985). Common processes of self-change in smoking, weight control and psychological distress. In S.Shiffman & T. A. Wills (Eds.), Coping and substance use (pp. 345-363). San Diego, CA.: Academic Press.

Prochaska, J. O. & DiClemente, C. C. (1999). Comments, criteria and creating better models. In W.R.Miller & N. Heather (Eds.), Treating addictive behaviors (2 ed., pp. 39-46). London: Plenum Press.

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In search of how people change. American Psychologist, September, 1102-1114.

Prochaska, J. O., DiClemente, C. C., Velicer, W. F., & Rossi, J. S. (1993). Standardised, individualised, interactive and personalised self-help programmes for smoking cessation. Health Psychology, 12, 399-405.

Prochaska, J. O. & Marcus, B. H. (1994). The transtheoretical model: applications to exercise. In R.K.Dishman (Ed.), Advances in exercise adherence (1 ed., pp. 161-180). Champaign, IL: Human Kinetics.

Prochaska, J. O. & Norcross, J. C. (1999). Comparative conclusions: toward a transtheoretical therapy. In Systems of Psychotherapy: A Transtheoretical Analysis (4 ed., pp. 487-528). Pacific Grove, CA: Brooks/Cole Publishing Company.

Prochaska, J. O., Norcross, J. C., & DiClemente, C. C. (1994a). Changing for good: a revolutionary six-stage program for overcoming bad habits and moving your life positively forward. (1 ed.) New York: Avon Books.

Prochaska, J. O. & Velicer, W. F. (1997a). Misinterpretations and misapplications of the transtheoretical model. American Journal of Health Promotion, 12, 11-12.

Prochaska, J. O. & Velicer, W. F. (1997b). The transtheoretical model of health behaviour change. American Journal of Health Promotion, 12, 38-48.

- Prochaska, J. O., Velicer, W. F., DiClemente, C. C., & Fava, J. (1988). Measuring processes of change: application to the cessation of smoking. Journal of Consulting and Clinical Psychology, 56, 520-528.
- Prochaska, J. O., Velicer, W. F., Guadagnoli, E., & Rossi, J. S. (1991). Patterns of change: dynamic typology applied to smoking cessation. Multivariate Behavioral Research, 26, 83-107.
- Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., Fiore, C., Harlow, L. L., Redding, C. A., Rosenbloom, D., & Rossi, R. R. (1994b). Stages of change and decisional balance for 12 problem behaviours. Health Psychology, 13, 39-46.
- Richards Reed, G. (1999). Adherence to exercise and the transtheoretical model of behaviour change. In S.J.Bull (Ed.), Adherence issues in sport and exercise (1 ed., pp. 19-45). London: John Wiley & Sons Ltd.
- Richards Reed, G., Velicer, W. F., Prochaska, J. O., Rossi, J. S., & Marcus, B. H. (1997). What makes a good staging algorithm: examples from regular exercise. American Journal of Health Promotion, 12, 57-66.
- Riddle, P. (1980). Attitudes, beliefs, behavioural intentions and behaviours of women and men toward regular jogging. Research Quarterly for Exercise and Sport, 51, 663-674.
- Riddoch, C. (1998). Relationship between physical activity and health in young people. In S.Biddle, J. F. Sallis, & N. Cavill (Eds.), Young and active? Young people and health-enhancing physical activity - evidence and implications (1 ed., pp. 49-68). London: Health Education Authority.
- Roberton, B., Uitenbroek, D., Hay, S., & Platt, S. (1997). Health behaviours among adults in Glasgow 1988-1995: The RUBHBC-CATI lifestyle and health survey. (Rep. No. 1). Edinburgh: The Research Unit in Health and Behavioural Change.
- Robinson, W. S. (1951). The logical structure of analytic induction. Sociological Review, 16, 812-818.

Robson, S. & Foster, A. (1989). Qualitative research in action. London: Edward Arnold.

Rodgers, W. M. & Brawley, L. R. (1996). The influence of outcome expectancy and self-efficacy on the behavioral intention of novice exercisers. Journal of Applied Social Psychology, 26, 618-634.

Rogers, R. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. Cacioppo & R. Petty (Eds.), Social psychology: a source book (1 ed., New York: Guilford Press.

Rollnick, S., Mason, P., & Butler, C. (1999). Health behaviour change : a guide for practitioners. London: Churchill Livingstone.

Ryan, R. & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55, 68-78.

Ryckman, R. M., Robbins, M. A., Thornton, B., & Cantrell, P. (1982). Development and validation of a physical self-efficacy scale. Journal of Physical and Social Psychology, 42, 891-900.

Sallis, J. F., Grossman, R. M., Pinski, R. B., Patterson, T. L., & Nader, P. R. (1987). The development of scales to measure social support for diet and for exercise behaviors. Preventive Medicine, 16, 825-836.

Sallis, J. F. & Hovell, M. F. (1990). Determinants of exercise behaviour. Exercises and Sports Sciences Reviews, 18, 307-330.

Sallis, J. F. & Patrick, K. (1994). Physical activity guidelines for adolescents: consensus statement. Pediatric Exercise Science, 6, 302-314.

Sallis, J. F., Simons-Morton, B., Stone, E. J., Corbin, C. B., Epstein, L. H., Faucett, N., Iannotti, R. J., Killen, J., Klesges, R., Petray, C., Rowland, T., & Taylor, W. (1992). Determinants of physical activity and interventions in youth. Medicine and Science in Sports and Exercise, 24, S248-S257.

Samuelson, M. (1997). Changing unhealthy lifestyle: who's ready... who's not? An argument in support of the stages of change component of the transtheoretical model.

American Journal of Health Promotion, 12, 13.

Saris, W. (1985). The assessment and evaluation of daily physical activity in children: a review. Acta Paediatrica Scandinavica, 318, 37-48.

Schwarz, N. (1999). Self-reports: how the questions shape the answers. American Psychologist, 54, 93-105.

Sechrist, K. R., Noble Walker, S., & Pender, N. J. (1987). Development and psychometric evaluation of the exercise benefits/barriers scale. Research in Nursing & Health, 10, 357-365.

Shaper, A. & Wannamethee, G. (1991). Physical activity and ischaemic heart disease in middle-aged British men. British Heart Journal, 66, 384-394.

Sharp, N. C. C. (1995). The health through the next generation: health through fitness and sport. Journal of the Royal Society of Health 48-55.

Shephard, R. J. & Bouchard, C. Population evaluations of health related fitness from perceptions of physical activity and fitness. Canadian Journal of Applied Physiology 19[2], 151-173. 1994.

Ref Type: Journal (Full)

Silverman, D. (1993). Validity and reliability. In D.Silverman (Ed.), Interpreting qualitative data: methods for analyzing talk, text and interaction (1 ed., pp. 144-170). London: Sage Publications.

Smith, J. (1997). Developing theory from case studies: self-reconstruction and the transition to motherhood. In N.Hayes (Ed.), Doing qualitative analysis in psychology (1 ed., pp. 181-199). Erlbaum, UK: Psychology Press.

Spray, C. M., Biddle, S., & Fox, K. (1999). Achievement goals, beliefs about the causes of success and reported emotion in post-16 physical education. Journal of Sports Sciences, 17, 213-219.

- Stephens, T., Jacobs, J., & White, C. (1985). A descriptive epidemiology of leisure-time physical activity. Public Health Reports, 15, 331-334.
- Steptoe, A., Doherty, S., Rink, E., Kerry, S., Kendrick, T., & Hilton, S. (1999). Behavioral counseling in general practice for the promotion of healthy behavior among adults at increased risk of coronary heart disease. British Medical Journal, 319, 943-948.
- Strauss, A. & Corbin, J. (1998). Basics of qualitative research: techniques and procedures for developing grounded theory. (2 ed.) California: Sage Publications.
- Sutton, S. (1996). Can 'stages of change' provide guidance in the treatment of addictions? A critical examination of Prochaska and DiClemente's model. In G. Edwards & C. Dare (Eds.), Psychotherapy, psychological treatments and the addictions (pp. 189-205). Cambridge: Cambridge University Press.
- Taylor, H., Jacobs, D., Schucker, B., Knudsen, J., Leon, A., & Debacker, G. (1978). A questionnaire for the assessment of leisure time physical activities. Journal of Chronic Disorders, 31, 741-755.
- Taylor, S. & Bogdon, R. (1984). Introduction to qualitative research methods. (2 ed.) New York: Wiley.
- Telema, R., Leskinen, E., & Yang, X. (1996). Stability of habitual physical activity and sport participation: a longitudinal tracking study. Scandinavian Journal of Medicine and Science in Sports, 6, 371-378.
- The Scottish Office Department of Health (1995). Physical Activity. In W. Dong & B. Erens (Eds.), Scottish Health Survey 1995 (pp. 11-44). Edinburgh: The Stationary Office.
- The Scottish Office Department of Health (1998). Working together for a healthier Scotland: a consultation document. Edinburgh: The Stationary Office.
- The Scottish Office Department of Health (1999). Towards a healthier Scotland: a White Paper on health. (3 ed.) Edinburgh: The Stationary Office.

- Thomas, J. R. & Nelson, J. K. (1996). Research methods in physical activity, (3 ed.) Champaign, IL: Human Kinetics.
- Treiber, F., Baranowski, T., Braden, D., Strong, W., Levy, M., & Knox, W. (1991). Social support for exercise: relationship to physical activity in young adults. Preventive Medicine, 20, 737-750.
- Triandis, H. (1977). Interpersonal behaviour, (Vols. 1) Monterey: Brooks/Cole.
- Turtle, J., Jones, A., & Hickman, M. (1998). Young people and health: the health behaviour of school-aged children - summary of key findings. London: Health Education Authority.
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, & National Center for Chronic Disease Prevention and Health Promotion (1996). Physical activity and health: a report of the Surgeon General Atlanta, GA: U.S. Department of Health and Human Services.
- Unger, J. (1996). Stages of change of smoking cessation: relationships with other health behaviours. American Journal of Preventive Medicine, 12, 134-138.
- Vaz de Almeida, B., Graca, P., Alfonso, C., D'Amicis, A., Lappalainen, R., & Damkjaer, S. (1999). Physical activity levels and body weight in a nationally representative sample in the European Union. Public Health Nutrition, 2, 105-114.
- Vealey, R. S. & Walter, S. M. (1993). Imagery training for performance enhancement and personal development. In J.M. Williams (Ed.), Applied sport psychology: personal growth to peak performance (pp. 200-224). Mountain View, CA.: Mayfield.
- Velicer, W. F., DiClemente, C. C., Prochaska, J. O., & Brandenburg, N. (1985). A decisional balance measure for predicting smoking cessation. Journal of Personality and Social Psychology, 48, 1279-1289.
- Velicer, W. F., Prochaska, J. O., Fava, J., LaForge, R. G., & Rossi, J. S. (1999). Interactive versus noninteractive interventions and dose-response relationships for stage-

matched smoking cessation programs in a managed care setting. Health Psychology, 18, 21-28.

Weiss, M., Smith, A., & Theeboom, M. (1996). "That's what friends are for": children's and teenagers' perceptions of peer relationships in the sport domain. Journal of Sport and Exercise Psychology, 18, 347-379.

Whitehead, J. & Corbin CB (1997). Self-esteem in children and youth: the role of sport and physical education. In K.Fox (Ed.), The physical self from motivation to well-being (1 ed., pp. 175-204). Leeds: Human Kinetics.

Woods, C. B., Mutrie, N., & Scott, M. More students, more active, more often: exercise behaviour change in a student population. Journal of Sports Sciences 17[1], 70. 1999.
Ref Type: Abstract

Wurtele, S. & Maddux, J. E. (1987). Relative contributions of protection motivation theory components in predicting exercise intentions and behaviour. Health Psychology, 6, 453-466.

Wyse, J., Mercer, T., Ashford, B., Buxton, K., & Gleeson, N. (1995). Evidence for the validity and utility of the stages of exercise behaviour change scale in young adults. Health Education Research, 10, 365-377.

Assistant Secretary of the University Court:
Miss F. M. Aiken



UNIVERSITY
of
GLASGOW

FMA/jr

Tue, Jun 25, 1996

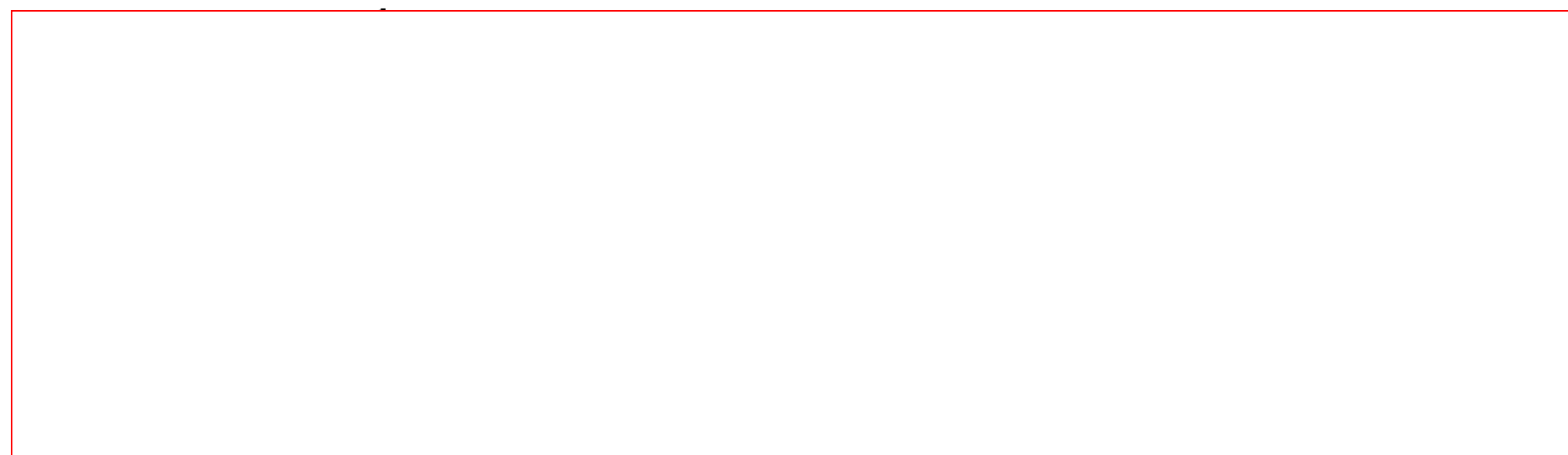
Dr N Mutrie
IBLS
Neuroscience and Biomedical Systems
Physical Education and Sports Science

Dear Dr Mutrie,

Ethics Committee: Monitoring Stages of Exercise Behaviour Change in Undergraduate Students

Thank you for your submission to the Ethics Committee. I am pleased to inform you that, acting on behalf of the Committee, the Convener, Professor McLean, has approved the project.

Yours sincerely,



COURT OFFICE

University of Glasgow, Main Building, Glasgow G12 8QQ

Secretary of Court: Mr Dugald Mackie, Direct Line: 0141-330 4246

Assistant Secretaries of Court: Miss F. M. Aiken, Ext 4243/4102; Dr A. B. Mitchell, Ext 5367/4170 191/L/FMA/Ethics

Administrative Assistants: Mrs A. Hall, Ext 5853; Mr A. Scrimgeour, Ext 8069

Telephone: 0141-330 4243/4102 Telex: 777070 UNIGLA Fax: 0141-330 4920

**UNIVERSITY OF GLASGOW
SPORT AND RECREATION SERVICE (SRS)**

Dear Student,
 We would like you to fill in the following short questionnaire which should take **less than 5 minutes** for you to complete. Your co-operation is voluntary and you may choose not to complete the questionnaire. The information will be used to understand the exercise patterns of students. Your name will not be associated with any data collected and your responses will remain anonymous. We may use your matriculation number to establish a follow-up address or to establish your age, place of schooling and other such information that is held in your central record. If you agree to your matriculation number being used to obtain other details please sign here.

Matriculation Number:96..... Date:

Signature:

REGULAR PHYSICAL ACTIVITY RELATES TO:

Exercise 2-3 times/week (minimum 20 mins.) e.g. Swimming/Jogging Aerobics/Hill walking (at least one/week) etc.	OR	Sport 2-3 times/week (minimum 20 mins.) e.g. Badminton/Squash Football/Basketball Golf or hockey etc.	OR	General Activity 4-5 times/week (totalling 30 mins.) e.g. Walking/Cycling to University, Social Dancing! etc.
--	----	--	----	---

Please read through all categories and **circle the category** which best describes how physically active you have been over the last six months.

- I am not regularly physically active and do not intend to be so in the next 6 months.....1
- I am not regularly physically active but am thinking about starting to do so in the next 6 months.....2
- I do some physical activity but not enough to meet the description at the top of the page.....3
- I am regularly physically active but only began in the last 6 months.....4
- I am regularly physically active and have been doing so for longer than 6 months.....5

Do you intend to be a regular exerciser over the NEXT 6 months? (Circle the appropriate number)

No intention to exercise				Definitely intend to exercise
1	2	3	4	5

Over the last two years in school did you take part in PE class during school hours? (Circle the appropriate response)

	YES	NO
--	-----	----

During the last two years in school were you involved after school in sports or exercise?

	YES	NO
--	-----	----

Any general comments you would like to make on your experience of physical activity in school or otherwise?

**UNIVERSITY OF GLASGOW
SPORT AND RECREATION SERVICE (SRS)**

Dear Student,
We would like you to fill in the following short questionnaire which should take **less than 10 minutes** for you to complete. Your co-operation is voluntary and you may choose not to complete the questionnaire. The information will be used to understand the exercise patterns of students. Your name will not be associated with any data collected and your responses will remain anonymous. We may use your matriculation number to establish a follow-up address or to establish your age, place of schooling and other such information that is held in your central record. If you agree to your matriculation number being used to obtain other details please sign here.

Matriculation Number:96 _____ (Please Circle) M / F Date of Birth:.....

Signature:

REGULAR PHYSICAL ACTIVITY RELATES TO:

Exercise 2-3 times/week (minimum 20 mins.)	OR	Sport 2-3 times/week (minimum 20 mins.)	OR	General Activity 4-5 times/week (totalling 30 mins.)
e.g. Swimming/Jogging Aerobics/Hill walking (at least one/week) etc.		e.g. Badminton/Squash Football/Basketball Golf or hockey etc.		e.g. Walking/Cycling to University, Social Dancing! etc.

Please read through all categories and **circle the category** which best describes how physically active you have been since October 1996.

I am not regularly physically active and do not intend to be so in the next 6 months.....1

I am not regularly physically active but am thinking about starting to do so in the next 6 months.....2

I do some physical activity but not enough to meet the description at the top of the page.....3

I am regularly physically active but only began in the last 6 months.....4

I am regularly physically active and have been doing so for longer than 6 months.....5

Do you intend to be a regular exerciser over the NEXT 6 months? (Circle the appropriate number)

No intention to exercise 1 2 3 4 5 Definitely intend to exercise

Please read through all items below and **circle the appropriate number / response.**

	Strongly Disagree			Strongly Agree
• I would be healthier if I exercised regularly.....	1	2	3	4 5
• I would feel better about myself if I exercised regularly.....	1	2	3	4 5
• Other people would respect me more if I exercised regularly.....	1	2	3	4 5
• I would probably be sore and uncomfortable if I exercised regularly.....	1	2	3	4 5
• I would feel that I was wasting my time if I exercised regularly.....	1	2	3	4 5

I am confident that:	Strongly Disagree			Strongly Agree
• I can explain to a sedentary person how they could adopt a more physically active lifestyle.....	1	2	3	4 5
• The advantages of participating in regular physical activity outweigh the disadvantages.....	1	2	3	4 5
• I can go into the SRS and take part in some form of physical activity I enjoy... I can accumulate 30 minutes of moderate physical activity over the period of one day, 4 or 5 times a week.....	1	2	3	4 5
• I can participate in regular physical activity for at least 20 minutes, 2-3 times per week.....	1	2	3	4 5

Are you a member of the Sport and Recreation Service (SRS)?	YES	NO
Did you receive a Package on Active Living from the SRS over the last 6 months?	YES	NO
If YES, how many packages did you receive?	1	2
Did you find it useful for becoming more physically active?	YES	NO

Please Turn Over



15th November, 1996

Hi [Student's name inserted here]

How are you? I hope you are well and that you have settled into your first term in University. Not too many late nights and plenty of study...

I suppose you are wondering who this letter is from? Well, my name is Catherine and I am also a student in the University of Glasgow. My PhD study involves working with students (like yourself) to encourage active lifestyles.

- What does 'Active Lifestyles' mean?
- Why should I be more physically active? What is in it for me?.
- Can anyone become involved? Even me?

Active Living will mean different things to different people, the important thing is that apart from being good for your health, it is enjoyable and within everybody's reach. For colourful and easy to read answers to the above questions read pages 4, 5 and 6 of the *Hassle Free Exercise Booklet* that you will find in your package on active living (PAL). Simple, yet informative, this guide has the very latest research finding about becoming more active. You may find that change is easier than you thought, fill out pages 8 and 9, and see what happens.

Your PAL will also give you information on the Sport and Recreation Service that is open to you as a member of Glasgow University. This is an excellent facility with friendly staff. Here you will get opportunities to unwind with exercise and socialise in the process. The important thing to remember is that 'everyone can be active' and that includes you. It does not mean that you have to spend loads of time in a gym or sweat until you drop. In fact it can be as easy as taking one small step and gradually building form there.

I hope you have found this information useful, please give your PAL some attention (it will provide a break from study notes) and it will be a good investment of your time. If you need any personal advice on exercise or any information about the Sport and Recreation Service, please do not hesitate to contact me or one of my colleagues. Thank you for your time, enjoy the rest of your term.

Take care,

Catherine Woods
Graduate Assistant

P.S. An example of both PAL1 and PAL2 are in the attached plastic folder

"Exercise, relaxation, sport the SRS has it all. Come in and check us out"
Sharon McNeish, SRS Director.



15th January, 1997

Dear [student's name]

Welcome back to second term. I hope that you *enjoyed* your holidays, celebrated New Year in style and are now looking forward to the term ahead. You may remember that in term one you received a Package on Active Living (PAL1). The idea behind sending you PAL1 was to get you to think about physical activity in a positive way.

Enclosed with this letter is the second and final instalment of your PAL. Its aim is to move on from thinking about getting involved in physical activity to actually putting those thoughts into action. To this end you will find:

1. *A sheet for listing your pros and cons on why you should become more physically active.*
2. *Some suggestions on how to go about planning successfully for physical activity in your lifestyle.*
3. *Some motivational tips on how to become more physically active. These will appeal to even the most unmotivated person.*
4. *Information on what the Sport and Recreation Service has to offer and how you can avail of free offers... Read On.*

Where do I go from here?

Good questions, I suggest that you:

Fill in the pros and cons of exercise sheet. This will help weigh up the advantages for you of becoming active, and highlight the barriers that prevent you from taking that initial step. Then complete the planning for physical activity sheet, this will help you to set yourself some short-term targets which are achievable. Finally, become committed to what you want to achieve.

OR

Alternatively, you could attend one of the workshops that will take place in the SRS over the next 4 weeks. Each workshop will last 30 minutes and is scheduled 3 times/week to provide plenty of opportunity to attend. It is entitled 'Physical Activity – How go get Started'. A personal invitation is in your PAL so that you and a friend can attend the workshop free of charge.

OR

You could avail of the physical activity consultation service that the SRS provides. You don't have to be a member to avail of this service, and it will give you an opportunity to discuss your current level of physical activity and how to change this. I have enclosed a leaflet which will give you more information on the service and times which you can book a consultation.

OR

You will also notice a small colourful booklet in your PAL, this booklet has been given to you as part of the 'Start a Starter' campaign run by the SRS. This campaign will run from now until March 30th, and it is aimed at encouraging everybody to become a little bit more active in 1997. Both current members and non-members are encouraged to take part. Browse through your booklet to find out how to avail of free access to the building, free equipment hire and much more besides.

In conclusion

The most important thing to remember is that by doing a little more physical activity everyday the physiological and psychological benefits are great. Try to exercise with a friend, join the Start a Starter campaign and meet lots of other new exercisers in the Stevie Building. Remember begin at whatever level of physical activity you feel comfortable with, add a few more minutes every so often and get into a routine of exercise that suits you.

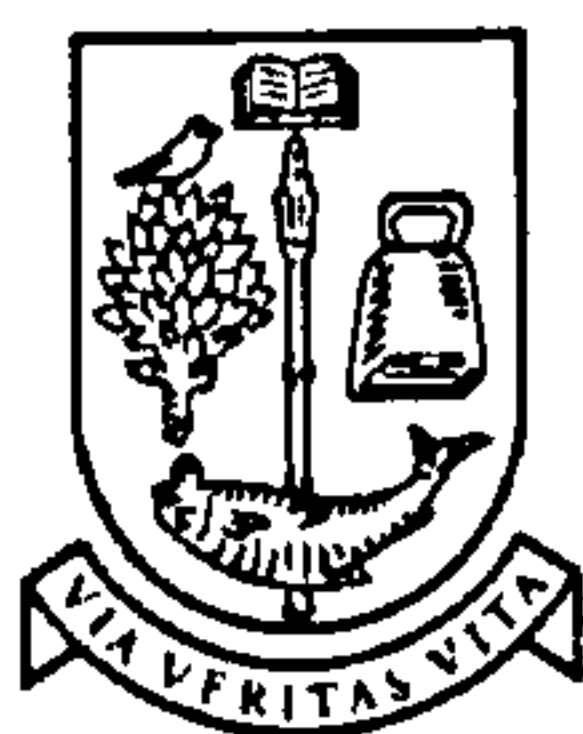
Regards,

Catherine Woods
Graduate Assistant

P.S. For timetables of taught classes, swimming pool access, sports classes etc. consult the SRS web page at [HTTP://www.gla.ac.uk/services/sport](http://www.gla.ac.uk/services/sport)

Intervention 1

**SPORT
AT
GLASGOW
UNIVERSITY**



**UNIVERSITY
of
GLASGOW**

Sport and Recreation Service

SPORT AT GLASGOW UNIVERSITY

The SRS

The Sport and Recreation Service (SRS) operates from the newly refurbished Stevenson Building in the heart of the Campus. The Building was opened in December 1995 by Gavin Hastings OBE. The Stevenson Building is open from 8.00 am until 11.00 pm, Monday to Friday and 9.00 am until 6.00 pm on Saturdays (Term Time).

Indoor Facilities

The facilities include:-

- A 25 metre swimming pool, 1 metre spring board, steam room and sauna.
- Three Activity Halls with space for everything from Badminton, Basketball, Judo and Exercise Classes.
- Wheelchair access and lift to pool.
- Two glass backed squash courts.
- A Muscle Conditioning Suite.
- A Cardio-Vascular Area with 22 pieces of top standard aerobic training equipment.

Tuition

Based in the Stevenson Building there is also a team of professional physical educators who provide teaching and advice to all the staff and students of the University Community on ev-

erything from how to get started on an exercise programme, how to improve your squash or learn to swim.

Here are just some of the courses on offer: Tennis, Badminton, Volleyball, Swimming, Lifeguarding, Muscle Conditioning and Squash.

Staff also organise intramural sport including leagues of basketball, squash and soccer. They can also help set up inter-halls competitions and provide organisational expertise to students who are running events on their own.

Recreation Use in the Stevenson Building

If you choose to use the Service purely as recreational facilities then you may be interested to note we hire swim-suits and trunks, towels, heart rate monitors, racquets for various sports and other pieces of equipment.

Exercise Classes

For some 15 years Glasgow University has offered exercise classes to all its community. Some start at 8:10 am! There are numerous ones run at lunch-time and a variety in the late afternoon and early evening. In total the SRS run over 50 classes attracting all ages and stages of fitness. It is not uncommon to find yourself exercising beside class-mates and

lecturers. Our Pop-mo and Tune-up classes are very popular. Lasting only 30 minutes, you can have a well-balanced work-out in your lunch hour. All of these are taught by the professional staff and are designed to enable you to be an independent exerciser; go at your own pace and have a great time!

Sports Science Support

The SRS is unique in the United Kingdom by offering the services of a resident part-time Sports Scientist based in the Stevenson Building. The Sports Scientist can help you improve your performance in all kinds of sports providing you with fitness assessments, dietary advice and psychological techniques for improving sports performance.

Relax in the SRS

The Stevenson Building has a viewing gallery overlooking the 25 metre pool which has a television and hot and cold vending. Whether you want to spectate or simply use the Stevenson Building as a meeting place, you will find the environment very friendly and comfortable.

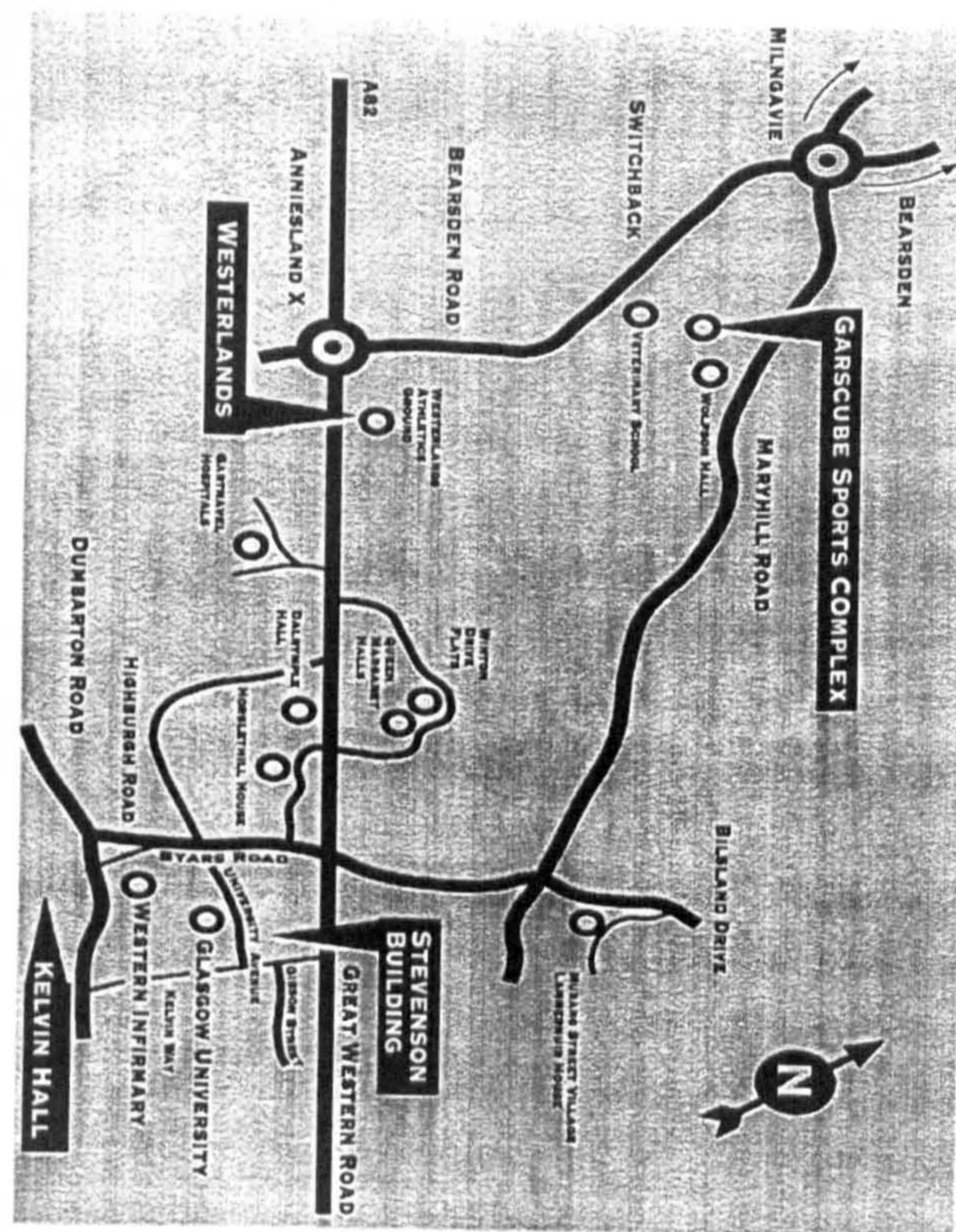
Outdoor Facilities

Glasgow is currently building new outdoor facilities in the grounds of the Garscube Estate close by Wolfson Halls and the Vet School. Phase I of the development will be ready for use in January 1997 and will include 4 grass pitches, 1 cricket square, an artificial floodlit pitch and Pavilion accommodation. Phase II of the development will see an extension of the tennis courts and additional pitches. Although off Campus the Garscube site will be within easy travelling distance (approximately 3 miles from the Stevenson Building). Whether you choose to use the site as the place for hosting inter-faculty competitions or a place for a scenic jog you will find the facilities are excellent.

Helping students participate in an active lifestyle and/or perform at their very best is our business. We look forward to welcoming you to Glasgow and to a healthy and active few years with us.

SPORTS SCHOLARSHIPS

The University of Glasgow manages sports scholarships for those students who are elite performers. Anyone interested in finding out more should call Ian McGowan on 0141-330-2423.



Glasgow University Sports Association

Students run representative sport via the Glasgow University Sports Association (GUSA). For more information please contact them directly on ext: 5342 or through their office in 62 Oakfield Avenue.





Intervention 2.

WORKSHOP INVITATION

The Sport and Recreation Service would like to invite you to attend a workshop that will be held in their facilities over the next few weeks. It is entitled:

Physical Activity - How To Get Started

This workshop is aimed at encouraging everyone to become involved in physical activity. It will give you ideas on how to succeed in increasing your current level of physical activity by answering questions like "how much exercise is enough?" "how do I start?" "what activity is best suited to me?" and so on.

*When: Mondays at 17.15pm - 17.45pm
Wednesdays at 1.10pm - 1.40pm
Fridays at 12.10pm - 12.40pm*

Where: 64 Oakfield Avenue, just off University Avenue.

Admit 2

Intervention 2

**EXERCISE,
SPORT AND
PHYSICAL
CONDITIONING
CONSULTATION
SERVICES**



**UNIVERSITY
of
GLASGOW**

Sport and Recreation Service

Exercise, Sport and Physical Conditioning Consultation Services.

CONSULTATIONS.

The Sport and Recreation Service offers a number of exercise, sport and physical conditioning consultation services. The aim of a consultation is to provide individually tailored advice and to facilitate action appropriate for each person in relation to specific problems and issues identified during the consultation.

WHAT DOES A CONSULTATION INVOLVE?

A consultation involves a 30 minute, confidential one-to-one meeting with one of our specialist Teaching Team in our Consultation Room in the Stevenson Building (Level 6).

WHEN AND HOW CAN I ARRANGE A CONSULTATION?

Consultations are available at a number of different times throughout the week and can be booked at Reception in the Stevenson Building.

Bookings can be taken up to one week in advance.

TYPES OF CONSULTATIONS

EXERCISE CONSULTATIONS

The purpose of an exercise consultation is to help currently inactive adults to arrive at ways of increasing their physical activity levels which are feasible for that individual. The goal is to initiate activity and put in place some strategies which assist the maintenance of this.

SPORT SPECIFIC CONSULTATIONS

The purpose of a sport specific consultation is to help sports men and women to develop those aspects of fitness specific to their sport with a view to improving their performance. The goal is to initiate a sport specific training programme.

PHYSICAL CONDITIONING CONSULTATION

The purpose of a physical conditioning consultation is to assist those people who are currently physically active to improve their levels of fitness. The goal is to initiate a structured individual programme of training.

Please specify the type of consultation you require when you book at reception.

Sport and Recreation Service

Fitness Assessment

As a result of a consultation you may be advised by your consultant to consider a personal fitness assessment. A limited number of fitness assessments are available each week and these can be booked at Reception in the Stevenson Building.

Note:

We do not offer consultations and advice concerning specialist medical conditions (relief from back pain, circulation problems etc.) or injury treatment and rehabilitation. These should be directed to your G.P. or specialist medical or health professional

The Consultation Times that are available during the week are listed below. Please consult these times and drop into the Stevenson Building to book your own personal consultation.

MONDAY	Claire Carney	12.45-1.15pm.
	Claire Carney	1.15-1.45pm.
	Ann MacPhail	4.00-4.30pm.
	Claire Carney	5.30-6.00pm.
TUESDAY	Claire Carney	12.45-1.15pm.
	Catherine Woods	1.35-2.05
	Claire Carney	5.15-5.45
	Claire Carney	5.45-6.15
WEDNES.	Ann MacPhail	11.30-12.00pm.
	Claire Carney	12.35-1.05pm.
	Alan Francis	1.05-1.35pm.
	Susan Craig	1.50-2.20pm.
	Claire Carney	4.30-5.00pm.
	Claire Carney	5.45-6.15pm.
THURSDAY	Susan Craig	10.55-11.25am.
	Alan Francis	4.05-4.35pm.
FRIDAY	Stephen Quinn	11.25-11.55am.
	Stephen Quinn	1.50-2.20pm.
	Susan Craig	4.00-4.30pm.
SATURDAY	Stephen Quinn	1.30-2.00pm.
SUNDAY	Catherine Woods	1.30-2.00pm.

Sport and Recreation Service,
Stevenson Building,
77 Oakfield Avenue,
Glasgow, G12 8LT.

For further information about the services provided by the S.R.S. contact:
Mr. Ian McGowan,
Assistant Director (Services)
Phone: 0141-330-5429. E-mail imcgowan@salyut.mis.gla.ac.uk



PAL 2

PROS AND CONS

Advantages of becoming more physically active

1. _____
2. _____
3. _____
4. _____

What BARRIERS are keeping your from exercising?

1. _____
2. _____
3. _____
4. _____

10 Ways to Get Moving

1. *Put your exercise clothes on when you get up, and don't take them off until you get some exercise.*
2. *Make a date with a friend and use this time to do something active.*
3. *Ask family and friends to remind you to exercise.*
4. *Plan to do something active during your lunchtime e.g. walks to the shops or the bank.*
5. *Go Dancing*
6. *Do physically demanding tasks around the house e.g. sweep the kitchen floor, or Hoover the living room carpet.*
7. *Plan a short bicycle ride.*
8. *Limit your television watching by 10% and substitute this time with some physical activity.*
9. *Think on the move, walk when you are trying to solve a problem.*
10. *Substitute a coffee break for an activity break.*

Add you own ideas.

11. _____
12. _____

PAL 2***Planning for Physical Activity – How to get Started.***

In the spaces below list the short term and long term goals you would like to achieve over the next 6 months. Keep them specific to what you want to achieve, realistic e.g. beginning with easy goals, and measurable so that you can see if you achieved them or not.

- *2 weeks: e.g. To walk at least 5 minutes three times a day, most days of the week.*

- *3 months: e.g. To walk for at least 10 minutes 5 days a week.*

- *6 months: e.g. To walk for at least 15 minutes a day, 5 days a week.*

Getting Motivated to Exercise

Does the thought of becoming involved in physical activity just not turn you on? Can you think of other things that you would rather be doing? The answer is simple – do't do something you don't like, or something that is not convenient. Use these pointers to find the missing ingredient – that is, what works for you and do that instead.

1. *Find an exercise that is right for you. If you hate running then don't go running. Despite your previous experience with exercise, it does not have to be unpleasant. You can get fitter by incorporating physical activity into daily life – walk to the cinema rather than get the bus, take the stairs in the library and not the lift and so on.*
2. *Think about why you have not become involved before now. If you have tried but not succeeded think about why? Be prepared for meeting the obstacles again and have a contingency plan. Weigh up the good points and the bad points about you and physical activity. So when it is raining outside and you think of catching a bus to the shops remember where your umbrella is...*
3. *Set yourself a goal, one that you can achieve and see the results within a given time frame (See above). Start gradually, try small tasks initially e.g. going for a quick walk during the breaks in your favourite programme and so on.*
4. *Find someone to exercise with, you can motivate each other, and if they are already member of the SRS you could join the START a STARTER campaign and nominate them for the Oxford Silver Medal (worth £200). This would be presented at the GUSA annual sports dinner dance in April if they were successful.*
5. *Physical activity should become part of your life. Do a little and gain a lot. Choose something you want to do, don't do too much too soon, plan when you can next do it again. Make your exercise convenient to you, use your free time well.*
6. *Once you have successfully started, enjoy the exercise for what it is; relaxation, a way to meet others, good for your body, good for your mind and so on.*

Adapted from Mutrie and Shannon, Independent on Sunday, May 1996.

**SPORT AND RECREATION SERVICE
MARTINMAS TERM (10TH OCTOBER - 20TH DECEMBER, 1996)
GROUP EXERCISE SESSIONS**

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
8.00AM.	8.10-8.40 Early Morning Tune-Up AH3 (SI)	8.10-8.40 Early Morning Tune-Up AH3 (SI)	8.10-8.40 Early Morning Tune-Up AH3 (*)	8.10-8.40 Early Morning Tune-Up AH3 (SI)	8.10-8.40 Early Morning Tune-Up AH3 (*)		
9.00AM.							
10.00AM.		10.35-11.10 55+ Class AH 1 (*)			10.35-11.10 55+ Class AH 1 (*)		
11.00AM.						11.00-11.30 Tune-Up (*) 11.30-12.00 Pop-Mo (*)	11.00-11.30 Pop-Mo (*) 11.30-12.00 Tune-Up (*)
12.00PM.	12.10-12.40 Tune-Up AH1 (*)	12.10-12.40 Pop-mo AH1 (*)	12.10-12.40 Tune-Up AH1 (*)	12.10-12.40 Pop-mo AH1 (*)	12.10-12.40 Tune-up AH1 (*)		
	12.10-12.50 Uni-Step (2) AH3 (*)	12.10-12.40 Power Pop-mo AH3 (*)			12.10-12.50 Uni-Step (2) AH3 (*)		
		12.10-12.50 Muscle Tone (1) AH2 (*)	12.10-12.40 Low-Key Pop-mo AH2 (*)		12.10-12.50 Muscle Tone (1) AH2 (*)		
	12.40-1.10 Pop-mo AH1 (*)	12.40-1.10 Tune-up AH1 (*)	12.40-1.10 Pop-mo AH1 (*)	12.40-1.10 Tune-up AH1 (*)	12.40-1.10 Pop-mo AH1 (*)		
	12.40-1.10 Low-key Pop-mo AH2 (*)			12.40-1.10 Low-Key Pop-mo AH2 (*)		12.50-1.30 Muscle Tone (2) AH3 (*)	12.50-1.30 Muscle Tone (2) AH3 (*)
1.00PM.	1.10-1.50 Muscle Tone (2) AH3 (*)	1.10-1.50 Stretch & Flex AH3 (*)		1.10-1.50 Muscle Tone (2) AH2 (*)	1.10-1.40 Stretch & Flex AH2 (*)		
	1.15-1.45 Tune-Up AH1 (*)	1.15-1.45 Pop-mo AH1 (*)	1.15-1.45 Tune-Up AH1 (*)	1.15-1.45 Pop-mo AH1 (*)	1.15-1.45 Tune-Up AH1 (*)	1.15-2.00 UNI-STEP VIDEO (SI)	1.15-2.00 UNI-STEP VIDEO (SI)
4.00PM.	4.30-5.10 UNI-STEP (2) AH3 (*)			4.30-5.10 Uni-Step (3) AH3 (*)	4.30-5.10 Uni-Step (1) AH3 (*)		
5.00PM.		5.15-5.55 Uni-Step (2) AH3 (*)	5.15-5.55 Uni-Step (1) AH3 (*)				
	5.15-5.45 Pop-mo AH1 (*)	5.15-5.45 Tune-Up AH1 (*)	5.15-5.45 Pop-mo AH1 (*)	5.15-5.45 Tune-Up AH1 (*)	5.15-5.45 Pop-mo AH1 (*)		CLOSE
	5.50-6.20 Tune-Up AH1 (*)	5.50-6.20 Pop-mo AH1 (*)	5.50-6.20 Tune-Up AH1 (*)	5.50-6.20 Pop-mo AH1 (*)	5.50-6.20 Tune-Up AH1 (*)		
6.00PM.	6.20-7.00 Conditioning Session AH1 (*)			6.25-7.05 Circuits AH1 (*)			

(*) Please note that these sessions are **TAUGHT SESSIONS**.

POP-MO.

This is an exercise in time to up-to-date music. **Twenty minutes** is given to up-beat aerobic exercise then **five minutes** of strength work and **five minutes** of flexibility work. Both men and women are welcome to the session. We would encourage you to modify the movements to keep your heart-rate within your target zone.

POWER POP-MO.

This session follows a similar format to Pop-mo but differs in the exercisers it hopes to attract; suitable for men and women with a high fitness level.

LOW KEY POP-MO.

This session also follows a similar format to Pop-mo. However, in this particular session the moves have been adapted to suit those either starting out on the trail of fitness or returning from injury.

TUNE-UP/EARLY MORNING TUNE-UP.

This session invites you to exercise with music in the background. There are **20 minutes** of aerobic work followed by **10 minutes** of strength and flexibility work. Participants are given an opportunity to monitor their activity by taking their own pulse rates and the emphasis is therefore very much on setting personal goals and personal pace.

STRETCH AND FLEX.

Flexibility is an important factor in physical fitness. Limited flexibility results in restricted movement and the greater possibility of injury. The "stretch and flex" classes are **30 minute** sessions devoted solely to safe stretching exercises designed to increase flexibility.

UNISTEP 1.

This is a **beginners** class which focuses on developing co-ordination and footwork for those who are new to Uni-step as well as providing a **low intensity** aerobic workout with some **strength** and **flexibility** work. To be sure of a place, book a step at Reception.

UNISTEP 2.

This is an **intermediate** level class lasting forty minutes. The first thirty minutes are given to **moderate intensity** aerobic exercise which involves basic step patterns. This is followed by five minutes of **strength** work and five minutes of **flexibility** work incorporating the use of the step. You donot need to be too co-ordinated to take part. To be sure of a place, book a step at Reception.

UNISTEP 3.

This is an **advanced** class where the step patterns are a bit more demanding. It is aimed at those who like a challenge to their co-ordination and a slightly more intense workout. It follows the same pattern as the Uni-step 2 class. To be sure of a place, book a step at Reception.

CIRCUITS.

A **forty minute** class geared towards the fit and committed sports person or fitness enthusiast looking for a challenging workout. The session starts with **five minutes** of warm-up/stretch exercises followed by **thirty minutes** of circuits incorporating muscular strength and endurance and aerobic work. The well deserved **five minutes** conclusion involves relaxation and flexibility.

CONDITIONING.

A **forty-minute** class geared towards the fit and committed sports person or fitness enthusiast looking for a challenging workout. This sessions consists of 35 minutes of aerobic/anaerobic work followed by 5 minutes of flexibility work.

MUSCLE TONE 1.

This is an **introductory low intensity** non-impact exercise class which aims to **increase muscle strength and tone**, so improving overall body shape and posture. Focal muscle groups will be the abdominals, upper and lower back, biceps and triceps of the arms, gluteals (buttocks) and quadriceps and hamstrings of the thighs.

MUSCLE TONE 2.

This is a **moderate intensity** non-impact exercise class for those who have been attending a Muscle Tone 1 class and/or have a reasonable level of muscular strength and tone. The aim of the class is the same but involves slightly more demanding exercise.

SPORT AND RECREATION SERVICE
MARTINMAS TERM (10TH OCTOBER - 20TH DECEMBER, 1996)
SWIMMING POOL
(WITH FREE ACCESS TO STEAM ROOM AND SAUNA).

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
8.00AM.	8.00-9.15 Sunrise Swim	8.00-9.15 Sunrise Swim	8.00-9.15 Sunrise Swim	8.00-9.15 Sunrise Swim	8.00-9.15 Sunrise Swim		
9.00AM.							
10.00AM.							
11.00AM.	11.00-12.00 DIVING PRACTICE Recreational Use - Shallow end				11.00-12.00 DIVING PRACTICE Recreational Use - Shallow end		
12.00PM.	12.10-12.55 Swimming Course Level 2 + Restricted Recreational Use						
1.00PM.		1.10-1.55 Swimming Course Level 1 + Restricted Recreational Use					
2.00PM.		2.00-3.00 Staff Lifesaving + Recreational Use - Half Pool	2.00-3.30 Lifeguarding Course + Recreational Use - Deep End		2.30-4.00 Bronze Medallion Lifesaving Course + Recreational Use - Half Pool		
3.00PM.							
4.00PM.							
5.00PM.	5.10-5.55 Swimming Course Level 1 + Restricted Recreational Use				5.10-5.55 Swimming Course Level 2 + Restricted Recreational Use		
6.00PM.	6.00-7.00 SWIMMING CLUB NO RECREATIONAL USE	6.30-9.30 SUB-AQUA CLUB NO RECREATIONAL USE		6.00-9.00 CANOE CLUB NO RECREATIONAL USE			
7.00PM.	7.00-8.00 WATER POLO CLUB NO RECREATIONAL USE		7.00-8.30 SWIMMING CLUB NO RECREATIONAL USE				
8.00PM.							
9.00PM.							
10.00PM.							
	C	L	O	S	E		

You can use the steam room and sauna at your leisure at no additional charge. Each holds 8 persons max. Please would all customers please adhere to this regulation.

Intervention 2.

NO MORE



**After A Hard
Day**

Start A Starter

1997

Voucher Booklet



Sport & Recreation Service

Valid until March 30th.

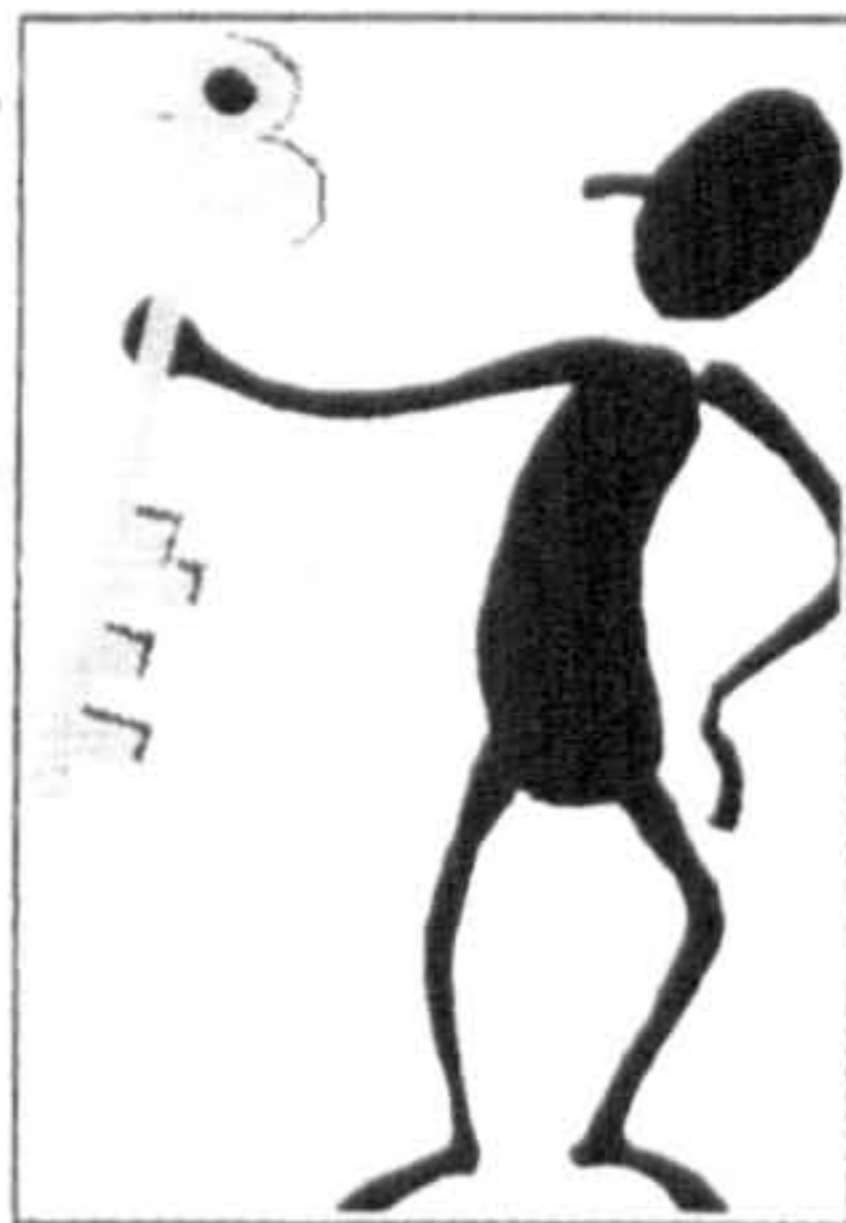
**Why Not
Put Some**



**ZEST In To
Your Life?**

5 Free Access Vouchers

Whoever presents this voucher is entitled to up to 5 free visits to the SRS. They may use all of the facilities. This voucher may be used during normal opening hours.



Voucher 1

Voucher 2

Voucher 3

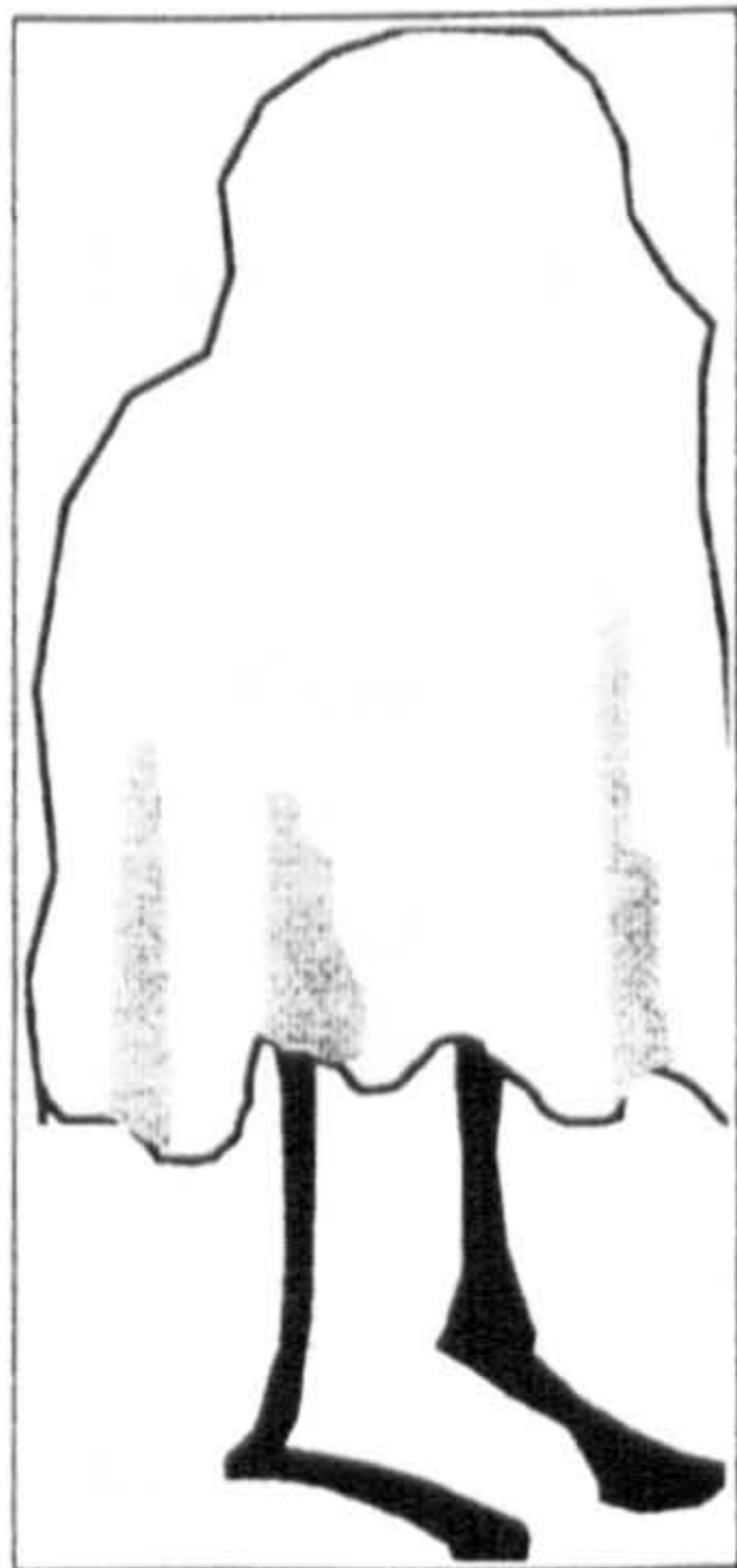
Voucher 4

Voucher 5

This voucher is part of the START A STARTER campaign, please use it to encourage fellow students/staff to exercise

Please mark out each voucher as used

Free Towel Hire



This voucher may be used to obtain a towel from reception free of charge.

This voucher is part of the START A STARTER campaign, please use it to encourage fellow students/staff to exercise

Valid until March 30th.

Voucher 1

Voucher 2

Voucher 3

Voucher 4

Voucher 5

Please mark out each voucher as used

Free Equipment Hire

1997

This voucher entitles you to hire out equipment in the SRS free of charge.

Valid
until
March
30th.



This voucher is part of the START A STARTER campaign, please use it to encourage fellow staff/students to exercise

Voucher 1

Voucher 2

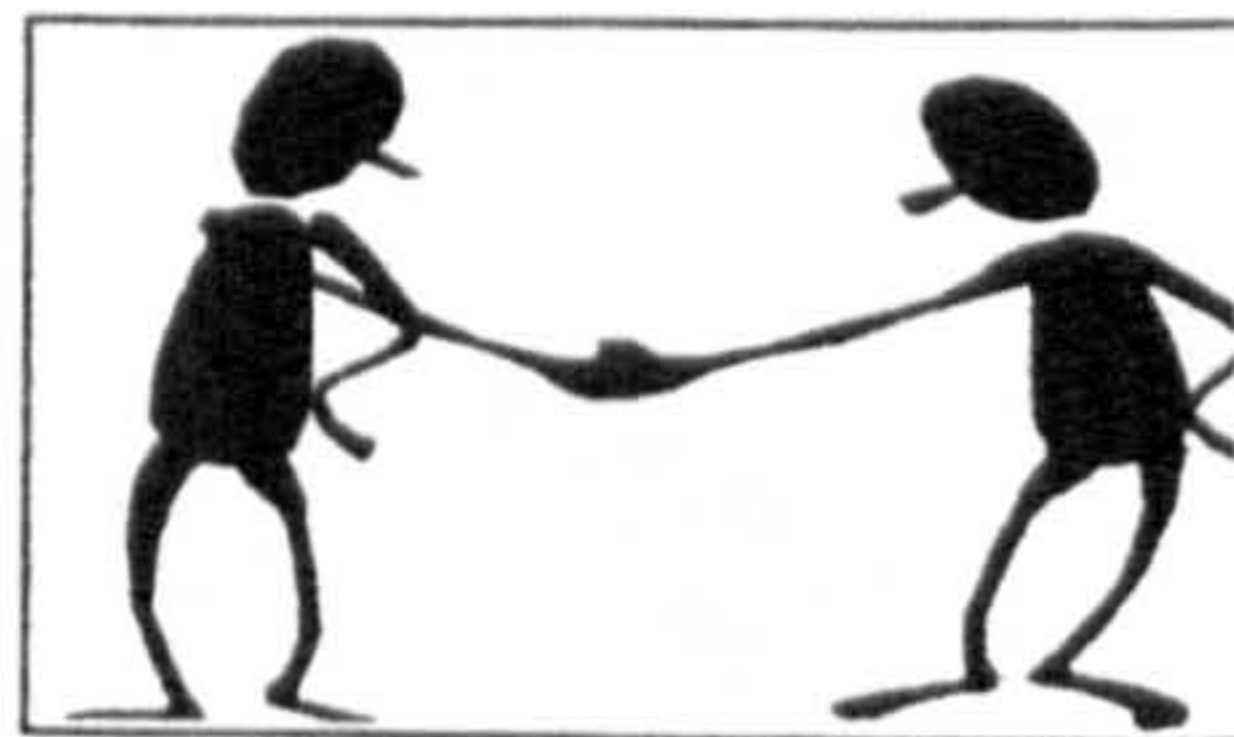
Voucher 3

Voucher 4

Voucher 5

Please mark
out each
voucher as
used

Exercise Consultation



Why not book a one to one consultation with Claire, Ann, Catherine, Alan, Stephen, Susan or Nanette. You will receive expert advice and the latest up to date information on how you can make your lifestyle more active.

Just make arrangements at reception and record the details below.

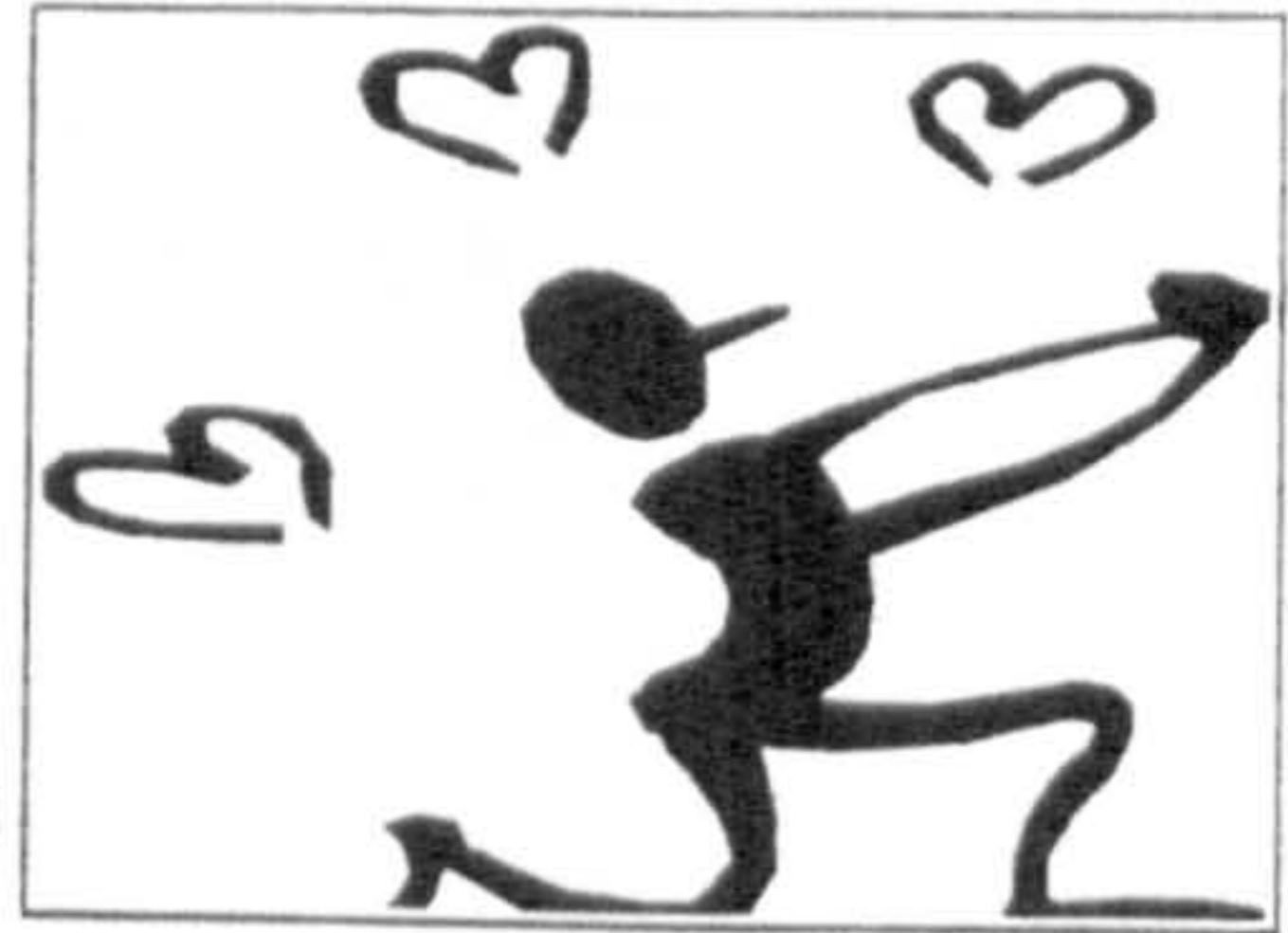
Date & Time of Consultation: _____

Person to Contact: _____

Outcome of Consultation _____

Cardio-Vascular Introduction

Why not book time with a member of the SRS teaching staff to find out more about our cardio-vascular equipment? Get the latest up to date information on how and why to include cv in your *active lifestyle*.



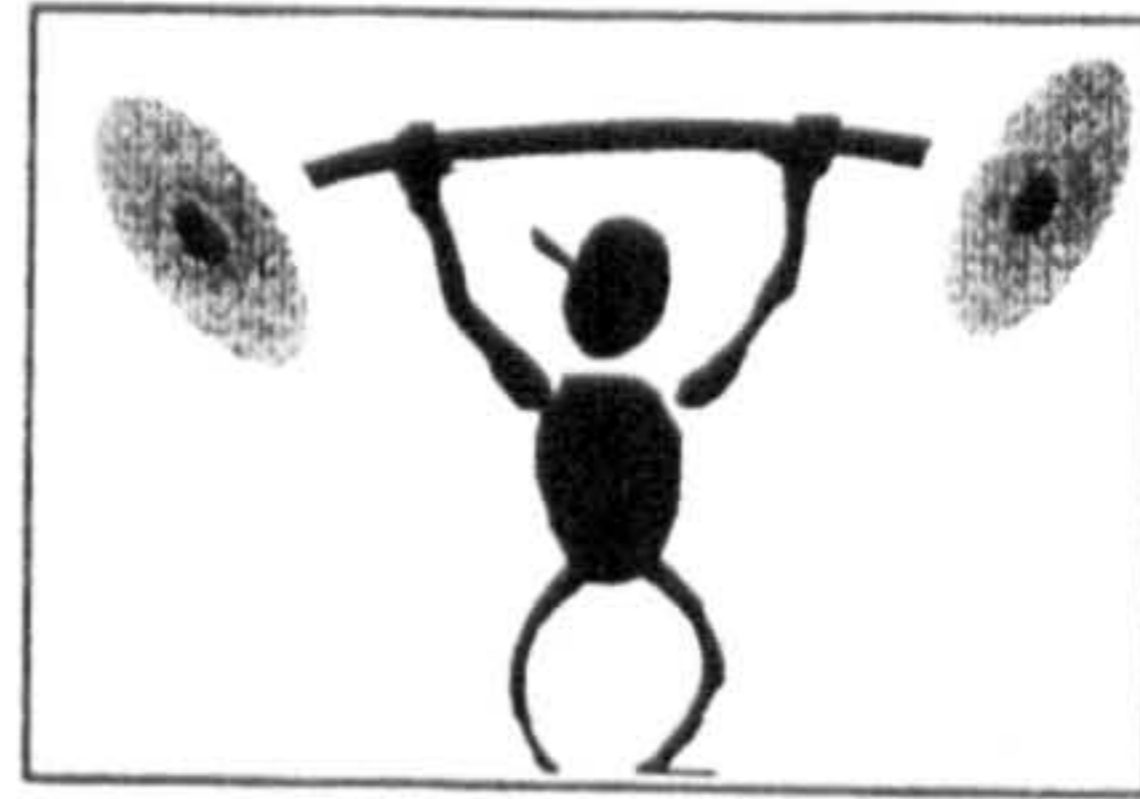
Just make arrangements at reception and record the details below.

Date & Time of Course: _____

Person to contact: _____

Outcome of CV Introduction: _____

Muscle Conditioning Introduction



Why not book an introduction to muscle conditioning? Find out what a Pec Dec really means... or simply find out why m.c. might be important for you. You will receive some help and the latest up to date information on how and why to include muscle conditioning into an active lifestyle.

Just make arrangements at reception and record the details below.

Date & Time of Course: _____

Person to Contact: _____

Outcome of MC Course: _____

What's On Offer?

Exercise Classes

(popmo, tune-up, step, muscle tone, stretch and flex and many more)

Sports Tuition Classes

(Swimming, badminton, squash, basketball)

Excellent Facilities

Just some of the services offered free to members of the SRS.



Check out the timetables in reception for details.

MY STARTER'S CONTRACT

I _____ propose to carry out the following exercise programme over the next _____ weeks. I will participate in aerobic activity for _____ minutes in week one and gradually build up my minutes until I can exercise for a total of 30 minutes during one day.

List of chosen activities:

When I have successfully completed this contract I will reward myself with : _____

Signed: _____ Witness: _____ Date: _____

MY STARTER'S CONTRACT

I _____ propose to carry out a muscle conditioning exercise programme over the next _____ weeks. I will balance my programme by working upper, middle and lower body, and by working both the front and the back of my body. I will choose a weight that I feel comfortable with and I will lift it up to a maximum 8 - 15 times. I will do all the exercises in my programme once only. I will build from there.

When I have successfully completed this contract I will reward myself with _____

Signed: _____ Witness: _____ Date: _____

Well it's just about the end for me, I have provided an incentive for you to become physically active. Now perhaps comes a Beginning For You...

Your Motivation,

Your Decision,

Your Choice.

Just Do It FOR YOU



Have you enjoyed your visits to the SRS?

Why not join up?

Hand this slip to reception with the following details and they will look after you.

Name: _____ **Staff/Student No.** _____

Address: _____

Telephone No: _____

Date Joined: _____

Intervention 1

Hassle Free Exercise



Contents

- 1 **Why be more active?**
- 10 **Who can be more active?**
- 16 **What's stopping you?**
- 18 **How should I feel?**
- 22 **How do I fit it in and build it up?**
- 26 **What can I do?**
- 30 **What will it cost?**
- 32 **Getting active, feeling good**
- 34 **What next?**
- 38 **Which activities?**

Step



Add a bit of physical activity to your present routines so that being physically active becomes a way of life.

- **FIND MORE ACTIVE WAYS OF DOING THE THINGS THAT YOU USUALLY DO**
- **GRADUALLY BUILD UP THE TIME THAT YOU SPEND BEING ACTIVE EACH DAY.**
- **ENJOY LIVING AN ACTIVE LIFE**

The aim is to build up to 30 minutes of activity in the course of one day. This may be enough for you but you can do more if you want to. If you find you enjoy being more active, then aim to move on to Step 2.

Step



Take part in exercise activities on a regular basis to improve your fitness.

- **MAKE THE PERIODS OF PHYSICAL ACTIVITY LONGER**
- **BE MORE ACTIVE MORE OFTEN**
- **MAKE YOUR EXERCISE ACTIVITIES MORE ENERGETIC**

This booklet is mainly for people who are starting off at step 1. If you feel you are already at this stage, then turn to page 34.

WHAT DOES

'being more active' mean?

Being more active will mean different things to different people. It all depends on your current lifestyle, for example how active you are at the moment, whether you smoke, what you eat etc.

The type of activities outlined in this book and the level at which you do them means you can start off at a very low level and build up gradually. The activities that you can start off with are everyday ones, like walking. You don't need immediately to take up a new sport - maybe you can do that later, if you want to. These activities might seem so ordinary that you'd think that they wouldn't have any benefit but they do. You will be benefitting your health by being more active than you are at the moment. Keeping physically active also helps to keep you mentally alert and feeling good.

Will being more active improve fitness?

You can only become fitter and maintain fitness by being physically active regularly. The more active you are, the fitter you will be and the better your body will work.

Research has been done into the benefits for your body of doing regular activity. It shows that:

- IT HELPS KEEP YOU SUPPLE AND MORE MOBILE
- IT HELPS STRENGTHEN YOUR MUSCLES, JOINTS AND BONES
- IT HELPS YOUR HEART WORK MORE EFFICIENTLY
- IT IMPROVES YOUR CIRCULATION
- IT HELPS PROTECT AGAINST HEART DISEASE
- IT HELPS TO RELIEVE STRESS AND DEPRESSION

Why other people like being active...

**'Meet new friends.
Support of other people.'**
James, 64,
retired, from Paisley

**'Coping with stress - I feel
calmer, more relaxed, less jumpy.'**
Iain, 42,
sales rep, from Stonehaven

**'Coping with changes
in your life.'**
Christine, 51,
factory worker, from Glasgow

'Able to dance all night...'
Christine, 62,
grandmother, from Ayr

**'Getting out of a rut,
making a change to your life.'**
Danny, 20,
unemployed, Dundee

**'I never thought such
little changes would make
such a difference.'**
David, 47,
driver, from Edinburgh

**'I sleep much better and
have more energy.'**
Gayle, 22,
student, from Dumfries

What would be the benefits to you of being more active?

1

.....

2

.....

3

.....



What are the main things stopping you?

1

.....

2

.....

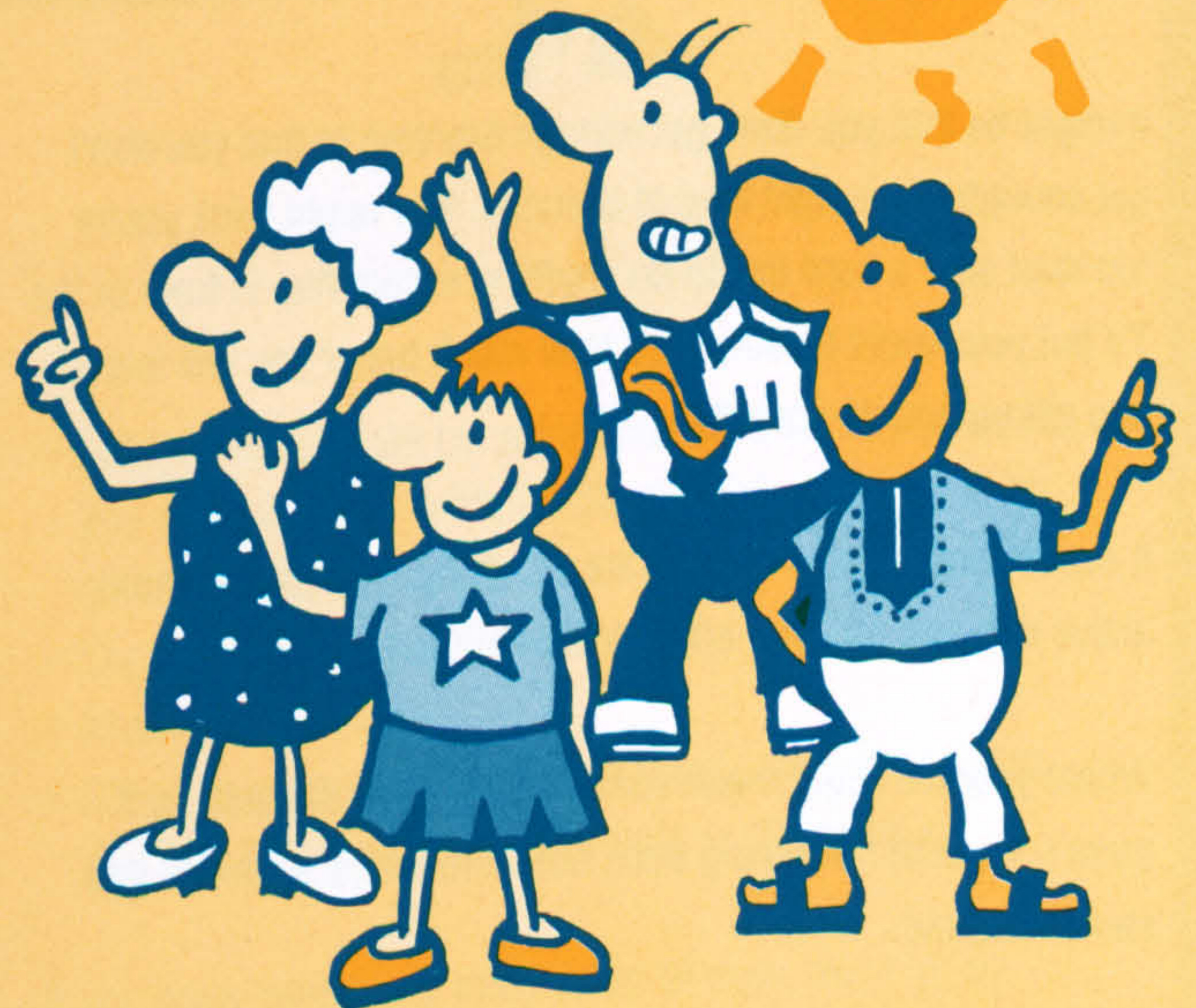
3

.....

If you can think of more obstacles than benefits, then read on - it might not be as difficult as you think. If you can see that the benefits outweigh the obstacles then you have taken an important step into active living.

WHO

can be more active?



...**you can!**

so what's stopping you

Everyone can benefit from being more active.

It might be that you don't get enough exercise or that you don't get enough of the right kind of exercise. You might think you're too tired after a hard day to do anything except flop in front of the TV but you would be surprised how much better you will feel if you get up and do something.

It doesn't matter how old you are, 16 or 66, you can be more active in a way that you enjoy and which suits you.

Where you live might mean some activities are difficult, eg if there's no local swimming pool, but there are other things you can do instead.

Men and women, single or with a partner, with children or without — it doesn't matter. There are many different ways you can enjoy being more active. You don't have to be 'sporty' or basically fit already and of course disabled people can get as much out of being active too.



Safety Tip

- Many activities can be safer and might be more fun if you do them with a friend. See 'Which activities?' for safety tips for various types of activity.
- Try to avoid walking alone at night.
- Keep to well lit areas.
- Carrying a personal alarm is a good safety precaution. You can buy them from hardware or DIY stores.

If you have been fairly inactive up to now, don't go to extremes and rush straight into being very active. Being active too quickly might also make you more vulnerable to injuries from over-using your muscles and joints. Building up gradually over time is what you're aiming for.

Medical

conditions should not necessarily stop people from being more active. Physical activity can help the following conditions:

..... **HEART TROUBLES**

..... **STRESS**

..... **BRONCHITIS**

..... **OSTEOPOROSIS**

..... **INSOMNIA**

..... **POOR CIRCULATION**

..... **ARTHRITIS**

..... **DEPRESSION**

..... **OVERWEIGHT**

..... **RAISED BLOOD PRESSURE**

..... **MENOPAUSAL SYMPTOMS**

The types and levels of activity

suggested in this booklet are suitable for

anyone with the conditions listed overleaf.

Swimming is a recommended activity during pregnancy and for those who are overweight or who have arthritis in their legs.

Physical activity programmes have also been found to help people who are recovering from drug or alcohol addiction.

The ideas and suggestions in the first part of this book will give you a start and, if you want to, you can move on to other things after you've convinced yourself that you can do it.

WHAT'S stopping you?

'I haven't got time..'

You don't need to set aside special time. If your life is already very busy, you can try building activity into your existing routines - walk a bit more of your journey to work or try walking at a brisker pace. Take the stairs instead of the lift or escalators.

'There's no gain without pain.'

Wrong. Physical activity should feel pleasant and comfortable. If it's painful, you're overdoing it and can hurt yourself. In the past some exercise advisers encouraged people to overdo it in the belief that it had to hurt to be doing you good. Today we know that's not only untrue, it can be risky.

'You need to go to classes or join a club.'

You don't. You can be more active without having to set aside special times to go to exercise classes. You don't have to join a sports or health club. You can have a game in the park with your friends or family. If you want to do something on your own you could go to the local pool for a swim.

'But you've got to be really dedicated if you want to get fit. It takes a lot of will power.'

Not really. If you build up slowly and gradually by doing a little bit more each week, it won't be a big effort. You'll gain a lot and feel the difference quite quickly.

'I'm not fit enough!'

You don't have to be fit to be active. Take your time. Take it gradually and listen to your body. Follow the guide to getting started.

'Most of the year in Scotland the weather's too bad to get out and be active'

The weather can put you off going out. But you can be active indoors. If the weather's bad you could still go swimming or dancing and it would probably cheer you up too. If it's really bad and you have to stay inside, try not to sit still for long periods. Take a lot of active breaks — go and make a drink or walk about a bit.



HOW

should I feel?

Whatever your age, ability or condition, you can benefit from being more active.

You don't need to consult your doctor before starting, if you follow the type and level of activity recommended in this booklet. Listen to your body and build up gradually. If you feel discomfort or pain when being more active than you should, of course, get advice from your doctor or an exercise specialist.

Whether you are being active enough to benefit your health depends on how often you are active, how long for and how much effort you put in. Try these questions:

Question 1 On how many days of the week do you do something that is physically active? Include anything that is energetic, whether work or leisure. For example using the stairs or walking the dog.

- NEVER
- ONCE A WEEK
- 2-3 TIMES A WEEK
- 4-5 TIMES A WEEK
- 6-7 TIMES A WEEK

Any level of physical activity is better than nothing. Ideally you should aim to do something physically active on most days of the week.

Question 2 On a day when you are physically active, what is the total amount of time that you put into it? Add up all the minutes that you are active during the day and tick the box that is nearest to your daily total.

- LESS THAN 10 MINUTES
- 10-20 MINUTES
- 20-30 MINUTES
- OVER 30 MINUTES

The amount that you should build up to is around 30 minutes in total each day, and on most days of the week.

Question 3.....

How much effort is involved in your activities and how do you feel when you're doing them? How do you feel immediately afterwards?

You should aim to stay within the moderate intensity zone. In other words, put in a fair amount of effort so that your breathing becomes faster than normal, but **not** so that you're gasping for breath. If you are, you have moved into the maximum intensity zone — so slow down. You should always be able to talk easily during activity.

Your heart should also be working a bit harder so that your pulse rate will be faster. If you're putting the right amount of effort into an activity, you should also work up a bit of a sweat, especially on a warm day or if you are warmly dressed. Activity should make you feel good, and ready to get on with life.

IS THE EFFORT YOU ARE PUTTING INTO THE ACTIVITY...

ARE YOU ABLE TO...

IS YOUR BREATHING...

light intensity?



whistle/sing?

easy?

moderate intensity?



talk?

faster?

maximum intensity?



gasp?

gasping?

A good way to build up this routine is

to take **4-6 weeks**

to reach the target.

HOW

do I fit it in and build it up?

Small amounts of active time can add up over the day to create a healthy routine of 30 minutes or more of physical activity on most days of the week.

WEEK 1•2

In the first stage would be to add 10–15 minutes of physical activity to your daily routines every other day over the next two weeks

take the stairs instead of the lift or escalators, for example in the shops or at work

take short walks to the shops from the bus or car park

take a walking break at lunch time

take the dog for an extra walk



WEEK 3•4

During weeks 3–4 you could gradually add in more minutes of activity so that you had 20–25 minutes of active time over the course of most days.

make your walks longer

get down to the gardening

go out on your bike

put on your dancing shoes



WEEK 5•6

Finally, towards weeks 5–6, you should add some more minutes so that on most days you had a total of 30 minutes of activity.

swim at the weekend

go for a game of bowls

take a long refreshing walk

keep up the stair climbing



WHAT

can I do?



The main aim is to be more active more often. Most things we do in our day-to-day lives can be made more active. It's not only what you do, it's how often, for how long and how energetically you do it that counts.

Even if time is tight, try to organise some time most days just for you:

- a 10 minute break from your daily routines for a walk will make you feel better
- at the weekend it might be possible for you to make time to go for a walk or swim

Make activity a part of your social life:

- dancing is fun, active and good exercise
- walk to the cinema or pub instead of going on wheels
- ask friends round for lunch and go out for a walk in the park afterwards
- find someone among your neighbours or workmates who also wants to get out more and be active — go for a walk together, go bowling, cycle or swim together



Avoid sitting for long periods, whether at home or at work. Break up the time you spend sitting down. Stretch your legs, move about.

- watching TV is how most people relax, but it's possible to make it more active — get up and do something else during the adverts
- choose the TV programmes you really want to see and do something active in between
- if you spend a lot of time sitting at a desk or keyboard at work, break up the sitting time with more active jobs
- use your lunch hour to get a break from your desk and the phone. Fresh air and activity can also help your afternoon's work

Travel on your feet. Make your daily journeys more active.

- walk all or part of the journey to work or to the shops
- if you usually travel by bus, walk to the next bus stop or get off a stop earlier
- cycling is fun and a cheap and active form of transport. Find a safe route for regular journeys and wear a helmet

Make the most of your time off. Get out of the house more and do something active.

- walk to get the milk or papers
- go out and play with the kids
- go for a swim with a friend, the family or on your own
- have a walk in the country or a park
- get your bike out and use the local cycle paths
- try something new – row a boat, fly a kite, play tennis in the park



Safety Tip

- Don't do strenuous activity after a big meal.
- Avoid straining activities like lifting heavy loads.
- Avoid sudden, jerky movements.
- If you have an active infection or illness, take it easier until you feel recovered.
- If you have pain or discomfort ease off.

WHAT

will it cost?



There are plenty of things that you do anyway that cost you nothing and could be used to help you be more active.

For example:

WALKING
DANCING AT A PARTY OR AT HOME
CLIMBING THE STAIRS

Some activities need a bit of money spent at the start but are then relatively cheap.

For example:

GARDENING
CYCLING

Then there are activities that you have to pay for every time but these can be cheap too.

For example:

A SWIM
TEN PIN BOWLING
AN EXERCISE CLASS

Many people think being fit has got something to do with running about in expensive trainers with a pair of shorts on. Activity doesn't need to cost very much. You don't have to buy special clothing, wear trainers or have special equipment. Some facilities also offer discounts or special rates.

GETTING ACTIVE

...feeling good



After you have tried this six-week plan for getting active on most days of the week, try answering these questions:

Am I more active than I was 6 weeks ago?

Am I feeling better for it?

Do I feel in better shape physically?

If you have managed this, well done! If you want to keep to this level of physical activity then bear in mind these tips:

keep it up regularly

keep choosing the active ways of doing everyday activities

mix and match the activities you like best for variety

keep building up and gradually doing a bit more

WHAT

next?



Step 2 If you find active living enjoyable but want more of a challenge and would also like to improve your fitness, then you should aim to increase gradually the amount of time and effort you spend being physically active over the course of the week. Taking exercise regularly can now become part of your more active lifestyle.

Here are some guidelines to follow if you want to go beyond Step 1 and make regular exercise part of your weekly routines.

1 **Make the times you spend being active more continuous. Keep moving for a bit longer each week.**

For example, you could extend your 5 minute daily walk to the bus stop to 15 minutes by walking to a bus stop which is further away. Or you could join a class where you will be physically active for 10 – 30 minutes non-stop.

2 **Gradually make your active times more frequent over the course of the week.**

For example, if there are times when you spend long periods sitting, can you find ways of breaking this up with some form of physical activity? Can you make the time to commit one hour each week to a regular activity or sport?

3 Put more effort into your activities so that your body has to work a bit harder than normal.

Work hard enough to make yourself a bit sweaty and out of breath, but not so hard that you're uncomfortable. For some this may mean putting more effort into the things you usually do. For others, it may mean trying out some form of organised sport or active leisure pursuit.

If you are exercising more vigorously, like running or playing a sport, always warm up first with a few gentle bends and stretches and cool down afterwards by walking slowly for a few minutes. That way there will be less risk of injury.

4 Keep it up.

Physical activity has to be a regular part of your life if it is to bring health benefits. In the long run you will be better off gradually building more active time into your existing routines in a way that suits you. Trying to be too ambitious might mean that you find it difficult and stressful because you can't make the time regularly.

If you want to aim for a higher level of fitness and stay fit, move towards having 2–3 days each week which include 20–30 minute periods of vigorous physical activity...For many this aim is a tall order.

If you can't manage it, don't give up. If you can keep up the level of activity recommended in Step 1, you will be benefiting your health.

Moving beyond Step 1 would be an added bonus to your health, fitness and general enjoyment of life.

WHICH

activities?

Apart from physical activities which are part of your everyday life, like climbing the stairs or walking to the shops, there are a wide range of activities that you might do to get more exercise. How do you decide which one to choose?

Some of the more popular ones are described below, but bear in mind these questions when you are choosing an activity to suit you:

WILL IT BE SOMETHING I ENJOY?

WILL I BE ABLE TO DO IT REGULARLY?

WILL IT SUIT MY POCKET?

WILL I BE ABLE TO FIT IT IN WITH EVERYTHING ELSE I HAVE TO DO?

WILL IT GIVE ME A GOOD MIX OF GOOD AND BAD WEATHER ACTIVITY OPTIONS?

Here are some examples of physical activities to start with and build on to. They are probably the easiest activities to build into your existing routines:

Walking

HEALTH VALUE

The most natural and accessible activity of all.

Brisk walking is good for building up your stamina.

Walking regularly is a good way of keeping active and mobile as you get older.

A good activity for relieving stress and tension.

PRACTICAL POINTS

It's a free and flexible activity - you can walk alone or with friends, in a range of settings, and you can mix it with other activities.

It can be part of your everyday routines, you need no special clothing or new skills.

If you would like to walk in the country with others, there are groups and clubs you can join.

Swimming

HEALTH VALUE

Swimming is an excellent activity for all round fitness.

Because your body weight is supported in the water, swimming is recommended if you are overweight, have arthritis in the hips or legs, backache, stiffness or disability.

It is excellent for building fitness and stamina.

PRACTICAL POINTS

Swimming is suitable for people of all ages and abilities. It's never too late to learn. Many local swimming pools run swimming classes for beginners, children and adults.

Most pools run special daytime sessions for groups like over 50s, parents and babies, ante-natal, mothers and toddlers.

Swimming is a reasonably cheap activity, although you pay more in pools which have flumes, chutes, waves, etc. There are often special rates for unwaged and retired people and some pools have season tickets.

Many pools have long opening hours which makes it an activity that's easier to fit into your routines.

Dancing

HEALTH VALUE

Dancing is a very good form of exercise.

It keeps your leg muscles strong and your joints supple and mobile.

If you dance energetically, it helps improve stamina.

PRACTICAL POINTS

Dancing takes many forms and can be enjoyed in many places - from your own house to local halls to ballrooms. It's an activity that appeals to people of all ages and ability levels.

Many kinds of dancing don't need special knowledge or equipment. If you want to improve your technique or meet others who enjoy a particular type of dance, you can join classes either run privately or by the community education department of the local council. Many councils put on 'Tea Dances' for older people.



Cycling

HEALTH VALUE

Cycling is good for building up your stamina and improving the muscle strength in your legs.

Because of the hazards of road accidents and air pollution, it's best to avoid rush hours if possible and to use cycle paths, if available, or use the less congested routes.

PRACTICAL POINTS

A new bike is quite expensive, but you should be able to buy a relatively cheap second-hand one. Ask for advice at your local bike shop.

Always wear a cycle helmet, make sure your lights work, and wear something reflective so you are visible to other road users.

It's important to buy a new helmet because second-hand ones might have been damaged in an accident even though they look fine.

Many people learn how to ride a bike as a child and it's a skill you can easily remember. The road safety department of your local council runs cycling proficiency tests for children.

Here are some examples of sports activities that you might try if you are trying to build exercise sessions into your weekly routine:

Exercise classes

HEALTH VALUE

Most Exercise classes will give you an all-round workout. The exercises should build up the muscle strength in your legs, arms, stomach and back. The continuous movement (jogging or jumping) will help to increase your stamina, and the bending and stretching will make you more supple.

PRACTICAL POINTS

There are a whole range of exercise classes to choose from - aerobics, keep-fit, popmobility, step, slide. These are all exercise classes done to music with a group of other people. A good chance to meet (new) friends.

Exercise classes are often graded by ability level - beginners, intermediate, advanced. If you are just starting, make sure you choose a beginner's class.

The class leader will remind you that you should decide your own pace - don't get uncomfortably out of breath. There should always be gentle warm-up at the beginning and cool-down at the end.

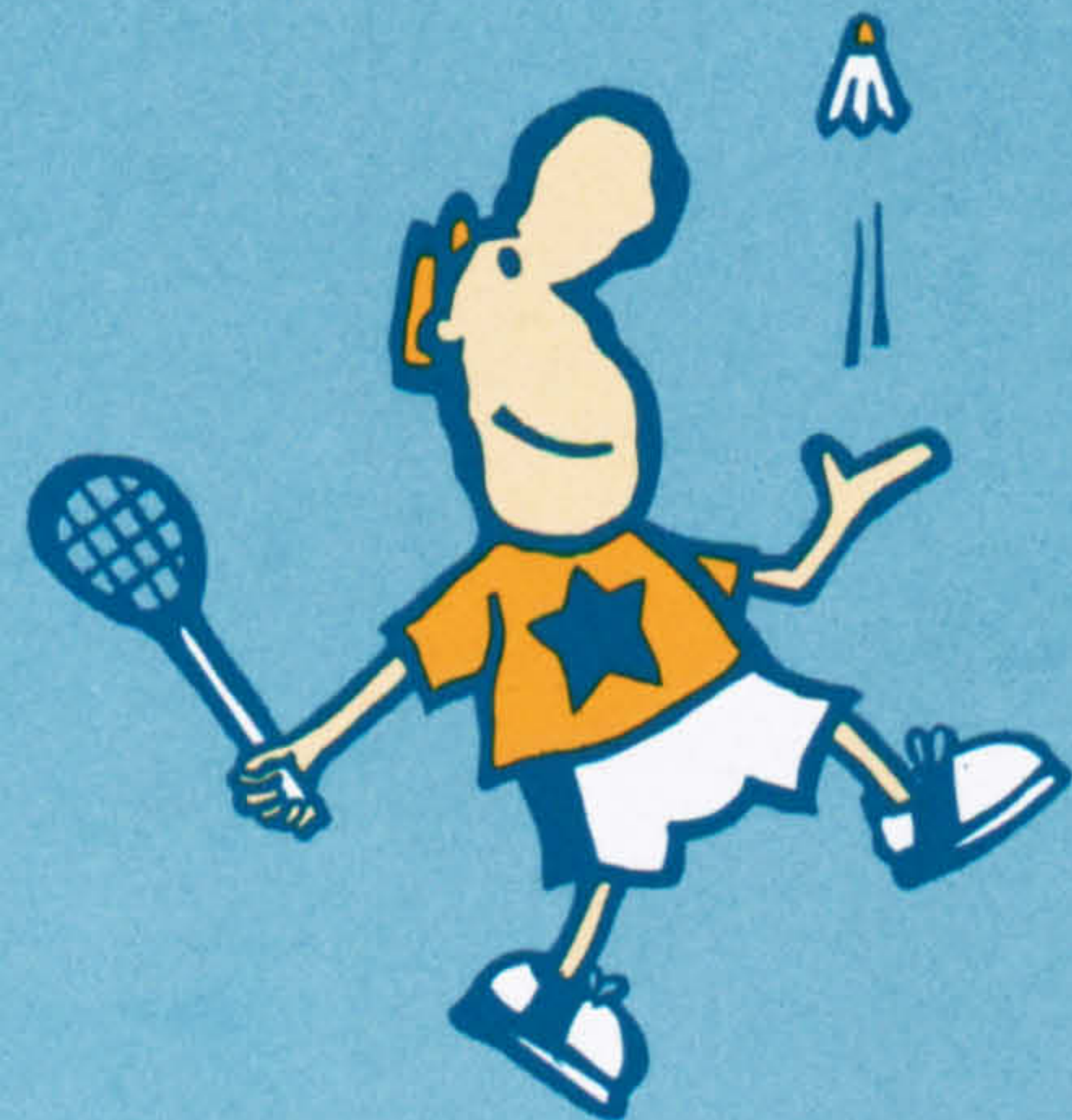
Badminton

HEALTH VALUE

Badminton involves lots of bending and stretching, so it's good for flexibility and leg strength. your stamina will also improve with chasing the shuttlecock.

PRACTICAL POINTS

Badminton is fun to play right from the beginning - you don't have to have a lot of skill to enjoy it. The better you get at the game, the more energetic it becomes.



Badminton courts can be hired at most local sports centres, but you can also play in school gyms and community centre halls.

You will need to buy, hire or borrow a raquet and find some suitable rubber soled shoes - ask for advice at your local sports shop.

Golf

HEALTH VALUE

Golf is more energetic than you might think, you don't need to get sweaty and out of breath to play this sport.

PRACTICAL POINTS

It's an activity that involves a lot of walking in the open air, carrying clubs or pulling a trolley. As such it's good for stamina and strengthening the leg muscles.

Scotland is famous for its golfing facilities. Most areas have a public golf course where you can hire equipment if you want to try your hand at the game. There are private golf clubs but they can be expensive to join.

Apart from getting hold of a set of clubs, you need to wear comfortable outdoor shoes and an umbrella or rain gear.

Bowling

HEALTH VALUE

Bowling is a good gentle form of exercise. The swinging motion of bowling improves flexibility in the shoulders and arms. Bowling is also good for leg strength.

PRACTICAL POINTS

You can bowl whatever the weather. You can play indoors in a commercial rink, bowling alley or on a carpet or mat in the local community centre. You can also play outdoors at the local bowling green.

You need to wear comfortable clothing and flat, smooth-soled shoes. Some bowling clubs let you hire woods to start with.



To find out what opportunities or special events exist in your local area, a good place to start is to look in your local newspaper.

Some other useful contacts are:

For classes at local schools, colleges and community centres contact the community education service in your area. This will be listed under your regional or island council in the phone book.

For activities run in your local leisure or sports centres, contact your local leisure services or parks and recreation department. This is listed under your district or island council in the phone book.

For information on canal walks, city walks, local footpaths and cycle paths contact your local leisure services or parks and recreation department. This is listed under your district or island council in the phone book.

For information about country parks etc contact the Countryside Ranger Service.

For information about specific sports contact the Scottish Sports Council, Caledonia House, South Gyle, Edinburgh EH12 9DQ

Physical activity is natural. Building more activity into your daily life is an easy way to keep healthy.

The type of activities and the level at which you do them outlined in this book means that you can start off at a very low level and build up gradually. The activities that you can start off with are everyday ones, like walking.

Men and women, single or with a partner, with children or without - it doesn't matter. You don't have to be 'sporty' or basically fit already. And, of course, disabled people can get as much out of being active too.

If all this seems too easy and you don't believe it, read *Hassle Free Exercise* and then make up your mind.



*Health Education Board
for Scotland*

Woodburn House, Canaan Lane, Edinburgh EH10 4SG

ISBN 1 873452 57 8 HEBS 94/03/ab

Created by Apex Design, Edinburgh Printed by Capital Print Scotland

Telephone Script

Interviewee Name:

Date:

Address:

Phone number:

Hello, my name is Catherine Woods, and I'm calling for the Sport and Recreation Service, at the University. We are following up some research that has been ongoing since you were in first year, it is to do with physical activity, you may remember filling in a questionnaire last April? We are interested in talking to second years who are active, and students who are not, and have no intention of being physically active in the future. _____ (person's name) your reasons for choosing to participate or not in physical activity are particularly important to us. We would like you to join a group of other second year students, who do similar amounts of physical activity as yourself to discuss this topic.

This is not a meeting to get you involved in physical activity, but strictly a research project to discuss the topic. It will be held on _____ evening, May _____, at 64 Oakfield Ave. It will begin at 5.30pm and it will conclude at 7pm. Light refreshments will be served and at the end of the meeting you will be given £5.00, to say thank you for your time. Will you be able to attend?

Yes (Confirm Name and Address)

No (Ask them if you could send a questionnaire for them to fill in, thank you and finish).

If yes

I will be sending you a letter in a few days confirming this meeting. If you need any help with directions or if you need to cancel, please call our office at 0141-3304540. Thank you and goodbye.



Letter Script

[Subject's name]
[Subject's address]

Dear [Student's name],

It was nice to speak to you last Monday. Thank you for accepting our invitation to attend the meeting at 64 Oakfield Avenue on Wednesday 6th May at 2pm. Oakfield Avenue is located off University Avenue (see map enclosed), and number 64 is opposite the main door of the Stevenson Building. The meeting will begin at 2pm and will conclude at 3.30pm; light refreshments will be provided.

We will be discussing exercise patterns of second year students. It does not matter whether you are physically active or not. Indeed, it is important to us that we hear from individuals who may not be physically active at the moment. All students in your group will be doing similar amounts of physical activity as yourself. Since we are talking to a limited number of students, the success and quality of our discussion is based on the co-operation of the people who attend. As you have accepted our invitation, your attendance at the session is anticipated, and will aid in making the research project a success.

This is strictly a research project and you will not be involved in any physical activity, nor will you be solicited to become a member of the SRS. At the conclusion of the session we will be giving you £5.00 in return for your co-operation.

If for some reason you find you are not able to attend, please call us to let us know as soon as possible. Our phone number is 330-4540.

We look forward to seeing you on May 6th.

Yours sincerely,

*Catherine Woods
Forum Moderator.*

*Sport and Recreation Service
Stevenson Building, 77 Oakfield Avenue, Glasgow G12 8LT
Direct Line: 0141-3304540 Web page [HTTP://www.gla.ac.uk/services/sport](http://www.gla.ac.uk/services/sport)*

Focus Group Interview Script

Introduction

Good afternoon and welcome to our session. Thank you for taking the time to join our discussion of physical activity. My name is Catherine Woods, and I am a researcher at Glasgow Uni. I am currently doing some research into the area of physical activity levels of 16 to 24 year olds. Assisting me is Claire Carney, also a researcher at the University.

We want to find out more about your views, opinions and experiences of physical activity. You were selected because you have certain things in common that are of particular interest to us. You are all second year students, and you all do similar amounts of physical activity. As I have said your ideas, opinions and experiences of physical activity are extremely important to us. **There are no right or wrong answers but rather differing points of view. Please feel free to share your point of view even if it differs from what others have said.**

Before we begin, let me share some ground rules. This is strictly a research project and no one will be asked to become involved in physical activity, nor will anyone be solicited to become a member of the Sport and Recreation Service. Please speak up-only one person should talk at a time. We're tape recording the session because we don't want to miss any of your comments. If several people are talking at the same time, the tape will get garbled and we'll miss your comments. We will be on a first name basis tonight, and in our later reports no names will be attached to comments. You may be assured of complete **confidentiality**. Keep in mind that we're **just as interested in negative comments as positive comments, and at times the negative comments are the most helpful.** **3mins**

Our session will last about an hour and fifteen minutes. Let's begin. We've placed name cards on the table in front of you to help us remember each other's names.

Let's find out- some more about each other, could I ask you to chat to the person next to you, find out their name, their course of study and how they traveled to the meeting. Then if you could introduce them to the rest of the group.

Ice Breaker

Talk to your partner, find out their name, their course of study and how they travelled to the meeting. Then, introduce them to the rest of the group. **4mins**

Opening Question

To begin, let's just think about all the types of physical activity there are. Talk to another person in the group and see how many types of physical activity you can up with? **3 mins**

Key Question 1

Tell us about your good or bad experiences of Physical Education when you were in school?

Sum Up! Parrot

Did these experiences influence how you think about physical activity now? **8 mins**

Sum Up! Parrot

Key Question 2

Tell us about any positive experiences of physical activity outside school? **5 mins**
What made it positive?

Sum Up! Recap

Key Question 3

When you matriculated to this in 1st year, you filled in a questionnaire relating to physical activity. Can you give us more details of why you said you were inactive in the 6 months prior to coming to University? **8 mins**

Key Question 4

4mins

What would have helped you maintain a physically active lifestyle once you left school?

NB - Explanations

Key Question 5

What do you think are the opportunities to lead a physically active lifestyle at University?

(Elicit information on the SRS, it's use or potential use.)

10 mins

Is confidence important, and if so how?

NB - Explanations

Sum up - anything else...

Key Question 5

Are there advantages to leading a physically active lifestyle?

Are there disadvantages to leading a physically active lifestyle?

Do the advantages outweigh the disadvantages, or vice versa?

5 mins

Key Question 7

10 mins

Supposing you did no physical activity at all, you were completely sedentary, and you decided you wanted to lead a more physically active lifestyle, what would help you to change and begin being active?

What do you think might change your mind in the first place?

Key Question 8

10 mins

Supposing you had begun to adopt a physically active lifestyle, what factors or influences would maintain you in this lifestyle?

Key Question 9

10 mins

If someone was to send you all this information through the post, do you think it would help you to lead a more physically active lifestyle?

Show them an example of the intervention:

- Hassle free exercise booklet,
- Start a starter booklet,
- Interactive worksheets,
- Exercise consultation leaflets.

Was there anything that caught your attention, or that you liked about the information?

Was there anything in particular that you didn't like?

Ending Question

Assistant moderator gives a short 2-3 minute summary of the focus group interview.

"Is this an adequate summary?"

5 mins

Final Question

Moderator gives a short overview of the purpose of the study.

"Have we missed anything?"

5 mins

Time Allocation for Activities to Be Completed									
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Beginning Week	20 th - April - 98	27 th April '98	4 th May 98	11 th May '98	18 th May '98	25 th May '98	1 st June '98	8 th June '98	15 th June '98
Literature Review	Develop Questions	Recruit Participants	Finalise Questions	2 nd FG (Monday 11 th) Exp Imp F 5.30pm-7pm	8 th FG (Friday 26 th) Con Non-Imp M 5pm-7pm	9 th FG (Friday 26 th) Con Non-Imp M 5pm-7pm	ANALYSIS	ANALYSIS	ORAL REPORT
Give to Review Group:	Organise room for focus group studies.	Analyse comments from Review Group.	Organise room for focus group studies.	3 rd FG (Wednesday 13 th) Exp Imp M 12noon - 2pm	9 th FG (Thursday 28 th) Con Imp F 12noon - 2pm	ANALYSIS	DRAFT REPORT	ORAL REPORT	
Discuss with MR, JD, NM	[NM, JD, MR, SMN, BM, IF, CC, AMP, IMG, JMK, EB, MD]	Recruit Claire, & Ann for observation of pilot focus groups.	Pilot FG (Wednesday 6 th) Exp Imp F 5.30pm-7pm [Claire]	4 th FG (Thursday 14 th) Con Imp M 5pm-7pm	ANALYSIS & Revamp Interview Guide if necessary.				
Identify Participants	Recruit Claire, & Ann for observation of pilot focus groups.	Finalise Questions	1 st FG (Friday 8 th) Con Imp F 5pm-6.30pm [Ann]	5 th FG (Monday 17 th) Exp Non Imp F 5.30pm-7pm					
	Categorise Participants		Revamp Interview Guide	6 th FG (Wednesday 20 th) Con Non Imp F 12noon - 2pm					
	Recruit participants for pilots and FG 1.			7 th FG (Thursday 21 st) Exp Non Imp M 5.30pm-7pm					

Dates Participants must be called by.

Friday 24 th Apr	Friday 24 th	Monday 27 th	Friday 1 st May	Friday 1 st	Monday 4 th	Thursday 7 th	Thursday 7 th	Friday 8 th	Thursday 14 th
Pilot FG	1 st FG	2 nd FG	3 rd FG	4 th FG	5 th FG	6 th FG	7 th FG	8 th FG	9 th FG
(Wednesday 6 th) Exp Imp F 5.30pm-7pm	(Friday 8 th) Con Imp F 5pm-6.30pm	(Monday 11 th) Exp Imp F 5.30pm-7pm	(Wednesday 13 th) Exp Imp M 2-4pm	(Thursday 14 th) 5pm-7pm Con Imp M	(Monday 17 th) Exp Non Imp F 5.30pm-7pm	(Wednesday 20 th) Con Non Imp F 12noon - 2pm	(Thursday 21 st) Exp Non Imp M 5.30pm-7pm	(Tuesday 26 th) Con Non-Imp M 5pm-7pm	(Thursday 28 th) Exp Imp F 12noon - 2pm

Raw Data Codes and First Level Themes list for all focus groups.

* Red ink indicates ideas for Second Level themes

Physical Education	PE		1
▪ Perceived Confidence	PE-PC	+/-	1
▪ Favouritism	PE-FAV	-	1
▪ Teachers	PE-TEA	-	1
▪ Style of teaching			
▪ Good = students feel in control			3
▪ Bad = students feel humiliated and bullied in front of their peers.			3
▪ Weather	PE-WEA	-	1
▪ Uniform	PE-	-	1
	UNIFORM		
▪ Team Selection	PE-TS	-	1
▪ Choice	PE-CHO	-	1
▪ Avoidance	PE-AVO	-	1
▪ Social Comparison Anxiety	PE-SCA	-	1
▪ Awkward Age	PE-AA	-	1
▪ Differentiation	PE-DIF	-	1
▪ Fun	PE-FUN	+	1
▪ Sense of Achievement	PE-ACH	+	1
▪ Friends (social support)	PE-SS	+	1
▪ Rationale	PE – Rat	-	4
▪ Why do PE			
▪ Fear of Injury	PE-Injury	-	3
	EC	+/-	?
Positive Experiences in Extra Curricular PA.			
➤ Responsibility attributed to 3 rd party	EC-FAC	-	3
➤ Perceived lack of facilities			
➤ Variety of activities			
▪ Not sports			
▪ Emphasis not on success, Fun not ‘torment’			
➤ Coaches	EC-TEA	-/+	3
▪ Encouraging – Positive feedback			
▪ Student seeks their approval rather than success			
➤ Self fulfilling Prophecy			
▪ Teachers encouragement leads student to perceive that they are good			
➤ Perceived Confidence	EC-PC	-	3
▪ Fulfilled need for success			
▪ University teams, no support for beginners	EC-SF	-	3
▪ Self Efficacy			
➤ Friends	EC-SS	+/-	3
▪ Social Support			
▪ Encouragement/Motivation from friends to participate			
▪ Fun - Diffuse tension of beginning activity			
▪ Social Counteraction			
▪ Change behaviours to unhealthy habits			
➤ Belonging	EC-BEL	-	3
▪ Need to be ‘completely part of the team’			
➤ Socialising through activity	EC-SOC	+	3
Influence			
▪ Social Comparison Anxiety	INF-SCA	-	2
▪ Need to feel safe, not intimidated			
▪ Constantly seeking approval from peers			
▪ Poor Body Image			
▪ Lack of Self-Confidence			

▪ Perceived Confidence (as above)	INF-PC	-	2	
▪ Friends (social support) (as above)	INF-SS	INF-	+/-	2
▪ Peer Pressure - Self Efficacy	PP-SF	-	2	
▪ 'Crazy Gym People'				
➤ Time	INF-TIME	+/-	2	
▪ Spare & Leisure Time		+	6	
▪ Time Pressure		-	6	
➤ Knowledge base	INF-KNOW	?	2	
▪ Ignorance prevents access to physical activity, therefore an informed start is essential.				
▪ Ex. Consultations				
➤ Experiences / Impact	INF-IMPACT	+/-	3	
▪ Bad Experience = Negative impact				
▪ Psychological impact e..g mental block re: participation				
▪ Control impact e.g. team pressure in participation not individual = no control				
▪ Good Experience				
▪ Being in control		+	3	
▪ Value of positive experiences = positive impact on future behaviour				
➤ Self Empowerment	INF-SELF-EMP	+	3	
▪ Being in control				
▪ Having a choice				
<hr/>				
Any details on why you were sedentary in the 6 months prior to coming to Uni?				
What could have helped you to maintain pal?	TRA	+/-	?	
➤ Exams	TRA-EXAM	-	4	
➤ Party time	TRA-PAR	-	4	
➤ Laziness	TRA-LAZY	-	4	
▪ Lazy attitude 'no willpower'				
➤ No habit	TRA-HAB	-	4	
➤ Extrinsic motivation for being active, no task orientation				
▪ Apathetic without pressure 'couldn't be bothered'				
▪ choose inactivity over activity				
▪ No association between leisure and physical activity. 'Exercise is not fun'				
▪ To sustain involvement PE needs to be relevant, enjoyable and needs to provide a means of support and access after school				
▪ Expense	TRA-EXPE	-	4	
➤ Structured Vs Active Lifestyles	TRA-PA		4	
▪ Not in a team = not physically active				
▪ No understanding of active lifestyle message				
▪ Quote P7 FG3 Noelle.				
➤ Friends	TRA-SS	+/-	4	
▪ Peer modelling 'active friend keeps me active'				
▪ Appropriate activity, peer pressure to do something you don't like.				
➤ Exciting or Fun	TRA-FUN	+	4	
▪ Novel activity, loads of variety, no competition				
<hr/>				
What are the opportunities to lead a PAL at University?	OPP	+/-	?	

➤ Facilities	OPP-FAC	+	6
▪ Excellent			
▪ Cheap			
▪ Wide Choice of Activities			
▪ Good Environment			
➤ High awareness of opportunities to participate	OPP-AWARE	+	6
➤ Getting Started / Routine	OPP-BEG	+	6
▪ Working life = potential for habit formation			
➤ Self Motivation	OPP-LAZY	-	6
▪ Laziness			
▪ Like the idea e.g. very good facilities but not the effort involved			
▪ Satisfaction at completing task (e.g. popmo), but not during the exercise.			
➤ Active living message	OPP-AC	+	6
▪ Awareness of			
▪ Active Commuting to University			
▪ No awareness			
▪ PA = Vogue exercise e.g. Rollerblading			
▪ PA = Only available in SRS			
▪ Knowledge of K'hall but not what is in it			
▪ PA not a priority in Uni.	OPP-PRI	-	6
➤ Stimulus Control	OPP-SC	+	6
▪ SB = Constant reminder to exercise			
➤ Knowledge base	INF-KNOW	?	3
▪ Ignorance prevents access to physical activity, an informed start is essential.			
▪ Exercise Consultations			
Advantages	ADC	+/-	?
➤ Look / feel healthier	ADV-HEA	+	7
➤ Fit for life / job	ADV-FIT	+	7
▪ Peer comparison			
▪ Well rounded individual			
➤ Increased Energy	ADV-ENG	+	7
➤ Increased Confidence			
➤ Social Acceptance of PA			
▪ Employers favoring active individuals over inactive individuals			
Disadvantages	DIS	-	7
▪ Obsessed	DIS-OBS	-	7
▪ Excuses			
▪ No perceived control over activity			
▪ Difficult to obtain a balance, moderation in amount of pa undertaken			
▪ Guilty for not going	DIS-GUI	-	7
▪ Time			
▪ Discomfort			
▪ Tired and sweaty			
➤ Unrealistic goals			
Do the advantages outweigh the disadvantages?	D-ADV		7
▪ Positive Attitude	D-ADV-HEA	+	7
▪ Important to be healthy			
▪ Attitude contradicts behaviour			
▪ A PAL counteracts a unhealthy lifestyle			
Is Confidence for PA important? How	CONF		7.1

➤ Increased self efficacy	CON-SE	+	7.1
▪ Knock-on affect to other aspects of life			
▪ 'if you can conquer the gym you can conquer anything'			
▪ Positive body image	CON-BI	+/-	7.1
▪ PA an integral part of how people portray themselves or how they are perceived by others			
▪ Differentiation	CON-DIF	-	7.1
▪ Negative body image 'man's arm'			
▪ You have to look the part to partake			
▪ PA = Social Status			
▪ Build confidence in general not just in relation to PA, and this helps in transition from school to university.			
<hr/>			
Adoption of a PAL	ADT	+/-	?
➤ Counter conditioning	ADT-CC	+	10
• Simple, small, lifestyle changes versus dramatic changes			
➤ Social Support	ADT-SS	+/-	10
• Encouragement from friends			
• Exercise with friends			
➤ Stimulus Control / Consciousness Raising / Social liberation?	ADT-SC	+	10
• Media Role - Advertising			
➤ Goal started			
• Pinpoint the source of motivation and work from there...			
➤ Dramatic Relief / Self-revaluation?	ADT-DR	+	10
• Scare yourself into activity. Look at yourself in the mirror!!			
➤ Retroactive Experience / Consciousness Raising	ADT-ENJ	+	10
• Remember what you liked as a child and begin from there.			
➤ Goal Setting	ADT-GS	+	10
• Take on too much – get disheartened			
• Don't know where to begin, what to do.			
➤ Positive Memories			
• Start with something you enjoy			
➤ External Motivation / Reward Management	ADT-BRIB	+	10
• Bribery? Prior to beginning activity??			
❖			
• I.e. Spending money – so buy physical activity gear.			
➤ Convenient – Exercise at home (Counterconditioning)	ADT-CON	+	10
• Minimise complications			
• Don't have to go anywhere			
• Cheap			
• You can watch TV			
<hr/>			
Sustain a PAL	SUS	+/-	?
➤ Self-reevaluation			
• Seeing results			
• Noticing a difference			
➤ PAL interpreted as structured exercise only e.g. popmo, swimming etc.			
➤ Environmental reevaluation	SUS-VAR	+	9
• Variety of activities to prevent boredom			

➤ Variety of option to prevent boredom				10
• E.g. FITT principles of training				
➤ Goal setting	SUS-REAL	+		9
• Be realistic e.g. a lapse is not a relapse				
➤ Helping Relationships	SUS-SS	+/-		9
• Encouragement form others / Social Support				
• Friends				
• Instructors				
➤ Self-liberation	SUS-ROU	+		9
• Routine – Regular exercise is easier to maintain (counterconditioning)				
➤ Social liberation – Join a club.	SUS-SO	+		9
➤ Dramatic Relief	SUS-DR	+		9
• Remember what you were like before you began exercising – scare you into maintaining				
➤ Appreciate the benefits (self-revaluation)	SUS-SR	+		9
➤ Feel guilty if you stop	SUS-GUILT	-		9

What would make you stop?

- Body Image – Muscles developing that you did not want
- Boredom
- No perseverance (due to unrealistically set goals)
- External motivation (doing it to please others)
- Doing it because you ought to ('it's so cheap to join')

Intervention feedback	INF	+/-	?
➤ Victimised	INF-VIC	-	10
• Bullied			
• Like being back at school			
➤ Support & Caring	INF-SUP	+	10
❖ Reinforcement	INF-ENC	+	10
➤ Consciousness Raising	INF-CR	+	10
• Subliminal messages		+	
• Stimulus Control		+	
• Did not read it		-	
• Lack of exercise is by choice and not by ignorance		-	
• Posters can provoke either +'ive or -'ive reactions, but makes individuals think.			
❖ Counter Conditioning.	INF-CC	+	10
❖ Vouchers	INF-VOU	+	10
• Cheap			
❖ Professional Advice	INF-ADVICE	+	10
• Self fulfilling prophecy - saying you can do it.			
• Personalised advice – saying what you can do.			
• Goal setting with someone – a purpose			
• Set in real world (inactive world), not ill-at-ease with environment.	INF-GS	+	
• Provide alternative options to those who don't want to go into the SRS			
❖ Self conscious	INF-PP-SELF CONS	-	10
• Fear of ridicule			
• Lack of self-confidence			
• Perceptions of inadequacy			
❖ Follow-up from consultation	INF-FUP	+	10
❖ Role Model		-	10
• Mother			

• Guilt / Paranoia at not participating	-	10	154
• Unfit = bad, Active & fit = optimal goal	+/-		154
• Long-term picture – fit = healthy, unfit = unhealthy	+		154
❖ Fear of commitment	-	10	154
❖ Would not fill in worksheets	-		154
❖ Personalised encouragement	+	10	154
• 1-1 consultation would be useful	+		155
• HR – no concept of being self directed	-		155
❖ Differentiation	-	10	158
• Them (fit) Vs Us (unfit)	-		158
❖ Perceived attitude problem among fit	-	10	158
• Confirmation of fear of those who are not fit	-		157
• Paranoia	-		157
<hr/>			
Physical education had experience/limited choice			157
Physical education good experience/self directed physical education			157
Positive Experiences/Primary			157
Transition/Primary			158
Opportunities/Primary			158
Opportunities/Independence			158
Transition/Anxiety			158
Sustain/Primary - option			158
SECOND LEVEL THEME – PERCEIVED COMPETENCE			159
FIRST LEVEL THEMES FROM WHICH THE CONCEPT PERCEIVED COMPETENCE EMERGED			159
Positive Experiences/Primary Vs Secondary school experience			159
Physical education/good experience/social comparison			159
Opportunities/For fitness/Social comparison			160
Opportunities/Experiences/bullying			160
Self-efficacy/lack of achievement			160
Positive Experiences/Competence			160
Opportunities/Lack of competence			161
Positive Experiences/Knowledge base			161
Opportunities/Knowledge base			161
SECOND LEVEL THEME – SELF-EFFICACY			162
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SELF-EFFICACY EMERGED			162
Self-efficacy			162
Self-confidence			162
SECOND LEVEL THEME – SENSE OF SELF			165
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SENSE OF SELF EMERGED			165
Physical education/good experience/isolation			165
Physical education/good experience/gender			165
Physical education/good experience/favourite			165
Physical education/good experience/teacher			166
Physical education/No experience/differentiation			166
Opportunities/Experiences/Differentiation			166
Self-efficacy/Differentiation/belonging			167
Positive experiences/belonging			167
Physical education/good experience/normalise			167
Physical education/good experience/peer pressure			168
SECOND LEVEL THEME – SOCIAL BEHAVIOUR			168
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SOCIAL BEHAVIOUR EMERGED			168
Positive Experiences/Classroom/energising			168
Positive Experiences/Significant Others			168
Positive Experiences/Friends/Social Support			168
Positive Experiences/Friends/No motivation for social interaction			168

SECOND AND FIRST LEVEL THEME WORDING.....	254
SECOND LEVEL THEME = CONTROL.....	254
FIRST LEVEL THEMES FROM WHICH THE CONCEPT OF CONTROL EMERGED.	254
<i>Physical education/bad experience/team selection</i>	254
<i>Physical education/bad experience/awkward age</i>	254
<i>Physical education/bad experience/compulsory</i>	254
<i>Physical education/bad experience/Physical education kit</i>	255
<i>Bad Experiences/Self-identified level of emphasis</i>	255
<i>Transition/Individual responsibility</i>	256
<i>Positive Experiences/External or Internal motivation</i>	256
<i>Self-efficacy/access</i>	256
SECOND LEVEL THEME = CHOICE	257
FIRST LEVEL THEMES FROM WHICH THE CONCEPT CHOICE EMERGED.	257
<i>Physical education/bad experience/limited choice</i>	257
<i>Physical education/good experience/self-directed physical education</i>	257
<i>Positive Experience/Priority</i>	257
<i>Transition/Priorities</i>	258
<i>Opportunities/Priority</i>	258
<i>Opportunities/independence</i>	258
<i>Transition/Apathy</i>	258
<i>Sustain/Variety – options</i>	258
SECOND LEVEL THEME = PERCEIVED COMPETENCE	259
FIRST LEVEL THEMES FROM WHICH THE CONCEPT PERCEIVED COMPETENCE EMERGED.	259
<i>Positive Experiences/Primary Vs Secondary school memories</i>	259
<i>Physical education/bad experience/social comparison</i>	259
<i>Opportunities/Facilities/Social comparison</i>	260
<i>Opportunities/Facilities/Intimidating</i>	260
<i>Self-efficacy/lack of achievement</i>	264
<i>Positive Experience/ Competence</i>	260
<i>Opportunities/Lack of competence</i>	261
<i>Positive Experience/Knowledge base</i>	261
<i>Opportunities/Knowledge Base</i>	261
SECOND LEVEL THEME = SELF-EFFICACY.....	262
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SELF-EFFICACY EMERGED.	262
<i>Self-efficacy</i>	262
<i>Self-confidence</i>	263
SECOND LEVEL THEME = SENSE OF SELF	265
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SENSE OF SELF EMERGED.	265
<i>Physical education/bad experience/Isolation</i>	265
<i>Physical education/bad experience/gender</i>	265
<i>Physical education/bad experience/favouritism</i>	265
<i>Physical education/bad experience/teacher</i>	266
<i>Physical education/bad experience/differentiation</i>	266
<i>Opportunities/Facilities/Differentiation</i>	266
<i>Self-efficacy/Differentiation-belonging</i>	267
<i>Positive experience/belonging</i>	267
<i>Physical education/bad experience/avoidance</i>	267
<i>Physical education/bad experience/peer pressure</i>	268
SECOND LEVEL THEME = SOCIAL BEHAVIOUR.....	268
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SOCIAL BEHAVIOUR EMERGED.....	268
<i>Positive Experiences/Friends/Encouragement</i>	268
<i>Positive Experiences/Significant Others</i>	269
<i>Positive Experiences/Friends/Social Support</i>	269
<i>Positive Experiences/Friends/Normalisation (or social liberation)</i>	269

<i>Opportunities/Friends</i>	270
<i>Self-efficacy/Friends</i>	270
SECOND LEVEL THEME = IMAGE	271
FIRST LEVEL THEMES FROM WHICH THE CONCEPT IMAGE EMERGED.	271
<i>Self-efficacy/ physique anxiety</i>	271
<i>Self-efficacy/Fashion</i>	272
<i>Self-efficacy/stereotypes</i>	272
<i>Opportunities/Facilities/Differentiation</i>	272
SECOND LEVEL THEME = HABIT FORMATION	272
FIRST LEVEL THEMES FROM WHICH THE CONCEPT HABIT FORMATION EMERGED.	272
<i>Positive Experience/ pattern of behaviour?</i>	273
<i>Transition/No established behaviour pattern</i>	273
SECOND LEVEL THEME = SELF EVALUATION	273
FIRST LEVEL THEMES FROM WHICH THE CONCEPT SELF-EVALUATION EMERGED.....	274
<i>Transition/ Physical activity not associated with leisure pursuit</i>	274
<i>Transition/Priorities/Reason?</i>	274
<i>Opportunities/worthwhile?</i>	274
<i>Decisional balance/Pros Versus Cons</i>	274
<i>Adopt/Rationale</i>	275
SECOND LEVEL THEME = LEVEL OF STRUCTURE	276
FIRST LEVEL THEMES FROM WHICH THE CONCEPT LEVEL OF STRUCTURE EMERGED.....	276
<i>Transition, Decisional balance and Self-efficacy/Structured versus Active</i>	276
SECOND LEVEL THEME = ADVANTAGES	277
FIRST LEVEL DATA FROM WHICH THE CONCEPT ADVANTAGES EMERGED.	277
SECOND LEVEL THEME = DISADVANTAGES	278
FIRST LEVEL DATA FROM WHICH THE CONCEPT DISADVANTAGES EMERGED	278
SECOND LEVEL THEME = FACILITY EMPHASIS	279
FIRST LEVEL DATA FROM WHICH THE THEME POSITIVE INFLUENCE AND HENCE FACILITY EMPHASIS EMERGED.....	279
<i>Opportunities/Facilities/ Positive Impact</i>	279
SECOND LEVEL THEME = PERSONAL EMPHASIS	280
FIRST LEVEL DATA FROM WHICH THE THEME NEGATIVE INFLUENCE AND HENCE PERSONAL EMPHASIS EMERGED.....	280
<i>Opportunities/Facilities/ personal emphasis</i>	280
<i>Transition/Expense or Access</i>	280
PROCESSES OF CHANGE	281
FIRST LEVEL THEMES FROM WHICH THE CONCEPT EXPERIENTIAL EMERGED.	281
<i>Adopt/Self-reevaluation</i>	281
<i>Adopt/Social Liberation</i>	282
<i>Adopt/Consciousness Raising</i>	282
<i>Adoption/Environmental Reevaluation</i>	283
<i>Adoption/Dramatic Relief</i>	283
FIRST LEVEL THEMES FROM WHICH THE CONCEPT BEHAVIOURAL EMERGED.	283
<i>Adopt/Reinforcement management</i>	283
<i>Adopt/Helping Relationships</i>	283
<i>Adoption/Counterconditioning</i>	284
<i>Adoption/Self-Liberation</i>	284
FIRST LEVEL THEMES FROM WHICH THE CONCEPT EXPERIENTIAL EMERGED	284
<i>Sustain/Self-Reevaluation</i>	284
<i>Sustain/Consciousness raising</i>	285
<i>Sustain/Dramatic Relief</i>	285

<i>Sustain/Environmental reevaluation</i>	285
<i>Sustain/Social Liberation</i>	285
FIRST LEVEL THEMES FROM WHICH THE CONCEPT BEHAVIOURAL EMERGED.	285
<i>Sustain/Helping Relationships</i>	285
<i>Sustain/Counterconditioning</i>	285
<i>Sustain/Self Liberation</i>	286
<i>Sustain/Stimulus Control</i>	286
SECOND LEVEL THEME = TTM EXTENSIONS	286
FIRST LEVEL THEMES FROM WHICH THE CONCEPT TTM EXTENSIONS EMERGED.	286
<i>Opportunities/Getting Started</i>	287
<i>Sustain/Getting started</i>	287
<i>Adopt/Goal Setting</i>	287
<i>Sustain/Goal setting</i>	287
<i>Sustain/Guilt</i>	287
INTERVENTION CRITIQUE	288
<i>Intervention/Efficacy/Usefulness</i>	288
<i>Intervention/Efficacy/Level of structure</i>	288
HASSLE FREE EXERCISE BOOKLET	289
<i>Intervention/HFE/Useful</i>	289
<i>Intervention/HFE/School Memories</i>	289
<i>Intervention/HFE/Old fashioned</i>	290
<i>Intervention/HFE/Negative statements</i>	290
START A STARTER VOUCHER BOOKLET	291
<i>Intervention/SAS-voucher booklet/usefulness</i>	291
<i>Intervention/SAS-Voucher booklet/Positive/Free Offer</i>	291
<i>Intervention/SAS-Voucher booklet/Positive</i>	291
EXERCISE CONSULTATION SERVICE	292
<i>Intervention/Usefulness/Exercise Consultation Service and leaflet</i>	292
INTERACTIVE WORKSHEET – 10 TIPS FOR GETTING ACTIVE	293
<i>Intervention/10-Tips/positive</i>	293
<i>Intervention/10-Tips/Negative</i>	293
SECOND LEVEL THEME = PERSON-CENTERED ENVIRONMENT	293
FIRST LEVEL THEMES FROM WHICH THE CONCEPT PERSON-CENTERED ENVIRONMENT EMERGED	293
<i>SRS/Improve Service/Social Persuasion</i>	293
<i>SRS/Improve Service/Encouragement</i>	294
<i>SRS/Improve Service/More Relaxed Atmosphere</i>	295
<i>Group Dynamics Analysis/Discounting/FG3-E</i>	296

Second and First level theme wording.

Second level theme = Control

This theme is a reaction to strong memories of being forced to take part in physical education. The experiences recounted of being forced to show people how bad you were implied an external locus of control. There was a perception of no choice being offered. An internal locus of control developed with an awareness of individual responsibility, this became evident once individuals left the school environment. For most this was welcome, for others it provided a challenge they were still getting used to.

First level themes from which the concept of CONTROL emerged.

Physical education/bad experience/team selection

The isolation of individuals through the process of forced *team selection* is a humiliating and frightening experience in school physical education for those who perceive they will not be chosen, or if chosen will not be good enough for the team¹. This serves to identify those who are 'no good' at physical education, and is the antithesis to encouraging team spirit. The horrible humiliating fear of not being picked for a team, or of being picked last². Even if you tried your best, and turned up for a match, only the 'good people' got to play. This leads to a need for extra encouragement by the teacher.

¹ 2: A I remember when teams were being picked, with everyone standing on a line and you wanted to be anything but the last, it was quite humiliating, a fear came to my mind' (FG1).

² 9: A I hated people picking teams because I was really rubbish at sports, you're not encouraged at all.

10: N That's really horrible, why do they do that?

11: All Yeah.

12: N What is the psychology behind team picking teams?

13: E It is actually a glorified form of bullying.

14: Y I was lucky because our PE teacher, she knew I was crap and she let me pick the teams' (FG3)

Physical education/bad experience/awkward age

The years in secondary school are often described as an '*awkward age*' where children develop quite quickly psychologically and physiologically. Defiance of authority, being self-conscious about puberty and body changes, and beginning to become aware of the opposite gender and how you look in their eyes can all detrimental to participation in physical activity.

54: I think it was just an awkward age, more than anything else, like when you are in 3rd or 4th year you are just going against everything, you don't want to be involved in any kind of social activity in class, you just go against it and you'd stop exercising (FG2).

25: A I think also you are at that grown-up stage when you don't want to know, like going out in a swimming costume and you're quite self-conscious about your figure and things like that – that could put you off. (FG3)

27: S When you are 13 or 14 you don't want boys seeing you in your netball skirt. You don't want them to see that at all. (FG4)

Physical education/bad experience/compulsory

The fact that physical education was a *compulsory* part of the curriculum in school. This aligned physical education to other subjects in school – part of the routine. It eliminated an individual's choice to participate or not, and their autonomy about what activity to participate in. For the non-physical education person, this highlighted their incompetence, as they become alienated from the 'sporty people' who enjoyed PE. It became something to be dreaded, because there was a penalty either for non-participation (enforced by teacher), or for participation (embarrassment about how 'bad' you were). "If you are not good at something, then being forced to show everyone how bad you were – not the biggest confidence builder!" or "To have 8

weeks of athletics, and being bad at every single one! The whole class waiting on you to finish!" When physical education is compulsory pupils try numerous things to avoid it, as the subject is 'forced' the perceived enjoyment is less. However, when school finished, in the pupil's free time they would get together (even the ones who had no kit during the day) and play football for example after school.

10: A I think having PE as a compulsory subject in school, you know you come to think of it as something you don't have an option, it's like the other subjects, where you dread coming to school, you dread going to the class just it becomes eh, a routine thing you're forced into it, you have to do it, it's not a part of enjoying something, its something that the teacher forces you to do, because if not there will be a penalty, a punishment' (FG1)

24: J I think when you're forced into doing something it doesn't make it very enjoyable. Like you've got to do this, you've no choice, but if you feel 'yeah, I can do this' then it's a bit more enjoyable, you feel as if I'll have a shot at it anyway. I think most physical education teachers didn't really encourage you enough (FG6).

3: K Nightmare, ah! It was not a lot of fun, because you were kind of forced to do it until 6th year even if you were rotten at it, but it kind of, yes it was always kind of, and the teaher's were always kind of, it was the only class in the school where teachers could show favourites (FG8).

Physical education/bad experience/Physical education kit

Being forced to change out of a school uniform into an ill-fitting *physical education kit* in the form of 'short shorts or gym pants' made participation in physical education embarrassing, uncomfortable, and something not to be looked forward to 'Absolute nightmare'. This leads to a self-conscious, non-enjoyable experience of physical education, which becomes more acute as the student gets older.

15: A Having to do it in gym pants,

16: E Oh, yeah, those really short knickers, like you'd say can we not just wear net ball skirts NO. Absolute nightmare, and then if they tried to do something interesting like basketball, the boys would think that they were absolutely brilliant, and that the girls knew absolutely nothing, and they'd just hog the whole thing.

...

60: N I think it was definitely gym pants

61: J I wouldn't have minded running about in like a netball skirt, but just the gym pants (FG2)

5: J I just remember being made to run round the school for cross... and just horrible things like that just standing in the freezing cold and frost and with tiny shorts on and slipping all over the hockey pitch. (FG3)

41: S When you exerice all the time and it was raining and the P.E. teacher was standing under an umbrella with their track suit on and go you must wear shorts. (FG4, 41)

Bad Experiences/Self-identified level of emphasis

Exercise habit formation was perceived to begin during school years, either through involvement in school sport or extra-curricular activity (e.g. local teams). The likelihood of this activity continuing after school was dependent on the opportunity and choice to participate at a self-identified level of emphasis. Once the pressure to compete at different levels became apparent the motivation to participate died away.

Taking part in non-serious, unorganized activities that focused on enjoyment, and having a laugh with friends would make you more inclined to just 'give it a go' (FG6, 30). You would also be made to feel you belong to a team for example, to feel completely part of the team socially and competence level. The physical activity involved in playing a sport becomes secondary to the social aspect of being involved, and this was not perceived as a sport. The activity becomes fun in a social way and there is no compulsion to be involved, therefore motivation becomes intrinsic. Being able to see results also provided a positive reinforcement that made the exercise more enjoyable, this hints at realistic goal setting.

The opposite being a sense of pressure to perform and ultimate ceasing of activity, when there is no intermediate level of competition; an all-or-none phenomenon was attributed to bad experiences of physical activity outside of school. This was interpreted as coaches etc. transferring their ambitions on to you, it involved too much commitment 'I was getting up at 5am every morning to go swimming, I quite enjoyed it a couple of times a week. It was like all or nothing' (FG5, 36). The activity was too competitive, and very often the fact that individuals developed at different rates (especially boys) was not taken into account. This meant that you were competing with someone 'twice the size of you, and twice the width, and you know he is brilliant on the rugby field' (FG5, 44). You can want to compete, but if you are forced into it competition is a bad thing.

Transition/Individual responsibility

During this period there was a novel sense of *individual responsibility* which was enjoyed¹, and for some challenging². For others the 'healthy thing' was not a part of their lifestyle, there was little need for it and other priorities took precedence³. Some individuals perceived inactivity as the normal thing to do⁴ and this led to the establishment of a vicious circle. Inactivity led to being unfit and therefore taking part in physical activity was too strenuous⁵.

¹ 70: K like you were always just told, but now it was great because you had 4 months off, you know from May/June... so I was totally unproductive, a total waste of time, but it was great' (FG8)

² 11: F If you did at school and you were forced to do it, then when you leave school you will think great, no one's going to make me, and you just don't bother. But if you don't enjoy it at school, you might like to keep it up.

12: G I don't know if I agree with that or not, because I quite enjoyed it at school, and I don't know in a way I think that although everybody dreads it, it's good that they sort of make you do it, because now nobody making me do PE and I don't do it, like I was on the cross country team and that, so now I don't do anything, so in a way I liked it, well not that I liked it but it was sort of good that somebody was making you do it because if not you wouldn't do it.

13: B I think as well because it was all organised at school, and now you're at University you just expect someone said right this is your set time, if someone said right we're doing some sort of set activity, you'd say right then, I have to sit down and say right where am I going to fit it in with work and all, like the regulation of it was good. Even if you didn't enjoy it you did get somewhere with physical activity, now that I'm the effort just isn't there.

³ 35: C Because it is like right I have done that stage I have done the healthy thing and I don't want to anymore'. (FG7).

⁴ 52: R I couldn't be bothered, frankly. If there was brilliant weather outside why do you want to go and run around kicking a ball or jogging and staggering home in the blazing sun when everybody else is just lying on the grass having a bottle of juice' (FG9).

⁵ 46: J I just couldn't be bothered participating in sport after school, I just couldn't be bothered and I would want to sit [at] home watching the TV and have coffee and relax just not going torturing yourself. Just not motivated in that way' (FG9).

Positive Experiences/External or Internal motivation

This encompasses having the choice to exercise on your own, where you can control who watches, and being able to be able to exercise in a setting where you can do as much as you want, for as long as you want, and where the only one you compete against is yourself allows the individual to be in control and is remembered as positive activity. The motivation that accompanies imposed exercise e.g. with being forced to do things like PE is extrinsic, whereas if 'you motivate yourself and if you want to do it, then you would probably enjoy it more' (FG5, 24) the motivation potentially becomes intrinsic. However getting involved in regular exercise either through sport or PE provides a 'discipline in your life', depending on whether you have a 'lazy' personality or not you may choose to do nothing once you leave that situation.

Self-efficacy/access

For those who were not regularly active, or who did not perceive themselves as 'athletic' (FG7, 122, contemplator), access to SRS facilities was an issue. There was a challenge to an individual's sense of control, as it was perceived that others could dictate if you were allowed to enter the organised physical activity scene, that is the 'sports building'¹.

¹ 159: K There is the first step to get in. You kind of have to have confidence to go 'please can I join' and stuff like that, and you kind of get all like hairs on the back of your neck that they are going to say 'I'm afraid not' eh when you walk up (FG8, preparer).

MEMOS

- There is a sense of different levels of maturity within the groups, you have one set of individuals who seem to need the imposed discipline of having to exercise at certain times per week, whereas others look forward to having the choice of doing things for themselves 'I think I am more physically active due to different factors sort of like looking at health, swimming and walking and I do it for myself' FG6, 49.

- Tracking implications, all references for sport, no mention of physical activity as a leisure time pursuit... you either sporty and involved (provided competition is not too tough), or you are not sporty and inactive.
- Retrospective theme, the majority of incidences appear to relate to past experiences apart from if an individual wants to join an organisation, service (e.g. SRS).

Second level theme = Choice

This theme has two sub-categories namely priorities and individual responsibility. The priorities component is to do with individuals identifying the most important priorities in their life at a specific moment in time, physical activity may or may not be included. The second component of choice is to do with individual responsibility, irrespective of opportunities provided individuals exercise the right to choose what they want to do.

First level themes from which the concept CHOICE emerged.

Physical education/bad experience/limited choice

The powerless feeling of limited *choice* as to what activities you could do in the physical education class was negative ^{1,2}. Physical education was taught in a similar fashion to other subjects in school, where everyone did the same things and variety was limited. It was also perceived that everyone had the same targets to achieve, irrespective of ability or experience (e.g. run the entire 1500m in cross-country) ³.

¹3: K Lack of choice I think. You had to do hockey in the winter and you had to do I can't remember what it was in the summer. You don't get much choice you just have to do what they tell you. So if you don't like hockey and you're not really going to get into it (FG4, preparer).

²3: JP Being out in the cold when it's muddy

4: M You were forced to do sports you might not pick necessarily.

5: JP Yeah.

6: K Cross country and things like that (FG5).

³9: R I didn't like the way it was so compulsory. We just didn't have a choice, like we used to go cross-country running, which was torturous because I am like an asthmatic person, so I would just like breakdown half way through... I didn't necessarily have an attack, it was just a real big hassle for me, and I just didn't have a choice, well I was made to feel that way if I wasn't doing it, so it did my head in (FG8)

Physical education/good experience/self-directed physical education

This theme refers includes data about being given an option of what activities you could participate in during your physical education class. For some individuals this choice was limited, however it still led to feelings of empowerment and it influenced the memories of physical education positively.

¹ 15: J When I got older at school they let you choose what you did for physical education, like you could choose either you know if you were good at hockey, you played hockey, or you could do dancing or you could do, there was a whole variety of things they you could do, and that made it a bit better because you weren't stuck doing sporty things you were completely rubbish at, and totally hated so you had a degree of choice and that was a bit better (FG3)

² 5: S We had quite a few things but they would divide the term up into modules or whatever and it would be different things to do so that you pretty much had at least one that you didn't mind as much you know. (FG4)

³ 7: H They gave us a choice when we were at school which was quite good and gave us a list in a group and [you picked] which ones you would prefer and a show of hands or whatever, you did that, and so we generally got to do what we liked but it was limited and I liked badminton and tennis and maybe sometimes go swimming and... (FG6)

Positive Experience/Priority

PA is not a priority as time, due to course work is of paramount importance. For others physical activity at this stage of their lives was too much hassle, and they could not be bothered. They do not see the relevance (they don't need to lose weight for example) or the rationale (why torture yourself?). Physical activity was

not a leisure pursuit. It was a means to an end, an end which was not legitimate at this point in time for this age group. 'When I was in school I used to do loads of sport, and now I just can not stand to move, from anywhere like in front of the TV, it's like, it's too much hassle and it is nothing to do with the way I was taught, it is just that I can not be bothered anymore. Because it is like right I have done that stage, I have done the healthy thing and I don't want to anymore' (FG7, 35)

Transition/Priorities

Once the exams were over it was just celebrating and partying, being on holiday and just relaxing after all the stress. It was also novel to have nothing to worry about, and no one telling you what to do, so nothing was done. Some individuals took up summer work and this led to time pressure, which left them with little energy and got them out of the *habit* of exercising¹. The motivation to become involved in physical activity during the transition from school to university includes having more time to choose to get involved if you want to, and being able to select something you enjoy. Establishing a routine to help break a 'lazy habit', and if having a reason for becoming active - something to aim. Exercise can be a way of helping you to stay thin, become more healthy and to counteract any bad habits (e.g. smoking) that you might have. When individuals had the option to choose whether to be active or not, some chose not to. There were no benefits to being active that were relevant to them 'the only reason I think most people do exercise is to try and keep thin' (FG4, 105). Exercise was associated with being slim or being healthy and unless you needed to lose weight or get healthy why would you think about it? There was no link between exercise and leisure activities.

¹ 54: K I left school, and I had a year out kind of a thing, and I ended up working so basically I didn't have much time or energy left after that, especially not to go and do a sport, and that kind of got me out of the habit of doing it (FG5).

Opportunities/Priority

At university there is an acknowledgement of the opportunities to be active are there, however 'the distractions are also there probably in some greater force' (FG9, 75). There is pressure for individuals to meet the academic requirements of their course, and also to bare the financial burden that accompanies being a student 'so it's either college work or else sleeping or else going out or a part-time job because the money is nice you know' (FG3, 103). An important aspect of university life is socialising and having a good time 'Last year I was there £5 in hand with the best intention and I thought two pints of larger, I think so. I didn't actually join. It just seemed that there were much more pressing [things] like getting drunk' (FG9, 74). Physical activity 'going to the gym' was perceived as a 'solitary activity' rather than having social benefits. It was acknowledged that being involved in sports would be more 'social' but due to low levels of self-efficacy for sport this was not a solution for the majority.

Opportunities/independence

Individuals pointed out that the University certainly could not be 'blamed' for them not exercising, as various opportunities were there 'the opportunity is there it is on a plate for you, you have to make the effort you know, you just don't bother' (FG4, 141). It was their choice not to exercise, exercise was not a priority and there was no pressure to conform. The language constantly referred back to the SRS should do this, or that 'I think you [SRS] should organise something like that within your course, em say not, or a wee bit like PE at school, but make it optional, if you made it optional then people would do it'. (FG5, 122).

Transition/Apathy

Being sedentary during the six months prior to entering University was attributed to *apathy*, being 'unenthusiastic about anything to do with activity' (FG3, 68), or 'having no willpower or no get up and go' (FG3, 79). There were few or no perceived benefits to exercising, and many barriers e.g. too tired, too much hassle, time demanding and there was a sense of wanting results without the effort. The intention to be active would be there, but the behaviour would not follow 'I will definitely go swimming today for half an hour and then I just don't bother' (FG5, 49). Physical activity was not a priority and unless you were the 'kind of person who was into doing exercise and going to specific things' you would not keep it up from school. It was 'a lot easier not to do exercise' (FG7, 83).

Sustain/Variety – options

In sustaining some level of activity there was a perception that it would always be difficult, therefore being able to vary the effort level required to sustain the activity was important 'maybe easing up a little bit' FG3, 165). For some it was perceived that sport or exercise were almost like arenas where individuals had to

'prove themselves', competition provided an opportunity to do this, if you felt you were not good then competition was a source of aggression, a frightening experience. This stemmed back to school memories. It was important that you could step outside of the purely competitive image¹. The ability to vary the activities you chose to participate in was also perceived as important to prevent boredom, however in choosing something new it was recommended that you chose something you were comfortable with². In a gym facility the concept of adding TV screens or putting computer games onto exercise machines was raised as a way of preventing boredom.

¹ 'I can't be doing with that [competition] side of it, I was going to be doing something it would be just for the exercise and get on with it without having to have that attached' (FG4, 277).

² 'If you are doing a certain sport for a while you might get bored of it, you have got to start to take up something else, and then you would have the same problem of not really knowing what to do (FG5, 183).

MEMO

- An implied sense of freedom that was absent in previous theme. Hence control and choice combine to form autonomy.

Second level theme = Perceived Competence

This theme has two levels – low or high. It refers to how individuals perceive their skill level for carrying out specific tasks e.g. physical activity. Individuals with low levels of perceived competence were not as likely to take part, or as likely to enjoy activity as individuals who had high levels. The idea of being a spectator orientated activity meant that for some the dominant motivation was not driven by the need to show others 'how good you were'; rather it was to conceal from everyone how ineffective and 'bad' you were at physical education. Individuals did not have, and did not appear to be encouraged to have a positive self-evaluation of their physical ability; there was little sense of achievement and hence perceived competence was very low.

First level themes from which the concept PERCEIVED COMPETENCE emerged.

Positive Experiences/Primary Vs Secondary school memories

Good experiences in physical activity outside of the physical education class were remembered as being in primary school 'at primary I really loved sports and then I got to secondary school' (FG4, 55). Here individuals remembered themselves as competent sports people 'In my primary school I was the best one I used to swim, and I got bronze, silver and gold' (FG3, 53). Once you moved to secondary school experiences of being bad at sports became apparent and 'you lose the mentality of wanting to go out there and do it' (FG3, 57). In first year, a lot of the activity is new, but by second year the activity becomes more competitive, and phases of doing OK are not as common. Individuals start to get embarrassed by their lack of ability.

Physical education/bad experience/social comparison

Social *comparison* (between pupils and their peers) is part of the psychological development of the adolescent as they search for their role identity (Erickson, 1966). In the physical education class this identity can be placed under threat, as the pupil who knows that he/she is not very good at sport (through previous failed participation attempts in relation to their very talented peers), is forced again and again to show how bad they are at a sport. This leads to a lack of confidence in individual ability (*perceived competence*), fear of failure (as you constantly fail to achieve even the simplest of tasks), intimidation (by

your team-mates) and a public display of humiliation and embarrassment as yet again you fail to achieve the required standard.

“The thing about sports in school is that they are really explicitly competitive, so if you are really not good, it’s really obvious to everyone else, whereas exams and things, people don’t know what your marks are, and if you have done badly you are not embarrassed because people don’t know, but if you are on the hockey team and you are the worst player it is easy for people to single you out as being the worst.” (FG7, 24, N)

For girls this can be even more acute as they have to overcome gender differences, with boys thinking they are automatically better than girls, and they have the onset of puberty to contend with. ‘We had basketball with the boys in school, but sometimes the boys would just laugh at us, we feel very stupid, not good at technique, especially if we have to pass the ball, we can’t pass, they just laugh at us’ (FG1).

Opportunities/Facilities/Social comparison

Getting involved in individual activities like going for a swim posed a more acceptable solution ‘Actually walking in and just going to the swimming pool or the gym or something like that, that is something I do... something I find really easy because you just like swipe your card and just walk in, get changed and do what you want’ (FG8, 89). The notion of ‘*constant comparison*’ which was evident in physical education is evident in the language here. It is almost like a ‘paranoia’ in that everyone is observing and making comparisons. This was obvious even in the architecture of the building in that you could be ‘watched’ when you were in the pool or doing popmo. ‘The popmo places, the people in the gym can watch you which I hate. I don’t think it is a good idea because you are self conscious enough as it is when your prancing around doing some exercise you don’t want someone staring down at you’ (FG4, 137).

This comparison was also apparent in the CV suite where ‘fit’ people were perceived to exercise for twice as long and twice as hard as you were. The muscle-conditioning suite [gym] posed a greater problem as it was for some a completely alien environment. ‘I have never set foot in the gym, I’m too scared to go anywhere near it’ (FG4, 133). Individuals remembered their experiences as feeling self-conscious, embarrassed and unable to use the equipment ‘They have hardly any music, so you go in and it’s really silent, and it’s all blokes and you pick up a little dumbbell and I feel really silly and really self-conscious’ (FG7, 97). It was a place where you had to look the part and dress the part ‘everyone was totally laughing... we didn’t have the proper trainers’ (FG7, 101).

Opportunities/Facilities/Intimidating

Those who are sedentary when they come to university, even though they describe the opportunities to become active as excellent, the concept of joining a club was incomprehensible. The perceived standard of ability was too intimidating, and you would either have to be very confident in your ability, or very enthusiastic to ‘pluck up the courage to turn up’ (FG6, 85). ‘I think you would feel very intimidated even if you don’t know anyone, you don’t know what level they are going to be at, and you think ah, you know I will probably make a fool of myself or whatever’ (FG5, 120). There was also an accepted protocol that had to be followed, even though training might not be ‘that hard, it seems kind of hard, like joining up, and then going up and knowing nobody’ (FG8, 89). These were barriers that individuals found difficult.

Positive Experience/ Competence

Being made to feel that you could achieve something was positive. It led to increased enjoyment, motivation and adherence. This experience was remembered positively many years after the activity^{1,2}.

¹ 36: N I used to love playing tennis and I got really good at it in Cyprus but I was really young. It was like from 9-13 that I was playing that and she was a really good coach and she kept on encouraging me and telling me that I should have dreams for the future and all this and then we left Cyprus and I quit tennis and never played it again in my life but when I was playing I really enjoyed that it was really good.

What do you think made it so positive

38: N It was something that I enjoyed doing. I could see that I was good at it and like I heard from my coach she was also pleased with my sort of the way I played positive feedback I suppose. It’s good hearing that you do things well even if you don’t. I mean it sort of encourages you to try harder. (FG3)

² 45: A I did marshal arts for a few years when I was in em, secondary school, I think the main reason for that was you see all these guys doing mad kicks on TV, and I thought why don’t I do that. And it was good, it got me started, it was good, I really enjoyed that, and I used to look forward to it, I used to go twice a week, and I used to really look forward to going, and we used to jump about and stuff, so it was quite good.

What do you think made it good?

47: A Eh, it was because it was something I really wanted to learn to do and I enjoyed the feeling of knowing I suppose that I could do it. You know, knowing I had got a kick right or whatever and I knew, that this and I would be practising and all that. That's something I really enjoyed. (FG8)

Opportunities/Lack of competence

In university as your previous experience has been in sport in PE then the most likely thing to try is sports that you enjoyed in school. All the clubs say 'everyone welcome' but 'technically there is a wee bit of you're either brilliant at it or you've been here for years' FG3, 39. If prior to coming to uni. you were active then the accepted view was that you would probably be involved in things now, continuing habit. However, if you had lost interest in sport 'it makes you feel bad when you do really badly in something and you think oh I won't bother then, and that's it.' FG4, 59. Prior to coming to uni and you 'don't think of myself as a sporty person' then there was little support for beginners. The alternative option to sport is the recreational facility, this has lots of technical machines that need to be tried, this has the sense of isolation in that 'I don't want to stand in the middle of all those crazy gym people, plugging at things you know, me trying to work them out' FG3, 52. This can be a barrier as individuals perceive that 'everyone else knows how to work the machines and I don't, I feel silly because I can't work the machines' FG6, 55. There is a perceived differentiation between them and us. Them refers to the active, competent individuals, us refers to the inactive, incompetent individuals.

23: LO Pain is Negative. I suppose like em achieving something makes it positive. If you're really not good at something you really don't want to be doing something and you fail at it if you like. It makes you feel bad if you're P.E. teacher or whatever says negatively 'oh come on you can do it' and you say I can't leave me alone. If you feel you've achieved something then it is a good feeling. (FG6)

Positive Experience/Knowledge base

An inadequate knowledge base can present a barrier to becoming involved in physical activity e.g. not knowing how to work the machines in the gym. Alternatively not knowing what exercises to do to get the right results and to prevent injury. Although individuals being informed of what to do does not immediately mean that they will choose to become involved.

52: E I don't know how to work half the machine weights - I would love to do them and stuff but I don't know how they work. I'm not stupid I would probably figure them out but I don't want to stand in the middle of all these crazy gym people, plugging at things you know, me trying to work them out. (FG3)

Opportunities/Knowledge Base

There was a lack of knowledge on how use the equipment that was in the SRS, this provided a barrier to exercise, and it heightened the idea that you would be laughed at if you made a mistake. There was also a sense of never having used a gym before so everything for knowing how to use the lockers right up to which class to go to, or where to get information presented a challenge to the individual to get the answers. It also presented a threat to their self-efficacy.

93: N It's a bit scary, because the first time I went I went on the step machine and there were two men on either side of me, on the steps, and I didn't know how to work it and I couldn't get the steps to go down, and I was practically jumping on the steps, and they wouldn't move, and I had been on steps before and it hadn't been a problem, like I don't know, I just couldn't, my weight wouldn't make it go down. And there was one guy, in his forties and he was laughing at me, and there was another huge guy on the other steps, and I just had to leave, no, I am letting those men laugh at me. (FG7)

MEMO

No development of either perceived confidence or knowledge base in school. This was especially evident for using leisure facilities, or exercising rather than playing sport. Perceived competence appears to be a retrospective theme to these individuals, their concept of how competent they are has been derived from past experiences. This implies that self-efficacy is the prospective element of perceived competence, as individuals do not know if they are good at aerobics or not, as they have not experienced it. But their believe

in their ability to carry out the activity is built out of their past experience, and current level of confidence. How self-efficacy can be influenced positively is outlined by Bandura (1977).

Second level theme = Self-efficacy

This theme has two levels –high or low- and two sub-categories – self-confidence and self-efficacy. The self-confidence theme refers to how an individual's sense of general self-confidence is challenged when they enter university. The importance of making the right impression on your peers during the initial months in university can be quite intimidating. The second part is similar to perceived competence but it is not to do with the skills one has, but with your individual judgement of what you can do with whatever skills you possess, if you think you can succeed then there is more chance that you will take part.

First level themes from which the concept SELF-EFFICACY emerged.

Self-efficacy

If participants felt confident in their ability to exercise then they were more likely to get involved than if they did not feel confident¹. This concept is referred to as exercise self-efficacy. Most references to physical activity in the focus groups involved either sport experiences, or structured exercise classes e.g. aerobics. For those who were not regularly active, or who did not perceive themselves as 'athletic' (FG7, 122, contemplator), beginning something new like 'doing fitness things' (FG7, 148, precontemplator) during this transition required a lot of confidence in your ability². Access was an issue as it was perceived that others could dictate if you were allowed to enter the organised physical activity scene, that is the 'sports building'³. There was also a perceived lack of belonging to this 'scene', as the concept of differentiation became evident⁴. The potential fear of making a fool of yourself⁵ and consequently ruining your chances of fitting in⁶ to the University environment all contributed to negative influences, and these limited the perceived enjoyment that could be derived from exercise or sport. A vicious circle was established, in that in order to begin activity you needed to believe in your own competence, you needed to know you could do it without making a fool of yourself. However it was felt that this confidence could only be gained by having positive experiences of physical activity, having tried it and succeeded.

For individuals who were regularly active, the feeling that being active could boost your confidence was mentioned, as 'you are pleased with yourself that you've motivated yourself and disciplined yourself, that's when I feel confident about things' (FG3, actioner). There was not the same fear about taking part and making a fool of yourself because you could not do something, or to the same extent as the previous group about how you looked when you exercised. However, exercise was perceived to take part in an 'arena' type setting with 'spectators' (FG6, actioner) and 'audiences' (FG6, maintainer), and individuals did feel less confident in some exercise arenas than others. This limited their choice of things they felt happy to take part in. In order to go into what they perceived as a fit environment –weights room, or some aerobics classes- where it was visually obvious if you could not keep up with everyone else you needed a lot of confidence⁷. Even though these individuals were in the regularly active stages of change, they felt that they were still unfit⁸. They tended to rely on 'constant comparison' as they constantly compared how unfit they were in relation to everyone else. Being unfit was perceived as a 'bad thing and everyone disapproves and everyone knows they should be fit and healthy' (FG6, 182, maintainer). They rarely remembered situations in which someone was as unfit as they were, unless this individual was their friend.

¹ 105: K Yeah, definitely, if you feel you can't do something [sport] then you tend not to go and do it (actioner).

106: JP Or if you think you are going to do something badly then what is the point of going and trying it? (preparer)

107: M You would just make a fool out of yourself. There is a lot of image with sport, you know our age image is a big thing, (actioner)

108: K Nobody wants to look bad.

- 109: M You wouldn't mind if you just looked OK, but nobody wants to make a total arse of themselves.
- 110: JP But on the other hand if you are very, very good, then you will want to go along and show off.
- 111: ALL Yeah. (FG5)
- ² 145: A Not afraid, well if you don't do exercise not afraid to start doing it, not afraid to walk into a room with people who are all toned, not caring about the flabby bits (FG7, contemplator).
- 150: R Yep, you don't want to start anything that you think people are going to be looking at you at, so you have got to have some sort of confidence to start off. You can kind of say, well I don't care what you think... (contemplator)
- 151: JO Yeah I mean there is the point that you have got to be confident when you have got to walk out into a hall or something with a pair of shorts on, and you have wee skinny legs, fat legs or something like that, if you are that conscientious, (contemplator)
- 152: G Or even out into the swimming pool, just with a pair of shorts on or something like that. (contemplator)
- ³ 159: K There is the first step to get in. You kind of have to have confidence to go 'please can I join' and stuff like that, and you kind of get all like hairs on the back of your neck that they are going to say 'I'm afraid not' eh when you walk up (FG8, preparer).
- ⁴ 184: K Just that there is always people in lycra always looking perfect and muscled and I just think ugh and compared to them and you feel out of place so in some way that is sort of confidence (FG4, preparer).
- ⁵ 170: A I think it is all about image, and not wanting to make a fool of yourself in front of anybody else. And it is more so at our age, we are a really bad age group for that, it is so much easier not to do sport and to try and retain a bit of image than to go to a sport and make a fool of yourself, and have people laugh at you. (FG5, preparer)
- ⁶ 150: A It's all quite intimidating, and like going into the sports building as well, you don't want to put a foot wrong, especially in first year like if someone says do you want to join us for a game of football, and even though you know this guy is your friend you might not know the other people you are playing with, and they might be good. And you think if I go along and I am not good enough he is going to reject me, things like that (FG9, contemplator).
- ⁷ Quotes by female focus group participants
- 177: A Well I don't have the confidence to go to the gym or anything you have to be superfit in there so once I'm perhaps a little bit fit I'll go in there... I think it's confidence to use the equipment in the gym...like it'll be for arms and I'm using it for legs or something and I'll feel really silly and that.
- 178: H The room with the weights as well. It's quite scary.
- 179: LA I booked in a consultation actually to go there, I had to get shown how to use this, I had to cancel it because of exams. I don't think I ever went in because I didn't know what to do (FG6, actioner).
- Quotes by male focus group participants
- A I think it depends on what you are doing, really and how you feel about it. Because sometimes me and a friend go up to the kind of weights room and we walk up to the bench, and there'd be big guys with the massive weights on either side, and we'd take them off and put a couple of small weights on and start up and that. And it can, I suppose sometimes it can affect you, like a friend of mine stopped because he felt that although jokingly he said it 'I think they are all laughing at me' whereas to some extent he did feel embarrassed that he was doing really small weights, and he just really stopped. Then I just fell back as well because I didn't have anybody to do it with (FG8, preparer).
- ⁸ 119: A I don't think it is confidence especially by the way you look I don't know sometimes you just feel that if you can conquer the gym and you can conquer anything' (FG3, actioner). .
- 182: ... you just feel so bad that you wouldn't want to go again because you're just not good enough to be there...Gym is for fit people, it's not for people getting fit' (FG6, 182, maintainer).

Self-confidence

The participants in all groups felt that confidence was important. In university the initial years were described as intimidating, as you change from attending a small school to attending a massive university; where everything is different, you don't know anyone and you are expected to know what to do¹. In order to survive this transition priorities were identified. You had to make some friends and you had to establish your 'street credibility' (FG1). In this process confidence was described as 'a sort of self-belief' (FG5, 147, preparer), an individual had a secure sense of who they were and this was impervious to what

other people thought of them. 'I suppose kind of happy with yourself, not intimidated by other things' (FG7, 144, precontemplator). Confidence was also seen as an important contributor not only to individual happiness, but also to helping you to get over obstacles in general, and to be the 'kind of person you want to be' (FG8, contemplator). Individuals recognised that they may not be confident as 'sports people' but this did not mean that they were not confident in other aspects of life. An analysis of the examples that individuals referred to when they were talking about confidence revealed that sometimes they were actually talking about exercise self-efficacy².

¹ 149: [R7.1 M] It's like what I was saying first and second years are really conscious, and it's a big place when you first come (actioner)

150: [R7.1 A] Yeah, you want to fit in, and it's like there's a huge pressure on you in first year, just to like fit in and you don't want to put a foot wrong in case that ruins it for the rest of your university career. Later on you realise that it doesn't matter, but in first year you're really, really worried especially in the first month or so because you don't really know anyone and you are trying to make friends and stuff, and you don't want to put a foot wrong or say anything wrong' (FG5, preparer).

105: K Yeah, definitely, if you feel you can't do something [sport] then you tend not to go and do it (actioner).

106: JP Or if you think you are going to do something badly then what is the point of going and trying it? (preparer)

107: M You would just make a fool out of yourself. There is a lot of image with sport, you know our age image is a big thing, (actioner)

108: K Nobody wants to look bad.

109: M You wouldn't mind if you just looked OK, but nobody wants to make a total arse of themselves.

110: JP But on the other hand if you are very, very good, then you will want to go along and show off.

111: ALL Yeah. (FG5)

Self-efficacy/lack of achievement

There were very few examples given of exercise or sport that any of the participants felt they were good at. This sense of 'not being good' was perceived to have developed during school years in physical education and generally through not experiencing success in relation to physical activity. When playing sport individuals perceived that it was very obvious if you were good or not, if you scored or missed baskets in basketball, whether your team passed the ball to you or not, or whether you could keep up with the class¹⁰. Others could quickly recognise incompetence, and this lack of achievement was central to a lack of motivation to continue being involved. This led to feelings of incompetence, which implied unfitness, which destroyed any motivation that they might have had to either begin, or continue being active once under pressure to stop. For the majority of individuals adopting a physically active lifestyle, or being physically active was something to be endured and not enjoyed. For those who were not regularly active, it prevented them from changing, or made changing very difficult as fitness was always relative to everyone else 'You're convinced you're the least fit person in that room, and that you look terrible in a T-shirt, or your leggings' (FG7, 123, contemplator). For those who were already active it emphasised exercise as a competitive pastime in which people waited to see if you could keep up or not.

¹⁰ 113: V I think every sport has it's so called unspoken standards, just like basketball if you keep shooting the ball and it doesn't get in you know you're not good it's just as simple as that, when you see someone just getting it all the time you know they are good. It's just like football every time the ball comes to you someone else will take it away you know how good you are I think that sort of thing and when you are swimming you can see who swims so well and so smooth and you are trying to struggle up the water then you know (contemplator)

114: A Other people will tell you whether it be directly someone sort of saying 'ha, ha look at you' or like the fact in the school playgrounds when they are choosing teams and you are just last and thinking co-incidence! People let you know some way or another like they won't pass to you and stuff, or if your playing tennis and stuff they'll be like, hit the ball to X, he's useless (contemplator). (FG 10)

Second level theme = Sense of Self

This theme revolves around the idea that individuals who perceived themselves as untalented in physical activity also differentiated themselves from those who they thought were 'sporty'. This difference led to groups being formed. A combination of peer pressure, and feeling different yet wanting to belong all contributed to the individual establishing a consistent and coherent sense of self and consequently self-identity. This concept of differentiation and consequential identity development began in school, but continued on into university where labeling depending on activity status was perceived to exist.

First level themes from which the concept SENSE OF SELF emerged.

Physical education/bad experience/Isolation

Isolation is a common experience in PE for the individual who does not get 'the hang of' a particular activity (e.g. badminton). These individuals, both in a group or by themselves, are assigned a specific practice area (e.g. bottom of hall) and left alone, while the attention was given to the rest of the class.

9: C It was fun sometimes, cause I did it up to 5th year when you don't technically have to, but we got to do a lot of basketball, it was more just having a laugh and just running about, and that was a lot of fun. But then you would do things like badminton, and I just couldn't get the hang of it at all, so we were all grouped at the bottom, by ourselves, and they'd pay attention to everyone else kind of thing...it was not very nice (FG2).

Physical education/bad experience/gender

When a physical education class is segregated by gender the variety of activities that are offered to the class is limited, boys for example play football and girls play netball. This leads to both genders having decreased opportunities to participate in different activities, and to a decrease in enjoyment of the physical education class. The girls perceived that the boys thought they were better than they were, they felt that the boys laughed at their lack of technique or ability¹. However, if the girls could show that they were better than the boys that was perceived as very good, because of the 'amazement' the boys would go through². In a single gender physical education class boys felt they could relax more than in a mixed class, where boys felt they had to 'show off' in front of the girls.

¹ 3: Having to do it in gym pants,

14: Oh, yeah, those really short knickers,

15: like you'd say can we not just wear net ball skirts. No. Absolute nightmare, and then if they tried to do something interesting like basketball, the boys would think that they were absolutely brilliant, and that the girls knew absolutely nothing, and they'd just hog the whole thing.

² 3: J I hated being with the boys. I didn't like that at all. They were always pretending to be better than you are. It was good if you were better than them because that sort of encouraged you, which was good. I think they were just sort of amazed that a girl could be better than them sometimes (FG6).

Physical education/bad experience/favouritism

Due to the practical nature of physical education, the physical education class was one in which teachers could actively show favouritism^{1,2}. The pupils who were co-ordinated, talented and had achieved in sport (e.g. on school team, or competed for Scotland) were given the most attention and encouragement. The pupils who hated physical education, who were 'not on the team', or were 'uncoordinated' received no encouragement, and were made to feel like they didn't count. They perceived that the teachers did not like them, they were harsh or nasty because of their inability to play sport.

¹ 22: K There's favouritism to the ones that are in the teams, they get a lot of attention, if you are not in the teams you get made to feel a bit like you don't really count. (FG4)

23: S Yeah, they don't tend to encourage you if you're not good at a sport they will just kind of ignore you and be kind of harsh towards you or whatever because they don't like you very much if you're not good at sport. (FG4)

² 2: K Nightmare, ah! It was not a lot of fun, because you were kind of forced to do it until 6th year even if you were rotten at it, but it was kind of, yes it was always kind of, and the teacher's were always kind of, it was the only class in the school where the teachers could show favourites.

3: JO That happened to, our PE teacher was always showing favourites, and it's just so, yeah, kind of not very fun. You are always kind of last pick, or you are not very good at something, it becomes very apparent. It was the only class in the school where the teachers could show favourites (FG8).

Physical education/bad experience/teacher

The teacher who did not 'put an effort' into the class, who did not enthuse their classes, who were unprepared, or who chatted while the some of the class sat in the changing rooms and did not bother attending the class was perceived as a bad role model. Alternatively the physical education teacher who is very strict, where you would be 'barked at' or 'bullied' into things, and the class would be like a 'military operation'. A very negative atmosphere, where the message of 'even a 2 year old can do that' pervades, nobody would want to go to. Teachers (in general) need to create an element of the participants wanting to do the class rather than being forced to do the class.

I took physical education at school and tried to get out of it as much as I could because it was all – it made you feel bad if you weren't very co-ordinated or you couldn't do – I mean I'm really bad at most physical activity there is not very much I like to do but if I tried and I couldn't do it I felt that the physical education teachers at my school were like, you know they would look down on you and didn't give you any encouragement so I generally tried to get out of it as much as possible. I didn't like it, I didn't like it at all. (FG3)

¹ 21: S Physical education teachers at our school were always really strict though so it sort of put everybody off and nobody want to go to it you know because they were very strict (FG4)

Physical education/bad experience/differentiation

Physical education was a place for comparisons; it was open to the categorisation of groups of individuals. The groupings were also based on physical ability in sport "there were those who did not take it too 'seriously', and then there was the 'rugby squad'"¹. The 'untalented pupil' finding it easier to get into what was termed the 'lazy category', avoiding physical education and physical activity at all costs, while letting the enthusiastic sports people 'get on with it'. The wearing of a physical education uniform was perceived to lead to a 'them and us' scenario, a concept of differentiation. On one side, you had the 'Reebok or Adidas runners', or the nicely ironed physical education kit on the other side you had 'smelly, creased and rubbish kit'². Social determinants also contributed to differentiation, in that a lot of the games are played in teams, sometimes you had to play with someone you did not like. These forms of peer comparison were perceived to lead to a decreased enjoyment of, and/or participation in the physical education class and hence physical activity.

¹6: JA There are always kind of groups of people, you have like your friends who don't take it too seriously, then you have like the rugby squad, who run around in big?? Or something and think they are the best. But, it wasn't too bad.

7: G Yeah, you can always say that there are always people who are bad in one thing, like you were saying, but they would maybe beat the others at something else, who were so good at the previous things.

8: K I would relate maybe to that, but there was always people who were good at everything, and people who were bad at everything, and you know, em, I mean people who were maybe looking at changed in the middle and stuff like that, but they were still kinda the same people at the bottom who were ??????, but then they didn't take it really seriously, the people at the top were always too competitive, always ultra competitive, and the other people just really didn't care about it, and just kind of. (FG8)

² 26: E Like the trainers as well you know named trainers you know Reebok, or Adidas trainers. Mine were rubbish and I hated putting them on. Or your PE kit was all creased and that.

27: MOD How would they have really good P.E. kits?

28: E Well the parents would iron all the stuff for them and mine had been lying in this kit for a week. Smelly and creased and I thought these are wrecked. Pretension about it. (FG3)

Opportunities/Facilities/Differentiation

The concept of *differentiation*, initially mentioned in the PE question was evident when discussing using leisure facilities. In all the focus groups there was almost a stereotypical image of individuals who exercised

regularly¹, these were described as 'fitness freaks' (FG3,), 'lycra people' (FG4, 131), 'professional players' (FG5, 119), 'huh! Sport, huh! (FG7, 91), 'huge guys with muscles 'this big' and really skinny women who are just perfect and they will be laughing at me' (FG7, 105). Individual's perceived that these 'fit' people would see them as 'unfit (FG7, 101)...a total mess (FG7, 101)...really silly (FG7, 97)...being laughed at (FG7, 93)...a complete prat (FG8, 88)', although there may have been an element of transference* in this.

¹ 184: K Just that there is always people in lycra always looking perfect and muscled and I just think ugh and compared to them and you feel out of place so in some way that is sort of confidence (FG4, preparer).

Self-efficacy/Differentiation-belonging

There was a perceived lack of belonging to the sport 'scene', as the concept of differentiation became evident. The potential fear of making a fool of yourself¹ and consequently ruining your chances of fitting in² all contributed to negative influences, and these limited the perceived enjoyment that could be derived from exercise or sport. Exercise was also perceived to take part in an 'arena' type setting with 'spectators' (FG6, actioner) and 'audiences' (FG6, maintainer). This had a direct influence on their self-efficacy and limited their choice of things they felt happy to take part in.

¹ 170: A I think it is all about image, and not wanting to make a fool of yourself in front of anybody else. And it is more so at our age, we are a really bad age group for that, it is so much easier not to do sport and to try and retain a bit of image than to go to a sport and make a fool of yourself, and have people laugh at you. (FG5, preparer)

² 150: A It's all quite intimidating, and like going into the sports building as well, you don't want to put a foot wrong, especially in first year like if someone says do you want to join us for a game of football, and even though you know this guy is your friend you might not know the other people you are playing with, and they might be good. And you think if I go along and I am not good enough he is going to reject me, things like that (FG9, contemplator).

Positive experience/belonging

A good experience of involvement in physical activity revolved around being made to feel that you belonged, your were not a hindrance to a team for example, to feel completely part of the team socially and competence level. The physical activity involved in playing a sport becomes secondary to the social aspect of being involved, and there it is not perceived as a sport. The activity becomes fun in a social way and there is no compulsion to be involved, therefore motivation becomes intrinsic.

30: K In my first year I was in the netball team and that was great. If you were good and you were in with your friends and the team it's great fun it's just when you grow up that you get less interested and do worse that you start to feel (FG4)

Physical education/bad experience/avoidance

The idea that physical education is a subject that is not on an equal footing with other subjects (e.g. Maths, English) is evident "She was good at it (physical education), she was always a very talented, artistically, sports wise, music wise and was not into education at all...". Physical education was either discontinued in senior years on the school curriculum, or it was a subject that was easy to avoid. Physical education teachers were not perceived to check up on absences of pupils from their classes as often as other teachers might. To *avoid* a physical education lesson was often in the self-interest of the individual concerned. It provided opportunities to relax (e.g. to sit and chat to your mates), to be defiant of the school system (e.g. to sneak out for a smoke, or avoid getting caught out), and/or to prevent humiliation (looking stupid etc.). This is unlike an academic subject, where there might be work to catch up on the next day, thus involving some form of penalty for missing the class.

54: S I didn't like physical education either at all and avoided and skived off an awful lot of physical education because [some people] skive maths and would go to physical education, I would skive physical education and go to maths just because if you weren't good at it it is the sort of thing you would be sort of like you would feel really stupid and feel humiliated at it. It was really obvious when you weren't good at it when everyone else was doing the hurdles and you couldn't do the hurdles and it was like a big NEON light on your head saying I cannot do hurdles (FG6).

Physical education/bad experience/peer pressure

For this group in physical education class, the *peer pressure* was not to participate, as you could easily get out of the class (no gear, felt sick, period pains etc.). By participating (irrespective of talent level) you were labeled as a 'physical education girl', highlighting that you were in a completely different category to those in your class who did not participate. Identification with the group of non-participants involved bribery, and friendship, as others backed you up on your excuse to get out of the class.

20: There was so many people that didn't do it, that you were considered enthusiastic if you actually brought your stuff, especially the girls, like the girls would all say ah, sir I feel sick or if it's a guy I have period pains so I can't do it, or they'd chew up crisps and chuck them at the floor and say sir I've been sick. Whatever, so if you actually participated, you were awfully know even if you were rubbish at it, they'd say, oh yeah, you're a PE girl because you were actually doing it. (FG2)

MEMO

- *Transference implies that this is how the individual sees themselves, but rather than admit it, they say that others say refer to them in that way?
- There was a sense of a self-fulfilling prophecy when the physical education class divided itself into categories, if you identified with a group who perceived that they were not sporty then the likelihood was that you would fulfill this image.

Second level theme = Social Behaviour

This theme is made up of four sub-categories namely encouragement, support, active normalisation and inactive normalisation. Friends and significant others (e.g. teachers, coaches, parents) were referred to frequently as being a source of encouragement to change a behaviour, this was usually through them believing that you could do it. They were also a source of support in that they provided vicarious experience, they helped you to adhere to an exercise regime, they exercised with you etc. Friends for these individuals also provided important information on what was the perceived social norm. This norm could either condone or reject the concept of a physically active lifestyle as socially acceptable. All of these categories interact to form a dominant social climate, which individuals who are involved in a transitional period in their lives identify with, and consequently condone or reject activity.

First level themes from which the concept SOCIAL BEHAVIOUR emerged.Positive Experiences/Friends/Encouragement

Friends can encourage the adoption of a physically active lifestyle for someone who has lapsed. They can encourage flat-mates to take part in structured exercise like popmo classes. They can be a role model 'it encourages you a bit more, you've seen that they've made time, and you think if they can do it so can I' FG6, 55. They can also be a source of increasing exercise self-efficacy in that 'my flat mate is bad at it [roller-blading] as well, it is actually really good exercise, but it's a good laugh, and because we are both bad at it there is no kind of embarrassment factor' FG7, 50. Other common factors for *good experiences* included being encouraged by a significant other (coach, teacher, parent), being made feel you were good, and that you could do it '[Marshall Arts] It was something I really wanted to learn to do and I enjoyed the feeling of know I suppose that I could do it' (FG8, 47). Being able to do things by yourself with no one around to laugh at you.

46: Y I suppose it was recently we started exercising again because I thought people will laugh at me and I didn't do anything till this year again because it was just I thought will people laugh at me I'm not any good at this, why should I bother I've not been good at it before. The only thing that I enjoyed was swimming. I'm still a bit overweight. I recently lost a lot of weight and I wouldn't have gone in a pool in a swimming costume or anything. It's friends that encouraged me to go back and I'm so glad I did because I really enjoy it now but not beforehand. (FG3)

203: G Yeah, cause in our flat, I live in a flat with 12 other people and it was definitely this one girl who had got a whole group of us going, because she worked in a hotel where they had a gym, and she'd really gotten into it, and she would just go and drag a lot of us along. And that's how, well now 3 or 4 of us go, on and off, regularly, but it's through her, we probably wouldn't have gone, if it hadn't have been that she took us, showed us everything. Rather than having to go to a stranger and do it, that was quite good. (FG2)

Positive Experiences/Significant Others

A really good coach will encourage the individual no matter what level of ability. This can be achieved through positive reinforcement, and can lead to a self-fulfilling prophecy where the encouragement makes the individual try harder¹. Active parents were also important as from this individuals increased their experience of physical activity, this was remembered as positive².

¹36: N I used to love playing tennis and I got really good at it in Cyprus but I was really young. It was like from 9-13 that I was playing that and she was a really good coach and she kept on encouraging me and telling me that I should have dreams for the future and all this and then we left Cyprus and I quit tennis and never played it again in my life but when I was playing I really enjoyed that it was really good.

37: What do you think made it so positive?

38: N It was something that I enjoyed doing. I could see that I was good at it and like I heard from my coach she was also pleased with my sort of the way I played positive feedback I suppose. It's good hearing that you do things well even if you don't. I mean it sort of encourages you to try harder.

²191: A Parents are quite an influencing factor, if you have a brother or sister that is heavily involved in a sport, and you aspire to be like them, and you think well it's in the blood, then maybe I have potential as well. So if they are continuing and they are older than you, and you've seen them make the transition and they are still doing physical fitness at university, then I think it does help, like my brother played hockey all the way through school, all the way through uni. and didn't lapse for any period of time. That made me think I am not going to be a slacker, I am going to try and follow his example. (FG1).

Positive Experiences/Friends/Social Support

Friends can provide social support in two ways, they can be a source or encouragement, and they can also be a source of normalisation of physical activity.

Positive Experiences/Friends/Normalisation (or social liberation)

The notion of exercise being a 'social thing' implies that it is not even thought of as a sport FG3, 43. The concept that a friend can help to make participation normal, this can be achieved through the prevention of embarrassment, they are someone to have a laugh with, someone you can talk to, and someone who can dissolve the tension of going into an exercise situation e.g. a step aerobics class. It is not really too serious, it is competition in a fun way. Participation can then move from an external motivation of doing it to 'get fit' FG4, 71, to an internal motivation 'I just went and I quite enjoyed it'. The atmosphere when exercising with friends is better, this is in contrast to exercising in school where people 'laughing at you because you can't do it right, or if you are doing it right and some of the guys are saying your good, the lassies are saying we hate you because you are good at it'. Your friends would all be of a similar level of experience and competence and therefore they would embarrass themselves as much as you would 'Ice-skating, cause everybody falls over and you just laugh at one another' (FG5, 57).

Basically talking about the process of change social liberation, where physical activity (or in this case sport or structured activity) is a natural, it is something that not everyone is elite at, it is part of your social life as well as being enjoyable. There is no link between playing sport and recreational pursuit.

Positive Experiences/Friends/Social Undermining

Friends can also be a source of demotivation as peer pressure may be to 'start smoking and drinking and to stop doing sports' FG3, 48. Also sharing a flat with others at Uni. they may be very active or lazy.

Transition/Friends

Friends influence whether an individual participates in an active lifestyle or not once they leave school. Friends can be a source of motivation to become involved in activity in that they provide an opportunity for social liberation (see key question 2). They can also provide encouragement to become involved, but they need to be around the same level as yourself. However if your friends are not active then they can act as demotivators to becoming involved. A perceived benefit of physical activity is that you can 'enjoy the friendship by playing sports together' (FG9, 60).

Opportunities/Friends

Friends increased the awareness of how good the facilities were at the University of Glasgow as they remarked at the opportunities here in relation to other universities. Social support for exercise was also found among departments in the university as they condoned exercise through organising opportunities for students to become involved. Friends provided encouragement to exercise, and we a motivation to stick to an exercise routine 'I have just started doing the bronze medallion... I do it with a friend and she keeps making me go because I keep thinking no I can't go, I'll give up, I'll never pass it, because I've never been one for sports, she says no you have to go I'm not going by myself so she makes me go in the end' (FG4, 124). The intimidation of going into a 'professional' situation is lessened if 'you go with a couple of friends, if you know they are at the same level as you, you wouldn't feel bad going along' (FG5, 120). However, it is important that your friends are around the same level of fitness as you. Exercise also provides an opportunity to 'socialise in a different field' (FG5, 122) if you go with friends from your course.

119: JP I think you would be put off, you would think like they are all very professional players would be going along.

120: A Yeah I think you would feel very intimidated, even if you don't know anyone, so you don't know what level they are going to be at, and you think ah, you know, I will probably make a fool of myself or whatever. But if you go along with a couple of friends or whatever, if you know they are at the same level as you, you wouldn't feel bad going along. (FG5)

Self-efficacy/Friends

Friends were identified as an important source of increasing individual confidence, they could make the task less 'daunting' (FG7, 140, contemplator). Provided they were around your level and you felt comfortable in their company then they could be a source of encouragement and social liberation¹¹. In order to facilitate an increased self-efficacy at university among unconfident individuals it was recommended that the level required for participation in sporting activities needed to be widened to include beginners, intermediate and advanced¹². Individual autonomy to be able to choose which level you want to participate at was also stressed as important. It was perceived that if the standard was advertised as low then more beginners would be encouraged to go 'They should put up a sign saying football for crap footballers' (FG5, 134, preparer).

¹¹ **173:** Once you have made friends and that, you know that if you make a mistake they are not going to laugh at you' (FG9, contemplator).

Do you think confidence is important?

132: M Yeah. I think so, especially when you are just getting into it, definitely. Especially if you are going on your own. Like what XXX was saying if you are with a group of friends then you kind of feel more confident, because then you can support each other, but if you are on your own it is a lot harder to get into it in the first place (FG5, actioner).

¹² **115: V** If I'm playing a game with others and we are learning together, I think I don't mind. Like if I'm playing rugby with Sam now, I wouldn't want to, because I know he is an expert in it, it is important, so I would join a tennis club, and I know that everyone is learning tennis then I would, it has quite an influence. (FG9)

140: A You could have one starting session where you go along, and you could have a coach there who is in that field. And he will put you in different groups you know the intermediate, beginner, expert, whatever, therefore you are in maybe with other people you don't know, I think a lot of it is just people who are intimidated going along to these things, because they don't know how they fare against other people and it's difficult to put yourself into how good you think you are...

141: M Even if there was something like beginner, intermediate and each phase groups and you could just go along and put yourself in one group.

142: K Aye, like the swimming pools have different times, that kind of thing ??? I think it would encourage more people to go.

Do you think it would work for university students?

144: M I think definitely it would work, especially for first and second year students. Because when you come up to uni. a lot of the time you have not got as much confidence, when you get older you do get more confident in what you do, so if you feel more confident and you could maybe join different level groups and you would be more inclined to go.

Football provides you with an alternative opportunity to socialise with friends without having to go to the pub. There was a lack of social opportunities with exercise mentioned by women, as you were either part of a formal club that was identified as social, or alternatively you exercised in the SRS. This was not identified as being a social activity

152: Right, a lot of your experiences are centered on football, would that be right?

] Yes.

[R7.1 K] Yeah, football is kind of a general sport that most guys especially play when they are younger, like you go down to the park and have a kick around sort of thing. It is continued on at school, and in most schools I would say it is the most kind of popular sport, amongst guys anyway.

[R7.1 P] It's cheap as well. Like if you ever wanted to go cycling you would need a bike, but football you just get a football and that's it.

[R7.1 M] You can also play anywhere as well, all you need is a kind of open space, and a few jumpers.

Is that a good thing or a bad thing that there seems to be quite a lot of emphasis put on it?

[R7.1 JP] It's good if you are good at football, but it would be better if there was more variety of sports.

[R7.1 M] But if you didn't like football it would be quite hard.

[R7.1 K] Like I don't really like football, like I didn't play much at school, and I just not really grown up with football, but again if there's like a group of friends kicking a ball about it is still enjoyable with your friends even if I don't really like football, I still enjoy kicking a ball about with my friends. As long as it is not really good, otherwise I just stand watching basically. I think it is all got to do with enjoyment, and socialising, I mean everybody goes to the pub and just sits and talks, but this is a different form of socialising and I think that's why people like sports and things. (FG 5)

Second level theme = Image

This theme has four sub-categories namely physique anxiety, fashion and stereotypes. The physique anxiety implied the in order to take part in organised physical activity you had to expose your body to scrutiny of others. A fashionable image was important to this age group, as wearing the appropriate 'NIKE training shoes' rather than 'tatty gutties' while exercising was important. There was empathy with portrayals of 'the perfect body', but at the same time a sense of confusion. Stereotypical images of women having no muscles while men were muscled, and of regular exercisers being 'fitness freaks' or 'crazy gym people' were evident.

First level themes from which the concept IMAGE emerged.

Self-efficacy/ physique anxiety

In order to take part in organised physical activity you had to expose your body to scrutiny of others. This meant that in order to go swimming you had to go through a preparation routine of shaving your legs for example, and that you had to have confidence to expose 'wee skinny legs or fat legs' to the world. This concept applied equally to both male and female groups, although females perceived that it may only have been a 'girl's attitude'^{1,2}.

¹ Quotes from female focus group participants

122: S Well the confidence to get there, like first of all, putting your T-shirt on and your shorts on and all that and then, to be confident enough to walk in the room with all these athletic people, you know, which you're sure athletic! They are all probably feeling exactly the same as you are, but you know, em, and yeah. (contemplator)

123: C You're convinced you're the least fit person in that room. And that you look terrible in a T-shirt, or your leggings, or things like that it just...(contemplator)

124: S but that is a girl's attitude, I am sure boys don't feel the same way, or maybe they do and we don't know about it. (FG7)

² Quotes from male focus group participants

151: JO Yeah I mean there is the point that you have got to be confident when you have got to walk out into a hall or something with a pair of shorts on, and you have wee skinny legs, fat legs or something like that, if you are that conscientious, (contemplator)

152: G Or even out into the swimming pool, just with a pair of shorts on or something like that, (FG8, contemplator)

Self-efficacy/Fashion

Image was important to this age group, there was pressure to look good 'half the time you know uni's a fashion parade' (FG3, 115, contemplator), therefore wearing the correct 'NIKE training shoes' rather than 'tatty gutties' was important in upholding this image (FG8, 162, preparer).

Self-efficacy/stereotypes

Individuals who were not regularly active at the time of the focus groups appeared to have no exercise self-image. Among the female participants there was an empathy with the media stereotype of women having no muscles, and seeing yourself hot and sweaty in gym mirrors as you exercised was not a good image 'it is not a nice sight when you see yourself all hot and sweaty' (FG7, 138, precontemplator). There was however some confusion about a fit, toned body being 'absolutely amazing' but then 'she has got muscles on her bust, see you don't want that. That's a disadvantage' (FG7, 155, contemplator). For individuals who had become regularly active since the study began their self-image had changed 'I have actually no muscles, like my aim is to be able to do one press-up. I used to be quite proud of the fact that I actually didn't have any muscles, like I don't do exercise I don't need to. Pathetic' (FG6, actioner).

Opportunities/Facilities/Differentiation

In all the focus groups there was a stereotypical image of regular exercisers who were described as 'fitness freaks' (FG3), 'lycra people' (FG4, 131), 'professional players' (FG5, 119), 'huh! Sport, huh! (FG7, 91), 'huge guys with muscles 'this big' and really skinny women who are just perfect and they will be laughing at me' (FG7, 105). Individual's perceived that these 'fit' people would see them as 'unfit (FG7, 101)...a total mess (FG7, 101)...really silly (FG7, 97)...being laughed at (FG7, 93)...a complete prat (FG8, 88)'.

Second level theme = Habit formation

This theme identified the importance of past habit in establishing a familiarity with activity. If this experience was positive then respondents indicated that this increased the likelihood of present participation. School was a key influence on habit formation as participation increased the likelihood of present involvement, whereas as avoidance increased likelihood of nonparticipation.

First level themes from which the concept HABIT FORMATION emerged.

Positive Experience/ pattern of behaviour?

Experiences in school provided the impetus of where to begin, if you had not begun there 'then there's not a lot available to just get up and start to do it at a later age'. Alternatively you didn't have to look for something new as you had some idea of what it would be like due to past experience. Positive memories of activities led to present participation 'I did aerobics, cycling and stuff but I did that outside school because I didn't mind that much, and I am still doing it now (FG3, 68).

Not involved in school implies no 'discipline in your life' (FG6, 46). If you have avoided sport for years by saying I'm not doing it then it's harder to motivate yourself to get involved even if you want to. This happens as you get older and then 'Yeah, because I suddenly thought I don't of myself as a sporty person' (FG4,). Not being involved during school years leads to an attitude of 'I am really unfit' FG3, 45, this is a barrier to future involvement.

School gives you an idea of what you enjoy and what you don't. This can lead to a valuable lesson that you participate for fun 'I play to play', however where this is learned due to the fact there was 'no point in playing to win because you won't so if you are going to play now you just play to take part' (FG8, 59). Then the likelihood of participation once the individual has left school decreases. However, even though all students would have been involved in these sports in school, only those who were good at them were perceived to be the ones to carry on with them after school.

I think sports as well, if you don't get into it when you are younger, then it doesn't become a habit and it is so say just to say I'll ditch physical education today, and you do it again the next week. Which is what I did, I mean I played about the garden when I was a kid, but that is the only exercise I have ever done and I never went to physical education at school, never, I just I don't know how I got away with it actually, but I just didn't bother, I just don't do anything now. (FG7)

22: Q3] Do you think your experience of PE, influences how you participate now, or don't participate as the case may be?

23: A I think probably because when you are at school you tend to develop most of your habits, like you might get into a sport like football or volleyball or whatever, and I think you tend to carry that on when you leave school. But if you have not got in to it, then there's not a lot available to just get up and start to do it, at a later age.

...

27: M Yeah because you know if you get into a habit, then probably the chances are you will have joined a club or something outside school, so there would be a good opportunity to carry it on, and that. You don't have to look for something, to start up something new. (FG5)

Transition/No established behaviour pattern

During the final years in school the entire emphasis was on exams and study and not much time was given over to physical activity. If students had chosen not to participate in PE during their final years in school, then not having done any exercise led to apathy about beginning during the summer months. For those who had taken part in PE there was the notion of not being forced to do it during the summer 'because at school you were forced to do it' (FG4, 98), and therefore without this external motivation individuals lapsed into sedentary lifestyles. 'Without a doubt, sporting activities ceased about the same time as I left school, I don't know they just ground to a halt really. And I suppose I just haven't missed it too much or I would have went back to it ...' (FG8, 78).

Second level theme = Self evaluation

This theme is concerned with the fact that physical activity was not connected to a leisure pursuit and therefore the rationale for taking part was usually due to external motivation like losing weight, staying healthy etc. Unless the individual identified with these motivations there appeared to be little chance of influencing their behaviour. Even those who were regularly active found it difficult to verbalise why they were involved. For some it was a sense of guilt, for others because it was what they ought to do, while for some the perception that being sedentary was wrong, or bad was mentioned. Enjoyment, fun or

socialising were also mentioned, but experiences of these feelings in connection with physical activity were scarce.

First level themes from which the concept SELF-EVALUATION emerged.

Transition/ Physical activity not associated with leisure pursuit

There was no concept of physical activity as fun, as a *leisure pursuit* it was 'a chore' carried out by 'fitness freaks' (FG7, 78). Recreational activities that were fun, that were not competitive, and that were not team based were not considered physical activity 'I didn't consider it physical activity going swimming on the beach three times per week so that's why I [said I] wasn't involved in anything. I was lousy in the team sports so I wasn't in any team...it was a leisurely swim, it was not a fast sort of 100 meters thing' (FG3, 74-75). Physical activity was a means to an end 'I did a wee bit of exercise before I went skiing in the Easter holidays... and I was thinking I could carry this on next term, but I haven't got back into the routine' (FG7, 81).

Even though low cost 'good facilities' were provided in university the feeling was that 'Unless you actually do play sport your not, or are you? going to get fit for the sake of being fit' the motivation did not come from enjoyment but from achieving a goal or an aim 'because it is always much better to do something with an aim rather than just sort of keep yourself ticking over when you could actually go and do other things' (FG7, 64). Similarly the motivation to begin exercising can be various, however in order to continue there was a perceived need to be part of a team and this provided barriers. 'You feel guilty sometimes about not exercising for a long time, so you go cycling or swimming, but taking it further and getting involved in groups or something. I just could not be bothered' (FG8, 66). One individual remarked on his motivation to become involved stemming from an intrinsic sense of 'I fancy that today' (FG7, 65), however he highlighted that it would be different for serious, competitive people who were part of a team.

Transition/Priorities/Reason?

Once the exams were over it was just celebrating and partying, being on holiday and just relaxing after all the stress. It was also novel to have nothing to worry about, and no one telling you what to do, so nothing was done. Some individuals took up summer work and this led to time pressure, which left them with little energy and got them out of the habit of exercising. 'I left school, and I had a year out kind of a thing, and I ended up working so basically I didn't have much time or energy left after that, especially not to go and do a sport, and that kind of got me out of the habit of doing it' (FG5, 54). The motivation to become involved in physical activity during the transition from school to university includes having more time to choose to get involved if you want to, and being able to select something you enjoy. Establishing a routine to help break a 'lazy habit', and if having a reason for becoming active - something to aim. Exercise can be a way of helping you to stay thin, become more healthy and to counteract any bad habits (e.g. smoking) that you might have.

When individuals had the option to choose whether to be active or not, they chose not to. For some, there were no benefits to being active that were relevant to them 'the only reason I think most people do exercise is to try and keep thin' (FG4, 105). Exercise was associated with being slim or being healthy and unless you needed to lose weight or get healthy why would you think about it? There was no link between exercise and leisure activities.

Opportunities/worthwhile?

When exercise was completed there was a sense of achievement at having finished a class for example 'it feels really nice having finished the class' (FG3, 88). However the process of actually doing the exercise 'jumping up and down and thinking this is so exhausting' (FG3, 88) or 'prancing about' (FG4) was not perceived as enjoyable or possibly worthwhile effort.

Decisional balance/Pros Versus Cons

In general all focus group participants felt that it was important to be healthy and therefore in a 'long term... rational view' the advantages outweighed the disadvantages. However it was also felt that there was a difference between what happens in theory and on a practical level¹. In other words if everyone genuinely believed that then he or she should be 'fit', but from a pragmatic point of view, the practicalities of becoming involved can be too demanding³. For sedentary individuals it was highlighted that in order to answer this question you would have needed to experience physical activity in the recent past⁷. A perceived lack of knowledge of what to do in exercise settings, alternative priorities and the time required meant that

becoming involved in essentially a 'torturous' thing had more disadvantages than advantages. An individual's current exercise stage of change was reflected in their responses to this question⁴.

Even though advantages outweighed the disadvantages that did not mean that an individual would exercise. Among all individuals, but particularly those in the not regularly active category there was little or no perception of being able to lead an active lifestyle through doing everyday things like taking the stairs rather than the lift, even though individuals were knowledgeable that you could be active through for example actively commuting to university. The concept was constantly compared to sport or organised activity, and you had to 'get active' rather than be active⁵. Thus to have the motivation to get involved in exercise it was recommended that you do it because you enjoy it, as 'the gym' was boring, while participation in games though more interesting required a certain level of skill and commitment. In order to overcome these barriers to motivation finding a hobby that you enjoyed was suggested⁶.

¹ 201: [R7 K] We are standing here and we know everything that you have got to go through to get fit to go through all that torture I just think the disadvantages definitely outweigh the advantages. In the long term being rational about it you know the advantages are more but then you think I'm going to have to go to the gym and torture myself you think no, because if the advantages were so obvious then everyone would be fit so when people aren't... (FG4, preparer).

²Do you think the advantages outweigh the disadvantages, or vice versa?

182: All Yeah

183: R They probably do, yeah. (precontemplator)

184: F I think everybody knows you should be active because of your health and everything, but it's so much easier just to sit and watch telly. You know, and people our age, we have got better things to do than go to the gym. I mean, there's the pub, and whatever, you know. (FG7, contemplator)

³ 121: J Laziness, sitting in doing nothing, it is a lot easier to put it [exercise] to the back of your mind (actioner).

122: LO To make yourself do it you've got to organise yourself so that is sort of trouble in itself never mind actually doing the thing so. (FG6, preparer)

⁴ 89: M I think there are more advantages to being fit and healthy. (actioner)

90: P Probably at the start of exercising it is probably the other way around. But once you get into it, you realise the advantages are probably good. (precontemplator)

91: JP I think it is to a degree, I think there would be more disadvantages if I was being really committed to say athletics, then I think the disadvantages would outweigh the advantages, but if I just had a sort of hobby, and it wasn't taking up my entire life then that would be advantageous. (FG5, preparer)

⁵ 134: D Disadvantages outweigh the advantages because there is so much effort and time to go and get active (contemplator)

135: R I think you go to the question of need. How physically fit you need to be, presumably if you enjoy sport or something then fair enough but if you're not particularly fussed about enjoying sport or whatever. I mean none of us are particularly fat or anything none of us are overweight so we don't need to go and work out and loose weight or we don't need to have a bigger lung capacity to be able to run faster or longer or whatever. We are living in Glasgow you have got the buses and the tubes where the hell do you need to run to. (FG9, precontemplator)

⁶ 97: JP The disadvantages, it is just too tempting not to bother.(preparer)

98: A It's motivation I think is difficult as well, because if you don't particularly enjoy it, well then you know, you are not sort of getting motivation from it. You know I like sailing, but it's just because it is what I like, so that is motivation enough for me, so that's why I do it. (FG5, preparer)

⁷ 188: F For me, I can't really answer that, I don't do anything physical, so I don't. At this moment in time I would probably say that the disadvantages outweigh the advantages, but maybe when I get older, I'll see sense and start going to the gym, you never know. (FG7, contemplator)

⁸ 137: E I think it's really important to be healthy. I haven't actually tried very seriously to quit smoking, but I started smoking when I was about twelve right and that's quite a bit of time and I've got a problem sometimes sort of breathing you know you can't get a proper breath. So I'm certainly going to quit when I leave Uni because I don't think there is any chance of quitting while I'm at University you know, and I wish I was healthier in general sort of to counter act the smoking. Because I really like smoking that sort of thing and I wish I could do more physical exercise because I could sort of smoke and get away with it a wee bit more rather than smoking and doing no exercise and just you know being a wreck (FG3, contemplator).

Adopt/Rationale

For individuals who did not exercise when they entered the university and who were still inactive 18 months later there was no sense of enjoyment with physical activity. It was hard for them to comprehend how

someone could enjoy activity and there was no motivation to be active¹. Taking part in exercise somewhere you feel comfortable was important to help you to change e.g. at home.

¹ 237: [R8 S] I think it's hard to explain to somebody that doesn't exercise - it's really

238: [R8 R] You enjoy it so

239: [R8 S] It's really difficult to explain to people what it is like being totally lazy and not caring about exercise - it's quite difficult. If you are at the opposite end you just don't get it - the person at the other side you just don't get it.

240: [R8 R] I don't get you at all. (FG4)

²224: [R8 K] It's sort of difficult - it is if you don't care you just really don't care do you

225: [R8 K] I have slight worries about the health but it's still very very distant and it is a bit half hearted occasionally going to the gym.

226: [R8 L] I think it takes so long to see the effects as well. Like if you could see the effects more, like a week or so.

227: [R8 K] They say it gets easier everytime, but it takes such a long time for it to get easier. You think I won't be breathless next time I do it and you come back and you are just as bad. I don't know how I could ever get ???

228: [R8 S] Is this conversation depressing you? (FG4)

MEMO

- There appeared to be no reference to rationale for participation in school. This was especially evident for sedentary individuals. This might refer to the need for discussing why physical education is on the curriculum and how it can effect lifestyles for example. This was be necessary from year one until the final year in school as rationales will and should be encouraged to change according to developing skills and interests.

Second level theme = Level of Structure

The idea that unless the activity was structured and organised it did not count as physical activity was evident. Lifestyle activity was perceived as secondary to its actual purpose i.e. work, gardening, having missed the bus etc. This had implications for becoming involved.

First level themes from which the concept LEVEL of STRUCTURE emerged.

Transition, Decisional balance and Self-efficacy/Structured versus Active

The idea that unless the activity was *structured* and organised it did not count as physical activity was evident. This implied that for those who do not perceive themselves as 'exercisers', physical activity was something you had to go out of your way to do. This had the implication that in order to participate in sports you had to be good which takes a lot of dedication and effort. Individuals did not appear to be able to set themselves realistic targets, and physical activity had to be almost maximal before it was beneficial. For individuals who had participated in extra-curricular physical activity up until the left school if they perceived that they were not really any good they would not maintain the activity once the informal forum for participation ceased.

Any lifestyle activity was perceived as secondary to an actual purpose 'I don't do it on purpose, I'll walk somewhere or walk upstairs or run somewhere it's just I'm in a hurry or because I've missed the bus' (FG4, 89), 'I didn't do any physical activity. I had a full-time job though ...I was working in a hotel... I suppose that was physical activity at work but I didn't do any conscious for as long as I can remember really before I came to university' (FG6, 75). If the individual did not perceive themselves as 'wanting to go out and do active stuff' (FG8, 71), or if their work commitments implied that they did not 'have any time to do any organised sport, apart from walking' then maintaining a physically active lifestyle for them was described as 'difficult' (FG8, 68). If facilities were not available, or there was a cost involved this limited the potential to become involved 'I think if you haven't got facilities to go, you can't really do anything' (FG5, 55), 'When I was living at home there wasn't, like if I really want to do stuff I could have gone out

and found the facilities. But there was nothing on my doorstep, nobody sort of encouraging me to do stuff' (FG5, 56). However, others commented on how walking around the university to get to lectures provided them with enough exercise to meet the requirements outlined in the information they had received. While some who identified walking as a form of activity were unsure of the value of walking 'it wasn't really worth it' (FG6, 74) or stated that they did not do organised activity.

86: [Q6] What do you think are the opportunities to be physically active at uni?

87: [R6 N] Well membership of the Stevie is really cheap, it doesn't really give many people an excuse not to be fit but,

88: [R6 E] for me I think what it is, is living in Murano St. I have got to walk 25 minutes to get to uni. 25 minutes to get back, by which time I have already done 50 minutes, and then doing half an hour in there I would be absolutely shattered by the end of it. And also with walking that amount of distance everyday, I have noticed the difference, because when I was at school, I used to get the bus everyday, and I never did any walking what so ever, I have noticed the difference in the last 18 months, I do feel fitter just simply doing that walk, but next year I am getting a flat in Gibson St. so it means I won't be walking anywhere near as much. So it means I will have to do something different just to maintain the basic level of fitness that I have got. (FG7)

Second level theme = Advantages

There was also a mixture of psychological and physiological advantages; these ranged from feeling good to having increased energy. An interesting thing was that there was no mention of enjoyment, the closest identification was relaxation.

First level data from which the concept ADVANTAGES emerged.

The next key question asked individuals to list what they thought the advantages to them were for being physically active. Again depending on the current stage of change of the individuals concerned there was division in responses given. Among individuals who were not regularly active, the advantages even though listed and known were interspersed with disadvantages; this was not as apparent in the more active groups¹. For example a precontemplator in a mixed group of individuals (n = 4, two precontemplators, one preparer and one actioner) responded to a comment that exercise could make you feel 'healthy' (actioner), by pointing out that you needed to know what it was like to feel healthy to appreciate this idea⁴. The advantages listed included an increased amount of energy, it can make you feel 'good', it can 'prevent injury', can help you sleep better, feel more relaxed and stress relief². There was a sense of achievement, a perceived better mood and it was felt that partaking in exercise could boost your confidence. Other advantages mentioned were help in weight management³ and health protection. It was perceived that regular exercise increased an individual motivation in general to follow things through, you organise and discipline yourself. Weight loss was the most common factor quoted as motivation for both men and women, however the concept of the 'ideal' body was often inspired by others rather than being an internally derived concept (e.g. media).

¹ **Are there any advantages to leading an active lifestyle do you think? [Inactive Individuals]**

166: N Stress, it get rids of stress, and it does...because I have been stressed out and I have done a bit of exercise and it actually lets you get to sleep at night. And it sort of tires you out physically and mentally, it is, I mean there are so many good points for doing sport, I know there are. (precontemplator)

167: E But you don't think that when you are just sitting there in front of the telly, do you?

168: S You feel like kind of justified in eating a fatty bag of crisps, like if I went and did some sport, or on the jogging machine or whatever, then that's OK, but when you haven't done any exercise and your eating this big chocolate bar or whatever, you think well Oh God! Is there a diet chocolate bar somewhere? (Contemplator)

Are there any advantages to leading a physically active lifestyle do you think. [Active Individuals]

92: J Of courser there are...Lot of reasons. Working hard and keeping fit. I found out last year that I had a heart murmur so that means that I have to get a lot fitter and use my heart and so I went walking so I thought I'm going to get fitter and get into Uni. each day, pouring sweat and just generally unwell so I think the health reasons are important for me. (actioner)

93: LA I think I'm definitely sleeping better, because I was an insomniac. Me and my flatmate would sit up to about 3am, before we'd finally get to sleep but now it's better. (actioner)

95: K It definitely clears my head. At exam time I get a lot fitter just because it gets me out of the library and just makes me feel a lot free. I couldn't cope with stress all the time and exams and all that kind of thing so I do a pop-mo or a swim sorts it out. (maintainer)

97: LO Get out and meet more people. (FG6, preparer)

² 113: N managing to keep up with everyone else on field trips' (FG3, contemplator).

³ 96: K It [exercise] definitely clears my head. At exam time I get a lot fitter just because it gets me out of the library and just makes me feel a lot freer. I couldn't cope with stress all the time and exams and all that kind of thing so I do a popmo or a swim, sort it out' (FG6, maintainer).

³ 168: S food tastes so much better if you have done some exercise. You feel justified (FG7, contemplator)

⁴ 153: S Can't remember the last time I felt really really healthy, but I don't feel unhealthy or anything like that but it's not like I've got anything to compare it to that I think oh I wish I felt like that you know like I feel so energetic or anything like that because I don't remember what it would be like so...' (FG4, precontemplator).

103: R Feel well. Yeah, I felt quite good, I mean I smoke quite heavily, and I drink so much, it is just nice to remember clear nasal passages... just keeping fit and running around' (FG8, contemplator).

Second level theme = Disadvantages

There was a mixture of psychological and physiological disadvantages identified by the respondents. The main concept was that physical activity was not worthwhile, the outcome did not justify the means. There were also a list of barriers that contributed to the list of disadvantages. Very strong emphasis.

First level data from which the concept DISADVANTAGES emerged

Individuals who are not regularly active described the disadvantages as the effort involved in just getting started¹. For more active individuals it was the maintenance that provided the problems². The effort was seen all participants as continuous and never ending as the effects of exercising did not last, once you stopped 'it's just not worth it, and you just get your beer belly back again' (FG5, 83, actioner). For some there was very little perceived incentive to do physical activity with plenty of barriers, as being physically active implied meant a lot of hassle for essentially a boring³, unrewarding pastime. It was expensive, time consuming, and embarrassing, it involved major changes to an individual's current lifestyle, and right now when they were young they could get away with things, and they were happy with the status quo⁴. There were also a million other things that some individuals would rather do⁵

There was also a sense of if you begin, how do you control it or stop? The notion of becoming obsessed with exercise that it would definitely eat into other areas of your lifestyle was prevalent⁶. This would lead to it being 'too serious' (FG8, 117, contemplator), you could 'over-do it' (FG9, 126 unknown), you would feel sore the next day, have to watch what you were eating and cause yourself an injury 'Stretch your tendons too far' (FG9, 128, unknown). There appeared to be little experience of setting realistic goals for which to aim, this meant that individuals became discouraged and ceased their efforts 'you set yourself goals that are too high and then you get disheartened and you just sort of blank them' (FG3, 132, contemplator).

¹ 137: C I think the advantages probably outweigh the disadvantages. I don't think we have identified that many disadvantages, it is just overcoming the initial inertia of a sedentary lifestyle, actually getting out and doing something (FG9 preparer).

² K 'you need a mountain of will power to stay on the thing' (FG5, actioner).

³ 84: M it's all right if it's a sport, because then you are doing something. But just going to the gym and stuff and going running, or just swimming up and down a pool. It's just far too boring you are there for about 10 minutes and you just get bored with doing it' (FG5, actioner)

⁴ R Is being fit and healthy such a big thing – so what if you are? I like the way I live (precontemplator)

S Yeah exactly (precontemplator)

R I'm happy with my life as it is. Would me living a completely different lifestyle and being healthy would that make a difference? Maybe I wouldn't be as happy if I ran around the gym every morning, cause I would hate it – it's not me'.

S It's the sort of thing you dread doing - hanging over your head that you have to go to the gym...

S It's not like this thing in my life that I feel so unfit and wished I was different or anything like that or think oh I'm really going to have to do something about this. Because I don't, it's not as if I feel

R Maybe when I get older I'll start thinking about it but not now.(FG4)

⁵132: D Probably the sort of obvious thing the whole disadvantage is there is a feeling that you could be doing something else that you would enjoy more when you're out doing a cross-country jog or something like watching TV or something really worthwhile' (FG9, contemplator).

⁶ 131: Y When I first started exercising again...I was getting really obsessive about it and like making myself feel ill and stuff and I had to like calm down because you can get a bit over zealous' (FG3, actioner).

Second level theme = Facility Emphasis

This theme is derived from the data that have a positive idea running through it. Upon analysis it was found that these themes revolved mainly around the structural opportunities that existed in the University facilities like access, location and equipment.

First level data from which the theme positive influence and hence FACILITY EMPHASIS emerged.

Opportunities/Facilities/ Positive Impact

It was perceived that there were lots of facilities and lots of clubs/societies to join at University. The most common adjectives used to describe the SRS facilities were 'cheap' (FG4, 119), 'brilliant' (FG3, 86), 'good location' (FG4, 126). 'I think the SB was easily accessible to everyone, £5.00 to join, most students live you know close to it and they are always you know when you start University 'join this club, do this, join the Stevie'. The University does encourage you to become athletic, you know work out and all that...' (FG7, 84). The fact that it cost £5 to join and that there were no other costs to use the facilities was a major bonus. This allowed individuals to try out different things 'So you can be rubbish, or you can start learning so that's an opportunity; you can hire courts or you can do whatever, and it is not a huge outlay before you find out if you are not good' (FG8, 91). It was perceived that different levels of ability were catered for 'I think they [opportunities] are really good, there is things like popmo when you are not competitive and swimming just go into the pool' (FG6, 81). The location of the Stevenson building –on campus- was a bonus, and the ease with which you could use your swipe card to get into the building made taking part in exercise easier. Individuals referred to how their friends were jealous of the facilities 'I hear from friends sometimes that they are also not very physically active. They always say we've got to go to the gym because it's so it's a good place to go, good machines, good classes and all that it is so ridiculously cheap and it's got the pool' (FG3, 88), this applied a social pressure to make use of the facilities.

89: [R6 A] I think it is quite kind of, very easy in a sense, it is like £5 to join, there's a lot of facilities and a lot kind of clubs and that, and I have a lot of friends I talk to, you know what I mean, and it's like eh, and you're easily talking about fees of like £20-£30 pounds a month, and stuff like that, you know what I mean. So, it is like really easy and that, but I suppose I never really joined any club or stuff like that because I never really, I think I always think I will, but I never get around to it, it is like there is always something happening, something, some holidays starting up, some exam coming up, something to do. Actually walking in and just going to the swimming pool or the gym or something like that, that is something I do, like every now and then, which is something I find really easy because you just like swipe your card and just walk in, get changed and do what you want. Whereas the clubs you just kind of I don't know, I feel like it is maybe, it is not even that hard but it seems kind of hard, like joining up, and then going up, and knowing nobody and that. (FG8)

Second level theme = Personal Emphasis

This theme emerged from the data that was clustered around the core idea of a negative impact. Once this was analysed it appeared that the main negative responses to the questions on university facilities had a personal emphasis. This implies that an individual could think that the facilities were great but if they perceived that they would impact on them personally in a negative sense they would not use the facilities.

First level data from which the theme negative influence and hence personal emphasis emerged.

Opportunities/Facilities/ personal emphasis

The fact that the Stevie was 'too popular' (FG5, 123) or 'really, really busy' (FG7, 115) at certain times was problematic. It meant that 'the pool was full', or you could not 'book a court for badminton', or the 'queue is 5 long for the running machine'. The fact that if you were unfit and you were using the CV equipment and there is a queue of people behind you watching you, this made the experience extremely uncomfortable. This may have contributed to the perception that the atmosphere in certain locations was unfriendly and very serious, this was especially evident in the CV area or in the muscle conditioning suite. In order to combat this it was suggested that peak usage times should be better publicised. The notion that there needed to be more informal, non-serious, low competitive opportunities to take part in games was stressed. In order for people to participate in these they would have to attract the mediocre players and avoid the stereotype 'professional players [who] would be going along' (FG5, 119).

A suggestion of how to make exercise more appealing in the SRS would be to organise league type activities through various courses, these would be optional and it would provide an opportunity to meet people on your course but in a less stressful situation 'this would give you a chance to socialise in a different field, and no one is gonna mind if you make a fool of yourself there, because it is all on a friendly basis' (FG5, 122).

Transition/Expense or Access

Maintenance of an active lifestyle during school vacation was hampered by the expense of joining or using leisure facilities. There was a perceived limited *access* to facilities especially for people who lived in small towns where they may not have had public leisure centers. There was also a lack of opportunities for participation for this age group, all the leisure centers appeared to cater for younger people. Activities such as walking –for those who identified themselves as lazy- were described as boring, whereas the more exciting activities were either too expensive or there was limited access.

Anybody else wanting to add anything else before we stop.

230: [R10 E] Do you think it's true that people who are in gyms and I don't know if you do a lot of exercise yourself but you know is it true that people who don't do a lot of exercise because a friend of mine lifts weights, a fella, a big time personal trainor and I said to him because he used to say ??? I said have you ever seen someone who has been really fat or anything walk into a gym. What do you think of them when they walk past you and your buddies and I said do you not sort of look at them and go and like make a joke or something like that and he said after saying all this rubbish about everyone should do it and it's not hard and they should make an effort and stuff he said no that there is stuff said about people like that you know what I mean. We knew all the time and technically he said that when they thing about it they should do it you know it's good for them going and starting again, but it's true that there is stuff said about you do you know what I mean if you walk into a place like that you know the regulars and stuff.

231: [R10 Y] I used to weight about 14 or 15 stone and I was a big big girl and I was like. I would never go anywhere for that fact and people say like no they don't talk about you, but the do, if you look like you haven't done exercise before and you are walking into somewhere and you are big they are like they do look at you like what are you doing in here. Whereas you think should I be one of them really do you know what I mean. (FG 3)

Processes of Change

The second level theme experiential refers to the strategies that individuals quoted for initiating physical activity that were primarily cognitive orientated processes of change.

First level themes from which the concept EXPERIENTIAL emerged.

Adopt/Self-reevaluation

A positive evaluation of the benefits over the cons of exercising was important for the adoption of a physically active lifestyle. For sedentary individuals in the focus groups a positive evaluation of exercise was related to external benefits such as loss of weight, vanity aspects, improving job prospects and the prevention of health problems. Motivation to participate in physical activity hinged on how well exercise could provide these benefits¹. Exercise was compared to torture or studying, it was something to be *endured* not enjoyed, only if you were good at something, or found a sport that you had not tried before that you enjoyed would your chances of sticking 'with it' increase. The cons of exercising were readily quoted, e.g. not seeing results, setting targets too high and becoming disheartened.

For more active individuals some internal aspects included a self-reevaluation of one's current lifestyle and seeing if you want to change anything². The concept of having to motivate yourself inwardly was discussed, in that unless you wanted to change 'no amount of literature would do it' (FG6, 154).

For most individuals they did not perceive a 'need' to be physically active and therefore it was not worth the effort³.

¹ 221: [R8 R] Summertime coming up, bikinis

222: [R8 N] and I am watching my two flat mates get slimmer and slimmer and get more and more toned up, and I mean I am just going ah! And they are going around in their little shorts and their crop tops and they are looking fantastic, it's just like I want to be like that, but they have done it, they've done work for it, you know and that's why yeah, I can see going to the gym does have results, so maybe that is going to make me want to go a bit more.

223: [R8 S] Yeah, vanity aspects. Everything comes down to vanity, and it will be, if I do start going to the gym, it will be because I have gone up a size, because my clothes aren't fitting anymore, and I look a bit flabby and I want to go out in the summertime, and I want to keep my boyfriend.

224: [R8 F] Exercise especially for our sort of age is geared towards making us look better, rather than getting fit. I don't know anybody who would go to the gym to get fit, they go to fit into their jeans and stuff like that.

225: [R8?] Yeah it is to look better

226: [R8 R] People seem to think if you go to the gym and you do everything then you are going to come out with like a model, and that is just never going to happen for most people, I mean

227: [R8 S] You can always hope.

228: [R8 R] Fair enough it is still pretty unlikely, like I don't know.

229: [R8 N] But you get really nice and toned though, which isn't a bad thing.

230: [R8 N] It's better than nothing.

231: [R8 C] Yeah, but how long does that take?

232: [R8?] Yeah!

233: [R8 N] Not as long as you would think

234: [R8 C] A week? Imagine, after going to the first session. Could you imagine going to the gym every week,

235: [R8 S] I think it takes about 6-9 months, I think, is that

236: [R8 C] That would be the end of August!

237: [R8 N] No I think after a couple of months you start to see a difference.

238: [R8 N] Is that what happened to your flat mate. This is starting to motivate me.

239: Yeah, her bum is gradually going in, she has quite a big bum, yeah, and seriously it is shrinking, I mean, it is, it seriously is, it's amazing, it is just getting smaller and smaller, it's getting narrower and narrower...she has always been sort of a 'gym person' on and off, but like she totally went at it from the

start of this term, and even from the start of this term until now, there is a big difference, and she still eats loads but she is just doing exercise most days and there is a big difference.

240: [R8 S] When I hear that, that makes me want to do something.

241: [R8 E] Yeah,

242: [R8 S] When I hear that I go ah! Yeah definitely, that's it, and then I think right now what have I got coming up? I have got the 4 exams coming up, and I am planning my... you know, I'll start I think after my exams, but I said that last term, so you know,

243: [R8 N] It is always tomorrow isn't it?

244: [R8 R] yeah, it's like studying, it is always put off.

245: [R8 S] You don't even have to go to the gym like you know, cause as they were saying you just have to walk places, but .

246: [R8 E] I know, because I think that I do walk so much, that I think ah! What's the point in going to the gym, whereas if I combined it, it would be much better.

² 127: [R8 K] I actually did that a few months ago totally I was just Me and a friend decided because we had had enough of our lives being such lazy slob and we just went overboard. We took up dancing. We went to Pop-mo. We took up mountaineering club and Pop-mo has been kept on but nothing else has. It was just ridiculous.

128: **Right so you think you maybe did too much. Right. What made you sort of think oh right okay let's change.**

129: [R8 K] We were all seriously depressed and you just had a week where we were all depressed and we felt that we had no friends, we had no lives, and we were getting fat and ugly and disgusting boring and so we just decided to do something about it. (FG6)

³ 155: [R8 S] You are probably happy with the fact that you are not doing any physical activity then why are you going to go out of your way to actually start to do that for what might be no reason. (FG9)

Adopt/Social Liberation

For inactive individuals most of their friends were also inactive 'none of my friends do exercise, none of them want to, there is no way I am going to walk into the Stevie building on my own and do the rowing machine 'hi'' (FG7, 211). This meant that sedentary living was the accepted *norm*. Alternatively, *modeling* your behaviour on active flat mates was an example of how to get yourself to adopt a physically active lifestyle. Friends can influence the level of social liberation that exists for you in your interpretation of physical activity. If opportunities to participate in exercise were relevant to those who want to become involved, e.g. the provision of beginners classes or a 'lazy people's day in the Stevie' (FG4, 235). This means reducing the perceived level of skill to a socially acceptable one, in that everyone is at a similar unskilled level. Unfit people tend to perceive anyone who does any form of physical activity as fit and sporty, this implies that they are looking for a differentiation between active individuals (irrespective of level) and themselves '... I said to my friends 'oh! I have a meeting today at the Sport & Recreation Service' it's like I didn't know you were fit/sporty' (FG6, 158).

Adopt/Consciousness Raising

In order to help you adopt a physically active lifestyle, it was suggested that remembering something you enjoyed doing previously and begin there. The rationale was that then you think of exercise as enjoyment and not a chore. For women there was a vast perceived amount of literature on physical activity, and especially on how to get started¹. Other examples of helping you to begin were to ask people who were already active how they got into it, it was perceived that they had more experience and that they could tell you what to do and how to do it. Using information that is readily available in the university was also commented on, for example the timetables in the SRS. Finally getting someone to either give a lecture on 'physical fitness' or getting someone to run a workshop for 'people who don't do any exercise but would like to do more'.

¹ 215: [R8 K] In our age group like girls have got magazines and they have always got articles that help you to get started - an exercise plan and things like that.

216: [R8 S] Yeh there is enough stuff around that everybody can have a guide of what

Adoption/Environmental Reevaluation

Joining the Stevie Building.

Joining clubs in the Glasgow University Sports Association

Playing frisby with friends at Garscube Sports Complex

Adoption/Dramatic Relief

Something that might shock you into adopting a physically active lifestyle included 'going up a size in clothes' (FG3, 206). The doctor measured your blood pressure and it was too high, or walking up a flight of stairs and finding out that you were totally out of breath and you can't manage them anymore. Realising that a healthier body implies a lower mortality rate, or if suddenly you were being teased by significant others about for example your weight and the only way you could rectify this was through exercise.

First level themes from which the concept BEHAVIOURAL emerged.Adopt/Reinforcement management

The concept of reinforcement management applied not only to once participation in physical activity had taken place, but also prior to activity. This idea came from sedentary individuals and its basis was to reinforce a change in thinking about becoming active. The purchase of new equipment would thus be an incentive to go for a swim. This idea links to the concept of starting with something you enjoy. For the individuals concerned they enjoyed spending money, and with the new equipment they felt more in place and more inclined to participate¹.

¹ Sometimes if you buy yourself something new to go along with like em if you are going swimming you buy yourself goggles I mean I bought myself a whole kit before...when I looked in the cupboard and I hadn't used it for at least three days and I thought I have to wear it, it cost this much, I have to go. (FG3, 148)

Adopt/Helping Relationships

Friends are important for providing support to help inactive individuals become more active. They can be a source of encouragement or support¹. They can help to alleviate the tension of trying something new². They are a source of vicarious experience, known to help increase self-efficacy. They can be a source of knowledge; they can show you around, explain what to do. It is important however that they are the same level as you are³. Friends can also act as *deterrents* to become more involved in exercise, it depends on what level of peer acceptance operates in your social network⁴.

¹ 139: [R8 MM] I think you would have to make your decision to want to change first and then get a partner to do it with you. It's quite encouraging. Getting a partner somebody else to do it together with you because I think for me I find it quite difficult to go to the Stevie alone. (FG6)

² 141: [R8 K] It's much more fun when you are not alone, it's like really funny em, you can laugh at each other, like I went once and I knew I looked ridiculous but I kept laughing at myself and my mate because like we were there.

³ 146: [R8 D] Maybe if a friend was going to start doing something that would help.

147: [R8 S] Provided they weren't too far ahead of you, saying well come on come on push yourself just encouraging rather than actually doing it along with you. (FG9)

⁴ 183: [R8 A] I think friends can be a big factor, like if you have a lot of friends and you say let's go training or let's go running or something, and they say they'd rather go smoke a fag or something then I don't think you would be likely to start. Whereas if you have got a few friends and they will go running with you or whatever, then I think you would be more likely to start up. (FG8)

190: [R7.1 R] One of my friends she goes to the gym but I am always in bed when she does and then she just carries on normally.

191: [R7.1 S] Yeah it's not like I hang about with a big load of sporty people that will make me feel guilty about it or anything I mean pretty much all my friends are at as lazy as I am so I

192: [R7.1 K] Yeh I think that is quite important because I think if you had friends that were always at the gym you would think then right I'll go along with you but if all your friends are just slobbering out, you think then I'll stay with them.

193: [R7.1 R] Maybe you choose your friends because they don't.

- 194: [R7.1 S] I think you gravitate to people who don't
 195: [R7.1 S] Even if I was like living with a big load of people that were going to the gym every day and coming back and saying you are so unfit I would just be like I don't care.

Adoption/Counterconditioning

In order to increase your chances of adopting and maintaining a physically active lifestyle it was thought that *small changes* that do not mean having 'to change your routine too much it's just like... you can walk somewhere... and it makes you less tired and then you think ah! right I can do this now' (FG3, 151). This involved making activity social, fun and 'part of your life instead of a chore' (FG3, 231). Alternatively for others having something organised that you can just pop along to would help, this would need to have different levels of ability catered for. It was important that you could find something suitable, 'something you could handle' (FG7, 198). For organised activity trying out a variety of things would make sure that you would find something you liked. Choosing exercise that is convenient was also identified as important, for example exercising at home is cheap, non-threatening and enjoyable exercise, whereas having to book courts a week in advance in a gym facility was the opposite.

Adoption/Self-Liberation

If you are happy leading a sedentary lifestyle then changing this is particularly hard. There was also almost an attribution effect in that if others would provide me with what I need then I might exercise

- 174: [R8 A] People who don't do any exercise but would like to do more. And you go along, and you maybe sit through a half an hour or someone talking to you about ways you can improve it and things like that, because I think you want all that stuff handed to you on a plate. You are putting all the effort to do the exercise you don't want to have to put in the effort to work out what it is you have to do. (FG5)

First level themes from which the concept EXPERIENTIAL emerged

Sustain/Self-Reevaluation

If an individual wanted to remain active, in order to help them sustain that way of living it was felt that seeing the results¹, making sure you were doing something you enjoyed, and something you felt you were good at would be important. It would also be influential if you felt better 'both inside as well as outside' (FG7, 255). Being regularly active would be good if it affected other areas of your life, for example if you could walk up the stairs without getting out of breath, if you were more motivated to study, and if you had increased amounts of energy 'you find yourself at the end of the day not being as weary and tired and worn-out, you have still got the energy' (FG8, 196), these would all help you to maintain an active lifestyle. For individuals who were regularly active and then they stopped, it was perceived that you would notice the drawbacks of ceasing an active lifestyle, and this would motivate you to continue.

However, for individuals who were not active at the time of the focus groups they felt that seeing any results for you effort was difficult if not impossible to achieve². This meant that if you motivated yourself from this point then if 'you are probably doing it and you feel no effect and you think, oh I was fine the way I was and then you stop. So' (FG4, 244). For them making the initial shift in behaviour 'getting the kind of roots planted' (FG8, 199) was the most difficult thing to achieve, and the alternative was a lot simpler 'I think it is really easy to be lazy right now. You just kind of sit in front of the TV, everything is so convenient' (FG8, 207).

¹ 161: [R9 D] Being able to see some results, for example, your weight dropping, or you're looking better and say 'hey you look good, must be doing something right'. Whereas I mean it could be the other way you could get really sore feet and that you're not going to be bothered, if you feel a difference, a positive difference then that's going to spur you on. (FG9)

² 260: [R9 S] I mean there are people that I know that are really really healthy and stuff and I do think oh maybe you should do that and I just don't.

261: [R9 R] But they are no different from you really are they, you can't see any benefits, do you?

262: [R9 S] No because I know this one girl and she goes to the gym and if she is not at the gym she is jogging and when she is not jogging she is at aerobics and the time that she doesn't spend at any of these or at work she is in bed. She is tired all the time. I mean it is not like I see the benefits

263: [R9 R] My flatmate comes in being bashed from a hockey stick, frozen. She has had to get up at some ridiculous hour like I am thinner than her - I really don't see the point in that.

264: [R9 K] you might get Muscle bulk which is horrible.

265: [R9 S] I think it's horrible. (FG4)

Sustain/Consciousness raising

There was a high awareness of the opportunities to be active in university but this did not mean they were taken advantage of. Some confusion over conflicting ideas, there was more knowledge needed as regards the minimum that everyone had to do to remain healthy. In the SRS access to information about what was on offer etc. needed to be stored outside of the building so that others could access it.

Sustain/Dramatic Relief

The *shock* you would get from remembering what you were like before you began exercising that could motivate you to continue¹, or alternatively a significant other e.g. doctor telling you to exercise.

¹ 'If you think about what you were like before you started exercising I mean that would be enough. I mean that would scare me not to stop I mean like you notice a difference. I walk up hills better and run and catch a bus you know and not feel like your going to faint' (FG3, 171).

Sustain/Environmental reevaluation

The notion of making a SRS a spectator-less environment was important to focus group 6. This could be achieved by blocking up the windows above activity hall 1.

Sustain/Social Liberation

It was perceived as easier to lose interest in something if you were exercising on your own, for example on an exercise bike. Whereas making exercise part of your social life, meeting people and socialising with people who were active meant that physical activity was accepted as the norm, and not an exception. However even though society in general was perceived as reinforcing healthy behaviours and living healthily, there were also contradictions. The development of a more automated lifestyle in a time when messages were saying to be more active was a source of confusion for some focus group participants. 'I don't think our lifestyle, like the programmes and things that you watch, I know that more and more it is encouraging you to do more sport, but the things that are coming out on the market they are all eh, require less effort. They are all becoming automatic. Like over in America and that you don't have cars that are manual and that, not that it is taking away much effort but that is the way life is progressing. Now you have remote controls for your telly, and things like that so like all these things. OK like they are telling you to do more exercise, but the things that you are buying are meaning that you don't do as much exercise really (FG5, 201).

First level themes from which the concept BEHAVIOURAL emerged.

Sustain/Helping Relationships

An important aspect of helping you to sustain activity was exercising with a friend, or socialising with active people. *Friends* could provide a way of ensuring that you would both turn-up as 'you would have to turn up she'd be standing there on her own waiting for me so I have to go' (FG3, 167). This encouragement was reciprocal, as you perceived to encourage each other. Significant others, for example the class instructor, could help to break the isolation felt when an individual enters an exercise setting on their own. Exercising with friends also provides you with a social aspect to the exercise, you get a chance to laugh and have fun with your friends, or alternatively you can meet loads of people, make new friends and enjoy the activity in the process. For neophyte exercisers, getting involved in exercise was essentially a people thing. It was felt that you enjoyed the sport, not because of the sport per se, but more so because of the individuals who were involved. Trying to adopt or sustain physical activity as a relatively new behaviour on your own was perceived to be very difficult.

Sustain/Counterconditioning

Getting into a *routine* that is suitable for your level of fitness, and that you can stick to is essential. 'If you've got a routine that works, like if your doing exercise and getting worked on, and feeling energetic and stuff the chances are you will stick to it. Then you have no reason to stop' (FG8, 198). Then keeping this routine, ensuring that you establish a habit 'If you actually get set up and have an active lifestyle then it's part of a routine so you everyday you go out and do a run or go out and play, whatever then it just becomes

like I'm doing this and you actually think about it and it actually becomes part of your life' (FG9, 163). *Goal setting* can help you to maintain activity provided you balance a sense of fun with your goals, your goals are realistic, you chose something you felt you were good at, and they were not too hard to achieve 'I completely peaked and then dropped' (FG3, 174).

Sustain/Self Liberation

There was little notion of *commitment*, sustaining an active lifestyle was something that required strong will power¹. However, if an individual was in a routine, it was felt that the order of the activity, and the fact that your life was organised in a certain way would be enough to make you stick to an exercise regime². Being in university did not lend itself to a committed routine as having to go home for holidays meant that your routine would be disrupted and it was difficult to switch into local opportunities to be active at home.

¹ 192: 'I think a lot of people don't enjoy sport, not sport but going to the gym and stuff, and unless you have got really good will power, it needs to be enjoyment. I mean I don't know how, I have no idea how you could make a running machine more enjoyable, but you know' (FG5).

² 260: [R9 S] If you are the sort of person who can keep themselves organised, if you can plan your time, plan your studying, plan your part-time job, plan your PE and any other activities that you know, I have got the [student union] Board so I have to plan that as well. Right enough there is only 24 hours in the day,

261: [R9 E] and you have to sleep.

262: [R9 J] Yeah, you have to sleep. But if you can organise your life then I think that would help.

263: [R9 E] And if you do it, maybe at a certain time during the week, maybe 3 evenings a week, or something like that, maybe the same evenings, then you get into that routine, and you think 'oh, it's Monday evening this is what I do' you know like Eastenders is on, on a Monday evening, it would be like 'oh, I'll go to the gym on Monday evening' or something.

264: [R9 S] I always plan the mornings, I think if you can like get up in the mornings, a little bit earlier, you know.

265: [R9 N] Because last thing in the day, you're knackered and you are not wanting to go to the gym.

266: [R9 S] Right, you might not want to go first thing in the morning, but if you manage to get up, it is always a bonus.

267: [R9 R] Maybe if you were in that routine, and you know at the end of term and you had to go back home to where ever you lived and you got out of that routine, you are out of that place to go to the gym and all, that would probably prevent you from carrying on. (FG7)

Sustain/Stimulus Control

Having reminders to exercise around the campus was suggested, these could be set up in the student unions or in student diaries etc.

Second level theme = TTM Extensions

There are four themes that apply to the TTM questions these are getting started, goal setting, level of structure, guilt and choice. Getting started is constantly referred to as though getting over the inertia of inactivity is the biggest stumbling block, if only I could begin then everything would be OK. Goal setting is to do with the lack of experience of goal setting, individuals can be all ready for action but unless they set their goals accurately then the sense of disappointment when they fail to achieve their goals is evident. Guilt is in reference to maintenance of physical activity in that the sense of what one ought to be doing would be strong enough to keep you motivated to adhere to an exercise regime.

First level themes from which the concept TTM extensions emerged.

Opportunities/Getting Started

The concept of getting into a more established routine was perceived as important to maintaining an active lifestyle. It was thought that this would be easier to do once you had a 9-5 job and an established daily routine, at university you classes were always changing and this made it difficult to get into a routine.

202: R Suppose the further you go in University the more you feel you should have done it at the beginning, especially now with the clubs. It is like a vicious circle, you think, ah well, I can't go now I am going to be in third year. I should have started long ago. (FG 7)

Sustain/Getting started

All groups felt that changing a behaviour like going from sedentary to active would be the most difficult aspect. Once you begin, it was felt that stopping was not necessarily a 'conscious decision' (FG3, 166). This meant that a lapse would if unchecked turn into a relapse back into sedentary living. 'I wouldn't think generally stop exercising they would miss it once and then miss again and then for some reason again and then they drift away which means you can't sort of say to yourself 'oh my God I'm about to stop so I'll fix it, you know you just end up drifting away. (FG3, 166)

199: R I find actually eh, once I had the routine going like say maybe twice or three times a week, like every second day it was quite easy to maintain, it was just a struggle getting it going in the first place you know. Getting the kind of roots planted, you know. (FG 8)

154: J I don't think any amount of literature would do it. It would probably make you think about doing it but whether actually yeh I'm going to do it make it better but it's something you've to do - once you have got over that hurdle then you're away (FG6).

Adopt/Goal Setting

Physical activity was seen as organised, structured activity. This could take the form of sport, or exercise in a gym facility. Goal setting was seen in these terms, e.g. three popmo classes per week. It was perceived as important to have a 'real reason' for doing activity, it was perceived that this would help you to 'keep it up' (FG8, 189). It was also identified as important to have this reason made personally (to yourself), but also publicly¹. Individuals saw goal setting as a challenge, for some, something they could not do very well; and this became a source of motivation². For others they set goals too high and became disheartened when they could no longer achieve them. This implied that external help was needed 'I mean if you went to the gym and get people who work there to set goals for you like weighing or giving you some kind of incentive to lose weight' (FG3, 147). Alternatively making physical activity a 'a social thing, that is part of your life instead of a chore' (FG4, 231) was not an example of goal setting. If the activity you were involved in was 'quite expensive'.

¹**152: C:** That brings us back to what Sam said a while ago about having an aim

153: S: To prove to both yourself and other people.

154: C: Some sort of goal that you are actually trying to do something. At some point you are going to achieve that, and that will give you further encouragement to achieve other things basically to carry on. (FG9).

² **180: [R8 K]** I think finding out how unfit you are and realistically how fit you can get, em because I don't think that suddenly tomorrow I am going to become a really good runner, em so I think realistically how much you can improve and how much effort and time it is going to take up to do it.

Sustain/Goal setting

Unrealistic goal setting was perceived to hinder maintenance of physical activity. If the perceived benefits did not arrive, or alternatively if your body began to develop in a way alternative to how you wanted it to change that might cause problems. This could mean developing muscles for women, or losing weight for men.

132: E You can feel miserable as well because you'll sit down and say I'm going to go to the Popmo for every day for half an hour and then you don't and then the next time you check your weight it's gone up again or something or your clothes don't fit you get really sort of disheartened by it you know I mean I've quite possibly read this in a magazine as well but it's true that if you set yourself goals that are too high then you get disheartened and then you just sort of blank them. (FG3)

Sustain/Guilt

In focus group four, experimental non-improve female there was a strong feeling of guilt about not being active. This was not mentioned in any other focus groups. The idea that being healthy, thus being active

was the 'right thing to do. The right way to lead your life' (FG4, 250) was very strong. This notion was felt to emanate from school, and also the idea that you had to take advantage of the excellent opportunities that the university provided as you would not have that opportunity again. There was a concept of differentiation as people who used the gym were described as 'really healthy'; this could affect how you felt. Guilt was described as a 'good thing' if it meant that you actually exercised, as for some (non-exercising schematics) that 'that is the only way I do things the I really don't want to do. Feeling guilty about it' (254). However for the aschematics within the group you would only feel guilty if it was something you wanted to do and just could not be bothered. Also the guilt described was 'not a really strong guilt... in the next hour just forget about it and the next day you've forgotten it' (259).

Intervention Critique

The data collected on the intervention was analysed to find out how useful the participants found the intervention. The results were as follows.

Intervention/Efficacy/Usefulness

The efficacy of the intervention for changing exercise behaviour was discussed initially. The data collected hinted towards the mini-theory Rationale for becoming involved in physical activity, as two second-level themes namely self-reevaluation and level of structure, from this mini-theory rationale were evident in the data. Participants in the focus groups had mixed reactions to the intervention; some felt that it was good to be targeted with an intervention while others were not so sure. They all felt that in order to change your behaviour and maintain a new behaviour it would have to be something you were thinking about prior to receiving the intervention material. This concept ties in with the second level theme self-evaluation, as an individual would have to consider why they would want to adopt a physically active lifestyle prior to making the change. This theme has already been discussed in chapter five.

240: But do you think you would actually use it? Or do you think you would kind of go yeah?

241: [R10 JA] Yeah I think people would use bits of it

242: [R10 K] Yeah, depending on what they might be interested in doing.

243: [R10 A] I think I would personally need to be thinking about it before hand, should I or not, then this would give me a wee bit more encouragement, and I might say oh yeah why not. Whereas if I wasn't thinking about it at all, then they might just throw it away, and it wouldn't even cross their minds. But I think it would help prop up people who might have had it on their minds, that maybe I should go along and then this free thing comes. I think that it would work for me in that sense. Like I was looking through this and I was thinking free towel hire, free equipment hire, and I was thinking, yeah! I could use this sometime, I think it would work. (Focus Group 8)

175: [R10 V] I do agree with your point but on the other hand let's say I have this book lying around and suddenly I just felt the need of having exercise it could be starting point and this could help. At least you know there is something at home lying there you could just see.

176: [R10 D] I think I agree with that something like this would be something to direct your impetus, rather than the impetus itself to start. (FG9)

Intervention/Efficacy/Level of structure

Participant's discussed how the intervention served to highlight alternative forms of physical activity rather than just structured exercise or sport. It also appeared to increase their awareness of how much activity they were actually doing through actively commuting to university each day.

309: [R10 R] When I was staying up at Murano Street last year and I had to walk twenty minutes to get anywhere I liked that yeah I liked that, like it was hassle at the time, but it just became part of your everyday life so I was probably getting loads of exercise I was probably quite healthy - thinking back.

310: [R10 S] After a while you start noticing that it gets easier as well because I was doing that last year going up loads of hills and walking up stairs. Because I was in the Adam Smith Building and four flights of stairs and in sociology building - James Black - it was three flights of stairs so I would be walking up a hill and then walking up that every morning and I felt that it started getting easier so, you feel fitter.

311: [R10 R] I felt quite a lot healthier after because I would be doing it two three or four times a day five times. The thing is I wasn't exercising I was going somewhere yeh. Like if you are walking to the pub you are like. It's not exercise on purpose it's more sort of secondary to getting places.

312: [R10 S] Yeh I don't mind it I really don't mind it if it is for that I mean ...I like walking as well especially if it is nice outside and whatever. I have got a friend who lives maybe about a mile away from me and I like walking up to her house and back all the time because it is a really nice walk and I enjoy that you know.

313: [R10 R] I don't think of that as being exercise it is probably because I enjoy it actually and ??? but I do enjoy that. It's probably quite a lot for me exercise (Focus group 4)

225: [R10 K] Because you have to do it [walk to University], it's something you have to do, you know and you wouldn't just go out and walk that distance, just for a walk you know, and that's the difference.

226: [R10 J] It's the only way you really do exercise is when you have to, I used to live 20 minutes away from the university and I used to walk in and out every day, but now I live in Oakfield Ave. here and I don't have the time to walk somehow (focus group 5)

Hassle Free Exercise Booklet

The discussion then evaluated each part of the intervention separately. The results revealed that both the HFE and the SAS were identified as being the most useful for adopting a physically active lifestyle. The HFE was identified as the best presented material; this was attributed to its colour print, its scarcity of words, the fact that it was targeted at beginners and its 'health value' on the different forms of physical activity listed. However, it was criticised for being targeted to an older audience and for being similar to mainstream health promotion literature that would have been seen in school.

Intervention/HFE/Useful

428: [R10 S] I think the title is quite good 'Hassle Free' as well, it might attract a few lazy people. (FG2).

439: [R10 A] I think that bit's true, 'what's stopping you?' I think if that bit was right at the beginning that would work, probably, because it is just a list of my excuses and reasons why they are a load of rubbish. Yeah! That should be in huge big type right at the very start and people would/might read the booklet. (FG2)

Intervention/HFE/School Memories

This intervention material was criticised for being similar to school literature that is used to promote other health behaviours like the cessation of smoking.

195: [R10 LA] It reminds me of things at school, just the stress of all these things that you could do and all the things that are out there it just depends really if you can be bothered or not. I don't think these things will make a difference.

196: [R10 S] I don't think it would make any difference either. I agree with Mary that if you want to do it you've got to choose yourself sending this out to people won't make them think yeh I could do it.

197: [R10 MM] Some people won't even open it and read it, 'cause they'll be like exercise (throwing action).

198: [R10 H] It might be useful to someone who is thinking about starting doing exercise but it wouldn't be any use to anyone else I don't think. If you don't want to do it you just don't do it. (Focus group)

209: [R10 JO] It reminds me of the smoke busters we used to get in school.

...

230: [R10 JA] Yeah, some of the initial stuff is a bit too wordy.

231: [R10 K] I think if you have more kind of things to write and to actually think about, like this... what are your benefits, what are the things that are holding you back, so make a date, let's start that kind of thing. I am just thinking of the stop smoking ones, like I have seen them that they should have, rather than just reading, that you should have to do something with them just to, and then because you write it you remember it more. You can of learn it, like school if you write it you are more likely to remember it, than if you just read it. (Focus Group 8)

183: [R10 S] It is presented in a way that at school you got things like that on smoking on drugs on drink and you basically all have the same message the same sort of layout question with the answers and things and sometimes you do feel it almost patronising sort of you look at it after a couple of days and you say oh turns you off a bit.

184: [R10 R] Just the colours alone makes you think it is for a five year old or something. Really bright and (Focus Group 9)

Intervention/HFE/Old fashioned

288: [R10 R] It is like you have to put a lot of time and effort into it.

289: How do you mean?

290: [R10 R] It's got all the little bits that you write in What would be the benefits etc.

291: [R10 K] It's got all the jolly pictures and you just think oh they always put jolly pictures in. You know when they try to make you do something you don't want to do. It's like a Dr. Surgery, they always have little pictures like that. (FG4)

181: [R10 C] The way that it is laid out I mean there is about half a dozen words on a page or something and as Sam says I think if something like this was aimed at students then it could perhaps be a little more factual it could contain a bit more like medical information or something maybe the benefits of leading a more healthy lifestyle which most students should be able to understand this perhaps is aimed at a different market.

182: [R10 A] This is trying to get away from the text book thing you can go to the Library and read that but it is pretty boring and I think that what they are trying to do here is like give you something that is clearly accessible sort of trying to show you that you don't need to know sort of what way is different aerobic exercise and stuff to get into shape and you can just do simple basic stuff and it is a simple basic kind of guide how to do it. (FG9)

Intervention/HFE/Critique (negative)

200: [R10 K] These other quotes from people. I think it's like some, no I don't like it, it's too fake.

201: [R10 J] I know that Step 1 and Step 2 thing you think hang on I have passed Step 1 and build up what you do and make it longer and I can't do that and then it makes you feel inferior you're just not doing it so getting steps and have Step 1 and then Step 2 then and probably can't pass then this is not for me and you just stop trying. (FG6)

172: [R10 C] No. I think it's aimed at the wrong market. It is because it seems to be saying - I mean it talks about leading a more active lifestyle it says about taking the stairs rather than taking the lift, walking an extra 100 yards a day sort of thing going to a tea dance or something which is perhaps if you are like 60 or something and just had a heart attack that might be good but I think as young adults we should perhaps do something a bit more strenuous in terms of...

173: [R10 R] It gives off an image that is really embarrassing. I mean look at that I mean look at that, it looks like Mr. Motivator has designed it or something, who ever thought about doing jogging and stuff when they say Mr. Motivator who was this embarrassing loud irritating guy with big glasses and his lycra suit on how many sat there and thought I would like to be like him. You talk about physical exercise, just go out an play football and run around and someone or something they might as well if they have nothing better to do.

174: [R10 A] The whole notion I think it is probably a pretty impossible thing to market because no matter how cool ??? you will always be sort of self consciously trying to be cool and then become so cool it's crap and you just think eh and I mean I don't know, I probably wouldn't, I didn't read it.

...

178: [R10 C] I don't think this is something that you would keep if you got it through the post you might put in a bookshelf if you weren't interested in it you would put it in the bin I think. (FG9)

Start A Starter Voucher Booklet

Intervention/SAS-voucher booklet/usefulness

The SAS booklet was identified as useful because of its application to the University's Sport and Recreation Service (SRS). The novelty of having free offers, and the information on the services available in the SRS was highlighted by all groups as particularly appealing. It was suggested that the presentation of the SAS could have been improved with colour printing and more general information on for example the benefits, the guidelines and the current statistics on participation levels among undergraduate students in the University.

Intervention/SAS-Voucher booklet/Positive/Free Offer

236: [R10 G] I thought the free access things were quite good, and you could look round if you are not already a member. Em, and see if it is what you want to do, like see if there is anything there that would catch your eye and get you interested.

237: [R10 R] Free beer, get free beer and they will come.

238: [R10 JO] A free bag of chips

239: [R10 K] I think the word free is great for students, because students go FREE, OK I will have a go at that, so I think perhaps, it does appeal to your kind of pocket, the fact that you don't have to make any kind of outlay, that you can come and find out stuff. Come and see what it is like, and then you think OH! This is not so bad, as you might have thought it would be. So that kind of introduces you in, so I think that is a good idea. You know that would be a good idea, because like you were saying if you are kind of intimidated by the muscle conditioning thing, then if someone comes over and takes you through all the stuff, for example you don't have to put on every single weight, you can do this and that, then I think that is a good plan, a good idea. (Focus Group 8)

203: [R10 E] It is another incentive so it's not bad.

204: [R10 J] It's good for someone who doesn't know if they want to join, and you can go, and you don't have to pay a huge amount...

208: Do you think first years might use it [Start a Starter Booklet] ?

209: [R10 E] It's free exercise sorry equipment hire the consultation see most of the first years would have signed up I would imagine for the free towel hire I don't know.

210: [R10 A] They would probably use the vouchers but I don't think they would fill in all the contracting and stuff like that.

211: Why do you think they might not use them?

212: [R10 A] I don't know it's committing yourself I suppose, something that could put you off maybe. (Focus Group 3)

Intervention/SAS-Voucher booklet/Critique (Positive)

209: R10 J] That little drawing at the front that's great. I think yeah! That's me, absolutely knackered. It's good because it has free vouchers and stuff and you can make up your own mind, and if you do go, the consultations are good as well. I never knew that about the consultation,

210: [R10 H] No, neither did I!

211: How did you find out about them?

212: [R10 H&J] Just in the stuff you sent us.

213: [R10?] These have expired already.

214: These are old ones.

215: [R10 J] That is what I would like. I really would like to have known that I could have got a consultation or somebody showing you round showing me what the facilities were and how to use the facilities, and introduce your services [SRS services].

216: Do you honestly think that if I sent this out to you in the post you would read it?

217: [R10?] Yes.

218: [R10?] Yeh, I would give it a bash.

219: [R10 L] Yes, it might make you think, oh, I'll go for a consultation.

220: [R10 S] Yeh, I'd probably look at it, even though I would do something totally different. I think it is good when you see 'FREE'

221: [R10 H] Yeah, something for nothing, get it. (FG6)

Exercise Consultation Service

Finally the exercise consultation leaflet was criticised for having too much information, and being too formal. It was suggested that the presentation of leaflet could be vastly improved through colour printing, reducing the amount of information given and making the content less formal.

Intervention/Usefulness/Exercise Consultation Service and leaflet

244: [R10 JP] I think that the exercise consultation, I know it is available, and it probably would be a bit valuable, but you just sit there and you know they are going to say, right you have to go for a 20 minute run everyday.

245: [R10 A] You basically know what they are going to tell you. You have to do more exercise and eh! You just don't want to hear it, and you know, it is like your mother nagging you or that. Because you know yourself, it is like just like an alcoholic, you know self-denial, you know you have to give up but you don't want to, it is the same with sport you know to do more, but you just don't want to, it requires too much effort and there is not enough rewards.

246: [R10 A] It's not really eye catching this, you know, it should have like FREE on it, and then you would go to it, and then you know you can get free consultations and that, I mean big writing to make you look at it. Because you don't actually, well I don't read it, I just look at it see that it's writing, and I don't bother picking it up. (Focus Group 5)

297: [R10 A] It's not really eye catching this, you know. It should have like FREE on it, and then you would go to it, and then you know you can get free consultations and that, I mean big writing to make you look at it. Because you don't actually, well I don't read it, I just look at it see that it's writing, and I don't bother picking it up.

298: [R10 M] I think I have actually read one of these once before, and I intended to go in for one but I didn't bother, it just, I don't really know what to expect. Will they make you do 50 press-ups and then say you are very unfit.

299: [R10 JP] And you know what they are going to say, like all right do set targets for this week, and then do another wee bit the next week, and then another wee bit the week after, I think it is because you know yourself roughly what they are going to say, you don't really bother with these things, because you know...

300: ?] Just how lazy you are.

301: [R10 M] Yeah, it just makes you feel even worse about yourself that you are not doing any exercise.

302: If I was going to do the questionnaire again with 1st years this year, do you think it is a good idea to send any of that stuff out or are there other ways that I could try to help them?

303: [R10 K] I think maybe sending that out, I mean this is eye catching as well. It is easy to read because it is not pages and pages of writing. It is easy to just glance over that and read it. Something like this [ex.con] is just so uninviting, you just open it up and there is just pages and pages of writing. But this [HFE] makes you want to read it more, because it is easy to read, and there is no strain on your brain. You are not doing any work. (FG5)

385: [R10 S] I thought, you see, it says the consultation involves only 30 minutes, at the beginning I might like someone to be round a little bit longer, or like available, I don't whether or not they will be, like available for any questions I might have, or just general, like if I am doing exercises for an hour, are they going to be there every time I do my, but then that's like a personal trainer, isn't it? OK, who do I think I am?

386: [R10 E] Maybe a follow-up situation, maybe two weeks later,

387: [R10 R] Maybe three months later,

388: [R10 N] At each time period on here [2 weeks, 3 months, 6 months].

389: [R10 R] Yeah, but what would they help you with? Which kind of exercise? (FG7)

Interactive Worksheet – 10 tips for getting active

The interactive work sheet was compared to a 'homework sheet', and even though the '10-tips on how to get active' were identified as interesting it was rated (along with the exercise consultation leaflet) as the least useful of the intervention material. It was suggested that the presentation of both materials could be vastly improved through colour printing, reducing the amount of information given and making the content less formal.

Intervention/10-Tips/Critique (Positive)

338: [R10 K] I don't think anyone probably bothered to get that biro write down the advantages and disadvantages really. Ten tips are quite good though.

339: Why do you think those are good.

340: [R10 K] Because they don't really sound like exercise and - do the housework - it makes you feel better you think that passes as exercise. Yeah, it says substitute a coffee break for an activity break, you think Oh!

341: [R10 R] Yeah, if anything comes through from sport, I will just put it aside. (FG4)

252: [R10 K] I think the 10 ways to get moving would kind of be a good idea if you can, because if you have something that isn't too hard you could think, Oh! I could do that, that's them kind of starting, you know kind of, just you know so that they are not kind of thinking of coming into the gym and running yourself into the ground for half an hour. You can plan to do this, or do something quite easy and they might think this is not quite so bad. (FG8)

Intervention/10-Tips/Critique (Negative)

343: [R10 K] It is too much like a homework sheet sort of. (Focus Group 4)

270: ?]It looks quite like an exam paper,

271: the right colour!

272: [R10 A] I mean the effort, like who's gonna, I mean when you have got study, I mean that's another thing when people find it hard to study, I mean the effort to sit down and write this out I mean I certainly wouldn't fill it in. (Focus Group 5)

Second level theme = Person-Centered Environment

This theme emerged during discussions on the intervention and the service provided by the University's Sport and Recreation Service. From the data analysis, three first level themes emerged and these clustered to form a second level theme, namely a person-centered environment. This theme suggests that the SRS as a organisation would have an interest in the individual and how they are progressing in their use of the facilities would be central to the service. This would be especially in relation to first year students, who may be sedentary and would be using leisure facilities for the first time.

First level themes from which the concept Person-Centered Environment emerged

SRS/Improve Service/Social Persuasion

The majority of focus group participants stated that exercising with friends in the SRS facilities was preferable to exercising alone. This supports the idea that physical

activity is a social behaviour, subject to social influence a theme that has already been discussed. Hence, from the perspective of the SRS, the concept of modifying to become more sociable and to employ a social persuasion strategy like targeting groups rather than individuals with promotional messages is a key finding of this research. In other words the SRS should aim to encourage individuals to exercise in a social, fun atmosphere, rather than to feel isolated and as if 'spectators' and 'audiences' are watching them in an austere atmosphere. This finding was particularly strong among individuals who identified themselves as not regularly active.

309: [R10 A] Instead of targeting the individual, you should target groups of friends. You are more likely to go and try something new in groups of friends, rather than try something new yourself. Because it is very intimidating by yourself. Cause I know when they are targeting you know it should be with friends kind of thing.

310: What do you think of the idea of going to a lecture theatre and then afterwards making a short presentation, and then sending stuff out to people?

311: [R10 A] Yeah,

312: [R10 JP] I think that might be more useful

313: [R10 A] yeah, because right there and then you are sitting beside people you know pretty well, and if you say to them well how about doing this/that. If you are in a group like here where we have never met before, and you like we are not like it is different, you are more likely to do stuff with friends.

314: [R10 K] Also there is no point in going to lectures at the end as well, because people when it gets to the end, they just want to get out. And it could be really interesting, but you are just interested in getting out the door.

SRS/Improve Service/Encouragement

Individuals frequently referred to the importance of feeling encouraged and how if they thought they were doing well in an activity it made them feel good. This data applies not only to past experiences but also to the SRS facilities. Encouragement by a teacher either through an exercise consultation, a phone-call or just a general comment in a class was cited as an important element in helping an individual to adhere to an exercise regime.

[Memo: In a conversation about the consultation service offered by the SRS]

217: [R10 E] You see coming from a professional and it's just encouragement again a professional says it's not hard to get back into it you just do this and this a week and that sort of thing because you can read stuff like every magazine says that someone talking to you and saying it's not hard and it's not difficult and here is a wee thing I've mailed out you know here's a wee leaflet that sort of thing. I think so yeah.

...

220: [R10 E] Say someone gives you a goal or a purpose. You know if you walk into the gym and you've got a purpose or you walk in that building with a purpose and you had to go and do so many of this and so many of that and so many of that.

221: How do you think the SRS could make that consultation procedure a little more friendly or accessible?

222: [R10 N] More time to actually have more personal contact... maybe sending things in the post, if I had felt that somebody was actually interested in whether I was you know continuing or not it would definitely encourage me to do more. I would continue doing things more. If they were to keep in contact with the person they had consulted through the post or whatever I think that would help.

223: [R10 E] I don't know what if you made them less formal. If you sat down and had a chat with someone who you found out then to be interested in sport you could sort of... but I mean it is level 6 in the cardiovascular room so you would have to walk past all the people on the machines and knock on the door

and then all the people on the machines could see you going in and then your speaking to someone in a tracksuit. I mean there is a difference they are in a tracksuit and you are not. I think even that shows that you are a sports person and I am not. So I don't know if you can do the consultations with phone. (FG3)

215: [R10 J] That is what I would like. I really would like to have known, that I could have got a consultation or somebody showing you round showing me what the facilities were and how to use the facilities, and introduce your services.

216: Do you honestly think that if I sent this out to you in the post you would read it.

217: [R10?] Yes.

218: [R10?] Yeh, I would give it a bash.

219: [R10 L] Yes, it might make you think, oh, I'll go for a consultation.

220: [R10 S] Yeh, I'd probably look at it, even though I would do something totally different. I think it is good when you see 'FREE'

...

234: [R10 J] I think the consultations are good because I think if you know what to expect one and if you go into the gym, and you've been shown how to do it then, you've the I've been shown and know what to do. Alternatively go in with somebody that knows exactly what they're doing (FG6).

385: [R10 S] I thought, you see, it says the consultation involves only 30 minutes, at the beginning I might like someone to be round a little bit longer, or like available, I don't whether or not they will be, like available for any questions I might have, or just general, like if I am doing exercises for an hour, are they going to be there every time I do my, but then that's like a personal trainer, isn't it? OK, who do I think I am?

386: [R10 E] Maybe a follow-up situation, maybe two weeks later,

387: [R10 R] Maybe three months later,

388: [R10 N] At each time period on here [2 weeks, 3 months, 6 months].

389: [R10 R] Yeah, but what would they help you with? Which kind of exercise? (FG7)

SRS/Improve Service/More Relaxed Atmosphere

The feelings of being under pressure to perform, to not make a fool of yourself and to know what you were doing in the SRS facilities were evident in the focus group data.

These feelings were referred to in every location from the cardio-vascular suite to the swimming pool. Thus it was perceived that a serious, formal atmosphere existed in the SRS facilities, and it was a place for professional people. It was suggested that a more relaxed atmosphere would be beneficial to encouraging new exercisers to begin being active, and to encourage other exercisers to maintain activity.

90: [R6 A] Well you would do it if your mates were into it, but like none of my flat mates are really active at all. Em, we went to the gym, what was it last term, just for a laugh, because one of my mates, he was really really into the gym, and he was showing us how to work all the machines and stuff, and it was all right, but, we keep saying ah! We should go again, we should go again, it would be a laugh, but we never really got around to it. We just never bothered about it.

91: [R6 C] Did you think it was a laugh though? Because I remember at the beginning I went into the gym, I have been in once, for about 5 minutes on the step thing, and I thought this would be fun, I went with my friend, and everyone was so, huh! Sport, huh! Must be muscle and it was like 'chill out' will you just take it as sport and not this thing... it's just the atmosphere, doesn't encourage you to do it. Yeah, yeah, [general agreement]

92: [R6 N] It's a bit scary, because the 1st time I went I went on the step machine and there were two men on either side of me, on the steps, and I didn't know how to work it and I couldn't get the steps to go down, and I was practically jumping on the steps, and they wouldn't move, and I had been on steps before and it hadn't been a problem, like I don't know, I just couldn't, my weight wouldn't make it go down. And there was one guy, in his forties and he was laughing at me, and there was another huge guy on the other steps, and I just had to leave, no, I am letting those men laugh at me.

93: [R6 A] Well that was why it was all right for us, because Graham was in there totally everyday, so he was like programming all the things, but I wouldn't go back in by myself, cause I wouldn't have a clue how to do it. (FG7)

218: [R10 Y] I know I personally wouldn't go to anything like thing, not because I'm scared of what they might tell me but I don't know I'm always wary of people that are like right into exercise they make you feel self conscious and from my past experience anyone like that can be very patronising and condescending to you I know these people probably aren't but I just have that experience of that and I wouldn't go. I think it's lack of confidence more than anything else but... (FG3)

269: [R10 K] The fact that it's, well I suppose the kind of desk and the things, and the fact that everybody in there is exercising, and the fact that you have to be EXERCISING to go into the Stevie building. That's the building where people are fit, and everywhere else is where people are, you know. So yeah! I think most of the people are probably worried about the fact that there's loads of stuff that you just haven't seen and how do you do it. People don't know how things are run, how things are operated. I think if people actually had knowledge about what to do, and they wouldn't feel so intimidated walking in.

270: [R10 JA] 'Cause even when you are going in, you see all these fit people running about, running about the streets. And even then there's some mad bloke doing pull-ups in the Stevie, the whole time. And you know you are no where near that so it's not enticing. (FG8)

Group Dynamics Analysis/Disregard/FG3-E

[Memo: Discussion on physical education in school, PE teacher was not seen as a role model]

4: [R2 E] At our school as well there were really sport ones were the favorites of P.E. teachers and stuff plus our teacher was crap. She was about 4'2" and she was really fat. She couldn't do anything herself do you know what I mean. Playing for the team or anything for the school I played hockey for four years for them and lost nearly every match because the school put money into the male hockey team and then they won the title for years running and no money into the female so we had a rubbish teacher and no coach and it was sort of like disheartening playing for a team that never wins and is a bit of a joke you know. Then I like ditched that.

[Memo: Discussing team selection, the notion of the teacher as a bully was put forward]

13: [R2 E] It is actually a glorified form of bullying.

[Memo: In response to a positive example of being give a choice in physical education. This was an opportunity to defy the school system and to do what you wanted]

16: [R2 E] We got to choose as well in the senior school but you could choose sports or you could choose something called community care and just went and visited an old person for the afternoon. Because the old man whom I visited didn't really know what it was about and I think we went about three afternoons in the entire year or the entire two years so I did nothing. There was a big group of us about fifteen of us did nothing for two years you know.

Fifteen of you were meant to call upon this old man?

[R2 E] No. About fifteen of us were in this community care group and nobody ever did it and that was just to completely avoid sports at all costs.

[Abstinence Violation Effect – Relapse Prevention Model, avoiding pe had positive rewards]

22: [R2 E] Half the time it was just boring. It was quite a big school and you know if it is only a thirty minute P.E. period or something and you go in and sort of the first five years at school you've got no study breaks or anything so then you have a half hour and if you didn't do P.E. you had a half hour to sit and chat to your mates or sneak out for a smoke or something so it was just far better to do that than go in.

23: Right.

24: [R2 E] It was just better to sort of sit around than go in because the P.E. teacher had been there for years obviously and I don't think that she ever thought of anything new and if she couldn't think of anything that was anything to do with the particular sport and she was taking a class with mixed sort of athletes and non-athletes so she would just say all run up and down five times and then she would just stand and chat to someone and do you know what I mean she wasn't putting any effort in so you weren't particularly bothered to go in. You would sit and talk in the changing rooms.

[Memo: Discussion changes and E addresses the notion of differentiation was apparante in the pe class not only in skill but also from an economic point of veiw.]

26: Like the trainers as well you know named trainers you know Reebok, or Adidas trainers. Mine were rubbish and I hated putting them on. Or your PE kit was all creased and that.

27: How would they have really good P.E. kits?

28: [R2 E] Well the parents would iron all the stuff for them and mine had been lying in this kit for a

week. Smelly and creased and I thought these are wrecked. Pretension about it.

[A contradiction, as the conversation moves on E does not appear to dislike activity per se]

33: [R2 E] Clubs outside school were good. There was a squash club that lots of people went to and there was stacks of people in that. Teams like, the best in Ireland, and I wasn't on it or anything it was just that there was good coaching and stuff like that so all my friends were in that for ages and I was as well. It was a damn sight better than what was given at school.

[Clubs at University]

39: [R3.1 E] The likes of the University here you play for a team or you were magic, at rugby or hockey before you came then you'll maybe cruise along to the hockey club and join but if you're really just sort of mediocre at sports then there is nothing really I mean you can mess around the gym and the swimming pool and stuff but like I was going to go and join something last year and then I think I went and saw the meeting but it was all people that had been there for years or they were just fantastic at it do you know what I mean. All the things that say 'welcome everyone', but technically there is a wee bit of you're either brilliant at it or you've been here for years. If you're just amateur and different stuff then there's not really the support given I suppose I don't know.

[Memo: Notion of not feeling very competent in skill level emerges]

40: Something that is positive and encouraging is good and something that is sort of not friendly in a way - is that what you're saying?

41: [R3.1 E] Friendly enough to be honest with you it's just not friendly enough to make you stay and feel completely part of the team. This was the particular time that

[Memo: Low levels of exercise self-efficacy are evident]

52: [R3 E] I don't know how to work half the machine weights - I would love to do them and stuff but I don't know how they work. I'm not stupid I would probably figure them out but I don't want to stand in the middle of all these *crazy gym people*, plugging at things you know, me trying to work them out.

53: Did you do anything like that at school?

54: [R3 E] No. I've used some of the things before but no. Plus I've read that you can go to the gym and ?? but if you're not doing the right amount of repetitions for the right parts of your body then you're putting lots of effort in and not getting you know the maximum amounts of results back so friends of mine that have gone and have consultations and programmes made out for them and stuff and that would be very helpful as well. I just haven't gone yet.

[The previous example is followed up by another reason why PE was dismissed in school, again the teacher is the source of disregard]

63: [R3 E] When we were in third or fourth year they used to have the P.E. skirts and the P.E. knickers and I think they were green. She said you can't jump in a skirt unless you've got your big short things. And there was one of the girls in our class had forgotten her shorts and like there was athletics training I don't remember what it was but she threatened to make her do it in her normal underwear right. The pitch was in front of all these mobiles and there is blokes at this school as well you know and she just said no and she said you will and you're going to do it. She had this girl in tears before she gave in and said that she didn't have to do it in her underwear in front of the whole school you know. She was in tears. Picking on her because of her P.E. kit you know.

[Memo: Discussion of transition between school and University]

66: [R4 E] Six months prior to October would have been A levels. The summer was just enjoying yourself after your A levels. You just partied and the Summer before you had to go to Uni., so that was why for me anyway.

[Memo: Justification argument stresses potential injury with activity]

82: [R5 E] Plus if you live and home and you're not close to a gym or anything I know you can go for a walk or go for a run or if you have got a bicycle but it's a bit boring if you are lazy inclined do you know what I mean. I would go water ski-ing well I mean I've never been water ski-ing but do you know that was as much on offer as going for a jog then I would probably do more if it was a wee bit exciting or something but it is very bland you know. Plus if you smoke it hurts your chest if you go running or anything because we went for a cycle last Summer and there was a massive hill that I had to cycle over to the next town to see an old friend of mine and there was a massive hill and at eighteen years old the two of us cycled up this really big hill and got to the top and there was a bank, there was this grass bank and we just crashed onto the grass bank - I couldn't breathe. We had to sit for about ten or fifteen minutes before we got our breath back and that is with smoking you know. *Cardiovascular exercise puts a lot of stress on your chest if you're not used to it you know. I think. I'm not an expert though.*

[Memo: Opportunities to be active in University]

86: [R6 E] I suppose technically they're grand at Glasgow anyway I mean you can't blame that I couldn't blame the University for me not doing any exercise because there's stacks on offer. I mean all the

signs welcome everyone working and all that sort of thing. *I mean it's a brilliant complex. I mean if you see round other Universities and some of their sports facilities are not half as good as they are here and so cheap and so.*

[Memo: Inactivity is justified with laziness/no motivation argument]

103: [R6 E] I think there are lots of opportunities and there are lots of ways to be fitter and if you're not stupid then you are completely aware of them because you can't not be in this day and age, you know the leaflets and television and but it's just the lazy factor I think is the problem plus the time, the courses are you know to do well and everything.

[Memo: Physical activity is something you can do when you get into the 'real world']

106: [R6 E] I think the opposite. I think when I get out like a job that's sort of regular maybe 9.00 - 6.00 or whatever you know you're in a routine and you're driving about and all this sort of thing and you generally ??? you use more like on a Tuesday and a Thursday like it will be a routine... You are a professional and you know well this is a very limited view so they go to the office in a tracksuit in the bag when they come back in like 6.30-7.30 aerobics or something and they just do two or three nights per week at aerobics and then your back home, and that's it you know. That's your routine and your discipline sort of thing so you know.

[Memo: The justification argument now breaks down into the need for confidence to be active]

120: [R7.1 E] If you feel good I mean say like you have done exercising you're sort of active person and you feel confident then it shows off and it rubs off, especially I mean this Summer maybe start looking for jobs in the field that you are studying that kind of thing do Summer work and then getting a job when you leave Uni. You sort of have confidence and well rounded and one of the companies taking people on now they have their own health care schemes and they will you know they are well into sports companies now or pressing the whole physically fit thing as well so it would help if you are confident with sports a little bit more when you've got a job.

[Memo: Weight loss as a justification argument, also hinting at not knowing what to do, E is very conscious or weight]

132: [R7 E] You can feel miserable as well because you'll sit down and say I'm going to go to the Pop=mo for every day for half an hour and then you don't and then *the next time you check your weight it's gone up again* or something or your clothes don't fit you get really sort of disheartened by it you know I mean I've quite possibly read this in a magazine as well but it's true *that if you set yourself goals that are too high then you get disheartened and then you just sort of blank them.* Especially through the winter and stuff when it's cold it's coming into the summer now so you get more active but in the winter you just totally blanked it and any time I did get depressed about my clothes not fitting me any more instead of just I said I'll do this, this and this and then I never did them and I just felt even worse you know. That can happen.

[Memo: Attitude/behaviour dysfunction]

137: [R7 E] I think it's really important to be healthy. I haven't actually tried very seriously to quit smoking but I started smoking when I was about twelve right and that's quite a bit of time and I've got a problem sometimes sort of breathing you know you can't get a proper breath so I'm certainly going to quite when I leave Uni because I don't think there is any chance of quitting while I'm at University you know and I wish I was healthier in general sort of to counter act the smoking because I really like smoking that sort of thing and I wish I could do more physical exercise because I could sort of smoke and get away with it a wee bit more rather than smoking and doing no exercise and just you know being a wreck. So I hope nothing happens to me I'm a bit paranoid I read a magazine article about people that are getting cancer are younger and younger you know so I will quite when I finish University but I just hope nothing happens to me before then you know.

[Memo: Discussion on what might help you to begin, dramatic relief ties in with weight]

163: [R8 E] Sometimes you can get a shock as well if you think you look like something or you are a certain shape or you look like something in an outfit there are no full length mirrors in our flat therefore I was wearing something and I thought I looked really well in it you know and I don't really mind. I was about 9 stone and $\frac{3}{4}$ or something which is okay it's not really bad it's not thin but *my stomach because I drink lots of beer and it's just got bigger and bigger and bigger it's quite disgusting* and the rest of me is grand I don't really mind it but my stomach is disgusting and I didn't fit the trousers it hangs over the top you know the way that big fat men's do, and I saw that when I went home and that shocked me and I just thought oh my God I'm disgusting. So I'm going to get rid of it before the Summer I have to. I'm not going to wear a bikini I couldn't wear one it's disgusting it really is. So that was a shock, a full length mirror shocked me into exercising.

[Memo: Discussion on maintenance of a physically active lifestyle, no mention of intrinsic motivation]

166: [R9 E] You can't really make a conscious decision before though people don't I wouldn't think generally stop exercising they would miss it once and then miss it again and then for some reason again and

then they drift away which means you can't sort of say to yourself oh my God I'm about to stop so I'll fix it you know you just end up drifting out. If you catch yourself drifting I mean that's grand but if you keep telling yourself ah, I'll go tomorrow it's just one day it's just two days then you'll just keep going I would imagine. You know.

[Memo: This individual appears to want to become more physically active than they currently are but they lack confidence to become involved. Friends are highlighted as an important source of encouragement]

168: [R9 E] It is the same sort of thing if you were really a friend or something then it would be harder to stop where even I suppose if you were in an aerobics class and you're on your own and you met someone there then if you didn't go and if they phoned you up to go it would encourage you to come back again because if you are sort of isolated you know a lot of exercises you can do on your own and isolated and the instructor doesn't know your name and no-one else knows your name so nobody notices if you're not there so it's not a big issue if you know whereas if the instructor if you didn't go for three weeks and then you came back and the instructor said where were you, you know what I mean, you'd maybe psychologically sort of thing that you had been missed if you are not there or something

[Memo: Discussion on the intervention material, a hint at introjected motivation to exercise]

178: [R10 E] I can't remember it. I can't remember that far back now. I think I was one of the only people in my sort of flat thing to get the stuff and I remember wondering why or how or why it was me ??? like had someone got inside information on me and my laziness?

[Memo: The importance of parental influence]

192: [R10 E] Just realising that you have got to be fit you can't spend your whole life a wreck. It is going to happen sometime. My mum keeps telling me, I mean if my mum is anything she's told me that she was thin and you know that she was thin until I was 22 and I was a size eight my whole life and now she's a size 14 or 16 and she has been dieting for as long as I can remember you know what I mean she used to do aerobics and she has just said to me get active now and just stick to it so that you can sort of because you can when you are a teenager and into your twenties and then you hit maybe I don't know old age or have a baby I don't know but mum has certainly been battling with it most of her adult life you know. So

[Memo: During a discussion on SRS facilities E reveals an embarrassment at exercising]

199: [R10 E] See the muscle conditioning introduction right the machine thing what time is the gym open and that because I would be *mortified* if I had to go in and ??? it was absolutely packed. I wouldn't mind the muscle conditioning introduction but I mean it's very very full half the time you know.

213: [R10 E] Do you know I think stuff like this is sort of sent out and you can read it in your room and it's very very easy to just set it down and forget about it as soon as you have read it. You see the muscle conditioning introductions and stuff like that you know you can have that on consultation I know it's impossible in the size of the University to have the sports people talk to every single student but it would be a far far bigger incentive do you know what I mean I know you can go if you want to go but then again see if you did have a consultation when you came to Uni or something I know it's impossible but if someone sat down and said what's your level of exercise and what do you fancy doing you know what I mean though. It would maybe encourage you from the very beginning. By word of mouth you know what I mean and then you are a wee bit more involved with the SRC perhaps rather than just feeling that it's the sporty people that go there and that's it.

[Memo: A lot of emphasis is put on the need for encouragement, this contradicts physical education experience]

216: Do you think something like that might help somebody who wasn't doing any physical activity?

217: [R10 E] Yeh. You see coming from a professional and it's just encouragement again a professional says it's not hard to get back into it you just do this and this a week and that sort of thing. Say someone gives you a goal or a purpose. You know if you walk into the gym and you've got a purpose. You wouldn't leave until you had it done and you'd know what you were doing and if you were nearer the gym and you would exercise and stuff and you had a purpose you could walk around do you know what I mean like you were there for a reason rather than because I used to float in and stand at the side of the machine and look round me and jump on and do 20 and then jump off again and then that would be it. That sort of way but if you were given a purpose and a set of things to do and get finished you would exercise sort of thing.

[Memo: Finally, E reveals again how self-conscious she is as regards exercising, she now worries about her weight (even though she slagged her pe teacher about weight), she is wondering what everyone else thinks is present]

230: [R10 E] Do you think it's true that people who are in gyms and I don't know if you do a lot of exercise yourself but you know is it true that people who don't do a lot of exercise because a friend of mine lifts weights, a fella, a big time personal trainor and I said to him because he used to say ??? I said have you ever seen someone who has been really fat or anything walk into a gym. What do you think of them

when they walk past you and your buddies and I said do you not sort of look at them and go and like make a joke or something like that and he said after saying all this rubbish about everyone should do it and it's not hard and they should make an effort and stuff he said no that there is stuff said about people like that you know what I mean. We knew all the time and technically he said that when they thing about it they should do it you know it's good for them going and starting again, but it's true that there is stuff said about you do you know what I mean if you walk into a place like that you know the regulars and stuff.

