10TH EUROPEAN CONGRESS OF SPORT PSYCHOLOGY PRAGUE 1999

PSYCHOLOGY OF SPORT AND EXERCISE: ENHANCING THE QUALITY OF LIFE

PROCEEDINGS PART (1)

CHARLES UNIVERSITY
IN PRAGUE
FACULTY OF PHYSICAL EDUCATION
AND SPORTS

Charles University in Prague
Faculty of Physical Education and Sport

PSYCHOLOGY OF SPORT AND EXERCISE: ENHANCING THE QUALITY OF LIFE

PROCEEDINGS

OF THE 10TH EUROPEAN CONGRESS OF SPORT PSYCHOLOGY - FEPSAC

PART 1

EDITORS:
VÁCLAV HOŠEK
PAVEL TILINGER
LUBOŠ BÍLEK

PRAGUE 1999

The proceedings were published under auspices of:

EUROPEAN FEDERATION OF SPORT PSYCHOLOGY (FEPSAC)
CHARLES UNIVERSITY IN PRAGUE, FACULTY OF PHYSICAL EDUCATION AND SPORT
MINISTRY OF EDUCATION, YOUTH AND PHYSICAL EDUCATION
CZECH ASSOCIATION OF SPORT PSYCHOLOGISTS

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PART 1

10th European Congress of Sport Psychology Prague 1999

Text content and language were not corrected
The quality of tables, graphs and illustrations corresponds to the quality of received submissions.

ISBN 80-86317-00-5

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PREAMBLE

The 10th FEPSAC, European Federation of Sport Psychology Congress held in Prague, Czech Republic was organized by the Charles University in Prague, Faculty of Physical Education and Sport, and by the Czech Association of Sport Psychologists under the auspices of the Ministry of Education, Youth and Physical Education of the Czech Republic.

The Proceedings Part 1 and Part 2 present keynote addresses and reviewed contributions of oral presentations, workshops and posters. The keynote addresses are published at the beginning of the Proceeding in Part 1. The scientific papers are ordered alphabetically, using the name of the first author. The contributions are published as the Science Committee received them. The authors are completely responsible for the form and the content of their presentations.

The Proceedings books reflect the main theme of the Congress: **Psychology of Sport and Exercise: Enhancing the Quality of Life** and the main topics and sub- topics as they are outlined in the Congress program.

Congress main-topics

1. Physical activity and the quality of life
2. Perception, cognition and group dynamics in action
3. Diagnostics, prognostic and intervention
4. Motor learning of sport skills
5. Sport psychology and the disabled individuals
6. Psychological aspects of sports management
7. Retirement from sport
8. Psychology of counselling and coaching in sport
9. Ethical issues in psychology of sport, Olympic ideas

Congress sub-topics

a) Social and organisational aspects of sport behaviour
b) Psychosocial development across the life span sport
c) Enhancing sport performance
d) Psychological aspects of health promotion
e) Physical activity and the self
f) Ethical and professional issues

The Science Committee received almost 300 submissions from sport psychologists from forty different countries. Most of the submissions were accepted for presentation, but only those papers, which met formal, methodological and relevancy criteria were published in the Proceedings books. It is our believe that the information and ideas from the submissions, which used methods relevant only to oral presentations have contributed to the scientific discourse of this congress.

The editors would like to express their gratitude to all reviewers for their work and to all presenters for their scientific contribution to the 10th FEPSAC Congress. The quality of presented work demonstrates a very exciting development in our discipline.

We hope that our meeting in Prague contributed to the advancement of sport psychology and to the start of new personal and professional friendships.

The Editors,
Václav Hošek, Pavel Tilinger, Luboš Bílek

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KEYNOTE ADDRESSES

CONGRESS PRESENTATIONS

SELF-ESTEEM AND QUALITY OF LIFE IN EXERCISE AND SPORT

Kenneth R. Fox, University of Exeter, UK

KEY WORDS: Self-esteem, physical self-perceptions, exercise, sport, mental well-being, quality of life.

ACKNOWLEDGEMENTS

The review described in this paper was funded by Somerset Health Authority, UK under the direction of the Somerset Physical Activity Group.

INTRODUCTION

The case for exercise and physical health is now widely established. Medical and health authorities world wide (WHO, 1995) accept that sedentary living doubles the risk of coronary heart disease, carrying a similar risk to hypertension and dislipidemia and not far behind smoking in its impact. Lack of exercise also raises the chance of obesity, diabetes, and some cancers. All of these problems are increasing at a time when affluence and technology in westernised countries are reducing daily physical activity in our lifestyles.

It is clear that there is ample evidence to call for increased activity to counteract mortality and morbidity and many countries have responded by launching national physical ctivity promotion campaigns. However, there is also concern about the growing incidence of mental illness such as clinical depression and anxiety. Additionally, there has been a recognition of a *psychological malaise* among the general public, characterised by conditions such as mild depression, low self-esteem, sense of purposelessness and hopelessness, high stress and tension, low sense of personal control and frequent negative affect. This is often put in context of unhealthy behaviours such as alcohol and drug abuse, social isolation and poor life adjustment. It is a scenario particularly observable in countries that have recently experienced strife, economic stress, or political upheaval but also present to some degree in stable societies.

The development of problems of psychological well-being has brought further attention to the role of exercise and sport participation in the improvement of *life quality* in the population. The medical definition of life quality targets maintenance of normal functioning and absence of the debilitations of disease. However, there is greater acceptance of the importance of the *subjective* base of life quality as characterised in the World Health Authority definition of health as being more than the absence of disease but the experience of social and mental well-being. This brings into play constructs such as life satisfaction, subjective well-being, emotional adjustment, stress and anxiety levels, life coping, social functioning as well as absence of mental illness and disorders.

Exercise is now being considered in the context of:

- Treatment of mental illness and disorders
- Prevention of mental illness and disorders
- Improvement of life quality and mental well-being of those with mental illness

- Improvement of mental well-being of the general population

There is a growing literature on the role of exercise in alleviating mental illness and improving mental well-being. Several books have summarised the literature including Biddle and Mutrie (1991), Leith (1994), Morgan (1997), a recent volume in preparation by Biddle, Boutcher, and Fox, and numerous review chapters and papers. The general areas that are addressed in the literature are depression, anxiety and stress, emotion and affect, self-esteem and self-perceptions, sleep quality and the negative effects of exercise. The remainder of this paper will focus on the role of exercise and sport in the improvement of self-perceptions, self-esteem and mental well-being.

THE CONSTRUCT OF SELF-ESTEEM

The topic of self-esteem seems to capture universal interest. Not only has it attracted more attention than any other psychological construct, it has attained significance at the institutional level in educational, corporate and government policy and also has captured meaning among the lay public.

Several features establish its importance to mental well-being:

- Self-esteem is widely accepted as a key indicator of emotional stability and adjustment to life demands and is therefore a critical contributor to subjective well-being. High self-esteem has been related to a range of positive qualities such as life satisfaction, positive social adjustment, independence, adaptability, leadership, resilience to stress, and high level of achievement in education and work.

- Low self-esteem is closely related to elements of mental illness and absence of mental well-being. It frequently accompanies depression, trait anxiety, neuroses, suicidal ideation , sense of hopelessness, lack of assertiveness and low perceived personal control. Improved self-esteem has therefore been used frequently as a target for change and also a success marker for psychotherapy (Wylie, 1979).

- Self-esteem and related self-perceptions are closely implicated with choice and persistence in a range of achievement and health behaviours and many contemporary theories of human motivation feature elements of the self (Biddle, 1997). High self-esteem is associated with healthy behaviours (particularly in adolescents) such as not smoking, lower suicide risk, greater involvement in sport and exercise, and healthier eating patterns. Self-esteem and self-perceptions of ability are therefore critical to understanding determinants of health behaviours and subsequently require consideration in health promotion policy.

Defining self-esteem

The academic field has suffered from a confusion of definitions and it is encouraging to see a recent increase in consensus (see Fox, 1997a). The self is best described as a complex system of constructs. *Self-concept* represents self-description of abilities, attributes, traits, and the roles played within life. *Self-esteem* or *self-worth* on the other hand is the evaluation of self. The self as director is capable of weighing up its performance in the many and varied roles that it performs, deciding which are critical for success, and evaluating itself against those

criteria for success. Self-esteem therefore is a self-rating of how well the self is doing. Campbell (1984) defines it as "an awareness of good possessed by self". It is therefore value driven and the criteria and content used to determine worth are dictated both by the individual and the primary culture in which he/she operates. Additionally, individuals might ascribe to subcultures that value other aspects of life such as athletic ability, higher spiritual or moral ground, or even criminal behaviour. Within these constraints, each person will draw upon a personal menu of attributes and achievements, placing greater value on some elements than others. Some personal menus may closely conform to cultural norms and expectations, while others are more individualised. However, the criteria on which self-esteem is based are ultimately set by the individual and because it provides the ultimate evaluative statement regarding the self, it carries highly charged emotional and behavioural consequences. Some psychologists would argue that there is nothing more important to the individual than self-esteem, suggesting it is one of the critical elements of well-being.

Measurement of self-esteem and self-perceptions

Over the last 15 years, there have been important advances in the way the self has been researched and assessed. Scales that provided an estimate of self-esteem by simply totalling a diverse set of self-ratings of specific competencies and attributes have been replaced by self-perception profiles. This recognition of the multidimensionality of self allows a richer picture of self-ratings on components that are culturally salient such as social functioning, academic and occupational prowess, and physical appearance and performance.

Alongside profiles, global self-esteem or self-worth is best measured by a separate subscale using items which avoid specific domain content and refer to pride in self, general competence, and equal worth to others. Rosenberg's 10-item Global Self-Esteem Scale (Rosenberg, 1965) is of this type and has been widely used. Harter's self-perception profiles for include a General Self-Worth subscale (Harter, 1988) as does Marsh's Self-Description Questionnaire series (Marsh, 1992).

With appearance of self-perception profiles and separate global or self-esteem scales, models have appeared to indicate how constructs might relate to each other. Some support has been provided for a hierarchical structure like the roots of a tree, with self-esteem forming the stable apex or tree trunk. Domains of life form the main roots, with increasingly finer roots that search out closer contact with life experiences and represent more specific content. This has been a highly significant development as it suggests that self-perceptions can be assessed across a wide spectrum from situation specific to global. Self-efficacy statements addressing perceived ability to successfully complete a task might represent a highly specific self-assessment. Self-esteem, or domain-specific self-worth or competence would provide more global constructs. Additionally it demonstrates potential pathways through which our interface with daily life events might generalise to global self-constructs.

Physical self-perceptions

With the emergence of multidimensionality, it has become possible to focus on assessment in a single domain. The physical self has been widely implicated in mental well-being as the body represents the public or presenting self and acts as a vehicle for expression and display. It has also been important as a determinant of exercise and sport behaviour. Clearly, effective measurement of the physical self is critical to documenting and understanding the impact of exercise and sport on mental well-being.

The Tennessee Self-Concept Scale (TSCS) (Fitts, 1965) was one of the first instruments to utilise a multidimensional structure and the instrument of choice in many of the earlier exercise/self-esteem studies. Unfortunately, the physical self subscale totals diverse items, many of which have little relevance to exercise, although the instrument has recently been modified and may be particularly useful for clinical settings with patients with psychiatric disorders. Two well-validated comprehensive instruments have been developed in recent years to assess self-ratings at two levels of the physical domain. The Physical Self-Perception Profile (Fox & Corbin, 1989) measures perceptions of sport competence, physical strength, physical condition, body attractiveness and an overall self-worth. The Physical Self-Description Questionnaire (Marsh et al., 1994) measures 9 elements of the physical self general physical self and general self-esteem. These instruments are recent additions and still have only been used in a handful of intervention studies.

One recent study (Sonstroem & Potts, 1996) showed the importance of measuring physical self-perceptions. They found that physical self-perception constructs, including physical self-worth, are related to indicators of mental well-being, even when self-esteem and socially desirable responding are controlled. It seems as though physical self-worth in its own right may be a useful indicator.

In addition to profiles, there are also instruments to measure singular aspects of the physical self. Constructs such as body image, body cathexis and body satisfaction appear most common and the recent addition of social physique anxiety (anxiety associated with displaying the body in public settings) to the literature seems promising.

The outcome of these developments is that there is now a wide choice of self-perception measures that can be categorised by their content (physical, social, academic, values etc) and their level of specificity (self-efficacy, competence, esteem). Appropriate choice will provide a much more complete documentation of change through intervention studies and advance the intervention literature. Sonstroem and Morgan (1989) have already presented a testable model indicating how experiences with exercise might improve self-efficacy and eventually affect physical self-worth and self-esteem.

For further information on assessment of physical self constructs, the reader is directed to Byrne (1996), Duda (1998) and Fox (1998).

THE EFFECT OF EXERCISE ON SELF-PERCEPTION AND SELF-ESTEEM

Evidence of associations between exercise and sport participation and specific self-perceptions abounds through cross-sectional research. Usually studies have compared active with inactive groups or fit or lean groups with unfit or overweight groups.
Generally, the evidence for higher global self-esteem in active or fit groups is inconsistent and weak at best. However, there is a stronger relationship with sport and exercise participation and aspects of the physical self such as sport competence, perceived fitness and body image and this has been substantiated using the recent perception profiles. It should be noted that there are exceptions as some studies indicate that exercising females remain critical of their bodies even though they become relatively fit and lean.

In the current climate of evidence-based-health (EBM) correlational evidence is given little credence and randomised controlled trials (RCTs) are required if health authorities are to be convinced of the efficacy of exercise in the promotion of mental health. Well-controlled studies are also particularly vital for the exercise/self-esteem relationship where there is a high likelihood of social desirability effects. In comparison to the effect of exercise on other mental health constructs, there have been few comprehensive reviews of its impact on self-esteem. Sonstroem (1984) provided a narrative review of 16 interventions, however, only four were randomised and only 10 had control groups. This pattern contrinues with the more comprehensive of the recent reviews including Leith (1994), Sonstroem (1997) and Spence (unpublished) and a useful discussion by Mutrie (1997).

Fox (1999) conducted a systematic search on studies that had used exercise to improve elements of physical self-perceptions or self-esteem. The search identified 36 RCTs and a further 44 non-randomised controlled studies. The main conclusions from this review are summarised as follows:

- Exercise **can** promote physical self-perception constructs including physical self-worth, perceived competence and body image.
- The evidence that exercise promotes global self-esteem remains weak and inconsistent. This is entirely in line with theoretical predictions that would suggest that self-esteem is a stable construct that has multiple life determinants
- Positive effects on physical self-perceptions can be experienced by all age groups and both gender but there is greatest evidence for change in children and middle aged adults
- Effects are likely to be greater for those with initially low physical self-perceptions and self-esteem
- Several types of exercise are effective but there is most evidence to support aerobic endurance and resistance exercise with the latter showing greater short term effect.

Much of the evidence behind these conclusions is based on outdated instrumentation which is likely to be less sensitive to self-perception change than the more recent perception profiles. There remain too few studies to determine the optimal frequency, intensity and duration of exercise although moderate exercise intensity with longer duration seems to produce the stronger effects. However, this in itself may not be a fruitful approach as individuals and populations may vary in their preference. There remains little real guidance as to the time frame required for lasting change although the evidence suggests that longer is better. There is no evidence to show that exercise can decrease people's chances of contracting mental problems, although large scale longitudinal epidemiological studies have not been conducted.

MECHANISMS OF SELF-PERCEPTION AND SELF-ESTEEM CHANGE

Intervention studies have not been able to determine the mechanisms of change. There are several possible candidates:

- An undetermined psycho-physiological or biochemical mechanism that enhances mood and positive self-regard.
- Enhanced body image, body satisfaction or body acceptance through weight loss or improved muscle tone.
- Enhanced perceived physical competence through improved abilities, prowess, and aspects of fitness such as strength and cardiorespiratory function.

- Enhanced sense of autonomy, self-determination and personal control over the body, its appearance, and functioning.
- Increased congruence between values, behaviours and competence concerning the physical self and a resultant identity shift or reappraisal.
- Improved sense of belonging and significance through relationships with exercise leaders or others in the exercise group.

The absence of a consistent effect across populations suggests that physiological or biochemical changes are not the primary mechanism for changes in the way we view ourselves. Several studies also indicate that changes in physical fitness are not essential although may be helpful. It is highly likely that the main mechanisms are social-cognitive in nature. However, investigations into the processes will hopefully provide an important 3rd phase of self-esteem research over the next decade (Fox, 1997b). Further developments in instrumentation will be required along with alternative methods of investigation that are capable of documenting the subtleties and dynamics of self-perception change during exercise and sport adoption and maintenance.

ISSUES IN THE PROMOTION OF SELF-ESTEEM AND LIFE QUALITY

The identification of 36 RCTs since 1970 with 9 being unpublished theses represents little more than one study a year. This is in contrast to the many hundreds of studies on other health interventions that have subsequently been subjected to meta analysis. Undoubtedly this is due to lack of priority given by health research funding bodies.

Most studies have been conducted by physical educators and exercise and sport scientists and evidence-based-health principles have not been adopted. For example, intention to treat statistics are not included, there is little evidence that cost effectiveness has been considered, and criteria for RCTs have rarely been fully satisfied. If the area wishes to become widely accepted as a health service, then it must align to their standards.

The research climate is becoming more inclusive and qualitative work is becoming more accepted. In order to identify mechanisms, new approaches are required alongside the traditional RCT. This may mean teams of researchers with different research expertise tackling the same problem.

Almost all of our evidence is based on those who volunteer for studies and remain in the exercise programme. In other words, at best we can say that exercise has a positive effect for those who are able to tolerate exercise. More research is needed on those who dropout or avoid programmes so that future work might address those who are most attracted to exercise and most responsive

The area suffers from the "so what" syndrome. It is not clear what increases in self-perception/self-esteem scores actually means in terms of well-being improvement. Studies are required that investigate degree of well-being change (such as emotional adjustment, reductions in depression, and life satisfaction) alongside self-perception change.

Finally exercise and sport psychologists need to devote as much time convincing those in the medical and health fields of the value of exercise and sport as they do convincing themselves and their colleagues. This will require, careful planning, courage and conviction.

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PSYCHOLOGY'S CONTRIBUTION TO THE PROMOTION OF PHYSICAL ACTIVITY: THE BERLIN EXERCISE STAGE MODEL

Reinhard Fuchs
HTWK Leipzig, Germany

Physical activity in the normal population is characterized by instability and fluctuation. Often people start an activity such as volleyball with much enthusiasm, they are full of enjoyment about the rediscovered bodily experiences they have missed for a long time, and they wonder why they have not begun this activity much earlier. However, after two or three months the enthusiasm has calmed down. The weekly activity times have lost their sacrosanct character. Alternative behaviors (e.g., watching TV, meeting friends) suddenly reoccur in one's mind. Finally the question is brought up whether all these exercise-related expenditures (far distance to the gymnasium, management of baby-sitting, financial costs etc.) outweigh the benefits of one's volleyball participation. And after all, some of the team members are strange anyway and I am not sure whether I really fit into this group...

The first step to dropout has been made. Dropout does not happen all of a sudden, not from one day to the next, but is mentally and emotionally prepared over a longer period of time. During this period the exercise behavior is still shown at least sporadically, because the person is not yet ready to admit (to himself/herself or to others) that he or she has actually lost the initial interest in the activity. However, the motivational basis for continuing exercise participation has become so weak that the behavior has no chance to concur with attractive behavioral alternatives. In the end an interesting TV-program may be sufficient to forget about today's exercise intentions.

In order to prevent dropout and to develop effective exercise promoting programs it is necessary to have a clear understanding of the psychological factors and mechanisms that lead to a continuous sport involvement. The better one knows the motivational and volitional processes underlying initiation, maintenance and eventually termination of physical activity participation, the better the chances that intervention efforts may be successful. The starting point of the present paper therefore is the question: What is psychology's contribution to describe and explain the behavior of physical activity?

DETERMINANTS OF PHYSICAL ACTIVITY

Determinants of physical activity were first examined systematically not in the field of sport sciences, but in the field of public health in the early 80s (see *Public Health Reports*, Vol. 100 [2], 1985). Under the headlines of "exercise compliance" and "exercise adherence" public health researchers were interested mainly in two questions: How do maintainers and dropouts differ? And what are the critical target variables on which psychological, educational and structural interventions should be focused to improve exercise compliance? Thus, public health research on sports determinants did not aim at the development and empirical test of complex theoretical models; instead, the interest was much more practically oriented in identifying those changeable personal and environmental factors that are relevant for initiation and stabilization of exercise behavior.

Probably the most well-known protagonist of exercise determinant research is Rod Dishman. According to his reviews of the literature, maintenance of *supervised sport activities* seems to be mainly influenced by the following factors: past program participation, overweight, type A behavior, perceived health or fitness, mood disturbance, spouse support, and access to sport facilities. On the other hand, maintenance of *free-living physical activities* may be affected by factors such as blue-collar occupation, overweight, perceived health or fitness, mood disturbance, self-motivation, and perceived lack of time (Dishman, 1993, p. 781). Dishman also identified a series of other potential exercise determinants for which empirical evidence is however still inconsistent. Such lists of determinants are certainly helpful to get a first impression of the personal and environmental correlates of physical activity. However, these lists are also of limited value in particular for two reasons:

(1) The first argument refers to the *a-theoretical empirism* of determinant lists. It is only asked: What is associated with physical activity? On which variables do adherers and drop-outs show significant differences? The identified factors are then declared critical determinants of physical activity on which intervention efforts should be concentrated. By this procedure a single variable of the in reality very complex motivational process is isolated from its context, the interdependence of this specific factor with other determinants is neglected, and thus it is likely that the real motivational meaning of the specific condition may not be recognized appropriately.

(2) The second argument concerns the *missing stage-perspective*. Recent research has provided empirical evidence that within the process of becoming and remaining a regular exerciser distinct stages can be differentiated (Prochaska & Marcus, 1994). By referring to the Transtheoretical Model (Prochaska & DiClemente, 1992) it is hypothesized that on each stage of change (precontemplation, contemplation, preparation, action, and maintenance) a different set of determinants may be relevant. For example, longitudinal data have shown that in the phase of exercise initiation the role of social support by one's partner may be more important than in the phase of exercise maintenance (Fuchs, 1996). It is therefore concluded that it makes no sense to search for *the* determinants of physical activity, it rather seems to be necessary to identify those different sets of determinants that are relevant at the distinct stages of the behavioral development.

In summary, public health research has initiated the systematic investigation of physical activity determinants and has provided the basis for a more in-depth going analysis of the conditions of habitual physical exercise. Future research in this field, however, has to be more theoretically founded and needs to adopt a stage-oriented perspective.

THEORETICAL MODELS TO EXPLAIN EXERCISE PARTICIPATION

A stronger theoretical orientation in exercise participation research emerged in the late 80s when academic sport psychology became stronger involved in this topic. Under the label of *Exercise Psychology* a new field of research was established in which the target behavior physical activity is examined (in the normal population, not only in athletes or sport students) by referring to theoretical models from general psychology as well as social, developmental and health psychology. The possible exercise determinants are no longer studied as isolated factors, but as components of a more comprehensive theory of behavior. Now, the search goes not for the best set of predictors, instead it is tested how good a *a priori* specified causal model (that is derived from a theory) fits empirical observations (e.g., Godin, Valois &

Lepage, 1993). Table 1 shows some of the theoretical models that are currently used to explain physical exercise.

TABLE 1. *Theoretical Models to Explain Exercise Participation*

1. General psychological models	
Schema theory	Kendzierski (1994)
Social cognitive theory	Bandura (1986)
Theory of planned behavior	Ajzen (1991)
Transtheoretical model	Prochaska & DiClemente (1992)
Protection Motivation theory	Rogers (1985)
Theory of self-determination	Deci & Ryan (1991)
Relapse prevention model	Marlatt (1985)
Theory of personal investment	Maehr & Braskamp (1986)
Model of mastery motivation	Harter (1981)
Health belief model	Rosenstock (1990)
Theory of goal orientations	Duda (1994)
2. Sport psychological models	
Sport commitment model	Scanlan et al. (1993)
MAARS[1)] model	Berlin study group (Fuchs, 1997)

[1)] MAARS stands for "Motivation zur Aneignung und Aufrechterhaltung Regelmäßiger Sportaktivität" [motivation for acquisition and maintenance of regular sport activity].

These approaches have been presented and discussed in detail elsewhere (e.g., Biddle, 1995; Fuchs, 1997; Godin, 1994; Thill & Brunel, 1995). All together, the predictive power of these models and theories is still rather low, in particular if we conduct longitudinal analyses. The amount of explained variance in the target behavior (physical exercise) ranges on the average between 15 and 20%. Several reasons may be responsible for this still non-satisfying result: (a) volitional factors which control transformation of intentions into actions are not taken into account (Gollwitzer & Brandstätter, 1997), (b) contents of the explanatory variables (beliefs, attitudes, normative expectancies, experiences, feelings, perceptions etc.) may not be well enough matched to the specific characteristics of the sport and exercise context, and (c) physical activity participation is seen as an all-or-nothing phenomenon so that the developmental aspects of the behavior (from precontemplation to maintenance) are neglected. In the following sections this third argument will be elaborated in more detail.

A MISSING DEVELOPMENTAL PERSPECTIVE

According to the Transtheoretical Model by Prochaska and DiClemente (1992) observable physical activity (i.e., the overt behavior) is only the preliminary endpoint of a development that had its beginning long before. The authors differentiate five distinct stages of change from precontemplation (where people not even think about the behavior in question) to contemplation, preparation, action and maintenance. This stage-model of behavior change was

first developed in the area of smoking behavior and only later applied to the field of physical activity (see Prochaska & Marcus, 1994). In its essence the Transtheoretical Model states that continuous behaviors such as physical exercise are the result of processes of reflection, weighing arguments, trying and implementation, and that interventions of exercise promotion need to be adopted to these different stages of change in order to be effective.

The Transtheoretical Model has been criticized in particular for its sometimes arbitrary stage definitions (Sutton, 1996; Fuchs, 1997). For example, the stage of maintenance is only reached when the person exercised regularly and had done so for at least 6 months (e.g., Marcus, Rossi, Selby, Niaura & Abrams, 1992). Why just 6 months? Why not 5 or 7 months? In fact the cognitive-psychological foundation of the Transtheoretical Model appears to be insufficient. In particular it is not clear in how far the five stages are *qualitatively distinct* and not only gradually different states on one single (motivational) continuum (Weinstein, Rothman & Sutton, 1998). The further development of the Transtheoretical Model therefore should focus on a more detailed explication of the specific psychological properties of the postulated stages. The concepts and empirical findings of modern action and volition theories (Gollwitzer, 1990; Heckhausen, 1991; Kuhl & Beckmann, 1994), in particular Heckhausen's *Rubikon Model*, may be useful in this regard.

THE BERLIN EXERCISE STAGE MODEL

The *Berlin Exercise Stage Model*[1] is an attempt to combine both, the thinking of the Trans-theoretical Model and the assumptions of the Rubikon approach. It postulates the existence of eight distinct stages of change: the first two belong to the pre-decisional phase, the remaining six to the post-decisional phase of the behavioral development. Figure 1 shows a schema of the Berlin Exercise Stage Model.

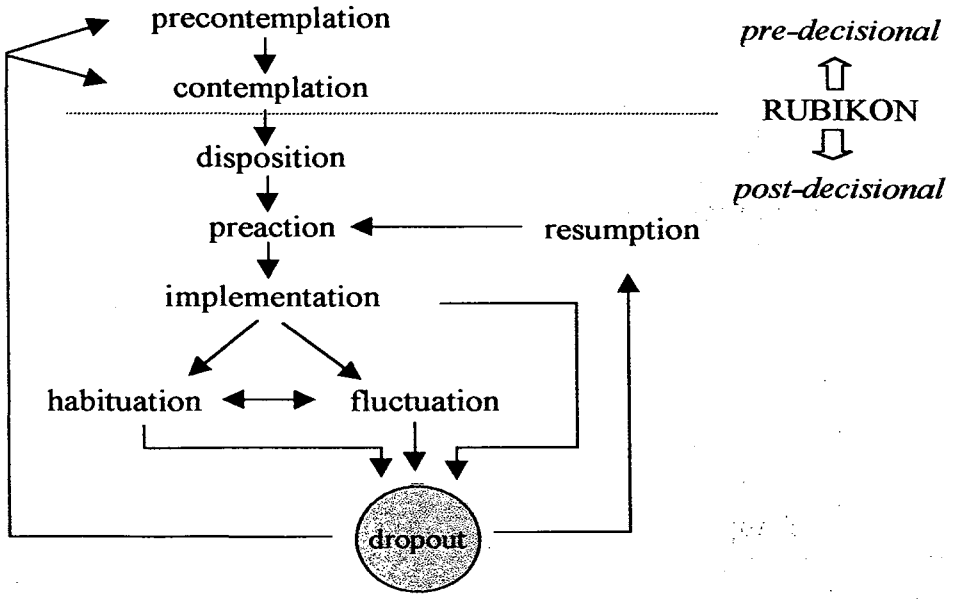

Figure 1. Berlin Exercise Stage Model

[1] Berliner Sportstadien-Modell (BSM)

The *stage of precontemplation* is taken from the Transtheoretical Model and is conceptualized accordingly as a state in which the individual not even thinks about a personal engagement in physical exercise. In contrast, the *stage of contemplation* is characterized by seriously considering a change in one's own activity behavior. This stage is comparable to the predecisional motivation phase in Heckhausen's Rubikon Model (Heckhausen, 1991). People in the stage of contemplation are in a "deliberative mind-set" (Gollwitzer, 1990): since a decision has not yet been made there is no need to protect ones standpoint against contradictory arguments; the person is still open to conflicting information about the costs and benefits of a personal engagement in sport activities. However, after the person has decided to participate in physical exercise, the psychological situation has changed. In the Berlin Exercise Stage Model this new phase is called the *stage of disposition*. Central to this stage is the presence of a "goal intention" (Gollwitzer, 1993) for example in the form of "I intend to participate in a fitness program". Goal intentions are the cognitive result of the preceding phase of contemplation. However, they only reflect the general commitment to a goal (to participate in a fitness program) not yet the details of how to realize this goal. With the decision to engage in physical exercise further deliberation is terminated. Now the person is no longer in a deliberative, but in an "implemental mind-set" (Gollwitzer, 1990). The basic decision is made (the person has crossed the Rubikon), the thoughts no longer concern the issue of "whether or not", but the question of "how to realize the resolution".

If persons have committed themselves to a specific exercise program and as to when, where, and how implementation of this program is to be started, they have entered a new phase in the development of exercise behavior that we have called the *stage of preaction*. The still vague goal intentions of the preceding stage of disposition have now turned into more specific "implementation intentions" (Gollwitzer, 1993). Such intentions take for example the format of "I intend to participated in the University fitness program on Tuesday evening at 6pm as soon as the semester has started". Thus, at the stage of preaction the former general decision to engage in a fitness program has turned into a rather specific action plan which links the intended behavior to a critical situation in the future (opportunity). – In case that the initiation of the behavior has been successfully launched on the basis of such implementation intentions, the person has entered the *stage of implementation* (see Figure 1). The exercise activity is tried for the first time and adaptational processes may become necessary to better coordinate the behavior with unexpected situational conditions. The new behavior needs to be in tune with other energy and time consuming demands and may require the use of metacognitive control strategies (Kuhl, 1992) to shield exercise intentions from being weakened by attractive alternatives.

The dividing line between the phase of implementation and the *stage of habituation* is difficult to draw. We speak of habituated exercise behavior when the person has succeeded in integrating his or her exercise participation into daily living, when strong links between specific situations and the behavior have been established (though situational cues only trigger decision-making about behavior, rather than the habitual behavior itself; Maddux, 1997), when the exercise behavior has become a routine that can successfully compete with behavioral alternatives, and when this routine is connected with a set of self-instructions that allow the management of arising barriers to exercise (e.g., an unexpected visitor) in a way that is stable with respect to the defined goal, and at the same time flexible with respect to different routes of goal attainment. Thus it is more the specific regulation structure of the behavior that makes it a habit and less the mere observational fact that the behavior has been performed repeatedly over months.

Sometimes physical exercise is performed without regularity over a longer period of time so that one cannot assign the behavior either to the stage of habituation or to the stage of implementation. In the Berlin Exercise Stage Model (Figure 1) such a sporadic, only occasionally shown exercise behavior that is practiced sometimes at several occasions per week, and then again not even a single time in a fortnight, will be classified into the *stage of fluctuation*. The instability of the behavior may be due to volitional processes of self-control and self-regulation (e.g., impulse control, arousal control, attention control; Kuhl, 1992) that are not effective enough to generate the planned exercise behavior even under unfavorable circumstances. In this case the exercise behavior is not shielded sufficiently from interfering behavioral alternatives, it is left too much under control of changing situational factors. A fluctuating exercise participation may become more and more regular and thus develop to a habit or routine. However, it may also destabilize to a degree that it is no longer performed at all. This event is usually called "dropout". According to the Berlin Exercise Stage Model dropout is no stage by itself, but only the endpoint of a specific stage development.

After the dropout has become an obvious fact persons either return into the pre-decisional states of precontemplation or contemplation or they remain in a post-decisional mind-set. For this latter case the Berlin Exercise Stage Model postulates the existence of a *stage of resumption*. This stage has some structural similarities to the stage of disposition: Persons at this stage are not engaged in physical activities right now, but have made the general decision to resume the former activity and have developed a corresponding goal intention (Gollwitzer, 1993), for example of the type "If I have some more time, I will continue my fitness training". Obviously this is only a very general statement that needs to be further specified by one or more implementation intentions to become behaviorally relevant. However, in contrast to goal intentions of the disposition phase the goal intentions at the stage of resumption are related to physical activities whose modalities of performance are already familiar to the person. Someone at the resumption stage is likely to know much more about the possibly occurring barriers to the behavior than his or her counterpart in the phase of disposition.

The Berlin Exercise Stage Model is an attempt to connect the philosophy of Prochaska and DiClemente (1992) with the thinking of Heckhausen (1991) and Gollwitzer (1993) by referring to the specific behavior of physical exercise. Recently, a system of 22 questionnaire items was developed to determine an individual's exercise stage according to the Berlin Exercise Stage Model (Fuchs, 1998). This instrument (*Fragebogen zur Diagnostik des Sportstadiums*[2], *FDS*) also provides the methodical basis for empirical tests of the Berlin Exercise Stage Model and its diagnostic applications.

A THEORY-GUIDED EXERCISE PROMOTION

In the title of this paper we ask for psychology's contribution to the promotion of physical activity. Can we expect that our social-cognitive models of exercise participation (Table 1) contribute to more effective and efficient interventions in the field of exercise promotion? Do such explanatory models provide the basis for a theory-guided exercise promotion that really deserves this label? First of all we have to remember the old principle according to which there is no 1:1 relationship between an explanatory theory on the one hand and a specific practice on the other hand. Specific intervention measures cannot directly be derived from theories that try to describe and explain a phenomenon. The search for methods to influence

[2] Questionnaire for the Diagnosis of Exercise Stage

other people's attitudes and behaviors is the subject of a different class of theories (educational or behavior modification theories). However, this does not mean that our psychological models of exercise participation are irrelevant for the practice of physical activity promotion. They may play an important role in determining the targets and guidelines of actual intervention efforts. Two guidelines seem to be of particular importance. Exercise promotion activities ought to be...

a) cognition-oriented: To reach the strategic goal of a stable behavioral change in the area of physical activity it is necessary to accomplish specific tactical goals on the cognitive-emotional level, i.e. on the level of experiences, expectations, beliefs, attributions etc.

b) stage-specific: Interventions need to be tailored to the individual situation. This means for example that for people at the stage of precontemplation other measures of exercise promotion may be effective than for those at the stage of implementation or fluctuation.

The translation of these two principles into a concrete intervention could be of the following form: The intervention project begins with a diagnostic phase in which all the members of the target group are classified according to their individual exercise stage. The conceptual basis for this classification could be the Transtheoretical Model or the Berlin Exercise Stage Model. For both approaches diagnostic instruments are available (Fuchs, 1998; Marcus et al., 1992). On the base of the obtained individual stage diagnoses one tries to build interventions groups as homogeneous as possible. The next step is the realization of the intervention activities that should be focused on those social and personal factors that are critical for the particular exercise stage of the intervention group. A precondition of such stage-specific interventions would be the existence of empirically confirmed knowledge about the factors that have an impact on the further development of physical exercise at its different stages. So far this kind of stage-specific knowledge is only partially available. For instance it is not clear which psychological and environmental conditions do have an influence on the transition from the stage of contemplation to the stage of disposition. To close such gaps of knowledge it seems to be necessary to test our theoretical models of exercise participation not only longitudinally but at the same time stage-specific.

Thus, the notion of a theory-guided exercise promotion begins to take shape. By theory-guided exercise promotion we mean interventions which try to influence precisely those personal, social or structural factors for which the underlying theory presumes that they are critical for the intended behavioral change at the given developmental stage. For the next years research in sport and exercise psychology is faced with the task to further specify the structures and contents of such a theory-guided exercise promotion.

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PHYSICAL ACTIVITY AND THE QUALITY OF LIFE

Václav Hošek, Charles University in Prague, Faculty of Physical Education and Sport

KEY WORDS: physical activity, sport, enhancing the quality of life for life span, psychosocial functions of physical activity, experience in the sense of flow

INTRODUCTION

Physical Activity and the Quality of Life are constructs with various definitions and varied applications. To be able to use these terms in the context of sport psychology we have to delimit and redefine their meaning.

Physical activity includes all human movement experiences, therefore it has a much wider range than activities related to sport alone. I understand the term physical activity as the sum of physical, psychological and sociological aspects, which include locomotion, activities at the workplace, daily routines fulfilling the basic needs of personal hygiene, nutrition, and sex. Of course, there is a great variety of leisure activities, including various hobbies, exercise, dance, outdoor activities, recreation and competitive sport. Psychologists do not like the fact that in qualifying of human activity the adjective „physical" invites, by association, the opposing adjectives: „spiritual" and „intellectual". Before we know it, we are in the middle of the Cartesian dualistic argument, which is difficult to accept in modern psychology. Essential prerequisites for human physical activity are anatomical structures and physiological functions, movement related abilities, and of course, we must not forget, motivation, which causes a wonderful variety of physical activities on the basis of psychological determinants.

Quality of life (QOL)is much more complex concept than physical activity, it includes philosophical, religious, political and health aspects, all of which, at times, are in a conflict. From an individual viewpoint the QOL depends on value orientation and a personal understanding of the meaning of life. It is this inner core of QOL, with its subjective experiences, which has become the main concern of psychological analysis. In terms of psychodiagnostic categories the most practical criterion for the QOL evaluation is the subjective satisfaction with it. The external side of QOL is normative in nature and it is trying to express what is generally, or normally, considered to be a good life. It is difficult to get consensus on the composition of the QOL. The existence of a wide variety of lifestyles and the relatively small success of totalitarian systems, which have tried to manipulate individual lifestyles, illustrate the difficulties in reaching an agreement on the norms for QOL.

In order to survive, society must define positive goals for its members and thus direct their energies to work for the fulfillment of the societal visions. The consumer oriented social systems are exhausting their potential and a growing number of people in the post-modern society are recognizing the shortcomings of this kind of social orientation. It is generally accepted that the QOL does not rest only in a choice of hedonistic goals. The art of leading the good life is in the balance between the ideal and the real. The QOL can be seen in the reduction of entropy in the world, in the creative and adaptive reproduction of life and in the efforts to leave one's legacy for the future generations. The elegance and eloquence of the

general social and political statements cannot change the fact that the modern societies in Europe often find themselves in an almost embarrassing ambiguity, as far as the QOL is concerned. This situation is complicated by current demographic changes and by the development of new social influences; for example, it can be said that Islam shows the people how to live better lives.

The largest progress in objectivization of the QOL was reached by the cooperative development of the economy and medicine. In 1993 Report, the World Bank analyzed the influence of more than 130 different infirmities on the QOL. In this Report, the World Bank used as a unit of measurement of the lowering of the QOL the number of years in one's life lived with impaired quality. The deficiency in the QOL as a result of an infirmity was called D.A.L.Y. (disability adjusted life years) This estimate of poor quality of life is particularly useful in the evaluation of chronic stresses and conditions which are not immediately life-threatening, and are therefore frequently underestimated. (e.g. obesity). During the same year the World Health Organization started the WHOQOL project, the goal of which was to re-evaluate how patients live with their infirmities. Disseminating this information should lead to an improvement in medical services. Numerous studies have been published on the improvement of the QOL for people with various movement impairments.

In this presentation, I do not intend to identify what is and what is not, nor for whom and when characteristic for the QOL I am certain that it is productive to think about the possible contributions, and in fact, of a direct usefulness of the intentional physical activity and sport psychology to the QOL. We can draw from a general biological argument, that the lack of mobility, in fact the lack of use of any human function causes systemic damage to one's health. Movement enriches life; it is a mediator of life and movement autarky is one of the most important factors contributing to the QOL The causal direction: lack of physical activity - poor physical condition - maladaptation - dissatisfaction with life is well known and understood by most people, yet the human indolence does have a negative influence. A large percentage of the population is convinced that their physical activity has reached a satisfactory level, while at the same time, our civilization is weakening as a result of hypokinesis. Today's young generation is getting older as passive spectators in front of the television, while the disturbing number of developmental and kinetic disorders is rapidly growing. There is no other scientific evidence, which is ignored more than the knowledge about the necessity of physical activity for the prevention of degenerative conditions as one ages.

PHYLOGENETIC APPROACH

A source of ideas about the determination of the QOL by physical activity lies in our knowledge of human phylogenesis. During human evolution, the level of physical activity acted as one of the most important evolutionary impulses. Those humans with the best movement abilities not only had the best chance of survival but also they had stronger reproductive potential. Metaphorically I could suggest that the violence of nature, and the heartlessness of Darwinian selection, forced humans to be physically active. Probably this reason some of the physiological and psychological mechanisms, such as stress response, i.e. readiness to fight or lassitude, i.e. the ability to save energy, were imprinted into human genes. These mechanisms have been very useful during the human evolution, but have now become a source of health problems. Fortunately, the aesthetic criteria for partner selection remained, and domesticating, civilization-induced changes (decrease in muscle mass, excess fat, shortening of extremities, shortening of skull base) are unattractive. The domesticating changes, according to Lorenz, are caused mostly by man's withdrawal from nature with its

natural selection processes, thus limiting physical activity. During the latest period of human evolution, the technological development increased the influence of domesticating conditions, so that they led to the biodegradation of the human species, mainly because of insufficient physical activity.

For a psychologist, it is interesting to note man's relationship to life's hardships and suffering, which are also apart of human genetic make-up. The reduction of these psychological genetic structures represents a decline of one of the essential human characteristics. We could speculate for a long time whether hardships and suffering relate to the QOL. If these natural obstacles are missing, they could be replaced by artificially created difficulties, but the conquering such artificial difficulties does not bring satisfaction. Useless discomfort is rejected because of the pre-programmed necessity to save energy. To summarize my thoughts about phylogenic determination of relationship between physical activity and the QOL, I conclude that our genes represent catalogues of instructions arising from the natural sources and that the natural maintenance of six hundred muscles, of two hundred bones and of the cardiovascular system by an adequate level of physical activity is also genetically pre-programmed. Deprivation in this area can lead to dependence on environment or technological aids, in both cases leading to a lower levels of the QOL. I could paraphrase Descartes' famous dictum „cogito, ergo sum" to „ moveo, ergo evolare possum" (I move, therefore I can evolve).

ONTOGENETIC APPROACH

The ontogenetic view of man represents an interesting relationship between physical activity and the QOL. The importance of the stimulating effect of physical activity in early childhood development is generally accepted. Sometimes, however, we do not realize the importance of child's physical activity in the development of the basic schemata of perception: what is up, what is down, inside, outside, what is hard or soft and what is gravity, centrifugal force or what, numerically, is five fingers. With only a slight exaggeration, it can be said that the basis of education is in physical activity. The physical self, self-efficacy and body image are important components of personality which are partially formed by physical activity. Play in the pre-school age has a very important social contribution to the child's development. In a certain sense we can say that child's play is the school for social interaction and is more important that adults' teaching. The basis of character development is in the interaction of playing children. Spontaneous physical activities, like seemingly aimless running, jumping, rolling etc. have a formative effect on the development of creativity, and yet, are seldom seen by adults as nothing more than fooling around.

Compulsory school physical education deserves special consideration. Because of its orientation on physical development, school physical education represents a balance to the mostly intellectual activities of school academic education. The health effect should not be limited only to the biological level; the socio-psychological factors also must be considered. From the QOL view point it should be made clear that biologically oriented physical activity is insufficient if the pupils are depressed, frustrated or, at times, even degraded. The less skilled pupils are particularly affected in the normative and performance, drill-oriented programs. Physical education class can became injurious to one's ego. Repeated experiences of feeling inferior have a demotivational character, they block the basic psychological aim of school physical education: the development of an interest in physical activity in the context of the QOL.

Less skilled pupils experience learned helplessness and the low levels of self-efficacy in the area of physical activity. This experience is typical for the children who are obese, less skilled, and who are deprived of sufficient movement activity and movement development at home. Instead of receiving effective encouragement to participate in physical activity, they are discouraged by their experiences and drop out of the physical education program. Their physical deficiencies deepen and have a negative effect on their QOL. The students' performance evaluation in PE classes often interferes with participation in physical activity. In our studies of the use of interpersonal norms by PE teachers, we found that, probably because of the competitive sport paradigm, PE teachers have a tendency to use interpersonal norms more often that the teachers of other subjects. Interpersonal norms were used even when it was obvious that intrapersonal norms would have a better motivational impact on the desire to participate in physical activity. The skilled children will usually gravitate toward their favored physical activity based on their specific abilities. The average and below average pupils need help in developing a positive attitude toward physical activity. This is achieved better by enriching positive experiences than by rational argument about the benefits of physical activity for the QOL. From the perspective of the increased probability of achieving desirable states during one's lifetime, school PE should promote experiences of success, joy, adventure, cooperation, creativity and other psychologically-optimal states and experiences as they are understood by Czikszentmihaly.

An element of excitement belongs to the QOL in the early years, although, unfortunately, many youngsters are sensation seekers, as described by Zuckerman. It is important to note that most of the experiences are not linked with physical passivity and that they have only the characteristics of spectating (virtual reality).In reaction to the information processing machine, the computer, young people have a tendency to fill their minds with outside content, live a fantasy and experience excitement and virtual adventure as spectators. The physical reality of the body is then neglected and, at times, it is devastated by drugs. In our study on the re-socialization of young prisoners, we found that more than one half of criminal activity was related to boredom combined with a sense of adventure and excitement. In our hypothesis we proposed to substitute the undesirable, free time activities of socially marginalized young men with sport. The results of the study demonstrated that, in twenty counties of the Czech Republic, there was a direct relationship between youth sport participation and youth criminality. Sport participation can improve interest in physical activity and positive value orientation and thus it can contribute to the QOL.

In early and mid-adulthood, the QOL is associated mainly with occupational career development and with family orientation. This is the time when each individual is creating a „map for the terrain of life" and a personal lifestyle. According to H. Thom, each person is creating a life reality in which he/she realizes the individual skills of existence. These skills, or techniques, are directed to fulfillment of existence, through existential experiences. According to V. Frankl, the existential approach to personal fulfillment, that is to the high QOL, is one of the central themes of humanistic psychology. Physical activity is a vehicle for human existence. Comenius explained this idea in his statement: „fabricabdo fabricamur"; freely translated: people keep creating and improving themselves by their own activity.

PHYCHOSOCIAL FUNCTIONS OF PHYSICAL ACTIVITY

More that ten year ago, one of the founders of Czech sport psychology, J. Hlavsa investigated the effects of physical activity on personality. To Hlavsa, the most important

positive effects on personality were in the areas of perception, socialization and heuristics. During the last few years, stress has been put on the importance of emotional intelligence, which develops in the interaction with physical activity. Hlavsa also spoke about self-discipline and the cultivation-cultural effect of physical activity, which he understood as a proof of the spiritual and physical unity. Some of these thoughts can be argued on the basis of the non-humanistic developments in the elite sport sub-culture of the last few years. The other important contribution of physical activity to the QOL is in the development of creativity. Getting away from the daily routine, and attempting to vary established techniques and combinations lead to new solutions of problems in physical activity and in life. The adaptation effects are evident during motor development and during a motor-learning process and are closely related to the ability to correct errors and improve use of feedback information. These experiences positively affect the QOL because we learn how to deal with limited success, with errors and with frustration. To be a „good sport" means to be mentally strong in ego threatening situations. One of the most important sub-groups of the effects of physical activity, according to Hlavsa are the vitalizing effects, which are closely related to one's health. These effects compensate for the sedentary way of life, contribute to relaxation and to good physical condition. The regenerative relaxation effect of active rest, decreases muscular and mental tension. The last group of effects of physical activity on personality and on the QOL includes hedonistic effects. The hedonistic influences of physical activity affect emotions, have euphoric tendencies and contribute to the aesthetic expression through physical activity. It is, of course, possible to analyze the influence of physical activity on personality and on the QOL in many different ways, but I still consider Hlavsa's pioneering psychological analysis very inspiring.

During one's lifetime, the second wave of interest in physical activity appears, as a rule, in the ripening age of adulthood, when the first signs of aging and of the involution difficulties start to appear. This post-facto approach is quite unfortunate as it suggested by the saying: „Better late than never, but better never late" As psychologists, we have to understand that most people are luke warm to the call for preventive measures when they do not feel threatened. Their motivation for physical activity increases considerably with the arrival of the negative effects of aging and impaired lifestyle. We can conclude that, up to that point, the rational, preventive-measures information for an improved, healthier lifestyle has had a limited psychological effect on lifestyle decisions. The new lifestyle information we receive as we age is not pleasant. Actually it conveys rather sad news. We are led to believe that, in order to be healthy, we must exert ourselves in endless physical activities, run for your life so to speak and generally suffer in order not to die of an early cardiac infarction. The relationship of physical activity and the QOL cannot be a question of a rational, accepted duty, but it should be based on emotional and habitual attitudes, which are fuelled by autotelic experiences. Sports and games frequently promote very rewarding, optimal, flow like experience in the leisure-time activities. This experiential approach to sport and games cannot stress the competitive side of sport in its pursuit of success. „Citius, altius, fortius" does not express fully the experiential character of sport and physical activity; it cannot and it should not be representative of the life long participation in physical activity. Sport can return back to its roots in the sense of endogenic rewards: muscular joy, functional pleasure and playful enjoyment. In terms of self-actualization, it should help in a socializing process of self-discovery and affirmation.

There is a special experience in achieving one's goals, „Par est fortuna labori" - freely translated: effort brings awards. The cathartic reduction of tensions at the end of the road is

well known. Of course, there will be questions, such as: Was the effort worthwhile? Does the pleasure felt during and after physical activity have a masochistic character? Psychologically, we can understand physical activity as a sacrifice, an investment, like a price, which will bring awards later, such as fulfillment, joy, comfort, which all lie within the experience and satisfaction arising from physical activity.

Our phylogenic ancestors were forced toward physical activity by the violence of nature: they had to survive. Because of this survival experience, the human species developed a genetically based need for movement, mental and physical stress, and fight and, on the other hand, the desire for comfort and lassitude. Overcoming any discomfort is always followed by a heightened sense of wellbeing. The rest is sweeter when one is fatigued from physical activity. The approach, through discomfort to a greater comfort, can be successfully used in participation in physical activity. Individual experiences are always enriched in a social context, which also includes agonistic, aleotoratic, vestigial and mimetic experiences of competitive and learning environments.

CONCLUDING REMARKS:

Physical activity contributes to the QOL through the development of motor efficacy, which is necessary for the movement autarkie. The relationship between physical activity and QOL is not only concerned with the mechanical motor efficacy, locomotion and health, it is also an instrument of self-realization. The effects of physical activity can be summarized into a group of enriching effects(heuristic, socializing, cultivating- culture enhancing, creative and integrating) a group of coordinating effects(regulating stimulating, adaptive, corrective and protective) a group of vitalizing effects (conditioning, health, contra-involutionary) a group of compensating effects (relaxation and regeneration). The last group, of hedonistic and aesthetic effects, is connected with optimal autotelic experiences. In this last group of physical activity effects and outcomes, sport psychology can make the most important contribution to the post-modern society.

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CONCENTRATION IN SPORT: NEW HORIZONS

Aidan Moran, Department of Psychology, University College, Dublin, Ireland

ACKNOWLEDGEMENTS

I wish to thank Tadhg Mac Intyre for some suggestions about research studies to be included in this paper.

INTRODUCTION

Over the past decade, research psychologists have shown increasing, interest in the mental processes of athletes. For example, within the past few years, publications have appeared on such cognitive topics as working memory (e.g. Woodin & Heil, 1996), perceptual expertise (e.g. Williams & Davids, 1998; Williams, Davids & Williams, 1999) and movement imagery (e.g. Smyth & Waller, 1998) in sport performers. At first glance, these developments suggest that cognitive psychologists have begun to appreciate the possibility that the domain of sport is a rich medium in which to explore how the mind works. Unfortunately, this conclusion is premature as the subject indices of recent textbooks in this discipline (e.g. Matlin, 1998; Solso, 1998; Sternberg, 1999) contain no references to research on athletic performance. Perhaps these authors regard sport as a frivolous activity - far removed from the serious business of studying how students think while sitting in front of computer screens in psychology laboratories. Alternatively, the dearth of references to athletic performance in cognitive texts may be due to the fact that sport scientists offer little theoretical analysis of problems like distractibility in sport. To explain, although there are many practical intervention packages available for athletes with concentration problems (e.g. see Schmid & Peper, 1998; Simons, 1998), there have been few studies of why sport performers suffer attentional lapses (especially those caused by their own thoughts and feelings) in the first place. Without such research, there can be no cross-fertilisation of ideas between the disciplines of sport psychology and cognitive psychology. So, in an effort to rectify this oversight, the present paper will examine a simple yet challenging question raised by the study of concentration in sport. Specifically, why do athletes find it difficult to control their thoughts and emotions when attempting to "focus" during competition? Hopefully, the attempt to answer this question will lead to some new horizons in sport psychology as well as to increased collaboration between cognitive and sport psychologists.

The paper is organised as follows. I shall begin by explaining the significance of research on concentration in sport. Then, I shall examine the nature and possible theoretical mechanisms of concentration "loss" in athletes. The next section will explore some problems arising from failureof mental control in sport performers. Included here are such difficulties as "choking" under pressure and "actions slips". Finally, having re-capitulated the theme of this paper, I shall sketch some new directions for research on concentration in athletes.

SIGNIFICANCE OF RESEARCH ON CONCENTRATION IN SPORT

Research on concentration in sport has both practical and theoretical significance for psychology. At a practical level, most athletes, coaches and psychologists agree that "concentration", or the ability to focus on what is most important in any situation while ignoring distractions, is a vital determinant of success in sport (Moran, 1996). However, it is

only recently that sport psychologists have begun to explore empirically the question of what precisely athletes should focus on during a competition (see Mallett & Hanrahan, 1997). And at a theoretical level, the study of concentration in sport enables researchers to investigate the intriguing construct of "mental control" - that familiar yet mysterious process by which people try to regulate their thoughts and emotions in accordance with their intentions. This term "mental control" refers to the process by which people try to "suppress a thought, concentrate on a sensation, inhibit and emotion, maintain a mood ... or otherwise exert an influence on their own mental states" (Wegner & Pennebaker, 1993, p. 1). As yet, this process is poorly understood. Thus Monsell (1996) concluded that "there remains a somewhat embarrassing zone of almost total ignorance" (p. 93) about how people control their thoughts and feelings. And yet, such control is carried out successfully by athletes who have learned to concentrate effectively. For example, Michael Johnson, a 3-times Olympic gold medallist sprinter, revealed that he manages "to cut out all the unnecessary thoughts ... on the track. I simply concentrate. I concentrate on the tangible - on the track, on the race, on the blocks, on the things I have to do. The crowd fades away and the other athletes disappear and now it's just me and this one lane" (cited in Miller, 1997, p. 64). Interestingly, Wegner & Pennebaker (1993) regard attention as "the central faculty of mental control" (p. 4). And so, by exploring concentration processes in athletes we are shedding light on the nature of mental control in the dynamic medium of competitive sport. But before we tackle this theme, we need to examine what "losing" concentration really means.

"LOSING" CONCENTRATION

Concentration, or the focusing of mental effort on sensory or mental events, has been likened to a mental spotlight which we shine at things in which we are interested (Hernandez-Peon, 1964). On the one hand, this metaphor is useful because it shows us that, despite what athletes often say (e.g. recall Gabriela Sabatini's admission in 1993 that she had "lost concentration" during her match against Mary-Jo Fernandez - despite needing just one point for victory when leading 6-1, 5-1, 40-15), concentration is never "lost" - but merely re-directed at some unhelpful or irrelevant target. On the other hand, the spotlight metaphor of concentration is un-helpful because it suggests that what is happening in the "darkness" is not relevant to current concerns. This view is mistaken because attentional researchers have discovered that unconscious factors can affect our behaviour. For example, consider "repetition priming" or implicit memory effects whereby people respond faster to an item if is preceded by a similar item than if it is precede by an un-related item. For example, one will recognise the word "doctor" quicker if it is "primed" by prior exposure to the word "nurse" than if it was preceded by an un-related word like "fruit". Therefore, due to implicit memory processes, improvements can occur in the speed or accuracy of our behaviour following repeated exposure to related stimuli (Thompson-Schill & Gabrieli, 1999). I shall return to this idea of unconscious influences on concentration later in the paper.

As the target of our concentration can come either from the outside world (e.g. a sudden noise or movement) or from inside our own minds, sport psychologists frequently distinguish between "external" and "internal" sources of distraction. Whereas the former term refers to objective stimuli which divert attention away from its intended target, "internal" distractions include a vast array of thoughts, feelings and/or bodily sensations (e.g. pain, fatigue) which impede our efforts to concentrate on the job at hand. Unfortunately, few studies have been conducted on the phenomenology of distraction in athletes. This neglect of distractibility is attributable to two main problems - one theoretical and the other methodological. First, for many years (e.g. dating back to the "multi-store" model of memory; Atkinson & Shiffrin,

1968) assumed falsely that information "flows" into the mind in only one direction - from the utside world inwards. In so doing, they ignored the possibility that information (and distractions) could travel in the opposite direction - from one's long-term memory into one's current awareness. A second reason for the neglect of internal distractions stems from a methodological bias. Specifically, researchers focused on external distractions simply because they were easier to measure than were self-generated distractors. As a result of this bias, the theoretical mechanisms by which internal distractions disrupt concentration were largely unknown until recently. Fortunately, Wegner (1994) has developed a model which rectifies this oversight by attempting to explain why people often lose their concentration at precisely the most inopportune moment.

WHY DO ATHLETES "LOSE" THEIR CONCENTRATION SO EASILY?

Interviews with athletes are replete with references to lapses of attention which seem to have led to errors of performance. Usually, these disractions are external in nature. For example, the golfer Padraig Harrington complained recently after a costly mistake which arose when "a spectator clicked a camera as I putted but it's my fault for hearing it. I'm just disgusted. I lost my concentration. It was harder to miss it than hole it" (cited in Garrod, 1999, p. 7). But sometimes, internal distractions are to blame. Thus Herrigel (1953), in his analysis of archery, noted that "as though sprung from nowhere, moods, feelings, desires, worries and even thoughts incontinently rise up, in a meaningless jumble, and the more far-fetched and preposterous they are, and the less they have to do with that on which one has fixed one's consciousness, the more tenaciously they hang on" (p. 53). This quotation is interesting because it suggests that internal distractions often have an ironic or paradoxical character. They seem to compel the mind to focus on that which it wishes to ignore (a point to which I shall return later when commenting on the difficulty of controlling emotions like anxiety).

Interestingly, it is this occasional "back-firing" of our attempted thought suppression which Wegner (1994) explores in his provocative theory of mental control. Briefly, this theory proposes that the mind wanders because we try to control it. In other words, trying not to think about something may paradoxically increases its prominence in our consciousness. For example, if one tries to focus on falling asleep, one may achieve only a prolonged state of wakefulness. Similarly, if one attempts to block a certain thought from entering working memory, it may become even more prominent in our consciousness. Clearly, there are many situations in sport in which such ironic self-regulation failures occur. For example, a negative command (such as "don't double fault" in tennis, "don't jump the gun" in sprinting or "don't over-shoot the hole" in golf putting) may produce precisely the opposite result one had hoped to achieve. Why does this happen?

According to Wegner (1994), when people try to suppress a thought, they engage in a controlled (conscious) search for thoughts that are different from the unwanted thought. But at the same time, an automatic (unconscious) search takes place for any signs of the unwanted thought. In other words, the intention to suppress a thought activates an automatic search for that very thought in an effort to monitor whether or not the suppression has been successful. Normally, the conscious intentional system dominates the unconscious monitoring system. But under certain circumstances (e.g. when our working memories are overloaded or when our attentional resources are depleted by fatigue or stress), the ironic system prevails and an "ironic intrusion" of the unwanted thought occurs. Wegner attributes this "rebound" effect to cognitive load. Specifically, whereas this load is believed to disrupt the conscious mechanism of thought control, it does not interfere with the automatic (and ironic) monitoring system.

This theory of mental control is supported by experimental evidence that people who had tried to concentrate under a heavy cognitive load ended up memorising, rather than ignoring, the distractors (Zukier & Hagen, 1978). Such research led Wegner (1994) to conclude that "the intention to concentrate creates conditions under which mental load enhances monitoring of irrelevancies" (p. 7). To summarise, Wegner's (1994) research helps us to understand why athletes may find it hard to suppress unwanted or irrelevant thoughts when they are anxious.

Clearly, what is required next is a study in which athletes are asked attend to certain instructions under differing amounts of cognitive load. Then, having been asked to ignore these instructions, the participants could be tested for "rebound" effects. A model for such research is an un-published study reported by Wegner (1997) in which he presented a simulated putting task to two groups of participants and asked them "not to overshoot" the hole. The golfers in these groups differed in degree of self awareness (high or low, achieved by requiring them to use either a glowing putter in a darkened room or a normal putter under similar conditions) and also in the presence or absence of cognitive load (a distractor). Results corroborated ironic control predictions by showing that the performers in the high self-awareness group tended to "overshoot" the hole relative to their low self-aware counterparts. In other words, trying not to putt too hard when one is cognitively overloaded is ironically counter-productive.

Interestingly, thought suppression research raises doubts about the validity of "thought stopping" as an intervention technique in sport psychology (e.g. see Bull, Albinson & Shambrook, 1996). Briefly, this technique requires an athlete to use a trigger word like "stop" in order to halt worries or other unhelpful thoughts. The problem with this technique is that trying to suppress a thought when one is anxious is likely to lead to an ironic rebound effect. For this reason, the US National Research Council's Committee on Techniques for the Enhancement of Human Performance warns against the use of thought stopping procedures (Wegner, Eich & Bjork, 1994). In passing, however, there is some evidence to indicate that ironic rebound effects are less powerful when one is trying to suppress one's own, self-generated intrusive thoughts in comparison with situations in which one is dealing with ideas which have been suggested by others (Kelly & Kahn, 1994).

WHY DO WE FIND IT DIFFICULT TO CONTROL OUR EMOTIONS?

Having explored why athletes may find it difficult to control their thoughts under conditions of stress or cognitive load, it is worth considering why they have trouble in regulating their emotions. According to Smith & Kemp-Wheeler (1996), emotional control is difficult for several reasons. First, there is an automatic nature of emotions. The input and output mechanisms of emotions are largely "hard wired" and hence we are likely to have only limited control of emotional expression. Second, cognitive researchers have discovered that certain schemas activated by emotional episodes can prolong the emotional experience disproportionately. For example, an athlete may lose a race or match and feel depressed afterwards. But this depression may be prolonged simply because it has activated deep-seated worries about being incapable of winning ever again. Third, emotions may be difficult to control because once they arise, they may influence information processing in ironic ways that exacerbate the emotional state in question. As Smith & Kemp-Wheeler (1996) put it, "a vicious circle ensues in which the emotion is maintained through processes that are not under conscious control" (p. 203). For example, Mac Leod & Mathews (1988) discovered that anxious people attend preferentially to threatening rather than neutral stimuli whereas the reverse is true for non-anxious controls. This "hypervigilance" may help to explain why

anxiety states are difficult to control. Specifically, anxiety may influence people to concentrate on potential threats in the environment, thereby counteracting the benefits of arousal reduction interventions.

OTHER FAILURES OF MENTAL CONTROL IN SPORT

A new heading for some old problems in sport comes from the study of cognitive "control failures" (Monsell, 1996) - or mistakes in attention, perception and motor behaviour which are caused by a disjunction between people's intentions and their actions. Included here would be such problems as "choking" under pressure and committing "action slips".

"Choking", or the failure of normally expert skills under pressure (Masters, 1992), is regarded increasingly as a problem stemming from excessive self-focus or "paralysis-by-analysis". Indeed, Monsell (1996) points out that investing too much executive control in a sport skill which is more appropriately performed at a "lower" (or more automatic) level can lead to mistakes - which happens when athletes "choke". An intriguing test of this theory was provided by Masters (1992) who hypothesised that when performers re-invest explicit knowledge in what should be an implicit or automatic procedure, their performance will be impaired. In this study, participants were instructed in golf putting in one of three conditions: An "explicit learning" condition (where they read detailed technical instructions about putting and were encouraged to think about the skill), an "implicit learning" condition (where they were discouraged from thinking about it) or a control condition (where they practised physically only). A mild source of stress was introduced by telling people that financial rewards for participating in the experiment could be increased or decreased depending on their performance. Results revealed that although the golfers in the implicit learning group were slower to acquire the skill of putting, they suffered less from being put under pressure than did their counterparts in the explicit learning group.

This finding that motor skills which have been learned implicitly are more resistant to breakdown under stress than skills acquired in a more traditional or explicit manner was replicated both by Hardy, Mullen & Jones (1996) and by Bright & Freedman (1998). However, the latter authors queried the explanation favoured by Masters (1992). Specifically, they suggested that the difference in performance between the groups was probably caused by differences between the learning and testing conditions. Further research is required to find out which of these rival interpretations is correct.

"Action slips" refer to situations in which we execute an inappropriate sequence of actions (the "wrong" plan) at the wrong time (Reason & Mycielska, 1982). For Reason (1990), such mistakes include all situations in which "a planned sequence of mental or physical activities fails to achieve its intended outcome, and when these failures cannot be attributed to the intervention of some chance agency" (p. 9). To illustrate, in canoe-slalom races, where sequences of decisions have to be remembered, action slips can mean the difference between success and failure. Thus the 1996 European champion in this sport, Ian Wiley, missed a medal in the Olympic Games in Atlanta simply because he misjudged his line to a gate and overshot it (Watterson, 1996).

Within cognitive psychology, "action slips" (Norman, 1981) and "cognitive failures" (e.g. Broadbent et al., 1982) are studied usually by requiring participants to keep diaries of occasions in which their overt actions deviated from their prior intentions. Unfortunately,

such constructs have not yet been examined systematically in sport psychology. Therefore, we need studies using diary methodology to classify athletes' self-reported cognitive errors over a given length of time.

What causes cognitive "control failures"? The standard explanation of these errors is that they are due to some defect in either the representation or the execution of these production rules. For example, if two or more action sequences share certain a common behavioural element or path, then some "cross talk" may occur at the "junction"of the underlying production rules. In this case, the "wrong" behavioural track might be followed unwittingly. Thus a person may absent-mindedly enter his/her bedroom to change clothes but may undress and go to bed instead. Here, a failure to monitor the junction between two similar behavioural programmes (i.e. the "changing clothes" and the "undressing for bed" sequences) may have triggered an unfortunate "cross talk" between actions. The common element in this example is the "entering the bedroom" routine. By analogy, unintended "cross talk" between automated action sequences may occur in sport also. For example, during a tennis match in which there is no umpire, the fact that both balls are lying within the receiver's court may influence him/her to believe falsely that it is his/her turn to serve. Here, collecting the balls may trigger automatically a "my turn to serve" programme. Similarly, in sports where sequences of decisions have to be made very rapidly (e.g. in equestrian sports), it is well-known that performers omit intended actions. This type of "slippage" between thought and action suggests that automatic sequences need to be monitored intermittently in order to produce desired behavioural effects. In summary, without occasional conscious monitoring, familiar action sequences in sport may "switch tracks" and lead to a subsequent deterioration of skilled performance.

Some progress has been made in the measurement of "action slips". Thus Broadbent, Cooper, Fitzgerald & Parkes (1982) developed the "Cognitive Failures Questionnaire" (CFQ) in an attempt to measure individual differences in people's susceptibility to everyday cognitive failures. In devising this instrument, these researchers were motivated by the desire to examine how defective mental control mechanisms might affect strategic aspects of information processing. Briefly, their test contains 25 items which purport to measure individual differences in susceptibility to various anomalies in cognitive performance (e.g. item 1, "Do you read something and find you haven't been thinking about it and must read it again?"). More precisely, respondents are asked to provide estimates of the frequencies with which they have experienced different types of performance breakdown or "cognitive failure" in the preceding six months. These items describe everyday different types of failures in such areas of perception, memory and action - each of which is linked to attentional processes. For each item, respondents must indicate the frequency with which they have made a designated mistake, using a 5-point scale ranging from "very often" to "never".

Available evidence suggests that a high score on the CFQ is associated with impaired cognitive performance on tasks where people are faced with concurrent attentional demands. herefore, it may be worth attempting either to validate this test athletes performing in competitive sport or to develop a sport-related version of it. One might expect that athletes who score highly on the CFQ would show weaknesses in their distribution of attention across concurrent tasks. Interestingly, some progress has been made in the assessment of the psychological correlates of attentional lapses in sport. For example, Bird & Horn (1990) found that cognitive anxiety in female softball players was, as expected, positively associated with frequency of "mental errors" (as assessed by coaches).

Interestingly, there are rare occasions in sport in which a "control error" has helped, rather than hindered, an athlete's performance. For example, in the 1997 Thailand Open, snooker player Nigel Bond staged a remarkable comeback to defeat the reigning world champion, Stephen Hendry, by five frames to four. Ironically, a mental lapse actually helped Bond to achieve this victory. To explain, Bond thought that the match was the best of eleven rather than nine frames and so "I still thought I was in with a shout even trailing 4-2. That helped me relax a little more than I normally would in that kind of situation" (Anonymous, 1997, p. 10).

CONCLUSIONS AND NEW HORIZONS

In this paper, I have argued that the study of concentration in athletes offers cognitive psychologists and sport psychologists an exciting opportunity to collaborate in exploring the problem of "mental control" -understood as the process by which people attempt to regulate heir own thoughts and emotions. Therefore, the following new horizons for research on concentration should be investigated. First, in an effort to find out what concentration "loss" means to athletes, research is required on a psychological typology of distractors. The old distinction between "external" and "internal" distractions may need to be revised because most distractions represent interactions between these variables (e.g. the appearance of a feared opponent may remind one of previous experiences with similar opponents). Second, we need a programme of studies designed to test Wegner's (1994) model of mental control in sport settings. This programme will help to explain the nature and effects of "negative" thinking in pressure situations. It may also clarify the value of using techniques like "thought-stopping" with athletes. Finally, a combination of diary studies and psychometric testing (e.g. with the "Cognitive Failures Questionnaire" of Broadbent et al., 1982) could help to elucidate the nature and predictability of "action slips" made by athletes in competitive situations.

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TOWARDS MULTIDIMENSIONAL HIERARCHICAL MODELS OF MOTIVATION IN SPORT

Athanasios Papaioannou, Democritus University of Thrace

KEY WORDS: Multidimensional hierarchical model, motivation, sport

INTRODUCTION

Recently, R. Vallerand (in press) proposed a hierarchical model of intrinsic and extrinsic motivation in sport and exercise. In the present paper it is suggested that all theoretical models of motivation in sport could adopt a multidimensional hierarchical framework. Firstly, the general framework is delineated. Then, an example of a theoretical model (goal orientation theory) within this hierarchical structure is presented. Finally, the benefits of doing research within a multidimensional hierarchical framework are specified.

THE GENERAL MULTIDIMENSIONAL HIERARCHICAL STRUCTURE

Any theoretical model could be placed within a framework consisting of at least three dimensions:

1. The domains of human action. The theories of motivation should be examined in different domains of human action. Most of the research in the sport context focused on achievement. Other domains should be also examined, such as discipline, prosocial behavior, morality etc.

2. The hierarchical levels of generality. The theories of motivation should be examined in three levels of generality. From the higher to the lower levels, these levels are the global (or personality), the contextual (or life domain) and the situational (or state). The global domain is subdivided in two orders. In the global lower-order level, motivation should be examined with reference to the particular domain of human action. In the global higher-order, motivation should be examined with reference to any human action in general. An example of a hierarchical model addressing three domains of human action and two life domains is depicted in Figure 1.

3. The process Social Factors –> Perception <–> Motivation –> Consequences. The social factor effects on people's motivation are mediated by people's perception. Motivation produces important outcomes, which can be affective, cognitive and behavioral in nature. Motivation also affects people's perceptions of the social factors. A three-dimensional model for two domains of human action (discipline and achievement), one life context (e.g., sport), three levels of generality and the continuum social factors-perception-motivation-consequences is depicted in Figure 2.

It is argued that all major cognitive theories of motivation could be examined within this framework. Constructs such as causal attributions, self-perceptions, goal orientations, intrinsic-extrinsic motivation, certainty-uncertainty orientations etc., could be formulated for each level of generality and tested within the framework of each particular level.

In future research in motivation in sport, the employed constructs of motivation, perceptions and motivational consequences should follow the rule of specificity. According to this rule, the constructs implying perception of social factors, motivational processes and consequence

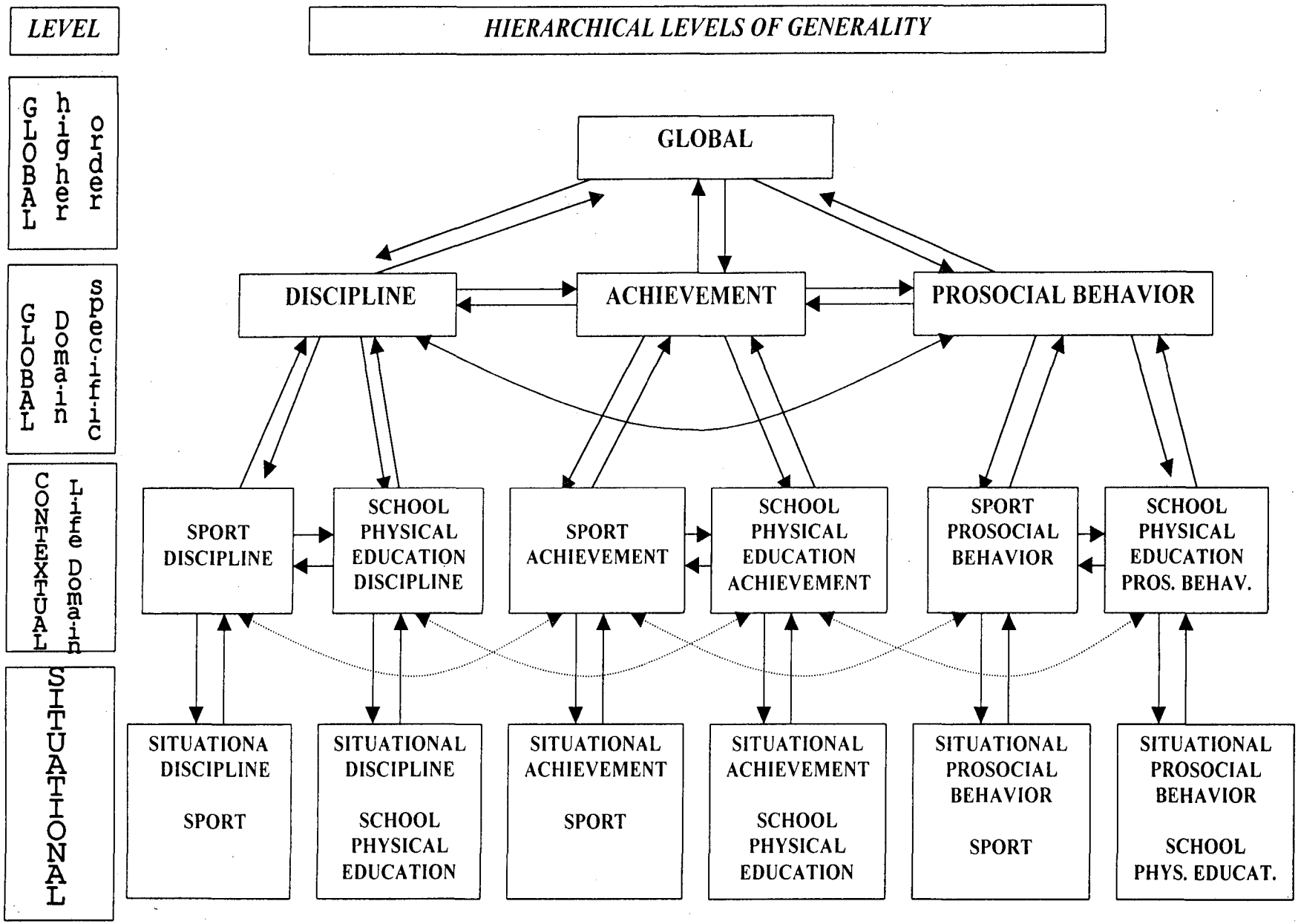

Figure 1. Example of three domains of human action and two contexts (life domains) in the hierarchical levels of generality

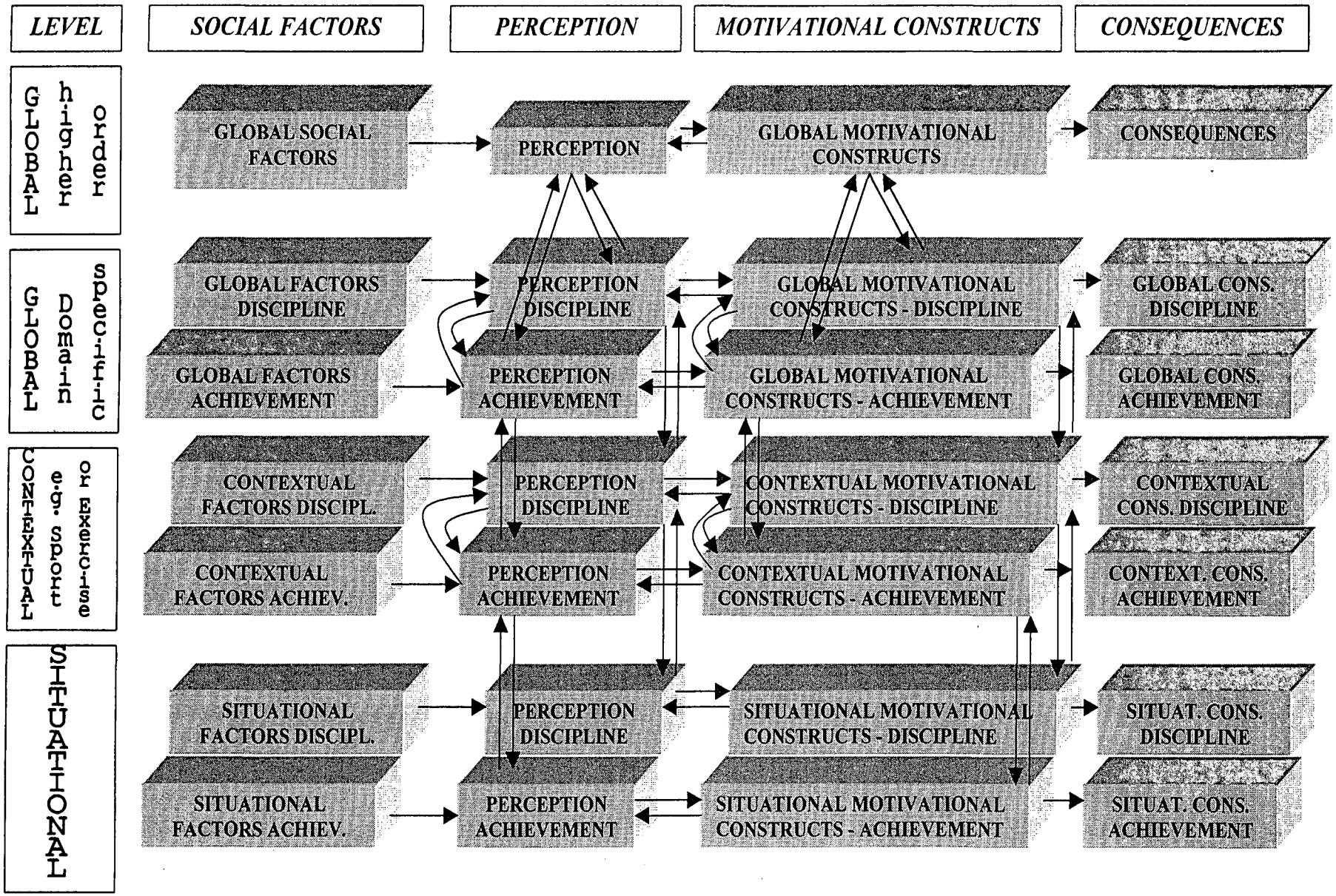

Figure 2. The general framework for two domains of human action (discipline and achievement) and one life domain (sport context).

of motivation should be specific to (1) the particular level of generality, (2) the particular domain of human action, and (3) the particular life domain.

This has important implication in terms of measurement procedures. For example, the consequences of motivation could be cognitive (e.g., learning strategies, concentration), affective (e.g., satisfaction, anxiety) and behavioral (e.g., task choice, persistence, intensity of performance etc.). According to the rule of specificity, if the examined outcome of motivation is satisfaction, then at the global higher-order domain life satisfaction should be examined. At the global human activity domain, satisfaction should be pertinent to the particular activity domain (e.g., satisfaction in the achievement domain). At the contextual level, satisfaction should be relevant to the particular life domain and the specific activity domain (e.g., satisfaction with sport achievement). At the situational level, satisfaction stemming from doing a particular action, in a particular context, at a particular moment, should be examined.

Social factors affecting people's perceptions and motivation at the situational level are the task structure, the authority, the rewards, the type of grouping, the evaluation and the time allotted for each of these social factors (Epstein, 1989). Other social factors at the situational level are the goal setting processes, the feedback, the strategies (learning, achieving, behavioral), psychological techniques etc. (Papaioannou & Goudas, 1999). When the situational factors occur in a regular basis in one particular life domain, they become contextual social factors affecting students' perceptions and motivation in the particular life domain. We can assume that the same social factors can have pervasive effects at the global level when they occur for long-lasting periods in people's life or at crucial periods of life (e.g., during infancy). Other social factors affecting people's perceptions and motivation at the global level are what we call culture, that is, values stemming from the religion, media, political, educational and sport system, family structure etc.

Another rule that should be followed is the rule of relevance. According to this rule, the perceptions of social factors should have direct relevance to the examined motivational constructs. For example, when the investigation deals with the effects of a particular coaching style on athletes' perceptions of autonomy and intrinsic motivation, the researcher should examine whether the athletes perceive this coaching style as autonomy-supportive.

Finally, it is suggested that there is a top-down and bottom-up effect among motivational constructs at different levels in the hierarchy. The same also applies for the perceptions. At the contextual level, correlation is expected among motivations at different life domains, but this is not expected at the situational level. At the global level, correlation is expected among motivational constructs at different domains of human action.

A MULTIDIMENSIONAL HIERARCHICAL MODEL OF GOAL ORIENTATION

In the last decade, goal orientation theory has been extensively examined in the sport domain. According to this theory, in achievement contexts two major goals predominate (Nicholls, 1989). When a task goal is salient, success is defined as personal improvement, personal criteria of evaluation are adopted and satisfaction derives from competence development. People try to learn new skills and develop their abilities. When an ego goal is salient, success is defined as outperforming others or a high normative performance, normative criteria of evaluation are adopted and satisfaction derives from evidencing high normative ability. People try to perform better than others, to win, to attain a high normative performance, or they adopt maladaptive strategies in order to avoid evidence of low ability.

The first version of goal orientation theory was built on a cross-cultural analysis of achievement motivation (Maehr & Nicholls, 1980). In this original model social approval was considered an important goal in achievement domains. Recent cross-cultural research implies that the social goal is very important in many nonwestern cultures (e.g., Hayashi, 1996). It is proposed here that the goal orientation theory should embrace the social goal.

Recently, Elliot suggested that the ego goal should be distinguished in performance avoidance and performance approach goals (Elliot & Church, 1997). Research in the academic domain provided construct and predictive validity for a questionnaire assessing task, performance avoidance and performance approach goals (Elliot & Church, 1997). The Elliot and Church (1997) instrument has been adapted for the physical education domain and the results supported its factor structure (Papaioannou & Theodosiou, 1999). In sum, it is suggested here that future research should focus on four goals, namely task, performance avoidance, performance approach and social.

How these goals could be depicted at the four levels of generality? It is suggested that at the global higher-order level the task goal implies people's tendency to improve themselves in any domain of human action. The ego-strengthening goal suggests people's tendency to strengthen their ego by appearing better than others. The ego-protection goal connotes a tendency to protect the ego from negative evaluation. The social goal denotes people's tendency to be loved and accepted by others.

At the global lower-order level these four goals are specified with regard to the particular domain of human action. For example, in the discipline domain, a task goal implies people's tendency to become an even more disciplined person. In the achievement domain, a task goal denotes people's tendency to improve their abilities and master any task. In the discipline domain, an ego-strengthening goal suggests people's tendency to appear as a person who is more disciplined than others, etc.

At the contextual level, these four goals are specified with regard to the particular domain of human action and the particular life domain. Likewise, at the situational level, these four goals are specified with regard to the particular situation. Sample items from scales assessing these four goals at the hierarchical levels of generality, for two domains of human action and specified for the physical education context, are presented in Table 1.

Let's turn now to the issue of perceptions of social factors. Mother is an important social factor affecting these goals. Following the rule of relevance, at the global level, the researcher should assess whether mother is perceived as a person who cultivates the task goal. In other words, whether mother is perceived as strengthening personal improvement in any domain of human action. Another perception should refer to whether mother emphasizes the ego-strengthening goal, that is, whether mother strengthens the act of appearing better than others. A third perception should refer to whether mother strengthens the ego-protection goal in any domain of human action. For example, whether children perceive that their mother makes them worry about the possibility of being negatively evaluated by others. A final perception at the global level should refer to whether mother strengthens the social goal, for example, whether she is satisfied when others express their love to her child. Table 2 presents sample items for the global and contextual levels of generality in the discipline and achievement domains.

TABLE 1. Sample items for scales assessing goal orientations at the global, contextual and situational level for two domains of human action

	Goal orientations at the higher-order global level
T	An important goal in my life is to improve myself in all life contexts
ES	In my life I try to demonstrate that I am better than most people
EP	In my life I often worry about the possibility of being negatively evaluated by the others
S	In my life I always try to make others love me
	Goal orientations at the lower-order global level, discipline domain
T	An important goal in my life is to make myself an even more disciplined person
ES	In my life I try to demonstrate that I am more disciplined than most people
EP	An important goal in my life is to avoid showing evidence of a non disciplined person
S	In my life I try to be disciplined in order to make people love me
	Goal orientations at lower-order global level, achievement domain
T	An important goal in my life is to improve my abilities as much as possible
ES	In my life I try to demonstrate that I have higher abilities than most people
EP	In my life I often worry about the possibility of showing evidence of low ability
S	In my life I try to be successful in order to make people love me
	Goal orientations at the contextual level, discipline domain
T	In the P.E. lesson, I really like to be disciplined
ES	In the P.E. lesson, I try to demonstrate that I am more disciplined than my schoolmates
EP	In the P.E. lesson, I try to avoid showing evidence of a non disciplined person
S	In the P.E. lesson, I try to be disciplined, so the teacher will love me
	Goal orientation at the contextual level, achievement domain
T	In the P.E. lesson, I prefer skills that really challenge me so I can learn new things
ES	In the P.E. lesson, I am striving to demonstrate my ability relative to others in this class
EP	In the P.E. lesson, I just want to avoid doing poorly in the class
S	In the P.E. lesson, I try to learn as much as possible, so the teacher will love me
	Goal orientations at the situational level, discipline domain
T	I enjoy being disciplined
ES	I am trying to demonstrate that I am more disciplined than my schoolmates
EP	I am trying to avoid showing evidence of a non disciplined person
S	I am very disciplined because the teacher likes it
	Goal orientations at the situational level, achievement domain
T	I am trying to completely master the skill that is presented
ES	I am striving to demonstrate my ability relative to others
EP	I just want to avoid doing poorly
S	I am trying to learn the skill and make the teacher love me more

Note: T: Task, ES: Ego Strengthening, EP: Ego-Protection, S: Social, P.E.: Physical Education

TABLE 2. Sample items for scales assessing perceptions of social factors emphasizing goal orientations at the global and contextual level for two domains of human action

	Global level higher-order
T	My mother insists that it is very important to improve myself in all life contexts
ES	My mother is very satisfied when I demonstrate that I am better than others
EP	My mother makes me worry about the possibility of being negatively evaluated by others
S	My mother is very satisfied when the others love me
	Global level achievement domain
T	My mother looks completely satisfied when I am improving after trying hard
ES	My mother praises me when I outperform others
EP	My mother makes me feel badly when I make mistakes while learning something new
S	My mother really loves me when I learn new things
	Global level discipline domain
T	My mother looks completely satisfied when I understand why I should be disciplined
ES	My mother praises me when I am more disciplined than others
EP	My mother makes me feel bad about myself when I am not disciplined
S	My mother loves me when I am disciplined
	Contextual level - achievement domain
T	The P.E. teacher is most satisfied when every student learns something new
ES	The P.E. teacher praises the students when they outperform their schoolmates
EP	The P.E. teacher makes students feel badly when they make mistakes while performing skills or playing games
S	The P.E. teacher really loves the students who are trying hard
	Contextual level – discipline domain
T	In order to maintain discipline in this P.E. class, the teacher helps us to become responsible persons
ES	In order to maintain discipline in this P.E. class, the teacher praises those who are most disciplined
EP	The P.E. teacher makes us feel bad about ourselves if we are not disciplined
S	The P.E. teacher really loves those who are disciplined in the lesson

Note: T: Task, ES: Ego Strengthening, EP: Ego-Protection, S: Social, P.E.: Physical Education

BENEFITS

1. It is helpful when we want to compare or combine different theories of motivation. In doing so, we should select constructs that are specific to the particular (1) level of generality, (2) domain of human action, and (3) life domain.

2. It helps us to understand the causal relationships among different domains of human action. It is not worthy to ask general questions such as "does sport participation affect school achievement, morality, aggressiveness, prosocial behavior etc." Instead, we can have theoretical frameworks suggesting under which circumstance sport participation is related to other domains of human action.

3. It helps us to understand the causal relationships among different life domains. For example, we can have theoretical frameworks suggesting under which circumstance achievement motivation in sport is related to achievement motivation in school or work.

4. It makes clear that when we investigate the role of social factors in human motivation, we should examine whether people perceive that these factors affect particular motivational constructs.

5. We can test more effectively the role of social factors in human motivation. We can see more clearly the social factors that are likely to affect motivation at the different levels of generality. For example, if we want to examine the effects of culture on motivation in sport, we should use both global and contextual constructs of motivation and perception and employ structural modeling techniques.

6. Motivation is viewed as an ongoing process resulting from the dynamic interplay between social and personality factors. Within this framework, dispositional factors affecting human motivation are considered as socially determined and changeable; however, different levels of stability are assumed at different levels of generality.

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EXERCISE DEPENDENCE AS A PRIMARY DISORDER

Jeremy Adams and Robert J. Kirkby
School of Public Health, La Trobe University, Victoria, Australia

KEY WORDS

Addiction, Dependence, Eating Disorders, Exercise.

INTRODUCTION

Clearly, involvement in exercise can facilitate increased physical and psychological health (Blair, et al., 1992). However, when exercise becomes compulsive and the individual is involved in excessive amounts of physical activity, health can be jeopardised, and the likelihood of experiencing illness or injury increased (Adams and Kirkby, 1998). The phenomenon of compulsive or excessive exercise has been labelled "exercise dependence" (Veale, 1991). Exercise dependence has been described as likely to be concurrent with an eating disorder (Davis, et al., 1994). Further, there appears to be a physiological basis for concurrent disorders of eating and exercise, as well as physiological explanations for exercise dependence and eating disorders as individual disorders (Adams and Kirkby, 1998; Pierce and Epling, 1994). Although there is little doubt that excessive exercise can be an aspect of anorexia nervosa, several investigators have proposed that exercise dependence may exist as a primary disorder, independent of an eating disorder (e.g., Le Grange and Eisler, 1993; Veale, 1991).

The purpose of this paper was to investigate further the relationship between exercise dependence and eating disorders. Specifically, to determine whether exercise dependence existing as a primary disorder, could be identified in an exercising population.

METHOD AND PROCEDURE

Participants were 217 volunteers (86 male, 131 female) aged 18 to 45 years (mean = 30.45, SD = 6.26), representing participants from 3 separate health clubs in the Melbourne metropolitan region. Participants were requested to complete a questionnaire package including a measure of exercise dependence (the Exercise Dependence Questionnaire (EDQ): Ogden, et al., 1997), eating disorders (the Eating Disorders Inventory 2 (EDI-2): Garner, 1991), gender, age, postcode, and exercise type, history, duration, and intensity.

RESULTS

Cluster Analysis

To identify natural groupings within the data, a k-means cluster analysis was performed, with an a priori assumption of 4 clusters. The analysis resulted in clusters containing 27, 50, 71, and 69 persons respectively.

Discriminant Function Analysis

To identify the variables most likely to predict membership to the 4 clusters, a discriminant function analysis was performed. Independent variables included scores on the EDQ, the subscales of the EDI-2, gender, weight, postcode, and total exercise performed in the previous week. Three discriminant functions were determined, each contributing significantly to the overall solution (χ^2 (51) = 600.95, $p < .001$; χ^2 (32) = 267.75, $p < .001$; χ^2 (15) = 96.44, $p < .001$), and accounting for 69%, 21% and 10% of the between-group variability respectively. The first discriminant function showed that the best predictors of differences between Clusters 1 and 2 and the other clusters were higher scores on the Drive for Thinness (DT), Bulimia (B), and Body Dissatisfaction (BD), subscales of the EDI-2. On the second discriminant function, persons in Clusters 1 and 3 were maximally separated from those in Clusters 2 and 4 by higher scores on the EDQ, and the Perfectionism (P) subscale of the EDI-2. Finally, on the third discriminant function, persons in Cluster 1 scored more highly on the EDQ than did persons in Clusters 2 and 4.

In summary, it appears that Cluster 1 represents persons with high eating disorder symptoms and a high level of exercise dependence (a secondary-exercise dependent state). Cluster 2 represents those with a classical eating disorder (i.e., low EDQ scores, but high scores on several EDI-2 subscales). Cluster 3, in which a high EDQ score was likely, but in which only the P subscale of the EDI-2 anticipated membership, is most closely associated with a form of exercise dependence in which there is no concurrent eating disorder (i.e., primary exercise dependence). Finally, Cluster 4 in which low scores on both the EDQ and several EDI-2 subscales were the norm, represents the (normal) condition consequent to regular exercising.

DISCUSSION AND CONCLUSIONS

Two particular findings of this study seem important. First, it was found that exercise dependence appears to exist as a primary disorder. That is, that it can occur without a concurrent eating disorder. The second was that an eating disorder, in conjunction with exercise, could result in a form of exercise dependence in which the dependence represents a secondary trait to the primary eating disorder pathology. Physiological explanations have been proposed for both these conditions. For example, on one hand, in accounting for exercise dependence as a primary disorder, several researchers suggested that exercise dependence could be the result of increased levels of endogenous opioids during exercise, leading to a dependence on these hormones (Pierce, et al., 1993; Steinberg, et al., 1995). Alternatively, it has been suggested that a sympathetic tolerance to the effects of circulating catecholamines could lead to a dependence on the stimulating effects of these hormones (Thompson and Blanton, 1987). Exercise dependence as a secondary disorder to an eating disorder, on the other hand, has been identified through animal research, and such a condition can be easily stimulated in animals submitted to a reduced feeding schedule and given free access to an activity wheel (Aravich, et al., 1994). Based on this research, it has been suggested that a reduction in food will increase exercise behaviour which, in turn, further reduces appetite: a phenomenon labelled "activity-based anorexia" (Pierce and Epling, 1994). Research into the effects of serotonin reuptake blockers, such as fluoxetine, has provided some explanation of activity-based anorexia, indicating that a serotonin dysfunction might be responsible, at least in part, for this behaviour (Aravich, et al., 1994). Further,

activity-based anorexia has been postulated as a possible mammalian evolutionary adaptation (Epling and Pierce, 1988).

The present findings are of particular value to both the psychological and sociological communities. Given the economic and personal costs of injuries and illnesses associated with excessive exercise (Kirkby, 1995), it would seem important to develop programs to reduce exercise dependence. To do this, identification of whether the presenting exercise dependence is concurrent with an eating disorder, or an independent disorder, is a prime consideration.

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VISUAL MODELING AND DISCOVERY LEARNING AS CONSTRAINTS ON THE ACQUISITION OF COORDINATION

S. Al-Abood, S. Bennett, L. Burwitz & K. Davids
Psychology Research Group
Department of Exercise and Sport Science
Manchester Metropolitan University

KEY WORDS
Observational Learning, Modeling, Informational Constraints, Coordination, Relative Motion, Skill Acquisition.

INTRODUCTION

Scully and Newell's (1985) model of observational learning conceptually linked the evidence from visual perception research on the nature of information picked up by observers (i.e., relative motion information), to Newell's (1985) framework of motor learning stages (cf., coordination, control, and skill). They proposed that the first stage of learning is concerned with the assembly of a coordination pattern, and that coordination-relevant information can be picked up easily from a model due to the evolutionary sensitivity of the human visual system to relative motion information. It was predicted that visual perceptual information on coordination of the model could constrain the learners' assembly of a successful coordination solution by directing search in the perceptual-motor workspace toward an appropriate attractor. Some work by Schoenfelder-Zohdi (1992) has lent credibility to these arguments. It was found that observational learning facilitates the approximation, within some bandwidth, of the relative motion of a model more successfully than a strategy of discovery learning. However, these data on the efficacy of the visual perception perspective were based on analysis of modeling by an individual subject, and there is clearly a need for further research on this approach. The aim of this experiment was to examine the predictions of the visual perception perspective with a low-constraints aiming task. Specifically, we were interested in the following predictions: (i) due to observation of the model directing learner's search of the perceptual-motor workspace, it was expected that modeling subjects would approximate the model's relative motion more quickly than a discovery-learning group. It was expected that a modeling group would show a lower level of inter-trial variability in movement coordination compared to a discovery group, particularly early in practice; (ii) if the observers acquired an appropriate coordination pattern more quickly than discovery learners due to directed search, it was predicted that the modeling subjects would score higher than the discovery learners, particularly early in practice.

METHOD AND PROCEDURE

Ten male students (aged 18.3-28.8 years) participated as novice subjects. All were right-handed and had normal or corrected-to-normal vision. The model was 36 years old. The task was to learn an underarm-intralimb coordination pattern so that a modified dart could be thrown to a modified-dart board (22.5 cms radius) located 3m away in the horizontal plane. The goal of the task was to score a high number of points by throwing the dart as close as possible to the central concentric ring of the board. The score of each trial ranged from 10 to 0 points, with 10 points being allocated for darts landing in the central ring and 0 points for the outer ring (see Figure 1).

Subjects were randomly assigned to 2 experimental groups (n = 5 in each): Discovery (Control) and Modeling. All subjects had 100-KR acquisition trials on day 1 and 20-KR

retention trials on day two. They were instructed to attain the highest score possible on each trial. Additionally, the modeling subjects observed 6 videotaped visual demonstrations performed by a skilled model (with 3000 trials practice) just prior to the beginning of the acquisition phase only and were instructed to use the demonstration information to help them learn the task.

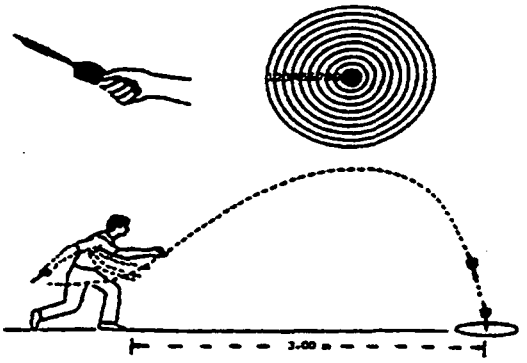

Figure 1. The Under-arm Modified Dart-throwing Task

Data on movement outcome (throwing accuracy scores) and kinematics (angular displacement of the throwing arm) were collected during acquisition and retention phases. Movement kinematics were recorded with on-line motion analysis system (Elite, Italy). To examine the effects of modeling on movement outcome, intra-individual mean outcome scores were calculated for each subject for the first 6 acquisition trials (1-6), last 6 acquisition trials (95-100), and first 6 retention trials (1-6), resulting in 3 blocks of 6 trials each (cf., Acq.1, Acq.5, & Ret., respectively). The resulting means were then analyzed in a 2 (Group) X 3 (Trial Block) ANOVA with repeated measures on the last factor. To examine the effects of modeling on movement coordination, the root-mean-squared error (RMSE) was computed between the normalized ratio of upper-arm- and lower-arm- to-horizontal angles for each time series of a trial performed by each subject, and compared to the mean normalized ratio of the model's trials[1]. Then, for each subject, means and mean standard deviations of RMSE were computed for each block of 6 trials following the same procedure used for outcome data. The computed means were then submitted to a separate 2 (Group) X 3 (Trial Block) ANOVA with repeated measures on the last factor. Significant ANOVAs were followed by Tukey HSD tests. The level of significance of all analyses was set at $\alpha = .05$.

RESULTS

Movement Outcomes: No significant effects were found for the group factor, $F(1,8) = .006$, $p<.938$, or for the group by trial-block interaction, $F(2,16) = .661$, $p<.529$. However, a significant main effect was observed for the trial blocks factor, $F(2,16) = 3.868$, $p<.042$. A follow-up test indicated a progressive improvement in outcome scores for both modeling and discovery group. The performance by the end of the acquisition trials (M = 4.96) was significantly better than that at the beginning (M = 3.7). No other significant differences were found.

Movement Coordination: The analysis of mean RMSEs revealed only a significant interaction for group by trial blocks, $F(2,16) = 6.016$, $p<.011$. Post hoc tests indicated that the modeling group (M = 1.014 & M = .970) had a lower mean RMSE than the discovery group (M =

[1] In this experiment, relative motion of upper-lower arm angles was used as a description of movement coordination. To quantify coordination, a ratio of upper-arm angle to lower-arm angle was calculated for each data point of a time series. This angular ratio was calculated as follows:
Angular ratio = ϕ upper arm / ϕ lower arm

1.713 & M = 1.515) during the first acquisition block and the retention block, respectively. The modelers' coordination approximated the model's relative motion more closely than did that of the discovery learners early in learning and in retention. However, there was no significant difference between the modeling group (M = 1.210) and the discovery group (M = 1.255) by the end of acquisition (see Fig.2). For mean standard deviations of RMSEs, no significant effects were found for group, trial blocks, nor interactions. However, the latter approached significance $F(2,16) = 3.062$, $p<.074$, with the data showing trends towards predictions.

DISCUSSION

The data from the present study confirm that observational learning can facilitate skill acquisition by directing learners' search towards appropriate coordination patterns. Support exists for the contention that video presentation of a movement skill can act as an important constraint on the exploratory search activities of the learner. This finding was manifest in the faster time of the modeling group to approximate the coordination shown by the skilled model. Support is provided for the theoretical predictions of Scully and Newell's (1985) visual perception perspective. Further the data extend the empirical work of Schoenfelder-Zohdi (1992) who found evidence in favour of this position with a single-subject design. It is interesting to note that support for the visual perception perspective was only forthcoming in an analysis of movement coordination patterns and not the outcome data. The low constraints of the task permitted successful outcome scores to be achieved by both the discovery and modeling groups. The implication is that use of outcome measures alone in studies of observational learning may be inappropriate, particularly when tasks with low constraints on learners are used.

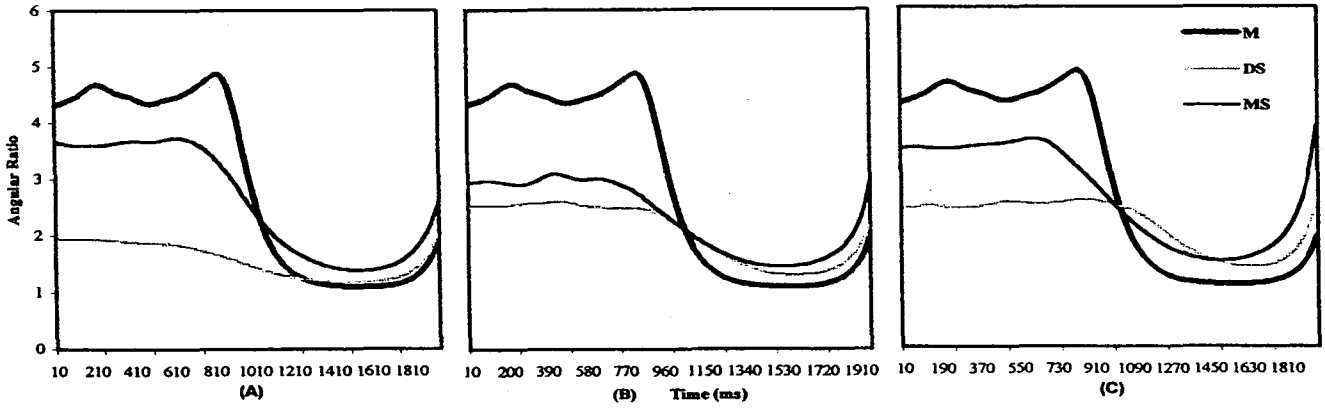

Fig.2. Relative Motion patterns (as an Angular ratio) of Upper-arm and Lower-arm Angles for One Representative Subject from Modeling Group (MS) and Discovery Group (DS) on the First Acquisition Trial (A), Last Acquisittion Trial (B) and First Retention Trial (C) Compared to that for the Model.

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MENTAL TRAINING AND MOTOR LEARNING IN VOLLEYBALL

ALVES, J. [1], BELGA, P. [2]& BRITO, A. P.[2]
[1]Polytechnic Institute of Guarda, PORTUGAL
[2] Human Kinetics Faculty (UTL), PORTUGAL

A – KEY WORDS

Motor Learning, Visualization, Mental Training, Volleyball

B- INTRODUCTION

The human being ability to execute motor activities is an essential characteristic of its own existence, being the movement study, or even the simple performance observation of an athlete who practices several sports, something extremely fascinating and thrilling.

Athletes like Rosa Mota, Miguel Maia, Eusébio, Figo, Carlos Resende, etc., surprised us with the high performance level they achieved.

How do they acquire the abilities that allow them such performance levels?

According to Feltz & Landers(1983), Rawlings, Rawlings, Chen & Yilk (1972) cit. por Schmidt (1993), Gabiele, Hall & Lee (1989), etc., the use of mental training is extremely effective on the learning of new motor skills and, therefore, on the performance's improvement.

Christina & Corcos (1988) refer to visualization as a technique of mental training that has been used more and more in the learning of new motor skills and with very encouraging results.

Also a substantial number of studies, according to Corbin's (1972) and Richardson's (1967) revisions, cit. by Annett (1991), showed that the execution of the skill in the imagination can result in a performance improvement, and that, though usually less notorious than the ones achieved with physical practice, they are, however, bigger than those found when there isn't any practice.

As a result of this, several studies have demonstrated the effectiveness of such technique in the motor learning (e. g. Alves and col., 1997; Rawlings, Rawlings, Chen &Yilk, 1972, cit.by Schmidt, 1993; Whitting, 1979; Hewitt, 1992; Calmels, 1988 and Schendlel& Hagman, 1991, cits. by Thomas, 1991).

The results that were found, in general, point to a positive effect of the mental training, almost identical to the effective real training. Nevertheless, Alves & col. (1997) and Schmidt (1993) suggest that the combination of mental and physical training can be more effective than the isolated use of each one of them.

Thus, the aim of the present study, is to verify if these effects are confirmed in tasks of precision, specifically for the service in volleyball.

C- METHOD AND PROCEDURE

A sample of 64 subjects was studied, all students, from 15 to 17 years of age and of both sexes. There were four groups: control group, real practice group, mental practice group and combined group (real and mental practice). The control group made only an initial and final evaluation. The real practice group accomplished, among the evaluations, 8 sessions (two per week) of 20 services each. The mental practice group accomplished equally 8 sessions but only with the visualization of the service movement, having accomplished the same 20 services after a short relaxation session. The combined practice group accomplished equally 8 sessions of 20 services, but before the effective accomplishment of the service, he visualized the movement that it would be executed next.

The ability in study was the service on top in volleyball. For the evaluation three areas were defined (close to the net, middle and distant area) with different scores (3, 1 and 2, respectively). The individual score was the sum of the points gained in 10 services. An initial and final evaluation was made and, between one and the other, there are 8 learning sessions of 50 minutes each.

The results were handled according two perspectives. In the first one, we made the comparison between the different groups trough the Variance Analysis (ANOVA).
In the second, we analyzed the learning evolution (as a percentage) of each group, from the initial situation to the final one.

D – RESULTS

We started by verifying if the four groups were identical at the departure. The results of the statistic comparison reveal an accentuated identity between them (p=.985).

However, as the comparison between groups is concerned, in the final evaluation, the results show significant differences between the three practice groups and the control group (p.<.01, .01 and .000, for the real practice group, the mental group and the combined group, respectively). On the other hand, the differences observed between the practice groups weren't very significant (fig.1).

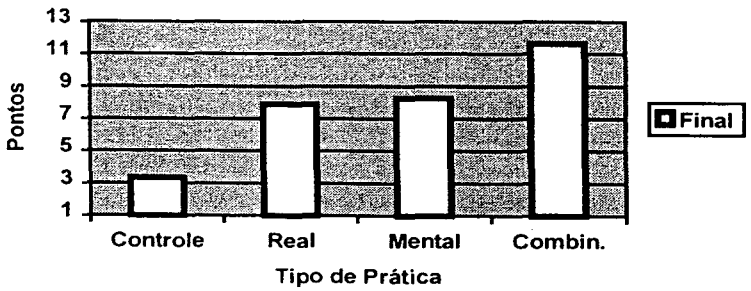

Fig.1 – Average of the gained points by the four groups in the initial and final evaluation.

The analysis of the learning evolution of the four groups from the initial situation to the final one reveals different kinds of behaviour (fig.2).

Thus, we can see that the control group has evolved in a negative way and its results have worsened (-29.9%). All the practice groups evolved in a positive way (+34%,+67% and

+178% for the real practice, the mental and the combined group, respectively). These percentages correspond to gains statistically significant only in the combined practice group.

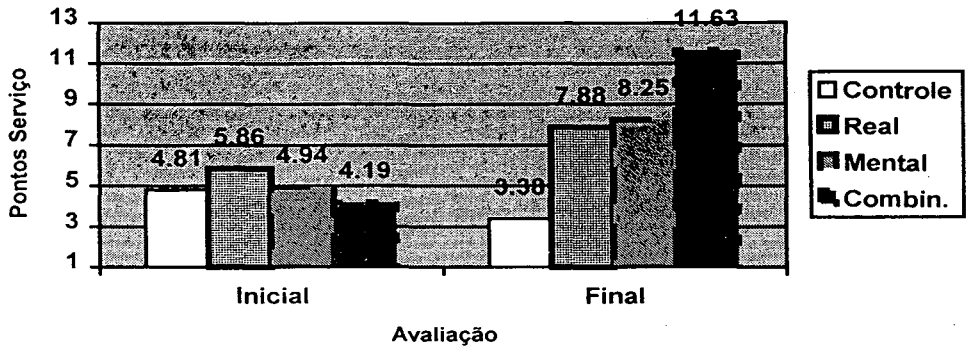

Fig.2 – Evolution of the Four Groups from the Initial Evaluation to the Final Evaluation

E – DISCUSSION AND CONCLUSIONS

These results clearly show a superior performance of the practice groups towards the control group, and of these towards themselves, after the learning sessions to which they were submitted. This improvement was bigger in the combined training group (+178%), followed by the mental training group (+67%) and finally the real training group (+34%).

These differences are due to differentiated practices to which the four groups were submitted, because they all present identical results in the initial evaluation (Fig.1).

These results confirm the literature data and the suggestions presented by Alves & col. (1997) and Schmidt (1993)concerning the hypothesis put at the beginning of the study in which the physical practice combined with the mental practice would produce superior results.

In conclusion, we can say that the mental training causes, by itself, significant improvements in the learning performance of the motor skills, however, a joint use of both physical and mental training produces a significantly superior learning.

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IMAGERY IN BASKETBALL – CONTRIBUTION TO FREE THROW ACCURACY

ALVES, J. [1], LÚCIA, G.[2] & PASSARINHO, J.[3]
[1]Polytechnic Institute of Guarda, PORTUGAL
[2] Human Kinetics Faculty (UTL), PORTUGAL
[3]University Lusofona of Humanities and Technologies (ULHT), PORTUGAL

A – KEY WORDS

Imagery / Free Throw / Learning / Basketball / Relaxation / Training

B- INTRODUCTION

Imagery has been a useful way for athletes such as Dick Burkel, Greg Louganis, Jean Claud Killy, Larry Bird, Reggie Jackson, obtain several victories in different situations in their lives. Imagery could be used in sports for performance enhancement, covert behavior modification and skill learning. Normally imagery is an activity associated with competition preparation, however, it could be just as and even more effective if used as a feature of skill learning.

A five step approach, proposed by Singer (1993), as any strategy is related with changing attitudes, concerned with acquisition, organization or integrated a new knowledge.

Several studies have demonstrated the effectiveness of imagery in the motor learning (e.g. Alves and col., 1997; Rawlings, Rawlings, Chen & Yilk, 1972, cit.by Schmidt, 1993; Whitting, 1979; Hewitt, 1992; Calmels, 1988 and Schendlel & Hagman, 1991, cits. by Thomas, 1991).

Thus, the aim the of this study is to analyze the influence of an imagery and relaxation program on the free throw success rates of women's team at beginner's level of basketball and to note the effects of stopping and restarting the program.

However, and according to Savoy and Beitel's when a program of mental training has been applied to the athletes, and if it's canceled or interrupt for any reason it could be more dangerous for them performance than if it will never was applied.

C - METHOD AND PROCEDURE

The following programs were used: Savoy and Beitel's "Mental Imagery for Basketball" (1996), Palmi's "Exercicios e programas de treino imagética" (1995) and Singer's "Five Step Strategy" (1988).

A sample of 32 subjects was studied, all females athletes, from 11 to 13 years of age. There were two groups: control group, and combined group (imagery, relaxation and five step strategy). The imagery program was introduced according to the training microcycles, during almost tree months, and the success rate of the free throw was evaluated at four points: - initial evaluation (1); - evaluation after the first phase of imaging training (2); - evaluation after stopping the program (3); and – final evaluation (4). Four series of free throws were done for each evaluation.

The results were handled according two perspectives. In the first one, we made the comparison between the different groups trough (t of student). In the second, we analyzed the same group in different moments.

D – RESULTS

We started by verifying if the two groups were identical at the beginning (Experimental group –26,5% and control group – 32%), in accuracy of free throws.

But after we applied the first phase of the program, the efficacy of free throw of the experimental group was higher than the control group (E – 44% C – 32,7%), considered statistical significant p=0.000 (Fig 1).

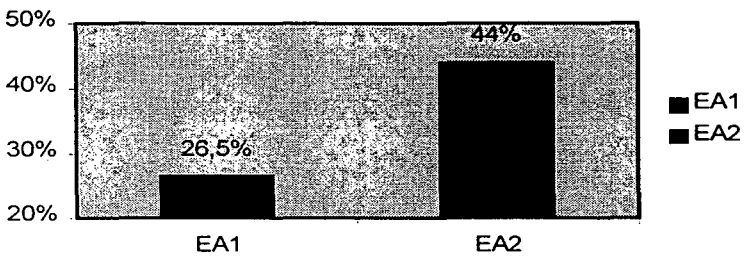
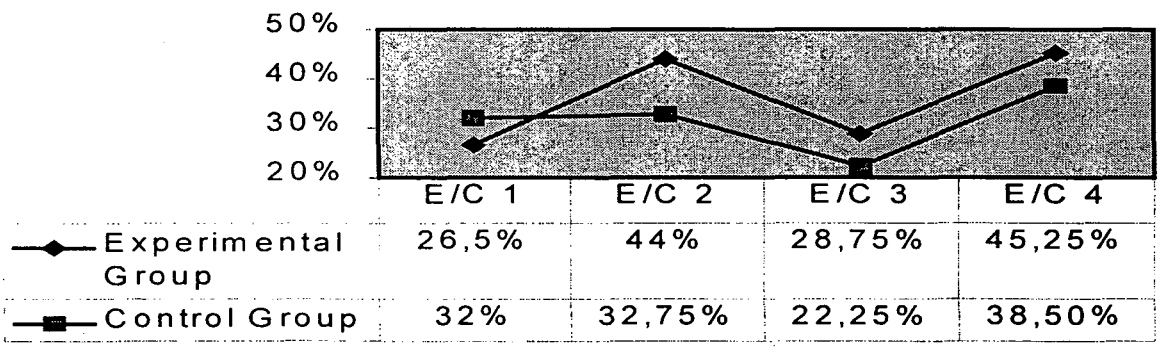


Fig. 1 – Average of the accuracy of experimental group, at first and second moments.



	E/C 1	E/C 2	E/C 3	E/C 4
Experimental Group	26,5%	44%	28,75%	45,25%
Control Group	32%	32,75%	22,25%	38,50%

Fig 2 . Average of both groups in every moments.

As also we can see, when the program was stopped, both groups decreased their accuracy. Nevertheless, the experimental group do not demonstrated such low mark (Fig 2). At the end both seems increased their accuracy.

E – DISCUSSION AND CONCLUSIONS

The results lead to the following conclusions:
- free throw success rates improved by 16% in the first phase;
- interrupting the program reduced success rates to pre-program levels;
- the second phase of the program led to a significant improvement of accuracy of free throw (p=0.2) and the overall rate improved (p=.000).

As we see this results confirm the literature data presented before, concerning with the hypothesis presented. In fact the imagery program associated with relaxation and the five-step approach, were beneficial for the improvement of the success rates in the free throw al beginner's level. And when was not applied any program the athletes decreased their performance.

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VALUES ASSOCIATED WITH SPORT IN SINGAPORE JUNIOR COLLEGES

Nicholas G. Aplin (Nanyang Technological University, Singapore)
and John E. Saunders (Australian Catholic University, Melbourne, Australia)

KEY WORDS: Values, Singapore, Schwartz Values Survey

INTRODUCTION

The values and value priorities that emerge from an integration of personal experiences, socialisation, and the contextual elements that define the society are associated with the decision to enter into, and commit to, the sport culture in Singapore (Aplin, 1998). The ideational foundations of participation in, and commitment to competitive sport in Singapore are apparently found within the school system. When participation in sport for Junior College (JC) students is voluntary, it is the commitment to representative sport through the extra-curricular activities system that distinguishes the real participant from the conscript.

In order to determine which values are prioritised in leading the motivation of individuals towards sport-elated goals, the Schwartz Values Survey was used. It represents an instrument with proven reliability and validity in the examination of distinct individual-level differences. Schwartz (1992) asserts that values serve as guiding principles used in the pursuit of desirable goals, and are structured in a hierarchical form to enable certain 'priority' behaviours to prevail at the expense of others.

METHOD AND PROCEDURE

SAMPLE

A total of 270 JC students (128 males and 142 females) participated in this study. Mean age was 17.7 (SD=0.63) years. The students represent the age group that provides the largest proportion of athletes participating in competitive sport in Singapore (Singapore Sports Council, 1992). Three broad categories of participation were identified: non-participation, low achievement, and higher achievement. Male and female subjects were assigned to their respective group based on involvement in school- or community-based extra curricular activities. Those individuals who had been selected for the higher levels of performance, for example, athletes in national representative teams, were designated as 'higher achievers'. Those who had shown commitment over time, but without the achievement of high performance standards were designated 'lower achievers'.

PROCEDURES

Students were administered the Schwartz Value Survey (1992), which assesses values and value priorities, by the principal investigator. Written approval was obtained both from the Ministry of Education and from the respective Principals of the schools to undertake the research project. All students were verbally assured of anonymity and requested not to sign their survey form. The inventory took approximately 20 minutes to complete.

RESULTS

VALUE CONFIGURATIONS

A multidimensional scaling analysis (MDS) was undertaken to confirm the structure of relationships between the values. The reliability of the individual value constructs themselves was tested with the use of Cronbach Alpha coefficients. The pattern of values and their location within the ten value types closely matched the prototype derived by Schwartz (1992). The Cronbach Alpha scores for the total sample were: Power (.72), Achievement (.67), Hedonism (.56), Stimulation (.77), Self-Direction (.57), Universalism (.64), Benevolence (.70), Tradition (.46), Conformity (.64), and Security (.65).

NORMALITY AND HOMOGENEITY OF VARIANCE

Data at the level of value types were tested successfully for normality by means of skewness and kurtosis statistics. Homogeneity of variance between the selected groupings was tested by means of the Levene F-statistic. Non-significant figures were produced for all ten value types (df. = 2, 267), indicating that the responses of the groups could be compared. Confirmation of the homogeneity of matrices was provided within the multivariate model by Box's M test of the equality of group covariance (M = 95.770, F (110, 192956) = .825, Significance = .909.

HYPOTHESIS TESTING

Based on the value grouping provided by the MDS, a MANCOVA using the three sub-groups as the independent variable was conducted with age, gender, and the individual's mean importance score used as covariates. MANCOVA revealed a significant effect for groups, $F(18, 514) = 1.982, p = .009$. Univariate F-test scores indicated that the groups differed significantly on two of the ten dimensions of the model: 'Stimulation' ($F = 6.753, p = .001$), and 'Conformity' ($F = 4.722, p = .010$). Pair-wise comparisons indicated that the Higher Achievers placed greater emphasis on 'Stimulation' than both the Lower Achievers, and Non-Participants. The Lower Achievers placed greater emphasis on 'Stimulation' than Non-Participants. The Higher Achievers and Non-Participants placed greater emphasis on 'Conformity' than the Lower Achievers.

DISCUSSION AND CONCLUSIONS

The primary purpose of this study was to compare higher achievers, lower achievers, and non-participants in sport on the values identified by the Schwartz Values Survey (1992). Groups differed significantly on two of the model's ten components: 'Stimulation' and, in a less clear-cut way 'Conformity'. The comparison between the three groups for the value type 'Stimulation' revealed a significant difference between all those with the mean scores increasing systematically from the non-participants group to the lower achievers, and then the higher achievers groups. 'Stimulation' may then be seen as the best indicator of differences. The higher achievers scored significantly higher than the lower achievers on 'Conformity', however, non-participants, also scored significantly higher than members of the lower achievers (p = .004).

STIMULATION

The need for stimulation is an important motivating force for human behaviour. It is concerned with the way individuals react to their environment and particularly with the arousal-producing properties of varying degrees of environmental stimulation (Donnelly and Birrell, 1978). Based on the results in this study, the need for 'Stimulation' is revealed as the

most relevant criterion for initial participation in competitive sport in Singapore and as a motivation to commit to high level performance.

The stimulation offered by sports participation is represented in affective experiences, which are presumably distinguishable from other experiences in the school environment. Decisions to participate or not are regulated by two factors: first, the compatibility of competitive involvement with the need for a certain type of stimulation, and second, by the strength of contending priorities, such as academic study and social engagement.

A number of characteristics make sports participation stimulating. For example, the presence of challenge and the excitement generated in anticipation of challenge are often important objectives of participation. If challenges are not present in a sport programme then the intensity of involvement drops, boredom creeps in, and withdrawal may be the result (Clews and Gross, 1995). At another level, the feelings of competence and intrinsic pleasure, which result from successful attempts at exploration, mastery, curiosity, challenge have been identified as important elements in encouraging a positive motivational orientation towards sport (e.g. Biddle and Brooke, 1992).

The ability of value constructs to differentiate between groups of participants and non-participants was small but significant. In identifying 'Stimulation' as the best indicator of differences, this study raises important questions about the influence of values and other affective constructs on the decisions to participate in sport. Yet, equally as striking as this finding was the identification of how homogeneous the value systems of the three groups were and how sport participation was associated with the smallest of value shifts.

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DYNAMIC DECISION MAKING IN SPORT: EXPERTISE IN SAILING.

Araújo, Duarte & Serpa, Sidónio, Laboratory of Sport Psychology
Faculty of Human Movement - Technical University of Lisbon
Email: Daraujo@fmh.utl.pt

Key Words: Dynamic decision making, levels of expertise, sailing, simulators,

INTRODUCTION

Several authors (Alain & Sarrazin.1990; Ripoll & col., 1995, Helson & Pauwels, 1988) refer to the need of considering the dynamic characteristics in sport. These researchers use some attributes of dynamic situations like time pressure (e.g. Ripoll & col. 1995), or they try to construct a model to simulate the dynamics of decision making (Alain & Col., 1990). According to the recent investigations in other areas than sport, a dynamic situation is defined by three characteristics: possibility of feedback, interdependent sequences of decisions, and time pressure (Brehmer, 1992, Kerstholt, 1994, 1995). The first two characteristics, and time pressure, were not considered in earlier researches in decision making in sport. According to the new approach regarding of decision making (Cannon-Bowers, Salas & Pruitt, 1996, Oranasu & Connoly, 1993; Klein & Woods, 1993) – naturalistic decision making – decision making is defined by the cognitive processes involved in controlling a dynamic situation (Kerstholt, 1994, 1995). Our purpose is to use a simulator having the fidelity conditions mentioned by Starkes & Lindsey (1994), that assure validity and reliability in measuring of decision making in sport (McMorris & Graydon, 1997), and that is in conformity with the naturalistic (ecological) decision making approach (Cannon-Bowers & Col., 1996). Based on the paradigm of knowledge representation in sport (Thomas, French & Humphries, 1986), the verbalisation, in this study, focuses the informational resources the subject uses to make decisions. On the other hand, the naturalistic decision making approach analyses the subject's interventions in the system (dynamic situation).

According to Starkes & Deakin, 1984, and Abernethy, 1994, the experts are not distinguished by their '*hardware*' characteristics, but by their '*software*' characteristics. We supported this conclusion in high level sailing (Araújo & Serpa, 1995, 1997). Thus, we will use a simulator to study the dynamic decision making in a specific situation of sailing (a simulated regatta), analysing three levels of expertise, according to a ranking based on the sailors' international competition curriculum. Our hypothesis are: 1) The higher the expertise in sailing the better is the performance in simulated regatta; 2) the information search and the interventions in the system vary according to the expertise level.

METHOD AND PROCEDURE

Subjects were 35 sailor and 46 non-sailors. The sailors were analysed as a whole group, and according to different levels of expertise: 1) sailors in the higher ranking level; 2) sailors in the lower ranking level; 3) sailors in the intermediate ranking level. Each one of these groups is composed 10 sailors. The top 10 sailors of the ranking are *experts* according to the Ericsson & Lehmann (1996) definition: all of them win, or were among the three best places, in several World Championships, European Championships or Olympic Games. The bottom 10 sailors have at least one international competition in their curriculum. They are not beginners in sailing.

The non-sailors group was dived into two groups: 23 were a control group for the sailors and the others 23 were control group to check if the verbalisation on-line interfere with the task.

According to Sanders (1991) recommendation, cognitive and behavioural measurements were took in order of time. We used a verbal protocol for measuring the cognitive abilities and a

video to record the interventions in the system for further frequencies observation. We measured the number of informations (from a verbal protocol) categorised in four types: adversary, spatial, manoeuvres and wind; the number of actions (interventions in the computer) categorised in two types: technical and adjustments; and the occurrence of the interventions and verbalisations in order of a sequence of homogeneous moments all along a regatta: start, first beat, round the 1st mark, downwind, round the 2nd mark and last beat until the finish line. These were the process variables. The product variables was the final classification, the time spend in total and the amount of points scored (following the ISAF procedures).

The used simulator was a commercialised software made by C. Dennis Posey (1996): "Tactics & Strategy Simulator" – Posey Yacht Design. This simulates the visual stimuli around the boat during a regatta. Some non visual information (the wind strength, the speed) is quantified in a small screen. The subjects verbalise on line all the informations they are attending and their intentions. They can intervene on the computer pressing four keys: two side keys of the 'mouse' and two keys from the keyboard.

For the first hypothesis we use the Spearman's correlation. For the second hypothesis we use parametric and non-parametric comparisons (Anova, T-test, Kruskal-Wallis, Mann-Whitney Wilcoxon); and linear regression multivariate and regression with optimal scaling (Catreg).

RESULTS

The functional fidelity of the simulator was tested by 5 expert coaches and by all the sailors in the study: when they were asked about the simulator relation to concerning the strategic aspects, the majority agreed with the functional fidelity. To measure the reliability of the dynamic decision making assessment, we used the Split-half method (as proposed by Helsen & Pauwels, 1988) with a result of Guttman split-half: 0,94.

For the first hypothesis the ranking points were inversely correlated with time spent (p=0,036) and with final classification (p=0,030). All the product variables had a high correlation (p=0,000).

For the second hypothesis, sailors were better, in referring to the product variables, having a high significant difference in their performance (p=0,000 for the three product variables). The difference between the non-verbalisation group and the verbalisation group was not significant (p=0,725).Concerning the three levels of expertise Table 1 refers to the product variables and the table 2 refers to process variables (most significant comparisons).

TABLE 1. Comparison between the three levels of expertise in the product variables

Variables	Experts	2nd experts	3rd experts	Test	P value
Final classification	2,0	3,5	4,0	Chi^2=3,884	0,143
Points	9,55	12,98	13,18	f=1,326	0,282
Time spent	1481,40	1522,90	1561,50	f=1,641	0,213

TABLE 2. Comparision between three levels of expertise in the process variables

Moment	Variable	Experts	2nd expert	3rd experts	Test	P value
Start	*Spatial inform.*	5,90	7,30	5,10	Chi^2=5,645	0,059
Beat	*Adjustments*	27,10	30,60	44,40	f=2,670	0,087
	Technical interv	8,90	8,80	13,20	Chi^2=6,756	0,034
	Total intervent.	36,00	39,40	57,60	f=4,298	0,024
Round 2nd mark	*Wind informat.*	2,90	1,10	1,40	Chi^2=5,244	0,073

In general, the difference between sailors and non-sailors, referring to the process variables, consisted in the fact that sailors verbalise significantly more information (specially the ones

concerning adversaries and wind) and non-sailors make significantly more interventions in the system (specially adjustments).
According to the regression analysis the sailors' best performances are determined by the reduction of actions in the start, the increment of processing in the start, the reduction of the processing of spatial information on first beat, and the reduction of wind search on downwind.

DISCUSSION AND CONCLUSIONS

The simulator allows a sport specific measurement of the decision abilities.
Dynamic decision making research in sport can reveal how the subject cognitive *software* of a develops along the process of acquiring expertise, until he or she becomes an expert.
Because they have a better knowledge the best sailors reduce the number of adjustments of their boat direction (interventions in the system): they don't use by trial-and-error strategies (action oriented strategies), but they understand and are more aware of the development of the system (judgement oriented strategies).
The better the sailor, the better his or her dynamic decision making processes. We can infer that dynamic decision making is one of the most distinguishing variables Regarding how competent is a sailor. This assumption may have a consequence in talent selection and in the increment of decision making training in sailing. The simulator can be used as a tool for training decision making (Starkes & Lindley, 1994), and for the design of training situations by the coach.

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STUDENTS' PHYSICAL ACTIVITY AT VILNIUS UNIVERSITY

Jurate Armoniene
Vilnius University

(A) KEY WORDS

Physical activity, valuable regulations, motivation, training factors, physicaly active (PA) and physicaly passive (PP).

(B) INTRODUCTION

Studying, leisuretime, job, living conditions are the processes of youth development events in Lithuania at the end of 90's. Virtually they are different from the social, economical and profesional possibilities of their contemporaries in West Europe,Scandinavia or North America There are some differencies in system of physical training at high and higher school or universities. A law of physical culture had been passed on the 25th of December in 1995. Weekly it provides 3 lectures of physical training at high or higher school during all studies (except final year). But poor material basis, lack of stock, inadequate public point of view to children' physical activity and healhty lifestyle make troubles to accomplish it. Hypodinamy is one of the most characteristic features in Lithuania's present. Every year the number of children having health's disorder is rising up. During the last two decades the number of people having heart and blood-vessel deseases has increased by ¼ in Lithuania, while it has redused by 1/3 in Europe. We have different points of view talking about physical culture, healthy lifestyle and leisure physical activities. It is attached much more attention to mental activity. BlauzdysV., KuklysV.(1982); GenevičiusJ.(1991); Kardelis K.(1993); Milašauskienė Ž.,Misevičienė I. (1993); Tendzegolskis (1985); Volbekienė V.(1978,1997); Armonienė J.(1995).
According to the current situation the teachers of physical culture are looking for new forms and methods of work. They are trying to accomplish new programmes and warrants of education.

(C) METHOD AND PROCEDURE

One of the purposes of the research is to establish the structure and forms of students' leisure time at Vilnius University and at the same time to estimate the quantitative side of the problem (duration of leisuretime) and the qualitative one - where, why and how the students spend their time when they are free from the lectures and how much time they spend for personal physical culture and self-dependent physical improvement. We established the habbits of physical culture and their physical activity when students at Vilnius University were free from studies using questionaired method. Pedagogical-sociological questionaire had been made from 3 parts: 1-general information, 2-psyshological information about personal health, 3- information about physical culture and sport. 1035 persons represented the experiment. They had been divided into physicaly actives (PA) and physicaly passives (PP). Pedagogical experiment took place in 1993. The students from departments of Medicine, Chemistry and History were participants of the experiment. Students' physical activity was estimated according to:
-the time provided for physical culture (academical physical training is not included).
-the habbits of physical culture during the leisuretime (choice of qualitied activities). Diaries of introspection had been made to look after the activity. The students indicated fulfiled physical activity, its duration and students' personal health.

-prioritaires of physical activity at the rest time. Electronic pedometer (Elektronika Ø Ý-01) had been used to adjust students' physical activity all around the year. Data of researches had been edited using the packet of SAS programs.

(D) RESULTS

In time of pedagogical experiment had been found the dynamics of students' physical activity in autumn, winter, spring and summer (see table 1.).

TABLE 1. Students' physical activity all around the year (steps per day)

Seasons/Departments	Medical	Chemistry	History
Autumn	8630.21±169.23*	8929.35±158.4	8326.4±171.2*
Winter	6431.51±101.36	6250.5±108.47	5998.36±121.37
Spring	10982.4±97.28	9678.5±92.5	9690.66±79.02
Summer	14513.46±105.3	13971.5±102.12	13890.36±101.37

*$p<0.05$ - reliability of results

Researching students' physical activity all around the year it is provided that the biggest physical activity exists in summer - approx.14133.60±102.93 steps a day. Imagine that students' physical activity conditionaly concludes 100% of active physical training. So in autumn physical activity concludes - 61.1%, in winter - 44.5%, and in spring - 71.5% ($p<0.05$). The final results of questionaires prove that physical activity among the 1st and 2nd year students is low: sedentary life brings satisfactorily 7.58±2.2 hour a day.Sitting 1st year student spends 8.4± 2.37 and 2nd year student spends 7.04±2.35 hour a day.The observed students take trainings approx. 2.8±2.65 hour per week. The 2nd year students' duration of physical activity is shorter than the first year students - 2.3±2.9 and 1.75±2.67 hour per week ($p<0.05$). Using the questionaire we tried to find out the reasons of students' physical passivity.Mostly they explained the lack of will (37% physical actives and 46% physical passives). 25% physical actives excused to the lack of time,17% physical actives and 18% physical passives complained the lectures started too early, 27% physical actives and 11% physical passives couldn't find suitable conditions for their trainings. At the same time the prioritaires of students' activities had been appointed. Mostly PA (86%) and PP (57%) prefer wallking ($p<0.025$).Regulary train only 11% PA stu- dents. Games are chosen by 17% PA and 3% PP students ($p<0.05$). 21% PA and 7% PP stu- dents spend their time at the discos ($p<0.05$). The most respondents from the passives' physical areas (53% PA and 57% PP) prefer TV ($p>0.05$), cinema - 26% PA and 50% PP ($p<0.025$), sleep - 21% PA and 38% PP. PA and PP students' leisure forms are definitly different.

(E) DISCUSSION AND CONCLUSIONS

Our researches confirm the opinion that students' physical activity depends on the endogenetical and egzogenetical factors (see table 2).

TABLE 2. Training factors of physical activity

Endogenetical		**Egzogenetical**		
Biological	Psychological	Ekological medium	Social environment	Cultural environment
central nervous system genetic biochemical state of human's organs' and skin health	learning abilities intellect intrinsic causes maturity		social microenvironment (family, school) social macroenvironment society (it's ideology , morals) media	science technics art education

Jankauskas J. and Logvinovas E. (1984) found optimum estimated standards of 18 years youth motor activities. According to these standards Vilnius University first year students' one day average of motor activity per studying time is low and consists from 97774.43±131.6 steps per day. Such low students' physical activity can't satisfy bioligical movement's needs of human organism. It egsists like one of the basic factors of health risk, making influence to healthiness. Using our researches we can ascertain that students' physical activity decreases in winter, so it is necessary to recommend practical homeworks while the students are going to pass their egzaminations. It could be personal trainings or non-traditional forms of physical culture directed to improve professional preparation or to stimulate creative activities. Physical activity would have to consist 1/3 - 1/6 of all time imposed to mental activity. 1,3-1,8 hours a day of physical activity would let succesfully fulfill University demands.
It is very important task - to train students to fulfill their leisuretime rationally and reasonably. At first the decision will depend on the family, later - on the high or higher school. Arranging leisuretime as pithy as possible, the whole training is growing better.

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SOCIAL PSYCHOLOGY OF PHYSICAL EDUCATION

Yves VANDEN AUWEELE – KATHOLIEKE UNIVERSITEIT LEUVEN – BELGIUM

Social skill development is a basic physical education (P.E.)- curriculum goal because contemporary life places a premium on citizens' ability to relate well to others, to work effectively in groups and to deal with interpersonal conflicts and tensions. Schools have an increased responsibility for helping pupils learn the skills needed to cope with these life challenges. A class that can be helped to develop to a group characterized by mutual support and trust contains opportunities for constructive peer feedback and feelings of being accepted (Weinstein, 1991; Gallagher, 1994). These positive relationships play an important role in developing social resilience in adult life, whereas poor school-relationships lead to social vulnerability (Vettenburg, 1988).

A second justification of having social skill development as a curriculum goal is the important part social processes play in the facilitation/inhibition of the realisation of the other curriculum goals: self concept, skill acquisition, and fitness development, i.e. pupils' self concepts are formed primarily through the feedback (reward versus disapproval) that they receive from teachers and classmates. The motivation to learn skills and to develop and to keep up an acceptable level of fitness is co-determined by the class climate, which implies that a class is more than a collection of individuals. It is a living social system within a larger environment (school, school district, local community) but also with its own subsystems. The physical education task will benefit from relational issues being settled to some degree. As relationships require less attention, more energy is available for physical education: improving fitness and developing skills (Stebbins, 1975; Schmuck & Schmuck, 1992; Tuckman, 1992; Underwood, 1988).

This section includes five chapters, drawing on expertise from Belgium, Germany, France and Finland. First the social and moral development of the individual are dealt with, secondly the main group processes in the classroom and finally the systemic nature of the P.E.-class and the development of the P.E.-class as a task group.

Although each individual experiences unique social influences and responds to them in unique ways, there are some developmental stages which all individuals go through as they mature. In chapter 1 and 2 Alfons Marcoen (Belgium) and Risto Telama (Finland) deal with the social and moral development. Children continue to grow psychologically within powerful environments (family, peer group, school) in which each developmental challenge will be faced, and the developing personality will be shaped.

The combination of teachers' responses to pupils' personal needs for affiliation, influence and achievement and the peer group's interaction with them will constitute the core of the group processes in the P.E. classroom. Chapter 3 by Dorothee Alfermann (Germany) deals with social interaction and communication between teachers and students and within student groups. Chapter 4 by Lucile Lafont and Fayda Winnykamen (France) focuses on two modes of interaction in groups which are especially relevant in our society, e.g. cooperative and competitive interactions. These issues, fitted appropriately in the educators' teaching goals and methods, can dramatically affect the educational climate, student learning and the teachers' behaviour.

The P.E. class is a task group with typical characteristics as a group which is more than a collection of individuals. It is a social system, a task group in which evolving goals, roles, procedures and interpersonal relationships are important issues to be understood in order to make the P.E. class more manageable and a good medium for social skill development (chapter 5 by Johan Hovelynck and Yves Vanden Auweele from Belgium).

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PSYCHOLOGICAL OUTCOMES OF PHYSICAL EDUCATION

Frank BAKKER - VRIJE UNIVERSITEIT AMSTERDAM – THE NETHERLANDS

Some readers will immediately associate a section devoted to psychological outcomes of P.E. with effects of P.E. (and sport) on pupils' personality, i.e. on the rather enduring dispositions, traits or characteristics of the personality structure.

This expectation should not be surprising because almost all European countries have experienced a period in which the position of P.E. in the school curriculum was justified by pointing out the assumed positive effects of this subject matter on personality. It was proposed that P.E. and sport would have favourable influences on character development, that means on dispositions such as perseverance, stamina and courage. Sometimes the character forming element was even specified according to the sport: judo would be specifically valuable in the learning of self control, boxing in increasing one's resilience, and jumping from a climbing ladder for promoting courage.

Also with respect to the effects of P.E. on cognitive functioning a variety of common sense conceptions existed that were used to legitimize the position of P.E. in the school. P.E. would be valuable for enhancing pupils' three dimensional thinking, for understanding the meaning of propositions like "in front of", "opposite" to, "behind", etc.

However, in the majority of European countries these claims are no longer used to justify physical education, because these assumed positive effects of P.E. on personality have not been supported by research findings (Bakker, Whiting & Van der Brug, 1990; Eysenk, Nias & Cox, 1982). The same holds for the negative effects (e.g. aggression, selfishness, jealousy) that are sometimes attributed to P.E. and sport.

In short, P.E. automatically produces neither positive nor negative outcomes and P.E. apparently does not produce effects on enduring personality dispositions, nor on basic cognitive functions.

The first focus in this section will be on the fact that any effect of P.E. is the result of good planning and of reflective teaching and learning (dynamic interaction between teachers and pupils) and secondly on the effects of P.E. on a number of psychological variables that are intrinsically related to P.E., such as attitude, enjoyment, motivation, beliefs about physical ability and competence, self esteem, concentration and attention, etc.

In chapter 1: Yngvar Ommundson from Norway and Michael Bar-Eli from Israel consider outcomes as motivation, achievement goals, affect, self-perceptions, pro-social behaviour and fair play.

These outcomes are intimately related to P.E. itself and are important both as P.E. curriculum goals with their own merit, and as prerequisites for the realisation of other curriculum goals. For example, a long lasting interest in sports and P.E. is likely to develop if pupils experience positive affect in their P.E. lessons. Ommundson and Bar-Eli discuss theory and research findings pertinent to the role of physical education with respect to promoting these outcomes.

They emphasize that the interaction between pupil characteristics and the way P.E. lessons are organized and presented are decisive in producing such outcomes. Creating a task oriented climate (see also section I of this textbook) appears to be the most productive way to increase intrinsic motivation, positive attitudes and to develop controllable and functional beliefs about the causes of success in P.E. In addition Ommundson and Bar-Eli discuss the social - moral outcomes of P.E. and the role of P.E. in relation to enhancement of self-esteem.

The latter issue is discussed in more detail in Chapter 2 of this section by Taru Lintunen from Finland. She begins her chapter by explaining the relationships between global self-esteem and the subaspects which are fundamental to P.E. Next she discusses the development of self-perceptions during childhood and adolescence and several important aspects of self-perceptions such as their stability and sex differences in specific facets. Finally Lintunen provides the reader with opportunities for promoting self-perceptions at school, particularly in P.E.

In chapter 3 Yannis Zervas from Greece and Natalia Stambulova from Russia discuss the effects of physical activity on cognitive functioning. The authors consider the acute effects of exercise on concentration and attention, problem solving, and reaction time. The general conclusion of research in this area is that exercise does not hamper cognitive functioning so long as the intensity of exercise is at a low or moderate level. Some research findings have, on the contrary, indicated facilitative effects of light and moderate exercise. High levels of physical exertion as well as fatigue conditions may have negative effects. In addition, Zervas and Stambulova show that the nature of the effects of acute exercise bouts on mental performance (whether facilitating or debilitating), depends on the level of physical fitness of the exercisers. A high level of physical fitness is associated with superior levels of mental performance during and after exercise.

Zervas and Stambulova's chapter underscores once again the general message of this section, namely that positive or negative psychological outcomes are not produced automatically, but depend on the way P.E. lessons are planned and organized.

PERCEIVING AND REALIZING AFFORDANCES IN SPORT

Workshop Theme and General Introduction

Frank C. Bakker, Raôul R.D. Oudejans & J.R. (Rob) Pijpers
Institute for Fundamental and Clinical Human Movement Sciences
Faculty of Human Movement Sciences, Vrije Universiteit, Amsterdam, The Netherlands

KEYWORDS research program, ecological psychology, affordances, sport, sport psychology

Movement in the context of sport can be analysed and studied in different ways and on different levels. The level of analysis advocated here is that of human action. Studying movement at this level implies that movement in sport is considered a relational activity, that is, an activity whereby the sport environment supports several affordances (Gibson, 1979/1986) of which the athlete realizes the one(s) that is (are) most appropriate at that moment. For instance, the situation on a soccer pitch offers a soccer player the possibilities to pass, shoot, dribble, and the like. Depending on the concrete situation in the game (where the ball is, where other players are etc.), the broader context of the game (the score at that moment, the relevance of the game etc.), and the intentions, traits and characteristics of the player (technical ability, game insight, fatigue, ambition, etc.) the player eventually realizes one of the affordances of the situation: he passes, shoots or dribbles.

The theme of the research program discussed in this workshop is the analysis of perceiving and realizing affordances in sport. Perceiving and realizing affordances is at the heart of any sport activity. In ball games, for instance, athletes jump away from an opponent or not, run for a ball to catch it or leave it for a teammate, sprint into the open space or await a better opportunity, et cetera. Of all possible actions in time only a limited number is executed. Somehow there must be a selection both in perception and in the realization of affordances. As for perception we contend there is a selection of the information that is picked up. Attention cannot capture all available information at the same time. In realizing affordances it is possible that more than one affordance is perceived while only one can be realized. It is impossible to both shoot at goal and pass at the same time. Only the eventual action reveals what the selection has been. Our research program aims to understand the factors that determine which affordances are being perceived and realized.

With respect to an analysis of the factors that determine the perception and realization of affordances, Newell's (1986) classification of "constraints on action" into three categories is useful. Constraints can be considered limiting factors, that is, factors restricting the (number of) possible actions. The length of a basketball player, for instance, limits (in combination with other factors) the affordances of this athlete on the court, such as being able or not to dunk the ball.

Newell (1986) distinguishes organismic, environmental and task constraints. Organismic constraints are the limiting factors of the actor himself, such as length, jumping power, maximal running speed, but also factors such as motivation, anxiety, fatigue and will-power. Environmental constraints could, in principle, contain all limiting factors outside the actor. According to Newell (1986), however, it is sensible "to distinguish between environmental constraints that are general and those that are task specific. Environmental constraints and task constraints are not mutually exclusive as their definition depends on the nature of the task" (p. 350). Examples of environmental constraints are gravity, temperature of the environment, humidity and illumination. In addition, information sources in the environment that are available to the perceiver in a certain situation (so that he or she can catch the ball; e.g., vertical optical acceleration and time-to-contact information) can be considered environmental constraints. The best examples of task constraints in sport are, of course, the rules of a game which, without necessarily being physical barriers, stringently determine what is and is not possible (allowed) during the game.

Research into the question which factors determine which affordances will be perceived and realized in sport, can be executed on the basis of Newell's (1986) classification of constraints. First, an analysis of these factors will lead to questions concerning the characteristics of the environment and the way in which these characteristics guide behavior. Second, research questions

will concern the role that characteristics of the actor play in the perception and realization of affordances. Third, perception and movement in the context of sport cannot be studied in a sensible way without taking the task constraints into account, that is, without taking into consideration the specific rules of each particular game of sport. The fact that in soccer the ball must be played with the feet (at least not with the hands) while in basketball and field hockey this is not allowed, has far-reaching consequences for the affordances within these specific sports.

The theme of the research program fits well with the tradition of ecological psychology (Gibson, 1979/1986) and its study of human movement (Michaels & Beek, 1995). Within ecological psychology an intimate relation between person and environment as well as between perception and movement is assumed. A description of the environment in terms of movement possibilities for the moving person in question is the result.

More than in the existing literature of the ecological tradition our research focuses on organismic constraints and their role in perceiving and realizing affordances in sport. Examples are the influence of state-variables such as anxiety, anger, frustration and fatigue on the perception of affordances. A frustrated soccer player on the verge of loosing the championship game, might be more prone than one of the winning opponents to perceive the ankles of one of the opponents as huge possibilities for action (instead of impossibilities). The same may hold for the striker who has just missed an open goal. Fatigue may also influence the perception and realization of affordances. Near the end of a game one does no longer run for balls for which one would have run at the beginning of the game. Or one no longer perceives passing by one's direct opponent as a possibility (and perhaps the possibility is indeed no longer there due to fatigue).

Next to these time-dependent state-variables attention is also directed to long-term factors such as ethical standards and values, and the experience of the athlete. It is known that experien-ced athletes focus attention on other (more relevant) information than inexperienced athletes so that they can act faster and more accurate. And the athlete who is sportsmanlike by nature will not give someone a vicious kick as quickly as someone for whom the end justifies all means.

Within the theme of the research program the focus is on the following concrete questions:
(1) What is the influence of movement of a perceiver on perceiving affordances and how can this influence be explained (Oudejans, Michaels, Bakker, & Dolné, 1996; Oudejans, Michaels, van Dort, & Frissen, 1996)?
(2) What is the influence of people's opinions about sportmanship on the decisions made in a particular game situation?
(3) What characterizes players who do perceive the relevant affordances in a particular game situation in comparison to players who regularly miss these affordances (what is game insight?) (Bakker, Beek, & Oudejans, 1996; Boschker, Bakker, & Michaels, this volume)?
(4) What is the influence of state variables on the perception and realization of affordances? What is the influence of the physical (physiological) changes due to fatigue and anxiety on the preferred boundaries of action (where one movement solution is replaced with another, e.g., where climbing up a surface without the use of hands is replaced with climbing with feet and hands? In what way does the subjective perception of these physical changes play a role)? (Bootsma, Bakker, van Snippenberg, & Tdlohreg 1992; Pijpers & Bakker, 1995; Pijpers, Bakker, & Holsheimer, 1997)
(5) What is the influence of imagery on the selected and executed movements in a particular situation? Does imagery lead to different preferred or selected affordances? In more general terms, what role does cognition play in perceiving and moving in sport (e.g., what is the influence of information about the weaknesses of the opponent)? (Bakker, Boschker, & Chung, 1996; Boschker, Bakker, & Rietberg, 1999)
(6) What is the role of attention in perceiving and moving in sport? In what way can (perceptual) learning and expertise change this role (Oudejans, Michaels, & Bakker, 1997)? What is the influence of the specific focussing of attention (on, e.g., yourself, your movements or the environment) on performance?