THE EFFECTS OF A GOAL-SETTING PACKAGE ON THE PERFORMANCE OF YOUNG FEMALE SPEED SKATERS

BY

Connie M. Wanlin

A thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

MASTER OF SCIENCE

Department of Physical Education and Recreation Studies
University of Manitoba
Winnipeg, Manitoba

(c) May, 1995

National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file *Votre référence*

Our file *Notre référence*

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-612-13552-7

Canada

Name_____

Dissertation Abstracts International is arranged by broad, general subject categories. Please select the one subject which most nearly describes the content of your dissertation. Enter the corresponding four-digit code in the spaces provided.

Behavioral Psychology (Sports Psychology)

SUBJECT TERM

0384

SUBJECT CODE

U·M·I

Subject Categories

THE HUMANITIES AND SOCIAL SCIENCES

COMMUNICATIONS AND THE ARTS

Architecture 0729
Art History 0377
Cinema 0900
Dance 0378
Fine Arts 0357
Information Science 0723
Journalism 0391
Library Science 0399
Mass Communications 0708
Music 0413
Speech Communication 0459
Theater 0465

EDUCATION

General 0515
Administration 0514
Adult and Continuing 0516
Agricultural 0517
Art 0273
Bilingual and Multicultural 0282
Business 0688
Community College 0275
Curriculum and Instruction 0727
Early Childhood 0518
Elementary 0524
Finance 0277
Guidance and Counseling 0519
Health 0680
Higher 0745
History of 0520
Home Economics 0278
Industrial 0521
Language and Literature 0279
Mathematics 0280
Music 0522
Philosophy of 0998
Physical 0523
Psychology 0525
Reading 0535
Religious 0527
Sciences 0714
Secondary 0533
Social Sciences 0534
Sociology of 0340
Special 0529
Teacher Training 0530
Technology 0710
Tests and Measurements 0288
Vocational 0747

LANGUAGE, LITERATURE AND LINGUISTICS

Language
- General 0679
- Ancient 0289
- Linguistics 0290
- Modern 0291

Literature
- General 0401
- Classical 0294
- Comparative 0295
- Medieval 0297
- Modern 0298
- African 0316
- American 0591
- Asian 0305
- Canadian (English) 0352
- Canadian (French) 0355
- English 0593
- Germanic 0311
- Latin American 0312
- Middle Eastern 0315
- Romance 0313
- Slavic and East European 0314

PHILOSOPHY, RELIGION AND THEOLOGY

Philosophy 0422
Religion
- General 0318
- Biblical Studies 0321
- Clergy 0319
- History of 0320
- Philosophy of 0322

Theology 0469

SOCIAL SCIENCES

American Studies 0323
Anthropology
- Archaeology 0324
- Cultural 0326
- Physical 0327

Business Administration
- General 0310
- Accounting 0272
- Banking 0770
- Management 0454
- Marketing 0338

Canadian Studies 0385
Economics
- General 0501
- Agricultural 0503
- Commerce-Business 0505
- Finance 0508
- History 0509
- Labor 0510
- Theory 0511

Folklore 0358
Geography 0366
Gerontology 0351
History
- General 0578
- Ancient 0579
- Medieval 0581
- Modern 0582
- Black 0328
- African 0331
- Asia, Australia and Oceania 0332
- Canadian 0334
- European 0335
- Latin American 0336
- Middle Eastern 0333
- United States 0337

History of Science 0585
Law 0398
Political Science
- General 0615
- International Law and Relations 0616
- Public Administration 0617

Recreation 0814
Social Work 0452
Sociology
- General 0626
- Criminology and Penology 0627
- Demography 0938
- Ethnic and Racial Studies 0631
- Individual and Family Studies 0628
- Industrial and Labor Relations 0629
- Public and Social Welfare 0630
- Social Structure and Development 0700
- Theory and Methods 0344

Transportation 0709
Urban and Regional Planning 0999
Women's Studies 0453

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES

Agriculture
- General 0473
- Agronomy 0285
- Animal Culture and Nutrition 0475
- Animal Pathology 0476
- Food Science and Technology 0359
- Forestry and Wildlife 0478
- Plant Culture 0479
- Plant Pathology 0480
- Plant Physiology 0817
- Range Management 0777
- Wood Technology 0746

Biology
- General 0306
- Anatomy 0287
- Biostatistics 0308
- Botany 0309
- Cell 0379
- Ecology 0329
- Entomology 0353
- Genetics 0369
- Limnology 0793
- Microbiology 0410
- Molecular 0307
- Neuroscience 0317
- Oceanography 0416
- Physiology 0433
- Radiation 0821
- Veterinary Science 0778
- Zoology 0472

Biophysics
- General 0786
- Medical 0760

EARTH SCIENCES

Biogeochemistry 0425
Geochemistry 0996
Geodesy 0370
Geology 0372
Geophysics 0373
Hydrology 0388
Mineralogy 0411
Paleobotany 0345
Paleoecology 0426
Paleontology 0418
Paleozoology 0985
Palynology 0427
Physical Geography 0368
Physical Oceanography 0415

HEALTH AND ENVIRONMENTAL SCIENCES

Environmental Sciences 0768
Health Sciences
- General 0566
- Audiology 0300
- Chemotherapy 0992
- Dentistry 0567
- Education 0350
- Hospital Management 0769
- Human Development 0758
- Immunology 0982
- Medicine and Surgery 0564
- Mental Health 0347
- Nursing 0569
- Nutrition 0570
- Obstetrics and Gynecology 0380
- Occupational Health and Therapy 0354
- Ophthalmology 0381
- Pathology 0571
- Pharmacology 0419
- Pharmacy 0572
- Physical Therapy 0382
- Public Health 0573
- Radiology 0574
- Recreation 0575
- Speech Pathology 0460
- Toxicology 0383

Home Economics 0386

PHYSICAL SCIENCES

Pure Sciences

Chemistry
- General 0485
- Agricultural 0749
- Analytical 0486
- Biochemistry 0487
- Inorganic 0488
- Nuclear 0738
- Organic 0490
- Pharmaceutical 0491
- Physical 0494
- Polymer 0495
- Radiation 0754

Mathematics 0405
Physics
- General 0605
- Acoustics 0986
- Astronomy and Astrophysics 0606
- Atmospheric Science 0608
- Atomic 0748
- Electronics and Electricity 0607
- Elementary Particles and High Energy 0798
- Fluid and Plasma 0759
- Molecular 0609
- Nuclear 0610
- Optics 0752
- Radiation 0756
- Solid State 0611

Statistics 0463

Applied Sciences

Applied Mechanics 0346
Computer Science 0984
Engineering
- General 0537
- Aerospace 0538
- Agricultural 0539
- Automotive 0540
- Biomedical 0541
- Chemical 0542
- Civil 0543
- Electronics and Electrical 0544
- Heat and Thermodynamics 0348
- Hydraulic 0545
- Industrial 0546
- Marine 0547
- Materials Science 0794
- Mechanical 0548
- Metallurgy 0743
- Mining 0551
- Nuclear 0552
- Packaging 0549
- Petroleum 0765
- Sanitary and Municipal 0554
- System Science 0790

Geotechnology 0428
Operations Research 0796
Plastics Technology 0795
Textile Technology 0994

PSYCHOLOGY

General 0621
Behavioral 0384
Clinical 0622
Developmental 0620
Experimental 0623
Industrial 0624
Personality 0625
Physiological 0989
Psychobiology 0349
Psychometrics 0632
Social 0451

THE EFFECTS OF A GOAL-SETTING PACKAGE ON THE PERFORMANCE OF YOUNG FEMALE SPEED SKATERS

BY

CONNIE M. WANLIN

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF SCIENCE

© 1995

Permission has been granted to the LIBRARY OF THE UNIVERSITY OF MANITOBA to lend or sell copies of this thesis, to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film, and LIBRARY MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or other-wise reproduced without the author's written permission.

Table of Contents

Abstract vi

Acknowledgements vii

Chapter 1

INTRODUCTION

Statement of the Problem 3

Definition of Terms 4

Delimitations 5

Limitation 5

Significance of the Study 6

Chapter 2

LITERATURE REVIEW

Goal-setting 7

Goal-setting: A Package Approach 12

Goal-setting Training 14

Self-Monitoring 17

Self-Talk 19

Feedback 21

Log Books 22

Visualization: A Dynamic Form of Goal-setting 23

Self-Efficacy 24

Applied Behavioral Analysis and Single-Subject Research Designs 26

Recommendations for Future Research 28

Chapter 3

METHOD

Subjects and Setting 29

Description of Subjects 29

Apparatus and Materials 30

Dependent Variables 31

Offtask Public Behaviors 31

Offtask Private Behaviors 32

Performance 32

Self-Efficacy 33

Goal Achievement 34

Treatment Integrity 34

Observers 34

Procedural Reliability 34

Subject Compliance 34

Online Assessment of the Independent Variable 35

Dependent Variable Accuracy Checks 35

Controlled Variables 37

Expert Observer Bias 37

Training Effects 37

Contamination Effects 37

Process Check 37

Coach/athlete interactions 37

Experimental Design 38

Procedure 38

Preliminary Phase 38

Baseline 38

Intervention 40
Social Validity 41
Chapter 4
RESULTS
Data Analysis 43
Criteria for Data Analysis 43
Dependent Variable Check 44
Table 1 44
Performance 45
Work Output 45
Figure 1 46
Figure 2 47
Times 48
Figure 3 49
Skill Development 50
Offtask Behaviors 51
Public Behaviors 51
Figure 4 52
Figure 5 53
Private Behaviors 54
Figure 6 56
Self-Efficacy 57
Figure 7 58
Goal Achievement 59
Training Effects 60
Coach/Athlete Interactions 60
Table 2 60

Social Validity 61
Table 3 62
Chapter 5
DISCUSSION 63
Social Validity 66
The Impact of Applied Research Settings 68
Chapter 6
SUMMARY AND CONCLUSIONS 71
Conclusions 72
Recommendations 72
Practical Implications 73
References 74
Appendices
Appendix A Consent Form 82
Appendix B Recording Sheet 83
Appendix C Expert Recording Sheet 84
Appendix D Treatment Integrity Check 86
Appendix E Intervention Prompt 87
Appendix F Self-Efficacy Scale 88
Appendix G Thought Content Assessment 89
Appendix H Log Book Page 90
Appendix I Goal-setting Checklist 91
Appendix J Social Validity Questionnaire 92
Appendix K Video Script 94
Appendix L Recording Protocal 98

Abstract

The main purpose of the present study was to assess the effective of a goal-setting package on skating performance (work output, 500m race times, and skill development), offtask behaviors, and self-efficacy. In addition, this study allowed for an assessment of goal achievement. A single-subject design (multiple-baseline across subjects) was used to assess the dependent variables. Subjects were four female skaters ranging in age from 12-17 years of age. One subject remained at baseline for the duration of the study. The results provide positive support for utilizing a goal-setting package in an applied setting. Work output was increased and offtask behaviors decreased. The social validity assessment provided further confirmation of the effectiveness of the goal-setting package. Skaters found the package to be beneficial. Suggestions for further research are discussed.

Acknowledgements

The completion of this is due to the wonderful encouragement and support of many individuals. First and most importantly my thesis committee.

Thanks to: Dr. Denis Hrycaiko, my advisor, for his guidance and wisdom throughout this endeavor, Dr. Garry Martin for his help in recruiting observers and for his practical suggestions, and to Dr. Mike Mahon for his help in developing my graphs.

Thanks also to the athletes who participated in this study as well as their parents and coaches, without whose involvement this study would not be possible.

Thanks to all the observers who helped collected the data, I couldn't have done it without their help.

Finally thanks to my family and friend whose support helped me through this project. Thanks!

CHAPTER 1

Speed skating is predominantly an endurance activity, however various distances are involved in competitions. Research within this sport, in the area of psychology, has been minimal. Some work has found that psychological advice can help short track skaters deal with mental problems (Qu, 1988). A study examining the psychological perspective of skaters found that those who made an Olympic team responded positively to training and achieved a psychological peak just before the trials (Gutman, Pollock, Foster, & Schmidt, 1984). Other factors that have been studied include inhibition (Maxeiner, 1985), motivation (Ralston, 1986), and predictors of psychological responses (Gutman, et. al., 1984).

In many individual sports and within the sport of speed skating in particular, there is a need for focusing and self-regulatory strategies (Martin & Lumsden, 1987). Self-regulatory strategies are techniques such as goal-setting, self-talk, and self-monitoring which help athletes to maximize attention to the coach's instruction (when they are given), monitor thoughts (i.e. to maintain technique and mood thoughts that will help keep the individual on task), and provide athletes with specific goals to work toward during practice. A problem with speed skating in Manitoba is that young intermediate level athletes receive little individual instruction from their coach and basically "go through the motions" by following what everyone else is doing in practices. Clearly it is important for athletes to learn skills to self-regulate and monitor their own behavior (Kirschenbaum, 1987, Martin and Lumsden, 1987, Chen and Singer, 1992). A pro-active approach to goal-setting may serve to provide athletes with these skills.

A goal-setting package should involve not only setting goals but developing skills which will aide in the execution of these goals. Kirschenbaum (1987) stated that "all serious athletes work on goal-directed behaviors in the relative absence of immediate external constraints" (i.e. engage in self-regulation). Two self-regulation/goal-setting models (Kirschenbaum, 1987, Garfield, 1984) serve as a basis for the present research. Both approaches emphasize the use of execution components such as visualizing goals and utilizing self-talk to help athletes achieve their goals. This is an important point, as a large portion of the goal-setting literature overlooks the specific steps that appear to be necessary to achieve desired goals.

Locke and Latham (1985) have examined the research in organizational psychology, from which goal-setting has its roots, and they have suggested that goal-setting should have a greater impact on sport performance than on organizational behaviors because measurement in sports settings is less intrusive. That is, it is easier to have people observing athletic behavior from the stands at an arena than it is to have them observe behavior in an office. Based on their research Locke and Latham (1985) made several recommendations which suggest the potential of goal-setting in sports. Of specific interest to the present study, Locke and Latham (1985), as well as Botterill (1983), suggested that goal-setting can not only facilitate enhanced performance, but it can increase self-efficacy, persistence and effort.

There are, however, many contradictions within the research literature. Recent empirical investigations of goal-setting in sport have been equivocal (Hall & Byrne 1988, Weinberg, Bruya, Jackson, 1990). Some studies (e.g. Botterill, 1983; Barnett & Stanicek, 1979; Weinberg, Bruya, Longino, & Jackson, 1988; Burton, 1989a,1989b; Boyce, 1992; Poag & McAuley,

1992) have found the positive effects of goal-setting as suggested by Locke and Latham (1985); while others reported no differences between goal-setting and various control conditions (Barnett, 1977, Weinberg, Bruya, & Jackson, 1985, Weinberg, Bruya, Jackson, & Garland, 1987, Miller & McAuley, 1987).

It is possible that the problem with this research is technological rather than theoretical. Much of the research in the area of goal-setting seems to suggest that goal-setting in general terms may improve performance in sport. However, one reason for the contradiction may be that the research has focused on the effects of simply setting goals and failed to consider the execution components underlying effective goal-setting. Alternatively, it could be that the research designs have not adequately controlled for spontaneous goal-setting or self-monitoring by the subjects (i.e. a lack of treatment integrity).

Beyond what the literature shows, it is important to consider that improvements in high performance athletes, in particular, may be clinically significant although not statistically significant (Bryan, 1987). Therefore it is important to look at ways to study the data that will take this factor into consideration. From this perspective a single subject methodology would allow for these factors to be addressed.

Statement of Problem

The primary purpose of the present study was to assess the effectiveness of a goal-setting package on the skating performance, public and private behavior, and self-efficacy of young speed skaters. A secondary purpose was to evaluate the benefits of log books in assessing goal achievement, and

the general use of the goal-setting package. In addition this study attempted to expand the depth of single-subject research designs in applied sport psychology, and within the sport of speed skating in particular. Finally, this study attempted to address the problems of past research regarding treatment integrity by using multiple subjective and objective measures.

Definition of terms

Coach \ athlete interaction A coach\athlete interaction occurs when the coach verbally interacts (e.g. statement, question, command) with the athlete during practice. Interections are classified as either negative (negative feedback), positive (positive feedback), or neutral (value-free question or statement).

Feedback Feedback consists of the information generated about a response (Siedentop, 1976). In this case feedback is in the form of: a) any verbal comments the coach makes in regard to the athlete's performance (i.e. standard coaching), b) self-assessment of practices and goals.

Frequency of skills The frequency of skills will be assessed on two levels: a) the total number of laps completed during one practice, and b) the completion of practice drills assigned by the coach.

Goal-setting Package Active goal-setting involves setting goals and utilizing techniques such as self-talk, self-monitoring, and visualization, to aide in the execution of these goals and enhance goal achievement.

Offtask private behaviors The offtask private behaviors is a measure of the frequency for which the athlete reports thinking about things other than task oriented private behaviors. The assessment involved using a thought content questionnaire (Ming, 1992; see Appendix G).

Offtask public behaviors The offtask public behaviors is a measure of the frequency behaviors such as: talking while the coach is talking, playing with equipement while the coach is talking, standing around for more than one minute while the coach is talking (see Appendix L).

Performance Performance is assessed on three variables: times (to be defined later in this section), skill frequency, and skill development (further definition is found in methods section).

Skills The skills in speed skating include the start, the various distances, and the skating technique and form.

Standard coaching Standard coaching includes the typical procedures used by the speed skating coach during practices. These include verbal instructions, correctional feedback, praise and encouragement.

Times Times in this study refers to the time of a 500m pursuit as taken by the observers during race simulations, and by officials at actual races.

Delimitations

1. This study is limited to a sample of four female speed skaters ranging in age from 12-17 years.
2. This study is limited to a comparison of the relative impact of the intervention and the standard coaching procedures.
3. This study is limited to the first short track training season

Limitations

1. This study is limited by the social evaluative influence produced by the presence of observers and a video camera.
2. The results of the study will be limited to the sample under investigation.

3. The social validity information is limited to the honesty and sincerity of subjects.

4. The subject pool is limited to those skaters who do not provide a scheduling conflict for data collection (i.e. that is two skaters having practices in two different rinks at the same time).

Significance of the Study

Speed skating is an individual endurance sport. At the competitive level it requires many hours of repetitive practice. During practice the coach has very little time for individual feedback so it is up to the athlete to maintain their focus and monitor their behavior. The present study attempts to provide the athletes with the skills necessary to maintain task focus during both practices and competitions. It was hypothesized that such a package has the potential to enhance skating performance and increase self-efficacy. As well, the skills learned in this study might serve these athletes for other endeavors in their lives.

This study attempted to determine whether a pro-active package approach to goal-setting was effective in enhancing goal achievement. Psychological skills that might enhance the execution of goals were utilized in an effort to better understand the possible reasons for the inconsistent empirical results in goal-setting research. In addition the study extended applied sports psychology research within the sport of speed skating.

CHAPTER 2

Literature Review

Goal-setting

Goal-setting is very important in the development of an athlete as it provides a means to clarify goals and help set priorities (Botterill, 1983). According to Locke and Latham (1985) success in competitive sports is dependent on two factors: skill and motivation. Both of these factors can be enhanced through goal-setting. Although elite athletes are born with considerable athletic potential, experts agree that motivation is essential for learning skills (Frierman, Weinberg, & Jackson, 1990).

It has been suggested by Locke and Latham (1985) that self-regulation is dependent on goal-setting. Goals provide a standard against which an athlete can evaluate his/her performance. This comparison serves as a basis for the self-assessment of performance.

Locke and Latham suggest that without this standard there is little incentive for action. From a behavioral perspective it is possible that athletes' behaviors are shaped by various contingencies provided by the coach. Rules, however, provide more specific contingencies for reinforcement. Goals are a type of rule.

Research in the area of self-regulation and goal-setting has its roots in non-sports fields. This research includes:

1) organizational research of management-by-objectives programs which are widely used in industrial settings (Odiorne, 1978 as cited by Weinberg, Bruya, Longino and Jackson, 1988),

2) research studying the effectiveness of self-management and goal-setting programs for increasing performance in business settings (Gist, Bavetta, Stevens, 1990, Gist, Stevens, Bavetta, 1991),

3) early academic research focusing on the association of intention, task set, and level of aspiration (Ryan, 1970, as cited by Weinberg, Bruya, Longino, Jackson, 1988),

4) current research in the area of self-monitoring (Morgan, 1985, 1987) external feedback and self-reinforcement, and public versus private goal-setting in school settings (Hayes, Rosenfarb, Wulfert, Munt, Korn, Zettle, 1985, Hayes, Munt, Korn, Wulfert, Rosenfarb, & Zettle,1986).

The research suggests that self-regulation training is a very important tool for increasing performance, self-efficacy and improving time management. It is also recognized that goal-setting training is an important aspect of a self-regulation package. However, the role of other characteristics of the training program (i.e. the type of goals set, the way in which goals are set (privately or publicly or both), and the need to combine with self-monitoring procedures in order to achieve success) is much less clear. A common methodological problem in these studies involves the use of a non goal-setting/ non self-monitoring control group. Due to the cognitive nature of goal-setting and self-monitoring it is difficult to prevent this (control) group from setting goals. In fact, spontaneous goal-setting/self-monitoring was reported to have occurred in some of these studies (e.g.. Morgan, 1985, 1987) and was a possible confounding variable in others (e.g. Hall, Bryne, 1988, Bar-Eli, Levy-Kolker, Tenenbaum & Weinberg, 1993).

Because self-regulation is clearly an effective tool that can improve non-sport behaviors and is seen as the key in achieving and maintaining

peak performance in sport, sports psychologists have promoted the use of these procedures to achieve various goals (Kirschenbaum, 1984, 1987; Locke & Latham, 1985). In fact, much of the research previously discussed has potential to generalize to sport situations. The application of these procedures to the sport context has, however, been limited to case studies, anecdotal evidence, exploratory experiments of related interventions, and a few empirical studies. Presently, various cognitive strategies (self-regulatory procedures) are becoming more widely used to improve the development and performance of a sport skill (Chen, & Singer, 1992, Weinberg, & Weigand, 1993).

Locke and Latham (1985) have listed several findings from organizational and laboratory research that they hypothesized would be generalizable to sport settings. They suggested that goal-setting: focuses and directs' one's activity, regulates effort expenditure (i.e. harder goals result in greater effort), enhances persistence, promotes development of new performance enhancement techniques, and may increase self-confidence, self-efficacy and concentration. They also suggested that goal-setting is most effective: when goals are specific, progressively difficult or challenging, when it involves setting short-term goals to facilitate long-term goal achievement (i.e. the use of subgoals), when it is used for simple tasks, when feedback showing performance or progress in relation to the goal is provided, and when there is a commitment and acceptance of goals.

As well Locke and Latham (1985) suggest that commitment can be affected by requiring the athletes to accept the goal and reasons given for its importance. This commitment can also be affected by the coach showing support and encouraging the athletes participation in the process. Finally they suggest that the selection of subjects for research in this area

must be carefully considered. The concern is that elite athletes are already highly motivated, and although they may be affected by a goal-setting program, increases in their performance may be minimal. Therefore studies need to be conducted over longer periods to show actual improvements. Ideographic multi-measurement designs should be considered to detect actual effects within this type of population (Vealey, 1988, Bryan, 1987, Greenspan & Feltz, 1989, Seiler, 1992).

Similar to Locke and Latham (1985), Botterill (1983) asserts that there are many benefits to goal-setting. He suggests, that goal-setting is important to clarify goals and priorities. As well, when subgoals and priorities are clear, and successive over a realistic time span to avoid information overload, athletes are then equipped to effectively focus their attention, energy, and activity. Other benefits suggested by Botterill (1983) include:

(a) increased commitment and motivation,

(b) immediate success (i.e. as a result of small subgoals),

(c) increased psychological maturity,

(d) improved coping capabilities,

(e) prevention of problem behaviors,

(f) more enjoyable and effective leadership (i.e. when athletes and coaches have agreed on a plan of clear goals and priorities),

(g) appreciation of planning and goal-setting, empathy for others rights,

(h) improved communication, happier athletes, better performances, more fun, and enhancement of life skills.

These considerations and benefits should be recognized when putting together a training program to yield the greatest treatment effects. There are, however, many contradictions within the research. Recent empirical

investigations of goal-setting in sport have been equivocal (Hall & Byrne 1988, Weinberg, Bruya, Jackson, 1991). Some studies have supported the hypothesis proposed by Locke and Latham (1985) finding positive effects of goal-setting (e.g. Barnett & Stanicek, 1979, Weinberg, Bruya, Longino, & Jackson, 1988, Burton, 1989a,1989b, Boyce, 1992, Poag & McAuley, 1992); while others found no differences between goal-setting and various control conditions (Barnett, 1977, Weinberg, Bruya, & Jackson, 1985, Weinberg, Bruya, Jackson, & Garland, 1987, Miller & McAuley, 1987). It is important to consider the type of goal-setting and training provided as well as the methodology when assessing the effectiveness of goal-setting programs (Burton, 1989b, Weiss, 1991, Hall & Bryne, 1988, Weinberg, Bruya, & Jackson, 1990, Locke, 1991, Weinberg, & Weigand, 1993).

Several factors may have contributed to a lack of significant findings in the goal-setting research. Based on a review of the forementioned literature the following problems need to be addressed:

1) There is a lack of applied research, particularly testing techniques in actual sports settings (both in practice and competition settings).

2) Goal-setting training is generally undertaken with group research designs and individual differences are not considered.

3) Due to the use of group designs small improvements may be masked by statistical analysis.

4) There is a lack of experimental control over spontaneous goal-setting in the "do your best" or no goal-setting condition used in the group designs.

5) Present research dwells on comparing various weak techniques (i.e. short term goals versus do your best condition) rather than putting together a powerful treatment package, as suggested by Azrin (1977).

6) There needs to be accurate description of the intervention as well as the operationalization of the dependent variables in question.

7) There is lack of component analysis within a goal-setting package that combines goal-setting training, self-monitoring, self-evaluation, self-talk, feedback, and visualization of goals.

8) Performance on the task for which goals are set is generally the sole dependent variable, other variables such as self-efficacy need to be considered.

Goal-setting: A Package Approach

A package approach to goal-setting is a pro-active philosophy which emphasizes the execution components of goal-setting in order to facilitate goal achievement. Execution refers to those components that are needed to help athletes reach and attain their goals. Within this package approach athletes have the opportunity to reflect on their personal philosophy of sport and their reasons for participating. On this basis they are taught how to develop a mission statement which serves as a guide to further goal-setting. Once this mission is identified athletes set long term and short term subgoals, while keeping their mission in mind. This approach also emphasizes goal-setting training. This training involves teaching athletes to set goals that are: specific, flexible, difficult (yet reasonable), stated positively, and based on feedback. In addition other psychological skills are included to aid in the execution of goals. These skills are self-monitoring, self-evaluation, self-talk, and goal visualization. This type of program is warranted as the goal-setting literature reviewed reflects a need for greater training in goal-setting (Weiss, 1991). Two examples of a package approach to goal-setting for applied settings are that of

Kirschenbaum (1984, 1987) and Garfield (1984). These approaches illustrate the need to include execution components if individuals are to effectively use goal-setting.

Kirschenbaum's Model: A self-regulation approach

Consistent high achievement of an athlete depends on the consistent successful use of self-related cognitive techniques (Chen and Singer, 1992). Self-regulation procedures may be useful in helping athletes improve their performance (Kirschenbaum, 1984). Self-regulation as defined by Kirschenbaum (1987) involves complex interactions between cognition (e.g. goal-setting), affect (e.g. fear), physiology (e.g. strength, flexibility), and environmental variables. It is stated that:

> "all serious athletes work on goal-directed behaviors in the relative absence of immediate external constraint (i.e. self-regulation)" (Kirschenbaum, 1987, p. S106)

Kirschenbaum (1984, 1987) suggests a five stage model of self-regulation including:

1. problem identification, that is specifying the goal to be sought,
2. establishing a commitment to meet goals;
3. execution, which includes self-monitoring, self-evaluation and self-consequation;
4. environment management, (e.g. keeping the athlete in an environment that will allow the athlete to focus the greatest amount of energy on performance);
5. generalization (i.e. maintaining self-regulatory behaviors across settings and over time).

Garfields Five Phase Goal-setting Plan: Making Your Mission Happen

Garfield and Bennet, in their book, Peak Performers (1984), present an applied five phase plan for goal-setting. This model begins with the development of a mission statement, which is a practical example of problem identification, which is followed by the development of long-term and short-term subgoals. The final three phases include: developing the peak performance assessment chart, the program training plan and translating goals into mental images (visualization). The latter phases could be equated to the execution phase of Kirschenbaum's model.

Clearly, based on the literature, there is a need for a multicomponent package approach which has achieved positive results in non-sport settings (Azrin, 1977). In the proposed goal-setting package the components consist of: goal-setting training, self-talk, feedback, goal visualization, self-monitoring and self-evaluation.

Goal-setting Training

Goal-setting training has received limited attention according to Miller and McAuley (1987). As self-regulation strategies such as goal-setting, self-monitoring, and self-talk strategies are being used with greater frequency the need for training in this area is becoming more important (Chen & Singer, 1992). Chen and Singer present four recommendations when applying self-regulatory strategies. They are as follows:

1) Global self-regulation techniques need to be taught besides specific learning and performance strategies for attaining achievement possibilities.
2) Self-regulation may make it easier for other strategies to be used, maintained, and generalized across different tasks and situations.
3) Not all strategies work for all individuals, adaptation may be needed.

4) Strategies should be only used when understood and applied appropriately.

Although performance enhancement is usually defined by objective success such as winning, several studies in the sport domain have emphasized the importance of assessing both objective and subjective measures of success (Miller & McAuley, 1987, Burton, 1989b). Behavioral observations of specific behaviors related to performance such as, offtask behaviors and skill completion, can also serve as objective measures. These may be reported through statistical analysis or visual performance increases on graphs. Social validation questionnaires and self-reports would be considered subjective measures. Single-subject research designs combine both types of measures (i.e. visual graphics of behavioral observations and social validation of results and self-reports).

Barnett and Stanicek (1979) used teacher-led conferences to promote the importance of setting verbal and numeric goals for archery performance. The goal-instructed group outperformed a group of similar ability whose conferences focused only on problem areas in skill execution. Miller and McAuley (1987) examined the effects of a 5-week goal-setting training program on basketball free-throw accuracy (objective performance measure), perceptions of success (subjective performance measure), and self-efficacy. The results, although showing no objective treatment effects, did produce subjective treatment effects. Subjects in the goal-setting training group had higher perceived success than the no-training group. As well, the goal-setting training group had significantly higher self-efficacy at the end of the treatment period than the no-training group. Therefore the goal-setting did have a significant impact on the success and efficacy perceptions although the data did not show

improvements in performance. Based on these results it is suggested that future research examine cognitive and behavioral effects of goal-setting such as: the effects on differing ability levels, diverse tasks, immediate and long-term effects and whether training is maintained.

Burton (1989b) examined the long term effect of a performance oriented goal-setting training program on the perceived ability, competitive cognitions and performance of collegiate swimmers. This study attempted to answer some of the questions presented earlier. The results confirmed the benefits of goal-setting training. Not only did this method modify athletes goal patterns toward a performance orientation, enhance perceived ability and competitive cognitions, but it actually improved performance as well. It was suggested that systematic, long-term psychological skills programs such as goal-setting training provides a viable approach to helping athletes enhance cognitions and performance.

This study is important because not only did it show the benefits of goal-setting training but an attempt was made to rectify some of the methodological concerns discussed earlier (i.e. the need for more long-term investigation and the use of more ideographic approaches). These methodological concerns were resolved by following the swimmers over a season and having them maintain logs which provided qualitative results as well as possible explanations as to why the treatment did or did not have an effect on that individual. Each of the various measurements provided support for the positive effect of the program. A limitation of the study was that as in most field studies many variables could not be controlled. However, many of these variables were accounted for in the personal logs kept by the swimmers. Future research could attempt to apply this form of

research design to different settings with different training packages. Furthermore, additional skills could be provided to enhance goal execution.

The research in the area of goal-setting training programs is clearly limited. It is important to consider particular aspects of goal-setting (Weiss, 1991) and other execution components which may enhance the benefits one wishes to attain.

Self-Monitoring

Self-monitoring is a key to the execution of self-regulation (Kirschenbaum, 1987) and is therefore a very important component of a goal-setting package. Bandura suggests that self-monitoring is a cognitive process that makes up self-regulation (Bandura, 1984). For individuals to regulate their behavior, they must attend to what they are doing (Bandura, 1984). For a self-regulation package to be effective athletes must systematically record their own behavior (Morgan, 1985, 1987). This recording is referred to as self-assessment, self-observation or self-monitoring (Morgan, 1985). Self-monitoring can be done in many settings. Students may monitor their study time, runners may monitor their pace, and a secretary may monitor his/her typing speed.

Social learning theory suggests that self-monitoring has two primary functions: it aids in the setting of realistic performance standards (i.e. goal-setting) and it promotes continuing changes in relation to these self-set goals (Bandura, 1984). Corrective feedback and an increase in motivation are also results of the self-evaluation and goal-setting inherent in self-monitoring techniques. According to social learning theory, most behavior is under self-regulatory control (Bandura, 1984).

The effectiveness of self-monitoring as a device for behavior change is dependent on many factors (Bandura, 1984). The nature of the task as well as the immediacy of the task have been shown to affect self-monitoring. Also the type of performance feedback has an impact. Clear, specific, and accurate feedback is more effective than vague, non specific and inaccurate feedback. The athlete him/herself will also have an impact on effectiveness (Chen and Singer, 1992, Kirschenbaum, 1984). Prior learning, cognitive style, affect, personality, prior experience, motivation, and abilities are some of the characteristics that need to be considered when designing a self-regulatory program which will enhance performance (Chen & Singer, 1992).

Self-monitoring procedures have been used to decrease problem behaviors in practice. McKenzie & Rushall (1974) were able to reduce absenteeism, tardiness, and early departure from practice by publically recording and charting these behaviors. In addition, work output increased by 27% at swimming practices, when swimmers self-monitored their output on a program board which was positioned at the end of the swimming lanes. These results were confirmed by Bell & Patterson (1978) who were also able to increase work output in swimming using this method. A third study, by Hume, Martin, Gonzalez, Cracklen, and Genthon (1985), also found public posting and self-monitoring on poster boards to be useful in decreasing off-task behaviors and increasing the number of tasks done within a free skating practice session.

Finally, in a study comparing two self-management packages to standard coaching, positive results were found with the self-monitoring procedures for improving practice performance of young gymnasts (Wolko, Hrycaiko, Martin, 1993). The results confirmed the effectiveness

of self-regulation procedures to increase practice performance (work output) of gymnasts. In this study self-set private goals were found to be slightly more effective.

The use of a single-subject research design was also important, as the results produced a performance increase of 20%. An important consideration of this study was the social validation of the procedure. The gymnasts and the coach felt that the results were valuable. By using this design it was possible to determine which procedures worked better for which gymnasts. As a result the coach could use principles of behavioral coaching and applied behavior analysis to tailor future programs for each gymnast individually.

It has also been demonstrated that positive self-monitoring can facilitate self-regulation of poorly mastered tasks (Kirschenbaum, 1987). Unskilled golfers who positively self-monitored generally showed improvements in performance as well as concomitant attitudes towards golf (Kirschenbaum 1987). Self monitoring consisted of either positive or negative self-instructions (i.e. reminders about how to execute key components or which errors to avoid). Self-monitoring has also been used to qualify goal statements, that is to use statements such as "I will" rather than "I won't" (Miller & McAuley, 1987). This is very similar to what is commonly referred to as self-talk.

Self-Talk

Self-talk is a self-directed technique used to develop control over the desired behavior. Key words are thought or verbalized and serve as cues for the appropriate behavior (Martin & Lumsden, 1987). The appropriate behavior is most likely the athlete's goal. For example a speed skater

might have a practice goal to maintain technical form throughout practice. To achieve this goal the athlete might say things to him/herself such as "keep low, push hard" in order to achieve the goal. The use of self-talk in goal-setting is part of the execution stage in Kirschenbaum's (1984, 1987) model of self-regulation.

Although this procedure is widely recommended in athletic self-help literature (Kirschenbaum, & Bale, 1983) very little sport based research has examined self-talk, particularly within a goal-setting package. Ziegler suggests:

"a void exists in understanding the behavioral change process that is possible when the intervention is self-directed by the performer" (p. 405, 1987)

Controlling the content of practice and competition thought is only beginning to be examined and its effect as a skill to assist goal execution needs further examination.

A major portion of the thought content during athletic performance should comprise: (a) task-relevant statements, which cue appropriate technique, (b) mood words which cue desired sensory feelings, (c) positive self-talk (referred to earlier as positive self-monitoring) which helps combat fatigue (Rushall, 1976)

These thoughts could also be combined with goal-setting procedures by using positive self-talk to cognitively set and confirm goals within a practice (i.e. self-monitor).

The effectiveness of different types of thought content in enhancing performance has been examined. The results confirm the effectiveness of self-talk in a number of situations (i.e. to improve mental preparation skills (Kendall, Hrycaiko, Martin, Kendall, 1990), to increase endurance in a

treadmill running task, speed of a 400m swim and ergometer performance of rowers (Rushall, 1984), to increase swimmers' training performance (Shewchuk, 1985), to improve performance of a complex skill (Ziegler, 1987, Ming, 1992), and to enhance healing (Ievleva & Orlick, 1991). Further research is needed to assess the generalizability by replicating these studies in different settings.

Self-monitoring is often used along with goal-setting as they seem to go hand in hand. For example, in a study by Miller & McAuley (1987) which examined the effects of goal-setting training on performance and self-efficacy, a self-monitoring component was included in which athletes used data sheets to help monitor and adjust goals. Kendall et. al. (1990) used logs to help athletes monitor mental preparation skills. What has yet to be investigated is the inclusion of a cognitive self-monitoring component, such as self-talk to effectively focus thoughts, in a goal-setting package.

Feedback

Feedback is the information generated about a response (Siedentop, 1976). According to Martin and Lumsden (1987) feedback is necessary in order for goal-setting to be effective. Giannini, Weinberg, and Jackson (1988) found that performance feedback alone seems to produce similar performance and motivational levels as formal goal-setting (Giannini et. al., 1988). Feedback also played a significant role in the results of a study by Frierman et al. (1990) who found that the success of the long-term condition over the do-your-best group may also have been attributed to the feedback given in the goal condition. Burton (1989a) noted that the lack of ongoing extrinsic feedback may limit learning on a complex skill such as field goal and free throw shooting. Individuals in this feedback condition

always knew how far they were from the goal, whereas those in Frierman et. al's (1990) do-your-best condition did not. Therefore the existence of performance feedback is critical to the success of a goal-setting program. Further research is needed to investigate the effects of different types of feedback. The use of logs as a source of feedback has yet to be systematically investigated.

Logs

Logs are personal diaries kept by athletes in which they record various behaviors, and events. These are used most often to keep track of training schedules and other physiological information (Sleamaker, 1989). It is suggested that logs can provide valuable information with regard to training. Logs might help answer questions such as: Why training is not effective; and what is going on in the athletes' life that could affect training (Sleamaker, 1989)? Logs are generally used as a tool to keep track of behaviors for measurement purposes (Burton, 1989b; Kendall et. al., 1990). Research has been reported using logs to self-monitor (Morgan, 1985, 1987). Anecdotal reports confirm the potential of logs to keep track of goals set and goals achieved, recording training programs followed, and noting mental factors relating to best and least best practices and competition (Orlick, 1990, p.28) . Because this information is written down it can be used as feedback for the athlete especially when coaching feedback is not always available such as in the case of the speed skaters. Logs may also be useful in providing self-report information about a specific component in a psychological intervention such as a goal-setting package. As a result one may better understand why a specific component may be effective or ineffective. Research examining the effects of logs as a

tool to self-monitor goals and other psychological responses needs to be enhanced.

Further research is needed to investigate the effectiveness of logs for the following purposes:

1) promoting generalization,

2) promoting maintenance of self-regulation and goal-setting packages,

3) as a means of providing feedback for goal-setting,

4) as a self-monitoring system to keep track of performance, self-efficacy and emotions,

5) as tool for athletes and coaches to evaluate what is going on in training, and

6) as a private contract within a goal-setting package.

Visualization: A dynamic form of Goal-setting

Botterill (1987) states that visualization is:

> "a dynamic situational form of goal setting which does much more for us than just deciding on an "outcome" goal. "Outcome" goals can provide incentive and direction but visualizing the "process" of situationally performing better is what is really important....If we can regularly see and feel ourselves accomplishing the next steps in our development, our chances of attaining outcome goals are best"

This technique involves the "pictures/images/thoughts that go through our minds" (Botterill, 1987). To date the goal-setting research has yet to examine the addition of visualization to a goal-setting training package although Garfield's (1984) model suggests its viability.

There are two main types of mental imagery or visualization, external and internal. External imagery is generally from a third person perspective. Internal imagery has a greater kinesthetic potential as it is distinguished by a first person perspective. Internal visual and kinesthetic

imagery has been suggested to be a more effective performance enhancement tool (Epstein, 1980, Ryan & Simons, 1983, Jowdy, 1990).

Orlick and Partington (1986) found that an important distinguishing factor between successful and less successful Olympic performers was their ability to use creative imagery, and their control and mastery of visualization and focus of attention.

Within Garfield's model of goal-setting, visualizing one's goals is the final step. He suggests that:

> "As long as your plan consists merely of words on paper, you will be using only the rational capacities of your brain, which functions best for language and logical thought processes." (1984)

Some have suggested that to achieve peak performance one must have an image in mind. Charles J. Hardy, a tennis professional has stated: "A single correct image is worth more than tons of verbiage, which overloads and restricts the performer's mind" (Garfield, 1984). Goal-setting which incorporates imagery is said to have greater shape and direction (Garfield, 1984). Further research is needed to investigate the effects of visualization on goal achievement and performance enhancement. Similarly, the effects of visualization on other factors such as self-efficacy needs to be examined.

Self-Efficacy

Self-efficacy is an individuals' belief that she/he can successfully execute the behavior needed to achieve a certain consequence. It can be viewed as a situationally specific self-confidence, rather than a global trait that accounts for overall performance optimism (Feltz & Weiss, 1982). Goal-setting has been suggested as a way to increase self-efficacy in sport (Locke & Latham, 1985, Feltz & Weiss, 1982).

The effects of goal-setting on self-efficacy may be important when considering its overall effectiveness. Gist et. al. (1991) examined the effects of self-management and goal-setting training interventions on self-efficacy, inter-personal skill acquisition and maintenance. It was found that self-management training reduced the self-efficacy /performance relationship. That is, those who were high in self-efficacy had greater skill maintenance than those low in self-efficacy. By providing training that strengthens skills, low and moderate self-efficacy trainees attained comparable levels of performance to that of high self-efficacy subjects. Self-management training may provide the skill development and maintenance that low self-efficacy trainees may not otherwise undertake.

The level of self-efficacy may be correlated with the choice of goals. Goal-setting strengthened the relationship between self-efficacy and performance for high self-efficacy participants. (Gist et. al., 1990, 1991). While self-management and goal-setting were studied as possible mediators, no causal account was provided. Goal-setting was present in both cases which suggests that the effects of goal-setting may be greater when incorporated in a self-management package. It is noted that goals set in both groups were variable as they were self-set and future research might examine the effects of externally set goals (Gist et. al. 1991).

Locke and Latham (1985) suggested that goal-setting would serve to increase self-efficacy in sports settings. Jourden, Bandura, and Banfield (1991) studied the effect conceptions of ability had on self-regulatory factors (i.e. perceived self-efficacy, affective self-reactions, and performance attainments) and the acquisition of a perceptual motor skill. The results attested to the impact of conceptions of ability on the development of competencies. It was suggested that the conception of

ability as an acquirable skill can serve to increase self-efficacy and a sense of self-satisfaction from striving for and achieving improvements in performance. It is important, therefore, to consider pre-existing beliefs to maximize the benefits of self-regulation. If goal-setting becomes a well-integrated part of the athletes' preparation, not only will performance be improved but confidence as well (Miller & McAuley, 1987). According to Bandura and Cervone (1983), goal-setting has an effect on self-efficacy and self-satisfaction. Goal-setting training has also been found to have similar effects (Miller & McAuley, 1987).

Earlier discussion examined the impact goal-setting has on self-efficacy. The training that is provided to develop goal-setting strategies is critical as to whether this will occur or not (Chen & Singer, 1992). A necessary step is to develop some type of rating scale in order to measure this effect. The measurement of self-efficacy varies from study to study based on the type of situation, be it organizational (Gist et. al. 1990, 1991) or a sports setting (Miller & McAuley, 1987). The common thread is that a rating system was used in which the individual rates how many times or to what degree they felt they could reach a particular level. In a sports setting, for example, an athlete may rate how many times out of ten or how many times in succession he or she can attain a specific subtask (Locke & Latham, 1985, Miller & McAuley, 1987).

Applied Behavioral Analysis and Single-Subject Research Designs

Applied behavioral analysis is a process which allows investigators to apply tentative treatments to behaviors and simultaneously evaluate their effectiveness (Baer, Wolf, & Risley, 1968). This type of process is a self-examining, self-evaluating, discovery oriented style of research (Baer,

Wolf, & Risley, 1968). It is ideal for examining socially important behaviors in their social settings. For this reason this process would be very useful for examining a treatment package designed to enhance sport performance in field settings.

Recent concerns have been raised as to the type of design best suited to the study of sports psychology (Bryan, 1987, Vealey, 1988, Greenspan & Feltz, 1989, Seiler, 1992). Bryan (1987) has suggested that sports psychology is mainly an applied field that emphasizes the study of solutions to practical problems, such as practice motivation, focusing and goal-setting, and therefore practical application should be the focus of research (Bryan, 1987). Although current research in this area has predominantly been undertaken using nomethetic group designs more ideographic methods are needed. Single-subject designs are an alternative recommended by numerous researchers (Bryan, 1987; Wollman, 1986; Martin & Hrycaiko, 1983: and Zaichkowsky, 1980). Single-subject designs eliminate problems encountered by group designs in field settings, such as the difficulty of finding large samples of highly specialized athletes to form control groups (Bryan, 1987, Seiler, 1982). Further, a no treatment control (which raises ethical concerns) can be avoided and these designs can be tailored to specific problems of specific individuals (Bryan, 1987). This flexibility is suited to the diversity found in sports and has been found to be an appropriate design to assess various mental skills interventions (Bell, Patterson, 1978, Hume et. al., 1985, Kendall et. al., 1990, Ming, 1992, Wolko et. al., 1993).

Recommendations for future research

In summary the research in the area of goal-setting suggests that goal-setting in general terms may improve performance in sport. Some support is given to the use of specific, difficult, short-term goals, the effectiveness of public over private goal-setting, the value of self-monitoring, and the effectiveness of goal-setting for increasing self-efficacy (Locke and Latham 1985). Further research needs to examine what will make goal-setting most successful, and how the execution phase in goal-setting can be enhanced to further the goal-setting effects. Techniques such as self-monitoring, self-talk, written logs, feedback, and visualization of goals, need to be systematically examined.

Research results are variable due to several factors, including methodology (Weinberg & Weigand, 1993). Many of the methodological shortcomings can be controlled for by using multiple measures and ideographic designs. A further advantage of these designs is that one could develop an individualized approach. Research is needed to examine the effects of component packages on various skills and in various settings. Use of these skills in competition settings, in particular, needs to be examined (Weinberg & Weingand, 1993). The use of behavioral analysis and single-subject research designs may be the best way to examine these questions.

CHAPTER 3

Method

Subjects and Setting

The subjects were 4 female speed skaters ranging in age from 12-17 years of age. These skaters were members of the provincial team and skated together twice a week for one hour. In addition, each skater skated at a home club two to three times per week. Skaters were selected based on the following criteria: a) the coach's recommendation (i.e. that the skater was not performing well in practice or in races, and/or that the athlete had a high level of offtask behaviors); b) they fell within the Canada Winter Games age range; and c) that these skaters did not provide any scheduling conflicts (i.e. that two skaters did not skate in different locations at the same time). Consent from the skaters and parents was obtained prior to the experiment. The consent form requested permission for the skaters to participate in a sport psychology project that would examine ways to improve performance (see Appendix A).

Data were obtained at three locations: a) the provincial team practices every Sunday and Tuesday, b) at the home club rinks for the skaters individual practices, and c) at race sites. Data was collected in both baseline and intervention phases in all three settings.

Descripition of Subjects

Subject 1

This participant was 15 yeas of age. She had been speed skating for several years. She was one of the top female skaters in the province, and the only female in her age group in Manitoba. She has an interest in many

sports and was contemplating dropping out of speed skating to pursue these other interests.

Subject 2

This participant was the oldest skater at 17 years of age. This was only her second year in speed skating. In the past she has involved in women's hockey. She was very excited about particpating in this study. She enjoys speed skating and is hoping to continue with the sport when she enters university.

Subject 3

This participant was 12 years of age. She is the top female skater in the province and one of the top skater's in her age group in Canada. She is a very bubbly energetic individual and was also excited about particpating in the study.

Subject 4

This skater was 14 years of age. She was involved in many school activities as well as modelling and was on the verge of quitting speed skating. In addition her best friend in the sport quit at the beginning of the season. Her particular interest in the sport was in long track speed skating.

Apparatus and Materials

A recording sheet was used by the observers (see following section) to record the frequency of offtask behaviors (see description in dependent variable section), the type of coach\athlete interactions, the practice times (500m times taken by skaters) and the number of skills completed. Skills completion included both the number of laps completed, and whether drills assigned by the coach were completed (see Appendix B).

A video camera was used to tape performance for assessment. Video tape footage from the baseline and intervention phase, both in the practice and competition setting, for each skater was given to two experts in the sport for the evaluation of the performance variable of skill development (i.e. form and technique, see Appendix C). Observers were provided with stop watches and at the beginning of each practice they were asked to record the duration of each instance of offtask behaviors. A video tape was shown during training to teach the skaters the components of the goal-setting package and how it was to be used in speed skating. This video tape served as a treatment integrity check (see description in following section). A treatment prompt was also be given to the athletes to post on their fridge at home in order to help remind them to complete their log books and to set their practice goals (see Appendix E).

Dependent Variables

Offtask public behaviors

Offtask behaviors are behaviors that are counter to the specific task which is to be undertaken. These behaviors were measured because they may have an effect on performance.

The frequency and duration of the offtask behaviors was recorded. Each time an offtask behavior occurred observers would start their stop watch and when the athlete went back on task they would stop the stopwatch. At the end of the practice observers wrote down the total duration of all the offtask behaviors on their recording sheet. In addition they recorded each instance of an offtask behavior. At the end of the practice they listed a total frequency of the offtask behaviors.

Offtask private behaviors

The rationale for this variable was that these behaviors would provide some insight into what the skaters were "thinking" during practice. It was hypothesized that once treatment was implemented the private behaviors would become more task specific. This behavior was measured by having the athletes rate various thought content questions. Some questions suggested that the skaters were having offtask thoughts, while other questions suggested that they were ontask and thus "focused". Off task private behaviors were determined by using a thought content questionnaire (Ming, 1992) (see Appendix G). To come up with a single point for graphing purposes the scores from the three ontask and offtask questions were calculated and the offtask scores were subtracted from the ontask scores. (i.e. on task total =15, offtask total=5, score equals 15-5=10). This questionnaire was given randomly a minimum of once a week and athletes were reminded of the importance of completing it accurately.

Performance

Performance was assessed in three ways: 1) skill frequency (the number of laps completed, and the completion of the skills program as specified by the coach), 2) time (simulation race times taken during practice by observers, and actual race times) and 3) skill development (the form and technique of skaters, see Appendix C). The reason for the complexity of this variable was to examine the various facets of speed skating performance.

1) Skill frequency

Skill frequency was made up of two factors: 1) frequency of laps completed, and 2) percentage of drills completed. When counting laps

observers only recorded those for which the skater completed a full lap at a constant speed. For example, if the skaters were doing start drills and skated fast on the take off and glided around this was not counted as a lap.

2) Times

To qualify for the Canada Winter Games athletes were ranked based on their times from the 500m pursuit. Pursuits were held for those attempting to qualify at the beginning of all competitions held in Manitoba . The two types of times taken were pursuit simulations in practice, and actual competitive pursuit races. Due to the fact that race simulations in practice were very disruptive and were not possible once the season was in full swing, simulations were completed only at the beginning of the study.

3) Skill Development

Skill development was to be a measure of the form and technique of the skaters. Skaters were videotaped from the side of the rink doing a straight away and a corner.

Self-efficacy

The self-efficacy was examined in an effort to verify the impact of goal-setting. Self-efficacy was measured using a two part scale (see Appendix F). First the athletes rated how confident they were at various levels (on a 10 point scale) and secondly, whether or not they felt they could perform at that level (yes/no). The score was based on a ceiling score of 100%. Self-efficacy was assessed as it related to event times and skill form/technique. Self-efficacy was assessed randomly approximately every second week at each phase of the study

Goal Achievement

Goal Achievement was measured by comparing the actual performance results with the goals the athletes set in their log books.

Treatment Integrity

Observers

Behavioral observations were taken by 9 university undergraduate psychology students. Three students observed approximately 6 hours/week and the other six students observed for 1 hour/week. Prior to observer training the observers were given a booklet which consisted of background information regarding speed skating and definitions of the dependent variables that they would be recording. Two experts in the sport of speed skating assessed the skill development.

Procedural Reliability

In order to ensure that the experimenter was providing the intervention as described, a video tape of the intervention was shown to each subject. In this way all subjects received the same instructions. In addition, during assessment sessions the experimenter followed a prescribed script of questions (see Appendix D).

Subject Compliance

In order to determine whether athletes complied fully with the instruction provided, the following checks were done weekly. First, the subject's log book was checked by the experimenter to ensure they were completed. Second, the experimenter asked the subjects questions related to the intervention to determine that they were using the intervention.

Finally, the coaches were asked if the athletes told them about their goals. In addition, the athletes had the opportunity (at any time) to ask questions related to the intervention package. In order to facilitate subject compliance athletes were reinforced for compliant behavior using praise (i.e. the experimenter would say, "good work, thank-you"), and the athlete was provided with an intervention prompt (see Appendix E). If the athlete was not compliant, they were asked why they were not compliant, prompted for recommendations to increase compliance, and reminded that compliance was necessary for beneficial results. Online assessment of compliance was evaluated in order to determine the consequences which might be controlling the athlete's behavior.

Online assessment of the independent variable (i.e. the intervention)

During the first two weeks of the intervention the experimenter met with the participants twice each week. Thereafter one meeting per week took place. These meetings lasted for approximately 5-10 minutes after practices and/or races. The purpose of these meetings was to answer any questions the subjects may have, to check the subjects' compliance and to make sure the subjects were using the intervention as described.

Dependent Variable Accuracy Checks

Prior to the study, student observers were trained to identify and record the frequency of laps, skill completion, times, the frequency of offtask behaviors (public), and the type of coach/athlete interactions. During training observers were shown the recording sheets and had the opportunity to practice recording the dependent variables at pre-season training practices. At the beginning observers were allowed to discuss and

ask questions of the experimenter as to what to record. This was done in order to develop a recording protocol to make sure that all observers were observing the same thing. Once the protocol was developed observers practiced recording the variables independently and simultaneously with another observer until inter-observer reliability scores (IOR's) were not less than 90%.

The IOR's were calculated for each variable by dividing the lowest number of agreements by the highest number of agreements of a measure at practice and multiplying the dividend by 100%. For example if one observer recorded 50 laps and the other observer recorded 49 laps, the IOR was 49/50 x 100 = 98% agreement.

The expert observers were trained using a similar procedure. That is, two experts in the sport were given two different video film clips to watch. The observers were asked to independently rate the form and technique of the skaters (see Appendix C). Race times (practice) involved having two observers time the skaters' 500m race. The times of the two observers were averaged, to compensate for any small discrepancies in the measurement.

Observer agreement (IOR's) for the frequency and duration of offtask behaviors (public), frequency of laps, skill completion, skill form/technique and the type of coach/athlete interactions, were calculated separately for each variable by using the total frequency for each variable observed during a practice. This method was used as it allows for the agreement of continuous observational sessions to be assessed.

IOR checks were done online throughout the study (on all variables and in the baseline and treatment phase) at 60% of the practices. In order to control for possible observer drift, all observers observed different skaters

each time, were paired with different observers, and were reminded of the observing protocol.

Controlled Variables

Expert Observer bias

To control for possible biases of the expert observers, the video tape footage was mixed so that the expert could not identify when (in what stage) the clip was taken.

Training Effects

The baseline conditions in this study involved standard coaching. In an attempt to control for the effects of this factor a multiple baseline across subjects design was used. One subject was maintained in the baseline phase for the duration of the study and was provided with the intervention at the end of the first short track season.

Contamination effects

An effort to control for contamination effects was made by stressing the importance of not discussing the intervention with anyone.

Process Check

Coach\athlete interactions

Coach\athlete interactions were monitored by the observers across all phases of the experiment. A record was kept of each time the coach interacted with a speed skater, and the type of interaction was also monitored. The interactions were classified as instruction or corrections,

positive feedback or negative feedback. IOR's were taken on these data as was previously described.

Experimental design

A multiple baseline across subjects single-subject design was used to examine the treatment effects of a group of performance variables and self-efficacy. Subjects were observed during both baseline and training phases. Data was collected at practices and at competitions.

Procedure

Preliminary phase

During this phase the experimenter met with the parents of the athletes and the athletes themselves to explain what the study would involve and to answer questions or concerns. Participants and parents were given the letter of consent and asked to confirm their desire to participate.

Observers were recruited during this initial phase. Nine observers were recruited. Once the observers were recruited a schedule was developed. Each practice to be observed was listed and observers signed up for the days they were available. Observers were trained in the recording procedures during the first week of the study (see section on observer training).

Baseline

During the baseline phase, data was collected at all sessions in which each individual skater participated. The data collection involved going to three separate home clubs and also provincial team practices. In baseline, subjects received traditional standard coaching at provincial and home club

practices. Standard instruction involved verbal drill instruction, group feedback and correction. Very little individual feedback was given during on ice practices due to the large number of skaters. The number of atheltes at a home club practice was approximately 30-35 skaters ranging in age from 4-65+ years of age. Provincial practices were less crowded as the average number of skaters was approximately 20-28 skaters. Skaters were continuously moving for most of the practice except for coach instructed rest periods. During rest periods skaters generally did one of the following, stand still, talk with another skater, skate slowly, and/or stretch.

During baseline observers recorded the following: times (this was done only occasionally because it was very disruptive to the practices), the number of offtask behaviors, number of laps completed during practice, the drill to be undertaken and whether the drill was completed. In order to prevent spontaneous goal-setting and self-monitoring the times were probed randomly during baseline. By using random probes, a skater could anticipate being timed and therefore was less likely to set goals or self-monitor than if data were collected continuously. The situation dictated that random probe times were needed.

These sessions were randomly videotaped to develop baseline measures of skill development (i.e.. form, and technique) which were rated by two expert observers. Random probes were dictated by the field setting, but were also very appropriate to avoid spontaneous goal-setting. It was difficult to get effective footage without disrupting the practice. A self-efficacy scale was given randomly in order to determine the self-efficacy of skaters before treatment (see Appendix F). Finally a thought content assessment (see Appendix G) was given randomly to determine what skaters were thinking of during practice prior to treatment.

Randomization was achieved through the natural constraints placed on the study. Athletes often would leave immediately after the practice therefore whenever athletes were available they were provided with the self-report questionnaires for self-efficacy and/or thought content. Athletes received these questionnaires at least once a week.

It was very important that stable baselines were achieved in order to: a) determine whether changes occurred between phases and, b) to determine causality (Bryan, 1987). For that reason measurements were taken until a stable trend was achieved. Work output was the variable used to determine time of intervention.

Intervention

Once a stable baseline in the skill frequency variable was achieved the first athlete was provided with a comprehensive goal-setting training package which included a video (a copy of the video script is found in Appendix K) and log book (see Appendix H). The log book was tailored to the video so that athletes could watch the video and complete the log book at the same time. The package was made up of the following sections: 1) mission development; 2) long-term goal-setting (which included calendar to aid in goal-setting); 3) subgoal and practice goal-setting (which included several pages for goal-setting and evaluation); 4) self-talk; and 5) goal visualization. Once a week the skaters met with the experimenter to make the necessary adjustments.

Before each practice skaters were asked to write their practice goals in their log books. Athletes were taught to set appropriate goals and a checklist was provided at the front of their log book for quick reference (see Appendix I). At the end of the practice skaters were asked to evaluate

their practice as to whether they achieved their goals, and how they felt about the practice. From this information goals were developed for the next practice. At the beginning of the week the skaters were asked to set a weekly goal. The goal was reassessed at the end of the week and a new goal was set. Athletes were encouraged in the goal-setting package to make goals manageable by breaking large goals into smaller subgoals to facilitate success. Athletes were also reminded that goals must be flexible, but also challenging to achieve the maximum benefits. The log book served as feedback for the athlete and as a qualitative measure within the study.

In addition to the private self-monitoring (i.e. the log book) athletes were also asked to share their goals (daily, weekly, and long term) with their coach/parent. Although the coach/parent was able to make suggestions as to the appropriateness of the goal the final judgment was the skaters'.

Social Validity

It is important that behavioral procedures not only produce demonstrable behavior change but also exhibit social validity along several dimensions. Social validation occurs on three levels (Martin & Hrycaiko, 1983). First, the target behaviors selected should be important. This criteria was met by having athletes set their own target goals and an assessment was made following the intervention to determine the meaningfulness of these goals to the skaters' themselves. Second, the program should produce large enough behavioral changes to be recorded as significant to participants. Third, the procedures should be considered acceptable to all those involved. These latter two concerns were evaluated through a post experiment questionnaire. Because there are several

components in this study athletes were able to rate which they felt were the most and least effective components (see Appendix J).

CHAPTER 4

Results

Data Analysis

Scientific and practical criteria are considered to be the basis for evaluating the effectiveness of treatment packages (Martin & Pear, 1992). Scientific criteria are used to evaluate whether the treatment is responsible for producing a reliable change in the dependent variable. When using single-subject research designs the most effective way of evaluating effectiveness is through visual inspection (Bryan, 1987). Data from the three dependent variables: performance (skill frequency, time, skill development), offtask behaviors (private and public), and self-efficacy were graphically displayed so that they could be visually inspected. In addition, practical criteria were assessed using the social validity measures discussed previously. This evaluation was based on results from the graphs, logs, and social validity questionnaires.

Criteria for Data Analysis

The criteria for visual inspection were as follows:

1) Changes in mean across phases: There should be consistent changes in means across phases, for each subject, for the treatment to be considered to have an effect on the variable in question (Kazdin, 1982).

2) Changes in level: This refers to the shift of performance from the end of one phase to the beginning of the next (Kazdin, 1982). Depending on which variable is analyzed, a change in level which is higher or lower will represent an effect. For example a lower level of offtask performance would mean an effective treatment.

3) Changes in trend: Data may show a particular trend during baseline. This refers to the tendency for data to systematically increase or decrease over time (Kazdin, 1982). A change in trend, for example, from an increasing slope in offtask behaviors to a decreasing slope of offtask behaviors would represent an effect at intervention.

4) Latency of Change: The length of time for an effect to show in the graphed data is important to consider when visually inspecting a graph (Kazdin, 1982). Thus the quicker the effect the better the treatment.

5) Overlapping points: This is the number of points in the treatment phase which are also present during the baseline phase. The effectiveness of a treatment is illustrated by a minimal number of overlapping data points (Kazdin, 1982).

Dependent Variable Check

The dependent variables were observed and recorded. In order to avoid observer biases inter-observer reliability checks were completed for 60% of the data. The average IOR scores for the specific variables and participants are displayed in Table 1.

Table 1: Average IOR scores

Subject	Offtask behaviors: Frequency / Duration	Number of Laps completed	Drill Completion	Coach / Athlete Interactions
S1	100% / 99%	99%	85%	100%
S2	97% / 97%	99%	99%	93%
S3	95% / 99%	99%	98%	91%
S4	96% / 90%	92%	96%	88%

Performance

Work Output

Work output was measured by the number of laps completed during practice as well as the completion of the drills assigned by the coach. The number of laps per practice was averaged to provide a score for the average number of laps per practice per week. This data is presented in figure 1. The percentage of drills completed per practice was averaged per week and is presented in figure 2.

The results from the work output variable produced an average increase in mean of approximately 37% across the three subjects who received the goal-setting package. Two of the three subjects (S2 and S3) showed immediate effects while the other subject (S1) showed a two week delayed effect. All subjects showed a positive change in trend.

S1 showed a mean change from 27 laps per practice in the baseline condition to 39 laps per practice in the intervention phase. The overall mean change from baseline to intervention was an increase in work output of 44%. There was a latency effect of two weeks. In week three there was a large increase in work output which remained relatively steady thereafter.

During baseline S2 showed a downward trend with only one week (week 3) of high work output. That week was the only overlapping data point from baseline to intervention. This subject showed an immediate positive change in level at the point of intervention followed by an increasing positive trend. S2 showed a mean change from 41 laps per practice during baseline to 54 laps per practice during the intervention phase. The overall change in means was 32%.

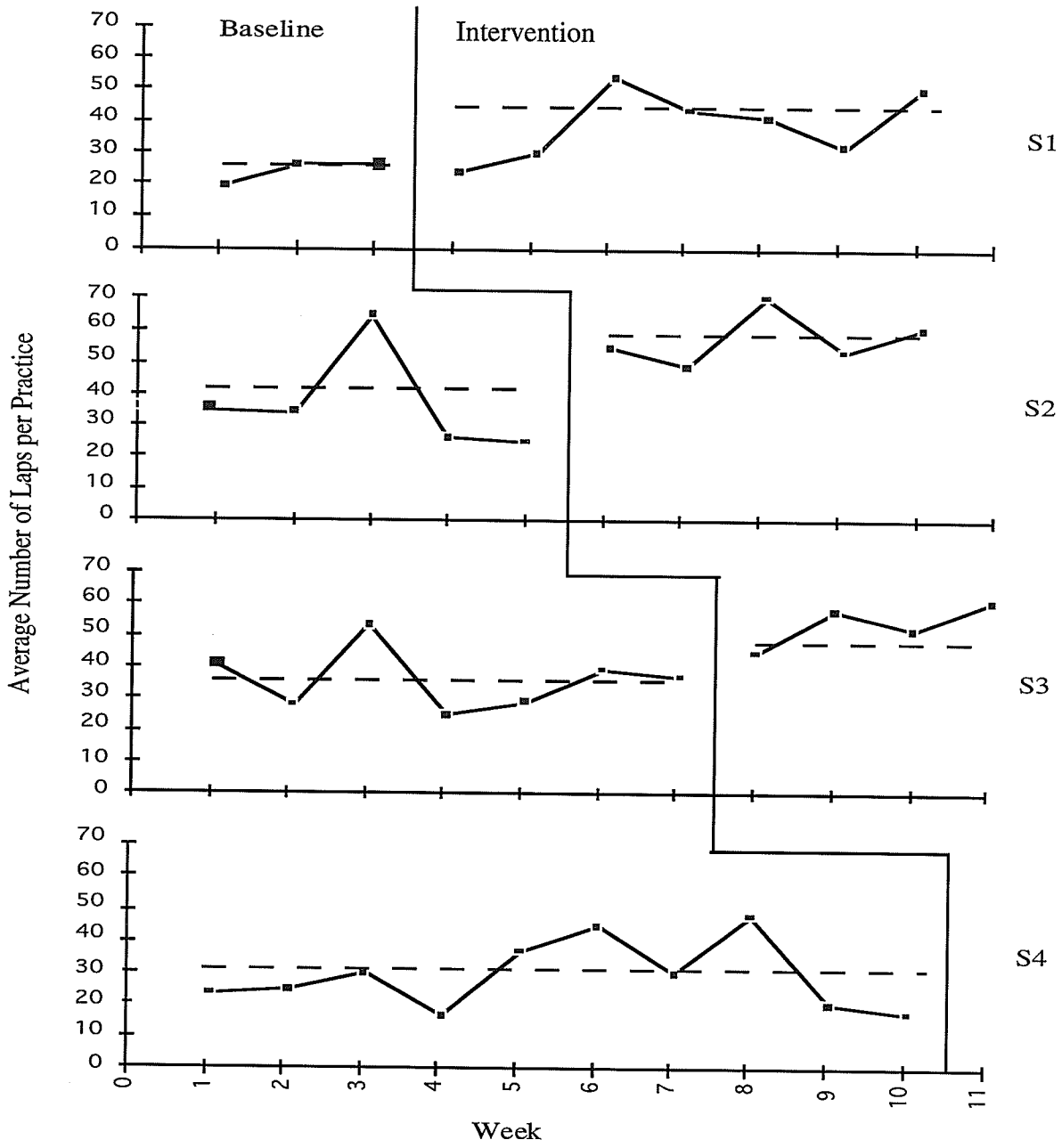

Figure 1: Work output - Average number of laps completed in practice per week

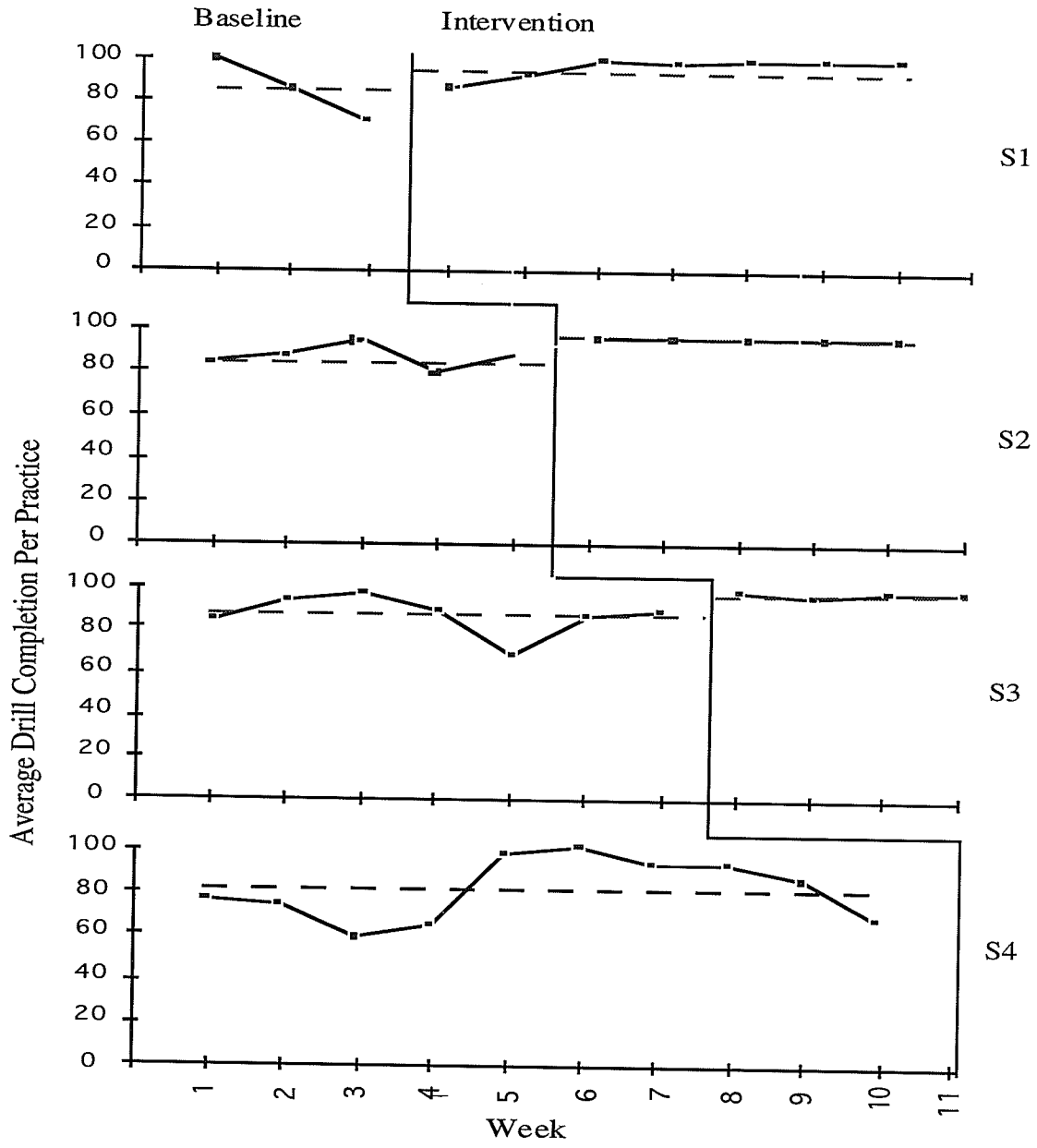

Figure 2: Work output - Average drill completion in practice per week

S3 also experienced an immediate change in level with an increasing positive trend. She showed a mean change from 35 laps per practice in baseline to 48 laps per practice during the intervention phase. During baseline there was a relatively stable level, however as with S2 there was a high point in week 3 which was the only overlapping data point.

The control (S4) varied in her level of work output. This result is consistent with the baseline scores for the three treatment subjects. The participant had a low of 18 laps per practice in week 4 and a high of 50 laps per practice in week 8. There was no general trend in the results. S4 showed a mean of 30 laps per practice throughout the study. On only three weeks did this subject go beyond 30 laps per practice.

The results for drill completion showed a very high level during baseline for all three subjects as well as the control subject. The average mean change for the three intervention subjects was approximately 10%. Two of the three subjects (S2 and S3), consistently achieved the ceiling (100% completion) after intervention. The third subject, S1, experienced an immediate effect and reached the ceiling within two weeks. Once the ceiling was reached it was maintained for the duration of the study for all three experimental subjects. The control subject maintained a somewhat lower level of drill completion (80%), although it was still quite high.

Times

Times over 500m were measured through pursuit race simulations during practice and actual races. Race simulations were held during the beginning of the season before the race schedule had increased to weekly meets. Data is displayed in seconds in Figure 3. Times in which the athlete fell while racing have been circled.

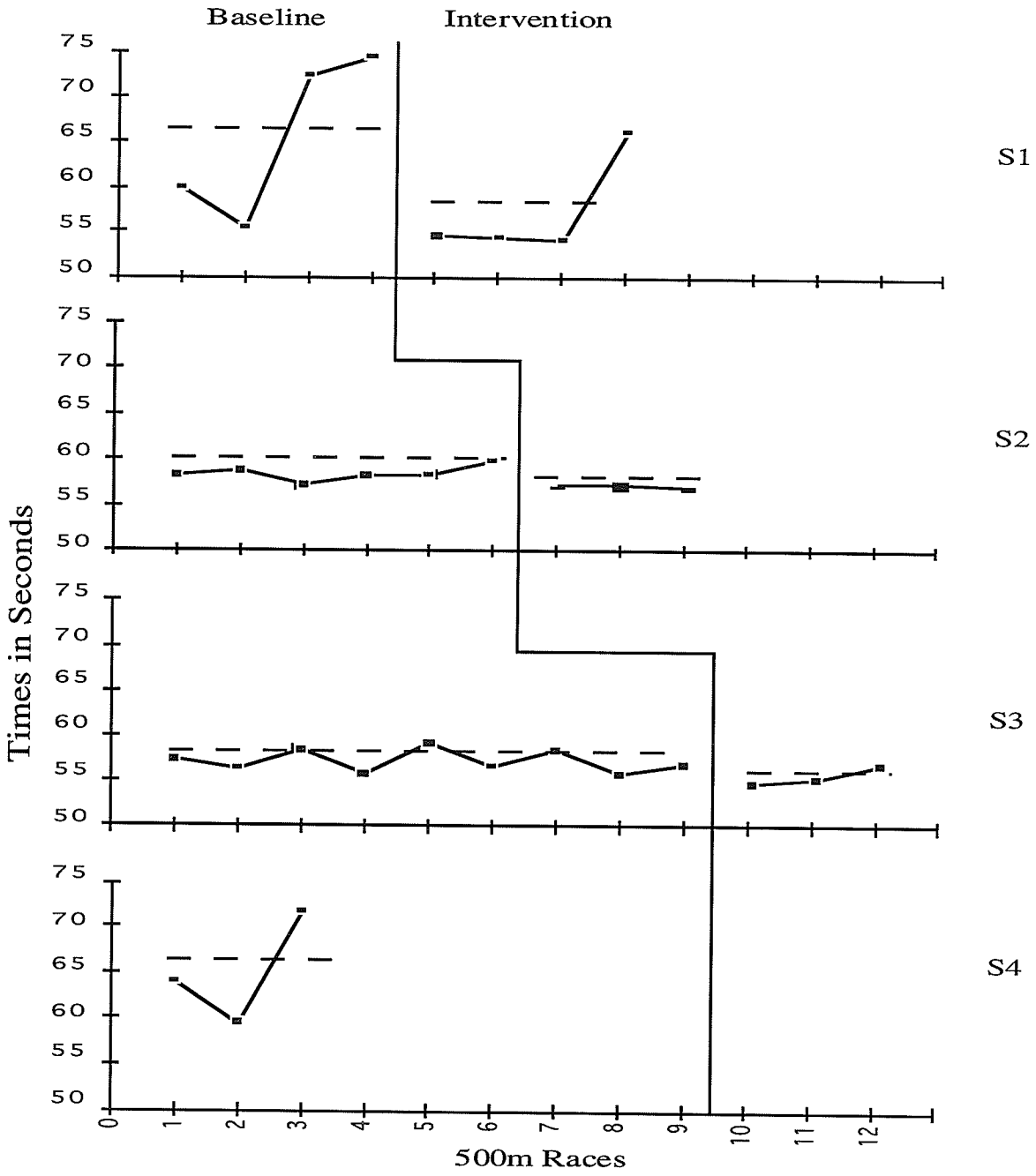

Figure 3: 500m Times

All subjects showed an improvement at the point of intervention. S1 showed a mean level change from 65.57 seconds to 57.49 seconds, an improvement of 8.08 seconds. She also showed a drop in falls from baseline to intervention and had only one overlapping data point. S2 also showed a change in mean levels, from 58.44 seconds to 57.17 seconds, an improvement of 1.27 seconds. S3 showed a change in mean level from 57.19 seconds to 55.72 seconds, an improvement of 1.47 seconds. S2 and S3 did not show much of a change during intervention. The control subject (S4) had the slowest 500m times with a mean of 65.05 seconds. S4 only participated in two races during the course of the study and only one race simulation was possible. The lack of race times was due to the choice of the skater not to race and also due to the limitations of race simulations in practice.

Variability also decreased when the intervention was provided. S1 and S3 showed a high level of variability during baseline which decreased during the intervention phase. This effect was particularly noticeable in the case of S1.

Skill Development

There was not sufficient data in which the expert observers could accurately analyse the performance of the partcipants to develop any conclusions. The reason for the lack of serviceable data was due to unforeseen setting and time contraints (See section: Impact of Applied Settings)

Offtask Behaviors

Public Behaviors

Offtask public behaviors were assessed in two ways, frequency and duration. The average frequency (Figure 4) and duration (Figure 5) of offtask behaviors per practice in each week is presented. Each subject upon receiving the goal-setting package experienced an immediate drop in both the frequency and the duration of the offtask. The offtask public behaviors were heavily impacted by the goal-setting package. The decrease in offtask behaviors was maintained for the duration of the intervention.

S1 dropped from a mean level during baseline of 10 offtask public behaviors per practice to a mean level of 0.9 during intervention. This subject dropped immediately to 2 offtask behaviors per week at the point of intervention. She maintained a zero level for the final three weeks of the study. The duration of the offtask behaviors measured also dropped dramatically and was maintained at or near zero.

S2 showed a greater fluctuation in offtask behaviors during baseline than S1. This subject had a high of 14 offtask behaviors in a single practice to a low of zero. Although this subject showed the ability to reach reach zero offtask behaviors in a practice during baseline, she was only able to achieve this level at two single practices. She dropped from a mean during baseline of 5 offtask public behaviors per practice to a mean of 0.2 during intervention. This subject reached the zero level immediately at the point of intervention and maintained this level throughout the intervention phase with little deviation. The duration of the offtask behaviors was similarly impacted.

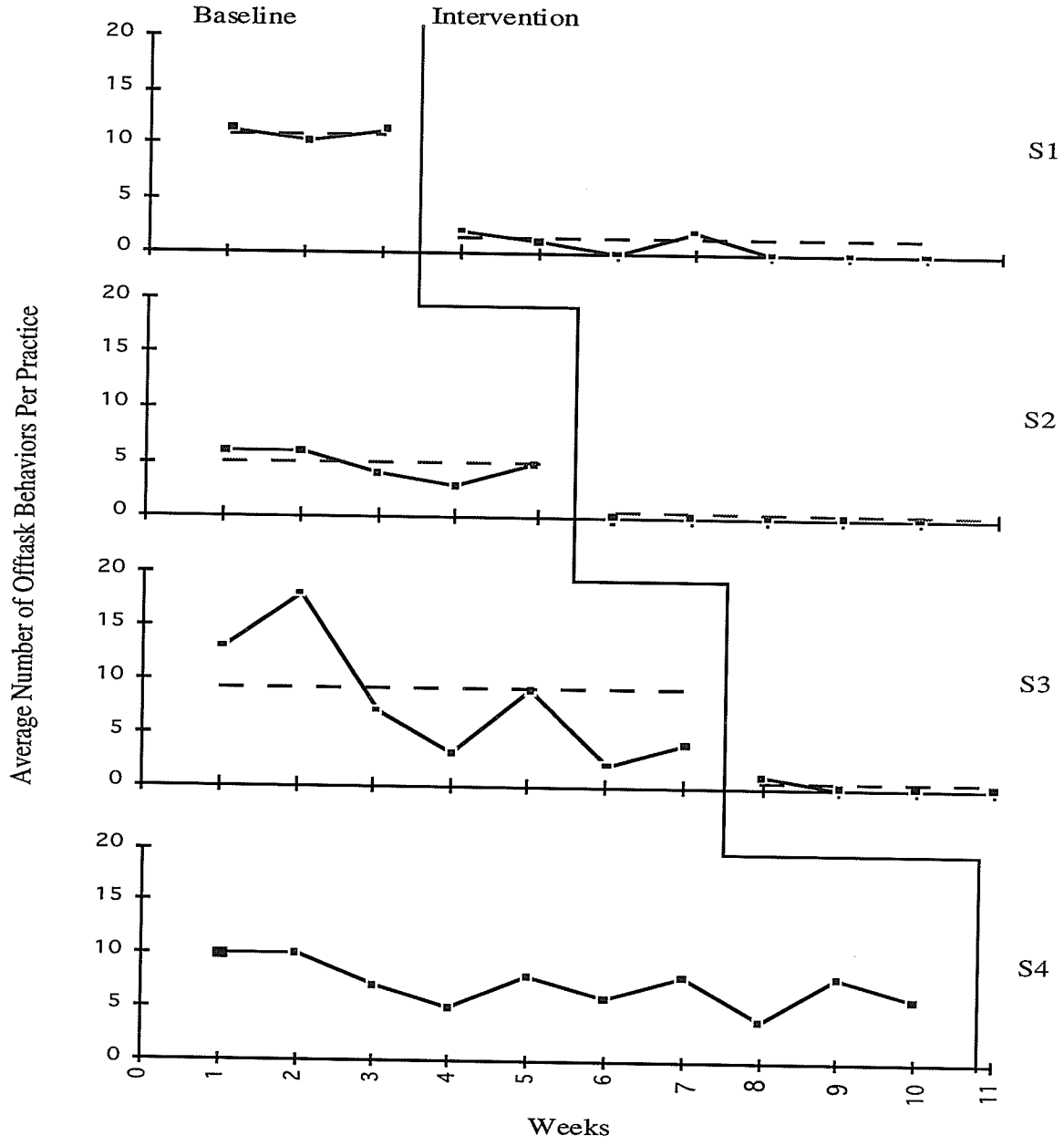

Figure 4: Average Number of Offtask Behaviors in a practice per week

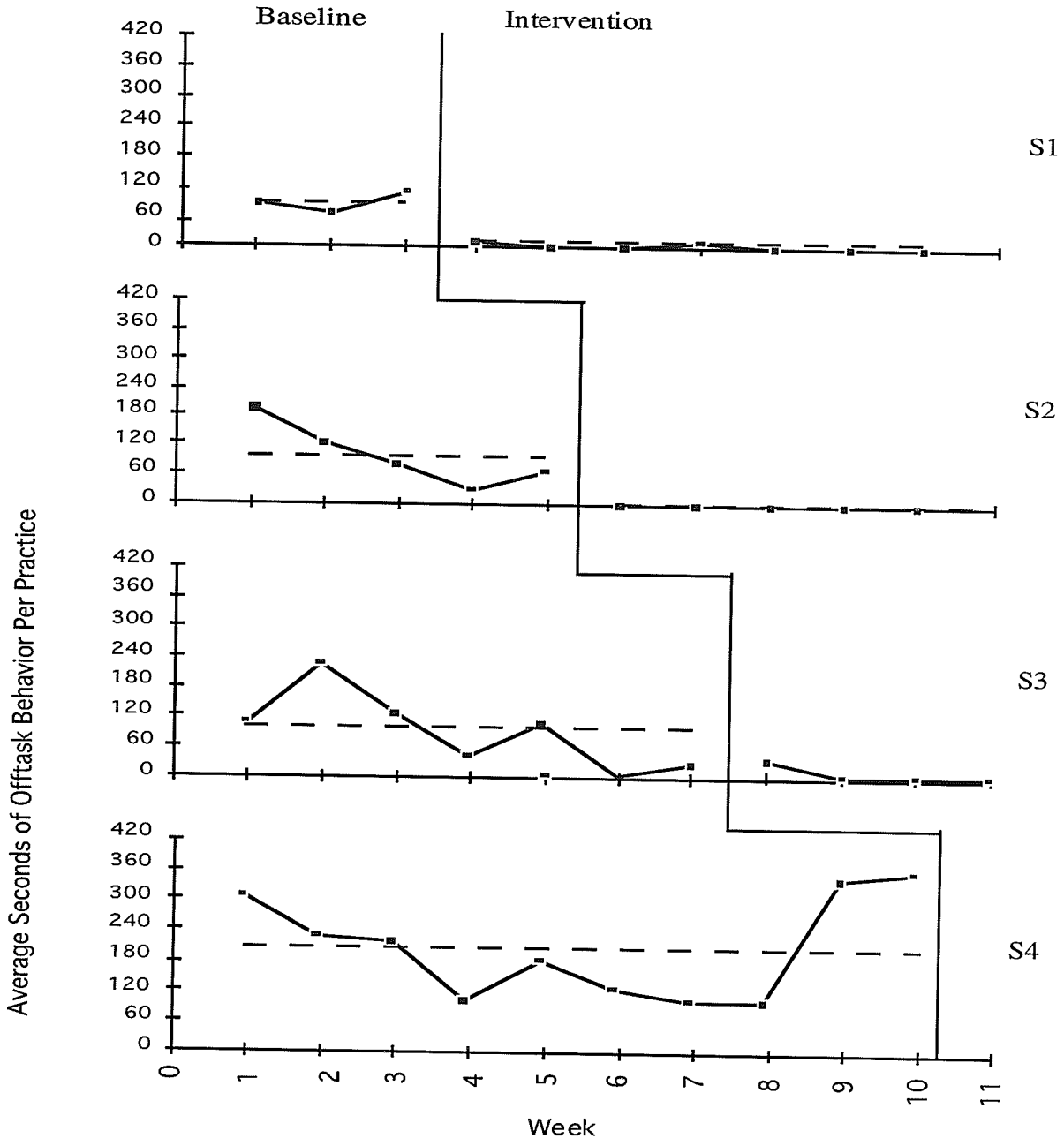

Figure 5: The average duration of offtask behaviors in a practice per week

S3 also experienced some variability during baseline. She had a high of 34 offtask behaviors in one practice to a low of zero. This subject reached zero offtask behaviors in baseline at three practices, however these occurrences were not consistent. She dropped from a mean during baseline of 9 offtask behaviors per practice to a mean of 0.5 during intervention. In addition she reached the zero level immediately at the point of intervention and maintained this level throughout the intervention phase with little deviation. The duration of the offtask behaviors was similarly impacted.

The final participant, S4, was maintained at baseline throughout the study. She maintained a high level of offtask public behaviors throughout the study. She experienced a high of 13 offtask public behaviors in one practice to a low of 4. This subject never reached the zero level and maintained a high duration of offtask behaviors.

Private Behaviors

Private behaviors were assessed with the thought content assessment. Three questions probed for offtask thoughts (e.g. Using the scale, how often did you think about your homework during the practice). Three other questions probed for on task thoughts (e.g. Using the scale, how often did you think about your technique cues). This was a self-report measure in which scores could range from 3-15 for offtask thoughts and 3-15 for on task thoughts. A single score was calculated by subtracting the score for offtask thoughts from the score of on task thoughts, for example a high score for ontask thoughts would be 15-3=12, or at the other extreme a high score for offtask behaviors would be 3-15= -12 (although this never happened). The data is presented in figure 6.

The data representing the private offtask behaviors is inconclusive. Only one subject (S3) showed an increase in ontask thoughts. S1 and S2 showed small immediate increases however these dropped below baseline levels after two weeks. The control S4 showed a fairly consistent pattern throughout the study.

Although S1 showed a small increase in mean from baseline to intervention. This increase continued in week 5 however dropped to near baseline levels in week 6. In week 7 there was a slight increase which was maintained in week 8. On task thoughts dropped drastically in week 10.

S2 showed a consistent level of ontask thoughts with a score of 9 during baseline. Only one data point exceeded the baseline points. During intervention there was a slight increase during week 5. During week 6 and 7 there was a drop in on task thoughts which was below baseline levels. There was an increase during week 9 and then a dramatic drop in week 10.

The most positive effect was exhibited by S3 who was the only subject to reach the ceiling (a score of 12) and maintained a very high score for the duration of the study. This subject maintained a mean of 9 during baseline and experienced an immediate increase at the point of intervention. There were no overlapping data points for this subject.

S4 remained fairly consistent in her thought content. She had a mean score of 8. She had a relatively high level of on task thought content.

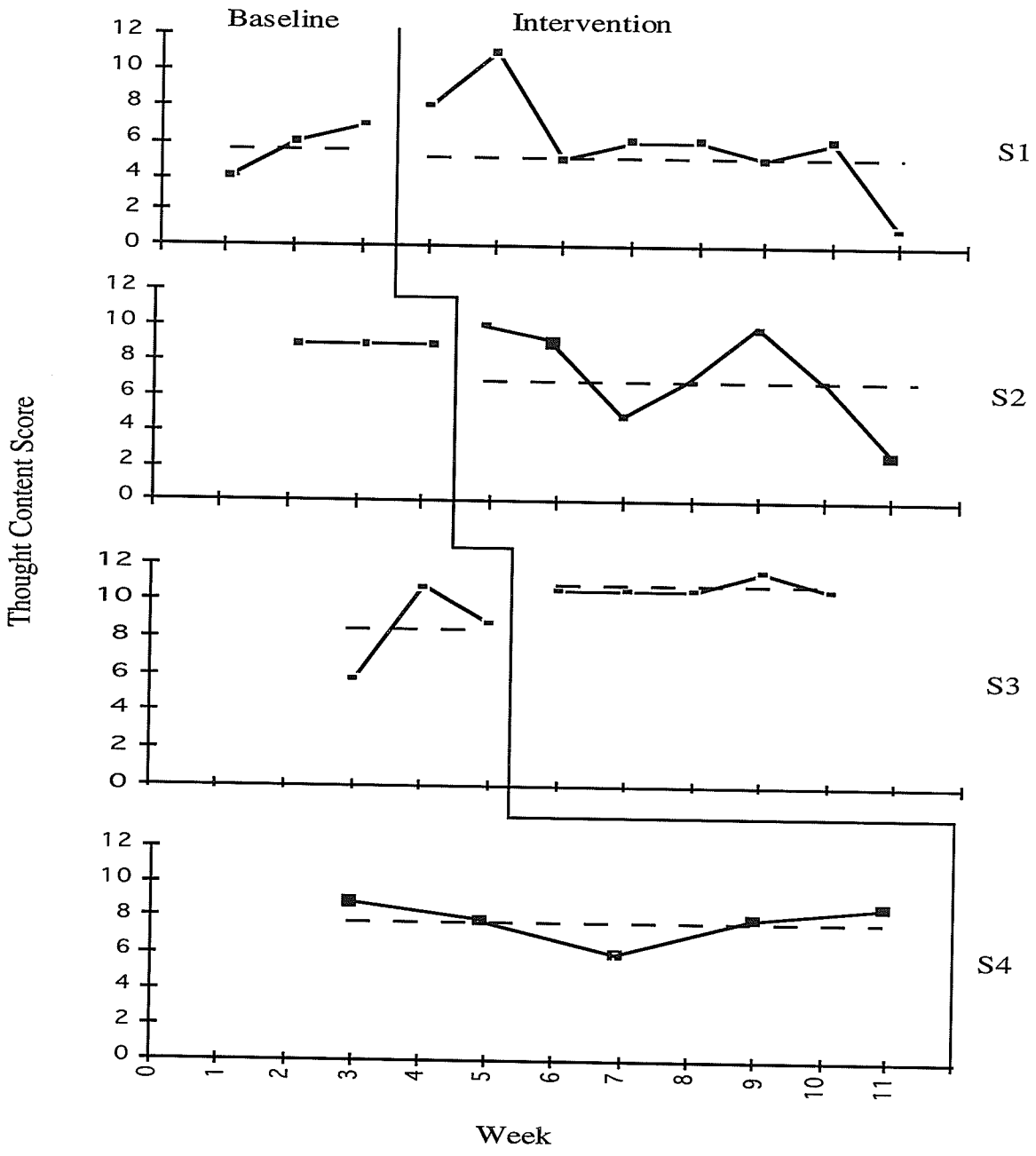

Figure 6: Thought Content Scores

Self-Efficacy

The self-efficacy scores were measured through a self-report instrument. Data for this variable is presented in Figure 7.

The results of the self-efficacy data showed a small mean improvement for the three subjects who received treatment. There was an average change in mean of 6% from baseline to intervention. Two subjects (S2 and S3) showed a positive trend during baseline. S1 showed a stable trend during baseline. The control subject was fairly constant in self-efficacy. She had a mean of 78%, which was lower than the other three subjects.

S1 showed a generally high level of self-efficacy which dropped ever so slightly prior to intervention. At the point of intervention she reverted to previous levels and during the next data point increased three percent. There was only one overlapping data point.

S2 started with a low level of self-efficacy which slowly increased. During intervention self-efficacy scores dipped for three points and then began to increase gradually above baseline levels. There was only one overlapping data point from baseline to intervention. Althought this subject had the greatest change in the level of means (10%) from baseline to intervention, the improvement was delayed 3 weeks.

S3 showed an increase during the baseline phase which continued during the intervention phase. There were no overlapping data points. There was a mean change of 4%.

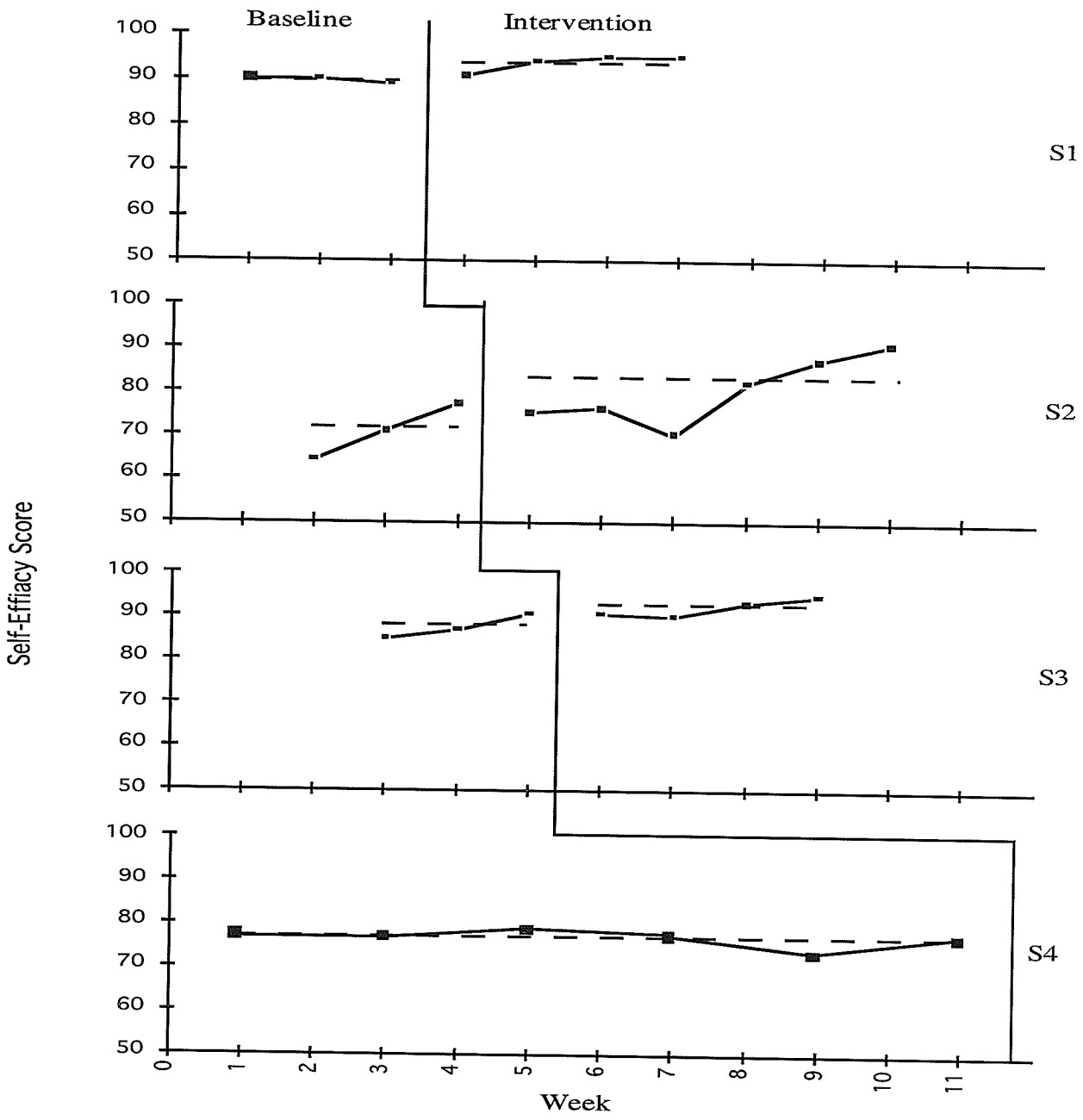

Figure 7: Self-Efficacy

Goal Achievement

As part of the goal-setting package athletes were asked to set long-term and short term practice and race goals. Athletes were to record these goals and assess them within their log book.

S1 met 72% of her practice goals. Of the goals that she did not achieve she wrote, "I ran out of time... if I had come earlier I could have attained this. It was hard to keep up to the guys. I felt really bad and was very tired." In general she was on pace for her long-term goals which were to do a 500m in 54.5 seconds by January. This goal was achieved. Her goals were consistent with the goal-setting checklist provided.

S2 was very diligent in her use of the log book. She wrote a great deal in the log book and reported that it was a very effective tool. She reached 76% of her practice goals. She was very consciencious about assessing the practice. She provided cues for what she needed to remember, e.g. "Good - it felt short though, we worked lots on technique and didn't seem to skate much, remember to skate hard always." She was also able to control how she felt about the practice (e.g. "it started off bad - my legs didn't seem to want to move so I decided to just concentrate on technique and it was good, then my legs started to move and it was better"). S2 also set goals according to the guideline provided in the goal-setting package and was able to reach her long-term goals.

S3 met 71% of her goals. Of the goals that she did not achieve she was able to pinpoint the reason for not reaching her goal (for example, she wrote "I didn't get any weight transfer"). S3 also set long-term and practice goals according to the guidelines. She reached her long term goals for the Canada Winter Games.

Training Effects

The results did not suggest training effects. Training effects would result in a relatively steady improvement in the baseline condition. None of the experimental subjects showed steady improvements during the baseline phase. S4 was maintained in the standard training condition for the duration of the study and showed no training effects.

Coach/Athlete Interactions

Coach/athlete interactions were recorded in order to assess whether or not the coach interacted in the same way with each participant. The total number of each type of interaction was calculated and divided by the number of practices attended by the individual skaters in order to determine the mean number of instances per practice. This data is presented in Table 2.

Table 2: Mean instances of coach/athlete interactions per practice

Subject	Instructions / Corrections	Negative Feedback	Positive Feedback
S1	2.3	0	.38
S2	2.1	0	.30
S3	2.5	0	.34
S4	1.8	0	.46

This data shows that in general the coach provided an equal amount of instruction to all subjects. The coach provided no negative feedback and a fairly equal degree of positive feedback. S4 received the most positive

feedback while S2 received the least amount of positive feedback. Overall the coach gave the skaters very little individual feedback.

There was no visible change from baseline to intervention. Coach/athlete interactions remained constant throughout the study.

Social Validity

The social validity questionnaire provided the opportunity to obtain the subjects perceptions of the intervention. The subjects who were provided the intervention during the study found it to be a positive experience. Two of the three rated the experience as positive and one rated the experience as neutral. Subject 3 wrote, "It was lots of fun."

Subjects were asked to rate how they felt about each component on a scale of one to five. This information is provided in Table 3.

All subjects stated that they would continue with at least some of the strategies provided in the package. When asked to comment on the goal-setting package and its components S2 wrote, "Very useful. I felt I improved, (and became a) more mentally capable skater." S3 wrote, "I can't visualize so I couldn't do #5 (goal visualization). Setting goals made me work harder." When asked if they would make any changes to the log book S1 and S3 said no and S2 wrote, "Too much on practice assessment, felt repetitive, took long time to fill out."

Table 3: Ratings of Individual Components in the Goal-setting Package

Component	Subject 1	Subject 2	Subject 3
Using the log book	3	1,5, did not enjoy filling it out but found it to be very useful	3
Talking about their goals with their coach/parents	5	3	5
Setting goals	3	4	5
Using self-talk	3	5	3
Visualizing their goals	5	4	1, this subject had problems visualizing
Meeting with the experimenter	3	5	5

1= did lot like, was useless 3= neutral 5= really liked, very useful

CHAPTER 5

Discussion

The present study provides strong support for using a goal-setting package in an applied setting. This package had a positive effect on several variables. Its particular strength was in increasing work output and decreasing offtask behaviors. This finding is consistent with previously reported results in the area of self-monitoring (McKenzie & Rushall, 1974; Bell & Patterson, 1978; Hume et. al.., 1985) and self-management strategies (Wolko et. al., 1993) These results are important because these strategies have a strong impact on how the individuals will perform.

The goal-setting package clearly had an impact on the performance of the participants in this study. The most significant performance component affected was work output. This variable clearly supported the hypothesis that goal-setting increases effort (Locke and Latham, 1985, Wolko et. al., 1993). The results demonstrated that subjects worked harder when they followed the goal-setting package. Following intervention subjects worked substantially harder in comparison to both their own baseline scores and the subject remaining at baseline.

Five hundred metre times were also positively enhanced following intervention, althought results were small in two of the three cases. The results show that times did not change significantly during training. When subjects 2,3 and 4's baseline data was examined there was no particular downward trend which would be expected based on the notion that, with training and experience, times will improve. However, when the intervention was provided the variability of the subjects' times decreased as well as the number of falls. This decrease in the variability and number of

falls suggests that the skaters were becoming more consistent in their performance.

Cognitive strategies are becoming more widely used to improve the development and performance of a sport skill (Chen, & Singer, 1992, Weinberg, & Weingand, 1993). Within the present study, however, skill development could not be effectively assessed due to lack of serviceable data. The reasons for this result are discussed in the section entitled, Impact of Applied Research Settings.

It was hypothesized that when athletes were provided with the goal-setting package their thoughts would become more focused on ontask thoughts. The results, however, did not support this hypothesis. S2 and S3 both had a great deal of variability in their results during intervention and there was a dramatic decrease in ontask thoughts at the end of the study. A possible reason for this way have been that both subjects were writing exams at this time and may have had difficulty putting these thoughts aside during practice. This may also be the reason why S3 was the only one to show an increase as she was younger and may have had less outside pressures.

Previous research has suggested that goal-setting and self-management strategies can be used to enhance self-efficacy (Locke, & Latham, 1985; Feltz, & Weiss, 1982, Gist Et. al. 1990, 1991). In contrast, the results of the present study showed minimal improvement in self-efficacy for the three subjects who received the goal-setting package. The impact of the program, however, may have been undermined by the high level of self-efficacy that the participants initially reported. In addition, the results for this variable were obtained through self-reports which are not always seen

to be favorable by the athletes. Finally the self-efficacy instrument used may not have had the power to detect any changes effectively.

The log books provided a great deal of valuable information concerning the quality of the athletes' participation. Previous research has utilized log books as a tool to keep track of behaviors for measurement purposes (Burton, 1989b, Kendall et. al., 1990). Research has also been reported using logs to self-monitor (Morgan, 1985, 1987). Anecdotal reports have confirmed the potential of logs to keep track of goals set and goals achieved, recording training programs followed, and noting mental factors relating to best and least best practices and competition (Orlick, 1990, p.28) .

The present study confirms the benefits of using log books as a tool within a goal-setting package. However, athletes reactions to using the log books varied. Although this component was not always considered to be enjoyable, it served as an excellent assessment tool. Not only did the log books illustrate whether the athletes were setting goals but also whether they were setting goals according to the guidelines that had been provided. This behavior is very important as setting goals ineffectively may have contributed to conflicting findings in past research.

In addition, the log books provided information on goal achievement. Athletes assessed whether they had reached their goals. In general, the athletes met the majority of their goals. When goals were not met, the log books provided information as to why the goals were not attained. This feedback was important and was used when setting future goals. The use of log books appears to be beneficial in a goal-setting package, however, it is important that individuals be motivated and committed to maintain this recording procedure.

This study was unique as it examined the effects of a goal-setting package on performance (i.e. work output, times, and skill development), offtask behaviors, self-efficacy, and goal achievement. Although a package approach to goal-setting has been suggested (e.g. Garfield, 1984; Kirschenbaum, 1987) no empirical research using this type of package with the sport of speed skatinghas been undertaken.

Social Validity

The results from the social validity questionnaire were supportive of the intervention. This questionnaire helped to provide some insight into the importance of the various components to the overall package. As well, the questionnaire demonstrated the individual differences that arose and the need to tailor an intervention to the individual.

Based on the social validity questionnaire athletes rated talking about their goals with their coach/parents highly. There was however some variability; S1 and S3 rated this as being very useful and enjoyable while S2 had a neutral response. One possible explanation for this discrepancy is that S2 appeared to be more introverted and internally driven whereas S1 and S3 were more socially oriented.

The participants also felt that meeting with the experimenter was important. This finding could reflect the novelty of having someone show special interest in them and their skating. From a consulting perspective this is important because it demonstrates that these athletes were open to discussing their mental training development.

The execution components included in this package received favorable ratings. S1 and S2 rated visualizing their goals highly, however S3 had problems with visualizing in general and could not picture her goals.

Using self-talk was rated as highly important to S2 while S1 and S3 had a neutral response. The results could be due to the fact that S2 appeared to be internally focused.

When the coach was asked for his assessment of the effects of the program he rated the goal-setting package very highly. He noticed an immediate effect when athletes were provided with the intervention. He noted that they became,"more attentive, more focused." He also felt that they worked harder during practice when they began to set goals.

When provided with the results the coach felt the offtask behaviors and work output were of significant value to him as a coach. He felt that because the athletes were spending less time in offtask behaviors they were able to absorb more of the information he was providing. In addition, he felt that they were able to get more out of their practices because they had a focus.

The coach felt that the improvements in times were important. He felt that these improvements may have been due to the young age of the skaters and the fact that they develop quickly. He conceded that because the athletes were working harder and were more focused would also contribute to the improvement in times.

The coach indicated that the most convincing factor was the participants performance at the Canada Winter Games. Of the athletes who represented Manitoba at these games (of those that trained in Manitoba) the participants of this study were the most successful. The coach attributed this outcome to the mental skills the partcipants of this study acquired. The social validity results supported the benefits of a goal-setting package and provided additional information concerning individual needs.

The Impact of Applied Research Settings

Although it is generally accepted that goal-setting is very important in the development of athletes and as a tool to enhance their performance, the research in the applied environment has been equivocal. There are several reasons for the lack of significant findings and the present study attempted to recognize and correct some of these problems.

Within the literature there has been a lack of applied research examining goal-setting within actual sports settings (Strean & Glyn, 1992). In contrast the present research implemented a goal-setting package within an actual speed skating provincial team training program. Although this approach avoids the artificial nature of a laboratory experiment, the experimenter often encounters "real world" difficulties beyond the experimenter's control.

Field problems which arose in the present study included: 1) the lack of ice time for 500m time trials; 2) the lack of ice time to video tape the skaters to analyze for skill development; 3) the commitment of the skaters to using their log books; 4) a lack of communication between the head coach, the assistant coach and club coaches; and 5) skater absences from practices.

In order for the participants to complete a 500m pursuit during practice the other skaters had to stand to the side. Not only did this limit valuable ice time, but the other skaters also wanted the same opportunity to skate the 500m pursuit. Unfortunately, with the number of skaters and the limited amount of ice time available this was not possible. For this reason 500m pursuits were only completed in practice during the early stages of the intervention. The results from these races were, however similar to race times performed during the same phase.

In order to collect sufficient data to analyze for skill development the athletes would have had to have been video taped one at a time doing a straight away and a turn. This approach would have taken a substantial amount of ice time which was not available. Within the present study in order to assess skill development and interfere minimally with practice skaters were video taped from the side of the rink during practice. Unfortunately, the results were of poor quality video tape and the expert observers were unable to effectively assess the tapes. Data was collected for each skater, however only one assessment could be made of the skaters skill level. As a result there was not enough data available to graphically display the results. No conclusions could be drawn from this variable.

At the beginning and throughout the study, skaters were reminded of the importance of completing their log books. For maximum benefits the skaters should have been recording their goals for each practice and race and reviewing what they recorded. This procedure was not always followed. The inconsistency of this behavior on the skaters' part illustrated the strength of the package which produced positive results despite this "real world" limitation.

Attendance is an important aspect of training. Athletes miss practices for various reasons. In this study there were three key reasons for absence from practice. The reasons included participation in a training camp out of the province, injuries, and the weather. S2 and S3 took part in a long track training camp which took place during week 8, while both were in the intervention phase. Fortunately long track and short track are quite unique and the camp did not appear to influence the intervention results (i.e. a change in mean levels). None of the subjects in the present study had any major injuries, however S2 and S3 both had minor injuries

during the study. As a result practices were missed. Other causes of missed or late arrival at practices were weather conditions and/or the distance parents had to travel to get their child to practice and back to school. S1 and S3 lived outside of Winnipeg and had to drive 30-40 minutes to get to practices. The provincial practices at 6:45 am were very difficult for them to get to, particularly when weather conditions were poor.

Despite the limitations outlined above the intervention was clearly effective in increasing work output and decreasing offtask public behaviors. The social validity measures provided additional support for demonstrating that a goal-setting package can enhance the overall performance of young female speed skaters.

CHAPTER 6

Summary and Conclusions

Locke and Latham (1985) have suggested that goal-setting should have a greater impact on sport performance than organizational behavior because measurement in sports settings are less intrusive. However, some of the goal-setting research in sport is equivocal. Despite these results it is generally accepted that goal-setting may improve performance in sport. A possible reason for the lack of significant findings in some cases may be that present research dwells on comparing various weak interventions. Azrin (1977) has suggested that treatment programs in applied settings should include as many treatment components as appear necessary to achieve the desired behavioral changes. Several studies have successfully used this behavioral package approach (e.g. Allison & Allyon, 1980; Kendall et. al.1990) in athletic settings. A goal-setting package might involve not only setting specific goals but also developing the skills which will aide in the execution of these goals.

The main purpose of the present study was to assess the effectiveness of a goal-setting package on the skating performance (work output, 500m race times, and skill development), offtask behavior (public and private) and self-efficacy of young female speed skaters. In addition, this study allowed for an assessment of goal achievement through the use of log books. A single-subject design (multiple-baseline across subjects) was used to assess the dependent variables. Subjects were four female skaters ranging in age from 12-17 years. One subject (S4) remained at baseline for the duration of the study.

The results provide positive support for utilizing a goal-setting package in an applied setting. Work output increased and offtask behaviors decreased upon intervention. Times over 500m showed small decreases for all subjects who received the goal-setting package. There was no effect on self-efficacy. The social validity assessment provided further confirmation of the effectiveness of the goal-setting package. All skaters who received the package found it to be beneficial.

Conclusions

1. The goal-setting package increased the work output, decreased 500m sprint times, and decreased offtask behaviors for all participants.

2. The log books were an effective tool for assessing goal-setting effectiveness and goal achievement.

3. Social validity measures indicated that the participants found the package to be beneficial.

Recommendations

1. Additional study should be undertaken on the effects of a goal-setting package within different sports, and with athletes of different ages, ability level and sex.

2. The long-term effects of a goal-setting package should be examined to determine whether the participants continue to set goals effectively after the intervention has been concluded.

3. Future research should investigate which component and/or combination of components are most effective in a goal-setting package.

4. Skill development needs to be considered as a dependent variable in future intervention studies.

4. Additional research is required utilizing single-subject designs to determine the effects of an intervention package. This type of design

allows a researcher to effectively monitor behavior over an extended period of time. This strategy could be used by coaches to evaluate their own coaching program over a season.

Practical Implications

1. A self-managed goal-setting package which is monitored by a consultant can increase work output. This approach is most appropriate in situations where the coach has minimal time to spend with the athlete, or where athletes receive minimal feedback from the coach.

2. A goal-setting package which includes the use of a log book can provide the athlete with valuable information about how they are training and serve as feedback for future goal-setting. The log book can also be used by the coach or consultant to determine if the athlete is setting appropriate goals.

3. A goal-setting package can help athletes develop mental skills that they can continue to use throughout their lives.

References

Azrin, N, H (1977). A strategy for applied research: Learning based but outcome oriented. American Psychologist, 32, 140-149.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1, 91-97.

Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. Journal of Personality and Social Psychology, 45, 1017-1028.

Bandura, A. (1984). Social foundations of thought and action. Englewood Cliffs, NJ: Prentice-Hall.

Bar-Eli, M. Levy-Kolker, N. Tenenbaum, G. Weinberg, R. S. (1993). Effects of goal difficulty on performance of aerobic, anaerobic and power tasks in laboratory and field settings, Journal of Sport Behavior, 16(1), 17-32.

Barnett, M. J., & Stanicek, J. A. (1979). Effects of goal-setting on achievement in archery. The Research Quarterly, 50, 3, 328-332.

Barnett, M. L. (1977). Effects of two methods of goal-setting on learning a gross motor task. The Research Quarterly, 48, 1, 19-23.

Bell, K. F., & Patterson, M. R. (1978). A self-monitoring technique for the enhancement of swimming performance. Swimming Technique, 14, 103-106.

Botterill, C. (1983). Goal-setting and athlete development. Science Periodical On Research and Technology in Sport, Sport Psychology BU-1.

Botterill, C. (1987). Psychological Skills in Sport & Life, Lifeskills Inc.: Winnipeg, Canada.

Boyce, B. A. (1992). The effects of goal proximity on skill acquisition and retention of a shooting task in a field-based setting. Journal of Sport Exercise Psychology, 14, 298-308.

Bryan, A. J. (1987). Single-subject designs for evaluation of sport psychology interventions. The Sport Psychologist, 1, 283-292.

Burton, B. (1989)a. The impact of goal specificity and task complexity on basketball skill development. The Sport Psychologist, 5, 34-47.

Burton, D. (1989)b. Winning isn't everything: Examining the impact of performance goals on collegiate swimmers' cognitions and performance. The Sport Psychologist, 3, 105-132.

Chen, D., & Singer, R. N. (1992). Self-regulation and cognitive strategies in sport participation. International Journal of Sport Psychology, 23, 277-300.

Epstein, M. L. (1980). The relationship of mental imagery and mental rehearsal to performance of a motor task. Journal of Sport Psychology, 12, 157-166.

Feltz, D. L., & Weiss, M. R. (1982). Developing self-efficacy through sport. Journal of Physical Education, Recreation and Dance, 53, 1, 34-36.

Frierman, S. H., Weinberg, R.S. & Jackson, A. (1990). The relationship between goal proximity and specificity in bowling: A field experiment. The Sport Psychologist, 4, 145-154.

Garfield, C. & Bennett, H. Z. (1984). Peak Performers: Mental Training Techniques of the World's Greatest Athletes, Jeremy Ptarcher.: Los Angelos.

Giannini, J. M., Weinberg, R. S., & Jackson, A. J. (1988). The effects of mastery, competitive, and cooperative goals on the performance of simple and complex basketball skills. Journal of Sport and Exercise Psychology, 10, 408-417.

Gist, M. E., Bavetta, A. G., Stevens, C. K. (1990). Transfer training method: Its influence on skill generalization, skill repetition, and performance level. Personnel Psychology, 43, 501-523.

Gist, M. E., Stevens, C. K., & Bavetta, A. G. (1991). Effects of self-efficacy and post-training interventions on the acquisition and maintenance of complex interpersonal skills. Personnel Psychology, 44, 837-861.

Greenspan, M. J., & Feltz, D. L. (1989). Psychological interventions with athletes in competitive situations: A review. The Sport Psychologist, 3, 219-236.

Gutman, M. C., Pollock, M. L. Foster, C., & Schmidt, D. (1984). Training stress in Olympic speed skaters: A psychological perspective. Physician and Sportsmedicine, 12(12), 45-48.

Hall, H. K. &. Bryne, A. T. (1988). Goal-setting in sport: Clarifying recent anomalies. Journal of Sport and Exercise Psychology, 10, 184-198.

Hayes, S. C., Rosenfarb, I., Wulfert, E., Munt, E. D., Korn, Z., & Zettle, R. D. (1985). Self-reinforcement effects: An artifact of social standard setting? Journal of Applied Behavior Analysis, 18, 201-214.

Hayes, S. C., Rosenfarb, I., Wulfert, E., Munt, E. D., Korn, Z., & Zettle, R. D. (1986). The effects of feedback and self-reinforcement instructions on studying performance. The Psychological Record, 36, 27-37.

Hume, K. M., Martin, G. L., Gonzalez, P. Cracklen, C., & Genthon, S. (1985). A self-monitoring feedback package for improving freestyle figure skating practice. Journal of Sport Psychology, 7, 333-345.

Ievleva, L. &. Orlick., T. (1991). Mental links to enhanced healing: An exploratory study. Sport Psychologist, 5(1), 24-40.

Jourden, F. J., Bandura, A. & Banfield, J. T. (1991). The impact of conceptions of ability on self-regulatory factors and motor skill acquisition. Journal of Sport and Exercise Psychology, 8, 213-226.

Jowdy, P. D. (1990). Muscular responses during mental imagery as a function of motor skill level. Journal of Sport and Exercise Psychology, 12, 191-201.

Kazdin, A. E. (1982). Single case research designs: Methods for clinical and applied settings. New York.:Oxford University Press.

Kendall, G., Hrycaiko, D., Martin, G. L, & Kendall, T. (1990). The effects of an imagery rehearsal, relaxation, and self-talk package on basketball game performance. Journal of Sport and Exercise Psychology, 12, 157-166.

Kirschenbaum, D. S., & Bale, R. M. (1983). Cognitive-behavioral skills in golf: Brain power golf. In G. L Martin. &. D. Hrycaiko. (Ed.), Behavior modification and coaching: Principles, procedures and research. Springfield, Illinois: Charles C. Thomas.

Kirschenbaum, D. S. (1984). Self-regulation in sport psychology: Nurturing an emerging symbiosis. Journal of Sport Psychology, 6, 159-183.

Kirschenbaum, D. S. (1987). Self-regulation of sport performance. Medicine and Science in Sports and Exercise, 19, 5, S106-S113.

Locke, E. A., & Latham, G. P. (1985). The application of goal-setting to sports. Journal of Sport Psychology, 7, 205-222.

Locke, E., & Latham, G. P. . (1990). A Theory of Goal-setting and Task Performance . Englewood Cliffs, New Jersey: Prentice Hall.

Locke, E. A. (1991). Problems with goal-setting research in sports - and their solutions. Journal of Sport and Exercise Psychology, 8, 311-316.

Martin,G. L. & Hrycaiko, D. (1983) Effective behavioral coaching: What's it all about?. Journal of Sport Psychology, 5(1), 8-20.

Martin, G. L., & Lumsden. J. (1987). Coaching: An effective behavioral approach (1st. ed.). St. Louis. Mo.: Times Mirror/Mosby College Publishing.

Maxeiner, J. (1985). Inhibition in sports with cyclical movements. International Journal of Sport Psychology, 16(3), 210-216.

McKenzie, T. L. &. Rushall, B. S. . (1974). Effects of self-monitoring on attendance and performance in a competitive swimming training environment. Journal of Applied Behavioral Analysis, 7, 199-206.

Miller, T. J., & McAuley, E. (1987). Effects of a goal-setting training program on basketball free-throw self-efficacy and performance. The Sport Psychologist, 1, 103-113.

Ming, S. (1992). The Effects of a Self-talk Package on the Figure Performance of Young Competitive Figure Skaters. M.A, University of Manitoba.

Morgan, M. (1985). Self-monitoring of attained subgoals in private study. Journal of Educational Psychology, 77, 6, 623-630.

Morgan, M. (1987). Self-monitoring and goal-setting in private study. Contemporary Educational Psychology, 12, 1-6.

Orlick, T. (1990) In Pursuit of Excellence: How to Win in Sport and Life Through Mental Training, Champaign, Illinois: Leisure Press.

Orlick, T. & Partington, J. (1986) Psyched: Inner Views of Winning. Ottawa: Coaching Association of Canada.

Poag, K., & McAuley, E. (1992). Goal-setting, self-efficacy, and exercise behavior. Journal of Sport and Exercise Psychology, 14, 352-360.

Qu, G. (1988). Discussions on the task of offering psychological advice to short track speed skaters. Sports Science/ Journal of China Sports Science Society, 8(1), 72-75.

Ralston, L. (1986). Motivating players toward maximum performance. Racing Blade, 18(3), 12-13.

Rushall, B. (1976). A direction for contemporary sport psychology. Canadian Journal of Applied Sport Sciences, 1, 13-21.

Rushall, B. (1984). The content of competition thinking. In W. F. &. W. Straub J. M. (Ed.). Cognitive Sport Psychology. New York: Sport Science Associates.

Ryan, E. D., Simons, J. (1983). What is learned in mental practice of motor skills: A test of the cognitive motor hypothesis, Journal of Sport Psychology, 5, 419-426.

Seidentop, D. (1976). Developing teaching skills in physical education .

Boston: Houghton Mifflin Co.

Seiler, R. (1992). Performance enhancement: A psychological approach. Sport Science Review, 1, 2, 29-45.

Shewchuk, M. (1985). Aspects of thought factors and their effects on performance in swimming. Master's Thesis, Lakehead University,

Sleamaker, R. (1989). Serious Training for Serious Athletes . Champaign, Illinois: Leisure Press.

Strean, W. B., & Roberts, G. C. (1992) Future directions in applied sport psychology research. The Sport Psychologist, 6, 55-65.

Vealey, R. S. (1988). Future directions in psychological skills training. The Sport Psychologist, 2, 318-336.

Weinberg, R. Bruya, L., Jackson, A., & Garland, H. (1987). Goal difficulty and endurance performance: A challenge to the goal attainability assumption. Journal of Sport Behavior, 10, 82-92.

Weinberg, R., Bruya, L., & Jackson, A. (1985). The effects of goal proximity and specificity on endurance performance. Journal of Sport Psychology, 1, 296-305.

Weinberg, R., Bruya, L., Longino, J., & Jackson, A. (1988). Effects of goal proximity and specificity on endurance performance of primary Grade Children. Journal of Sport and Exercise Psychology, 10, 81-91.

Weinberg, R., Bruya, L., & Jackson, A. (1990). Goal-setting and competition: A reaction to Hall and Bryne. Journal of Sport and Exercise Psychology, 12, 92-97.

Weinberg, R., & Weigand, D. (1993). Goal-setting in sport and exercise: A reaction to Locke. Journal of Sport and Exercise Psychology, 15, 88-96.

Weiss, M.R. (1991). Psychological skill development in children and adolescents. The Sport Psychologist, 5 (4), 335-354.

Wolko, K. L., Hrycaiko, D.W.& Martin, G.L. (1993). A comparison of two self-management package to standard coaching for improving practice performance of gymnasts. Behavior Modification , 17 (2), 209-223.

Wollman, N. (1986) Research on imagery and motor performance: Three methodological suggestions. Journal of Sport Psychology, 8, 135-138.

Ziegler, S. (1987). Effects of stimulus cueing on the acquisition of groundstrokes by beginning tennis players. Journal of Applied Behavior Analysis, 20, 405-411.

Zaichkowsky, L. D. (1980). Single case experimental designs and sport psychology research. In C. H. Nadeau, W. R. Halliwell, K. M. Newell & G. C. Roberts (Eds.), Psychology of motor behavior and sport -1979 (pp171-170). Champaigh, Il.: Human Kinetics.

Appendix A

Consent Form

University of Manitoba

Faculty of Graduate Studies

The effects of an active goal-setting package on the performance and self-efficacy of young speed skaters

Dear Parents:

I am writing to request the permission of you and your child to participate in a sport psychology study that I would like to conduct during the coming year. This study will be examining ways to improve performance and self-efficacy (self-confidence in regards to their sport). Participants will be introduced to various ways to regulate their behavior such as: goal-setting, self-talk and self-monitoring. Based on previous work in this area, I anticipate that the program will give the participants skills to help them focus during practice and competition as well as enhance performance and increase self-efficacy. Every one within the study will receive the program, however in order to collect data and provide athletes with an individualized package I will work with each athlete in the study individually. I would ask that the participants do not discuss the study amongst each other until the collection of data is complete. Also participants may withdraw from this project at any time. This study will last from the beginning of September to the middle of November. I would greatly appreciate your support in allowing your child to participate.

Sincerely,
Connie Wanlin

I give my child permission to participate in this study.
_____(Parents signature and date)

I would like to participate in this study.
_____(Skater's signature and date)

Appendix B

Recording Sheet

Skater:_____ Session #_____

Date: _____ Observer:_____

I. Offtask behaviors

Frequency:

Total Frequency:_____

Total Duration: _____

II. Laps

Total number of laps: _____

III. Program instructed by coach:

Programs	Complete	Incomplete
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

IV. Coach/Athlete Interactions:

Instructions/Corrections	Negative Feedback	Positive Feedback

V. 500m time:_____

Appendix C

Expert Recording Sheet

	YES	NO
Basic Position		
a) ankles straight		
b) skates parallel 6"-8" apart		
c) knees over toes		
d) 90° bend at knees		
e) back bent at least 45°		
f) center of gravity in middle of blade		
g) head up, looking 6"-10" in front		
Push to the side		
a) complete extension of leg		
b) all weight on support leg		
c) 90° bend in support leg		
d) skates parallel, pointing straight ahead		
e) center of gravity over supporting leg		
f) head, knee and foot in same vertical line		
Arms		
a) relaxed yet controlled		
b) hands open		
c) no higher than shoulders		
d) swing backwards and forwards		
e) slight bend in elbow in front		
Return of leg		
a) legs parallel during recovery		
b) all weight on support leg		
c) knees and feet come together		
d) leg relaxed after push to side		
e) support leg bent 90°		

YES NO

Turns

a) push straight out along radius lines
b) slight body rotation to left
c) body lean to left
d) left arm swing reduced
e) feet close to ice during cross over
f) push with whole blade, not toe
g) legs bent 90°

Starts

a) skates parallel, 45° to line
b) skates shoulder width apart
c) even weight distribution
d) slight bend in leading arm
e) trailing arm loosely extended behind
f) arms and legs working in opposition,
i.e., left arm, right leg together
right arm, left leg together

Appendix D

Weekly Assessment

Treatment Integrity Check

Skater:_____

Session#_____

Date:_____

Questions:

1. **How is the program going?**
2. **Do your have any comments or concerns?**
3. **May I see your log book?**
4. **If log is completed then verbal praise.**

   If log is not completed ask about athletes reason for not completing.

   Stress the importance of completing their log.
5. **If there are any problems or concerns mentioned related to the intervention go over the intervention checklist at the beginning of the log book so that the athlete understands the program.**

Appendix E

Intervention Prompt

Don't forget to:
1) Write your practice, weekly and long term goals in your log book.
2) Assess your practice and reevaluate your goals.
3) Tell your coach about your goals.

Keep Smiling!!!

Appendix F

Self-Efficacy Scale

500m in:	Yes/No	Confidence (10pt. scale)
1:20	_____	_____
1:00	_____	_____
0:45	_____	_____

Can you maintain technique for:	Yes/No	Confidence
half the practice	_____	_____
whole practice	_____	_____
every practice	_____	_____
half of a race	_____	_____
most of a race	_____	_____
every race	_____	_____
important races	_____	_____

Comments:_____

_____

Appendix G

Thought Content Assessment

Skater:_____

Session#_____

Date:_____

During practice how much did you think about the following things on a scale of 1-5.
1= not at all 2= a little 3= sort of 4= quite a bit 5= all the time

1) I thought about my form:
1 2 3 4 5

2) I thought about what I'm going to do after practice:
1 2 3 4 5

3) I thought about my practice goals:
1 2 3 4 5

4) I thought about the instructions my coach is giving:
1 2 3 4 5

5) I thought about how tired my legs were:
1 2 3 4 5

6) I thought about school work I have to do:
1 2 3 4 5

Please list any other things you may have been thinking about during practice and rate them as done previously:

Appendix H

Hrs of sleep:_____ A. M. Heart Rate:_____ Date:_____	Willingness to train Low 1 2 3 4 5 High Training Intensity Low 1 2 3 4 5 High
Practice Goals: (Before Practice)	For next practice my goals are:
Practice Assessment: How did practice go? Did I meet my goals? My goals were: Easy 1 2 3 4 5 Too Hard	COMMENTS:

Appendix I

Log Book

GOAL-SETTING CHECKLIST

1) Is this goal specific. Example: My goal for this practice is to do five really good starts (see the form and technique checklist for a description of a good start) during the start drill, this makes it easier to measure goal achievement.
2) Is this goal reasonable, goals should be difficult yet attainable (e.g. if you currently skate 500m in 58:01 seconds then a reasonable goal would be to aim for a 2-3 second improvement in one week).
3) Be flexible, you may have to adjust your goals (i.e. if you get sick or are injured).
4) Read how your last practice went and set your present goals based on that.
5) Keep in mind what your long term goal and mission are when setting your short term practice goals.
6) Use self-talk as a tool to help you achieve your goals. Example: if your goal is to do five good starts you may want to have cue words to remind you of what you need to do to have a good start, i.e. Blast, Push.
7) Visualize your practice goals before you step on the ice for practice.
8) Visualize your race goals before you step on the ice for the race.
9) Be descriptive about your goals so that you can develop a mental picture (i.e. visualize them).
10) State your goals using positive words, I will do five really good starts today. Remember to use positive self-talk at all times.

Appendix J

Social Validity Questionnaire

Skater:_____

Session #_____

Date_____

1. Overall how would you rate this experience?
Negative----------Neutral----------Positive
Comments:

_____

_____

2. Rate how you felt about each of these components on a scale of 1-5
1=did not like, was useless 3=neutral 5=really liked, very useful

1) **Using the log books**
2) **Talking about your goals with your coach**
3) **Using the stop watches**
4) **Setting goals**
5) **Using self-talk**
6) **Visualizing your goals**

Comments:

_____

_____

3. Would you make any changes to the log books? yes no
Comments:_____

_____

4. Would you continue with any of these strategies?
Which
One/Ones:_____

_____

_____

Please feel free to list any additional recommendations or comments:

_____

_____

_____

_____

Appendix K

Video Script

Intro:
Hi, My name is Connie Wanlin, I'm a student at the University of Manitoba and I'm interested in ways to make your performance better. On this tape I'm going to work through the steps you need to become an active goal-setter with the help of Christie Peters and my assistant and amazing demonstrator Janos Englert. But enough talk let's blast ahead.

(Motivating music and speed skater video tape)

Phase 1 -THE MISSION

When setting your goals it is important to have a mission to work from. So, what is a mission anyway?

A mission statement is basically your private reasons for wanting to accomplish a special goal in life or in sports. Its kind of your personal philosophy. Every one has some sort of mission. The following are some clips of peak performing athletes from this past winter Olympics, each states their personal missions. This should help you to get an idea of what goes into a mission statement.

Examples of Mission Statements: Show clip of peak performers.

To help you develop you mission I'm going to ask you some questions. This should help you to get in touch with your won reasons for participating in speed skating. Write down your thoughts in a list or a cluster.

What FEELINGS do you experience when you are having the most fun in your sport.

Do you have any athletic heroes or heroines
Think about what these people and their accomplishments mean to you, how did they change your personal history, what things do you most admire about these people

Is there someone in your life, such as a friend, parent, coach, who has influenced your interest in sports? What is it about your relationship with

this person that motivates you toward accomplishing whatever it is you want to do in speed skating?

Think about these questions and your answers. When you put them all together you will get you very own mission statement.

Does anyone want to share there mission?

Those are excellent!
Any Questions?
Once you have your mission statement exactly how you want it write it in your log book. You will see that there is a special page to write it on.

Phase 2- How to set LONG TERM GOALS

OK we have a mission. But now we need to set some objective goals to help us achieve that mission. First we'll start with some long term goals.

Instructions
1. Write down all races on the calendars provided in the log.
2. Read through the goal-setting check list in the log
3. Based on your times from last year and your mission what would you like to achieve by the end of this season. Write them down.
4. Work from this goal backwards so that you have a goal for each race.
When you have your long term goal (s) set write them in your log book.

Show an example.

Phase 3 - SUBGOALS and PRACTICE GOALS

Now you have some idea of where your going. To make this effective you need to set practice goals that will help you achieve your long term goals. These are called short term or subgoals.
This is where your log book really becomes important. Before every practice you need to write down one or two things you would like to accomplish in practice. For example: After practice you need to evaluate your goals and set goals for the next practice. Always go over the goal-setting checklist if you have any concerns or if they are really a big problem come and ask me.

Phase 4 - SELF-TALK and GOAL VISUALIZATION

You have a mission, long term and short term goals now you need to execute these goals. This is the "active" part of goal-setting. In this phase you will learn about two tools that will help you achieve your goals.

Self-talk
Yep! It is just what your thinking. Talking to yourself. There are three basic types of self-talk:
1) task-relevant statements: these are key words that help give you a cue for the proper technique example: keep tucked
2) mood words: these are key words that give your senses a cue example: blast!
3) positive self-talk: these are positive statements to say to yourself like I can do this, I can keep going, to help you make it through a race when you think you'll never make it. This can and should be practiced at all times. Being positive is very important in peak performance.

So how can I use self-talk to improve my skating? Well there are several ways.
In practice:

Self-talk can be very useful in practice. As you will be setting goals for each practice its important to run through this practice objectives in your head once before stepping on the ice. This way your goals will be fresh in your mind and you can structure your self-talk around it. For example if your goals for practice were:
1) To do 5 correct starts
2) Remain positive for the entire practice
You may use key words that will remind you of what you have to do to do a great start. Also through the practice you may want to say to yourself, "Good job, keep it up, I can do it, I will have a great practice."
You can use key words to remind yourself about technique and form, also self-talk helps to keep your mind busy and focused on speed skating and not in some other world. To help you do this you will find a section in your log book with various pictures of speed skaters in various position in a lap. What I want you to do is write in what you should think about at each position. Use the Form and Technique checklist to help you.

OK. How did it go. Let's see what Christie put in her book. So Janos are these the write things?

You may have to make adjustments. Remember you want to keep it brief. If you wouldn't say anything in certain position or feel uncomfortable doing so feel free to leave it blank. This is your program.

In a Race

First it would help to think back to your best race. What did you say at the beginning, middle end. It may help to draw the oval and write your key words down. This will take practice and eventually you will have designed a set of key words that work best for you. To give you a better understanding what follows is a clip of an Olympic downhiller using his self-talk 0:33:55

Goal Visualization

This is also pretty self-explanatory. It means making a mental picture of your goal. To help you develop a mental picture of your goal there are a couple of steps to follow:

1) Write down the goal
2) Describe every thing involved in achieving that goal
3) Be as descriptive as possible describe the place, day, what your going to do, say...

Many Olympic athletes visualized their goals. The following are some examples of goal visualization.

Susan Auch 1:12:07
Sylvain Bouchard 1:07:49

Conclusion

As you can see there is more to goal setting than just setting a goal. You need:

1) to have a mission
2) set some long term goals
3) develop short term subgoals to help achieve the long term goals and mission
4) use self-talk and visualization to help you achieve your goals

By following these suggestions you will be well on your way towards goal achievement!!!

Appendix L
Recording Protocal

Laps:

Only count laps which are completed at the same speed and in the correct speed skating tuck for the entire lapt. For example, do not count sprints in which the skater skates fullout for the first half of the lap and then glides on two feet standing up for the remainder of the lap.

Offtask behaviors:

Count each occurance of the following behaviors:
- Not paying attention to the coach when he/she is speaking, for example: talking to someone else while the coach is talking, playing with their equipement, looking around, fooling around with other skaters (i.e. shoving, and pushing).
- Standing around when they are supposed to be skating.
- Skating in an incorrect position, i.e. standing up instead of being in the skating tuck.

Time the duration of each occurance of offtask behaviors. Do not reset the stop watch after each occurance this way at the end of the practice you will record the total time spent in offtask behaviors for the entire practice.

Coach/Athlete Interactions

Each occurance of coach/athlete interactions must be recroded as either positive or negative feedback, or instruction and/or corrections. Only count occurances in which the coach speaks to the specific skater whose behaviors you are recording. Positive feedback is defined as praise. Negative feedback is defined as reprimands.