

# Current status and prominent issues in sport psychology interventions

ROBIN S. VEALEY

*Department of Physical Education, Health, and Sport Studies,  
Miami University,  
Oxford, OH 45056*

## ABSTRACT

VEALEY, R. S. Current status and prominent issues in sport psychology interventions. *Med. Sci. Sports Exerc.*, Vol. 26, No. 4, pp. 495–502, 1994. The prospect of human psycho-behavioral change has fueled the development and growth of applied sport psychology and psychological intervention with athletes. The purpose of this review is to examine the current status of sport psychology interventions and identify issues related to psychological intervention in sport. The development of sport psychology in North America is overviewed and issues arising from the emergence of applied sport psychology are identified. Sport psychology intervention research is reviewed and it is concluded that the effectiveness of sport psychology interventions is supported in the literature. Problems in intervention research are identified and future directions for sport psychology are suggested. These suggestions include a science-practice integration, the use of idiographic assessment methods, the identification and control of moderator variables, and the contextualization of interventions within the unique environment of sport.

INTERVENTION RESEARCH, APPLIED SPORT PSYCHOLOGY,  
PSYCHOLOGICAL SKILLS TRAINING, MENTAL TRAINING

The famous psychologist William James wrote that “the greatest discovery . . . is that human beings, by changing the inner attitudes of their minds, can change the outer aspects of their lives.” The intriguing possibility of human psycho-behavioral change is the basis for psychological intervention with athletes and has fueled the development and growth of the field of sport psychology. Sport psychology specialists have joined the ranks of physiologists, biomechanists, nutritionists, and others in an attempt to enhance the performance and sport experiences of athletes.

The purpose of this paper is to examine the current status of sport psychology interventions and identify issues related to psychological intervention in sport. The paper is divided into four sections. First, the development of sport psychology in North American is overviewed in an attempt to historically contextualize current trends in

the field. Second, issues arising from the emergence of applied sport psychology are identified. Third, an overview of sport psychology intervention research is provided. Fourth, future directions for intervention research in sport psychology are suggested.

## DEVELOPMENT OF SPORT PSYCHOLOGY IN NORTH AMERICA

Sport psychology in North America began with Coleman Griffith's early work in the 1920s and then remained largely dormant until the 1960s and early 1970s when several organizations were formed that focused on the systematic study of psychological processes in sport. These organizations included the International Society for Sport Psychology (ISSP), the North American Society for the Psychology of Sport and Physical Activity (NASP-SPA), and the Canadian Society for Psychomotor Learning and Sport Psychology (CSPLSP). Also, the establishment of the *Journal of Sport Psychology* in 1979 provided a forum for research in sport psychology and was an additional impetus in the development of the young field.

During the late 1970s an interest in applied sport psychology, or mental training with athletes, emerged in the United States. The term psychological skills training (PST) was coined to describe techniques and strategies designed to teach or enhance mental skills that facilitate performance and a positive approach to sport competition. A major premise of PST is that athletes are basically mentally healthy but they may need to learn cognitive skills and strategies to cope with the various demands of sport competition (20,28). For example, imagery, relaxation, and goal setting may be used to cope with competitive stress, facilitate attentional control, and enhance self-confidence. Thus, PST is an educational approach in which psychological skills are viewed as learnable. Based on the development of PST and the emergence of sport consumers eager to utilize these techniques, sport psychology specialists began to engage in psychological training with athletes.

Interest in PST proliferated in North American during the 1980s and has continued into the 1990s. Numerous

books outlining various PST approaches have been published (44), a professional association (Association for the Advancement of Applied Sport Psychology—AAASP) has been formed for researchers and practitioners interested in PST applications, and two journals (*The Sport Psychologist* and the *Journal of Applied Sport Psychology*) have developed to stimulate and communicate research and methods pertaining to applied sport psychology. PST has also become more visible as professional and world-class amateur athletes employ sport psychology specialists and publicly acknowledge the importance of psychological skills in their performances. The United States Olympic Committee (USOC) currently employs two sport psychology specialists to coordinate research and engage in professional practice with athletes and teams sponsored by the national governing bodies of Olympic sports.

### ISSUES IN APPLIED SPORT PSYCHOLOGY

The development of applied sport psychology has created numerous professional issues regarding the practice of PST and the definition of “sport psychologist.” These issues have elicited a great deal of discussion in the sport psychology literature (2,9,10,15,21,31,39) and culminated in guidelines set by the USOC regarding who can engage in psychological training with athletes and what types of psychological services can be offered to athletes under the USOC’s jurisdiction (USOC83). Similarly, AAASP has established criteria used by the organization to evaluate and recognize individuals as “certified consultants” in applied sport psychology, which precipitated further controversy over the practice of sport psychology. Clearly, the questions as to who is qualified to engage in sport psychology intervention and what types of sport psychology interventions are appropriate have been discussed extensively by professionals in the field. However, the focus of this paper is on a third issue which questions the legitimacy and effectiveness of sport psychology interventions.

The issue as to whether a legitimate body of scientific knowledge exists in sport psychology to guide intervention with athletes has greatly influenced the development of the field. In 1985, the membership of NASPSPA voted not to address issues relating to the professionalization and application of sport psychology. This stand by the preeminent sport psychology organization at that time was the catalyst for the birth of AAASP as an association that would address professional issues such as sport psychology intervention. *The Sport Psychologist* was begun in 1987 as an refereed journal for research and professional practice articles based on sport psychology interventions. Although an organization and journal have been established to advance applied sport psychology, there remains skepticism as to whether scientific evidence warrants psychological intervention with athletes (13). Smith

(40) maintains that the ultimate credibility of sport psychology relies on the commitment and ability of sport psychology professionals to uphold standards of scientific accountability. He states that sport psychology professionals have an ethical obligation to ensure that consumers are not presented with exaggerated claims or unrealistic expectations regarding sport psychology intervention. However, Smith supports the efficacy of sport psychology interventions and advocates a balance between science and practice in sport psychology. Streat and Roberts (41) assert that applied sport psychology has not taken seriously enough the need to critically examine the efficacy of intervention techniques being used by sport psychology practitioners. However, they also state that to abandon sport psychology intervention at this time is illogical as a foundation of scientific and experiential knowledge is available to support current intervention. Gould (13) takes a similar position by asserting that no profession has a complete scientific data base and sport psychology intervention should be guided by the integration of existing scientific knowledge with accepted practice and experience. This integrative perspective currently guides intervention in other professions such as medicine, education, and engineering. And certainly, the literature on intervention effectiveness in sport psychology is expanding as researchers attempt to understand the processes underlying human psycho-behavioral change.

### REVIEW OF SPORT PSYCHOLOGY INTERVENTION RESEARCH

As stated previously, the objective of sport psychology intervention is psycho-behavioral change to enhance performance and the quality of the sport experience for athletes. Many different psychological intervention techniques are used to elicit psycho-behavioral change and different models or approaches to intervention have been developed (e.g.,1,11,44). Three areas of intervention that are extremely popular in sport psychology include imagery, goal setting, and arousal regulation. These research areas are extensively reviewed in separate articles in this volume. Perusal of these articles indicates that equivocal results have been found in each of the areas, yet research evidence does exist to support the efficacy of these interventions.

The research findings are clearest in the imagery area, which is logical as mental practice research has been published since the 1930s and the accumulation of knowledge is greatest in this area. Hundreds of studies have been conducted examining the effects of imagery or mental practice on sport and motor performance. Imagery is one of the most popular intervention techniques in sport psychology (44), and the accumulation of research evidence supports its effectiveness in performance enhancement. Goal setting is an important feature of sport psychology intervention based on the premise that conscious goals

regulate human cognition and behavior. However, goal setting in sport settings has yielded equivocal results and the efficacy of goal setting as a psychological intervention in sport awaits additional research that accounts for individual and situational moderator variables unique to the sport environment. One of the most important psychological skills for athletes is the ability to regulate emotional arousal as it is manifested both cognitively and somatically. Arousal regulation can and should take many forms due to the multidimensional nature of the arousal construct (30). Research has supported various arousal regulation techniques as facilitative to arousal control and sport/motor performance.

One explanation for the equivocal results in sport psychology intervention research is the widespread use of nonathletes as subjects and contrived laboratory tasks as measures of performance. The generalizability of many findings to actual competitive sport settings are questionable. Thus, in this section findings from sport psychology intervention research that is generalizable to sport situations is reviewed to evaluate the current state of knowledge in this area. That is, only studies that provide psychological intervention to athletes and measure performance in noncontrived competitive situations are reviewed. This is not to say that intervention studies that use nonathletes as subjects and novel or basic motor tasks as performance measures are less significant in our study of psycho-behavioral change. Clearly, the knowledge base in sport psychology is advanced by accumulating evidence using different types of designs and methodologies. However, the objective of this review is to examine psychological intervention research in ecologically valid situations.

The section is divided into four parts. First, a comprehensive review of psychological interventions conducted by Greenspan and Feltz (18) is examined. Second, an updated review of intervention research is presented. Third, problems in intervention research are identified and discussed. Fourth, nonexperimental research approaches to the study of psychological intervention in sport are overviewed.

### Greenspan and Feltz Review

To examine the efficacy of intervention techniques in sport psychology, Greenspan and Feltz (18) conducted a review of psychological interventions used with athletes who competed on a regular and organized basis in noncontrived competitive situations. Twenty-three interventions met the criteria of the authors and were included in the review. Interventions were categorized into three areas: relaxation techniques such as visuomotor behavior rehearsal and imagery (9); behavioral techniques such as reinforcement, self-monitoring, and feedback (3); and cognitive-restructuring techniques such as systematic desensitization and stress inoculation (11).

In general, the interventions used to enhance the performance of athletes in competitive situations were associated with improvements. Particularly, educational relaxation-based interventions and remedial cognitive restructuring interventions were effective. However, the authors state that they were able to infer causality in only 11 of the 23 interventions. The majority of the interventions used less than 10 college athletes as subjects and 83% of the interventions tested athletes in individual skills within team sports. Interventions were more educational (74%) than remedial (26%). Educational interventions emphasize the development of psychological skills while remedial interventions evaluate subjects and then implement and assess the effectiveness of a prescribed intervention. The remedial interventions all involved cognitive-restructuring techniques and single-subject designs. Most of the interventions (78%) were multimodal and included relaxation in the treatment.

With regard to design characteristics of the interventions, 65% included some type of control using either a control group or an appropriate single-subject design. Only 18% of the studies employed a manipulation check that the authors felt assessed the degree to which subjects were affected by the intervention. Few studies (22%) compared the effectiveness of different intervention strategies. Of the five studies using this comparison design, three demonstrated greater effects using a combination of strategies as opposed to using single treatments. None of the studies in the review used follow-up procedures to examine the maintenance of treatment effects.

Overall, the Greenspan and Feltz (18) review provides an accurate account of externally valid intervention research in sport psychology. Not only does the review provide useful information about the effects of psychological intervention on sport performance, but it also presents important data about the characteristics of subjects, interventions, and research designs and methods to account for the types of research being conducted in this area.

### Follow-up Review of Intervention Research

To follow up the Greenspan and Feltz (18) review, the sport psychology literature was perused to examine intervention research published since that time. Five journals (*International Journal of Sport Psychology*, *Journal of Applied Sport Psychology*, *Journal of Sport and Exercise Psychology*, *Research Quarterly for Exercise and Sport*, *The Sport Psychologist*) were reviewed and intervention articles that met the criteria of using athletes in competitive performance situations were selected. Eleven total articles including 12 interventions were identified that met the criteria of the review.

A summary of the characteristics of the 12 intervention studies included in the review are listed in Table 1. Interventions were categorized into three areas: cognitive ( $N = 7$ ), cognitive-behavioral ( $N = 3$ ), and behavioral ( $N = 2$ ).

TABLE 1. Characteristics of intervention studies.

Study*	N	Sample	Task	Design	Treatment	Control	Manipulation Check	Reported Effect
Cognitive								
8	27	Junior elite volleyball	Serve reception	Group	Cognitive-affective stress management	Yes	No	+
24	4	College basketball	Defensive skill	S-subject	Imagery, self-talk, relaxation	Yes	Yes	+
14	6	College gymnasts	Seasonal performance	S-subject	Rational-emotive therapy	Yes	No	-
6	65	College swimmers	Seasonal performance	Group/case	Goal setting, imagery	Yes	Yes	+
37	18	Elite skiers	Ski race	S-subject	Self-talk	Yes	Yes	+
12	1	College tennis	Seasonal performance	Case	Goal setting, imagery, arousal regulation	No	No	+
35	29	Club figure skaters	Free skating group	Group	Imagery	Yes	No	-
Cognitive-behavioral								
46	40	Youth basketball	Free throw	Group	Imagery, relaxation, routine	Yes	Yes	+
7	3	College golfers	13 Golf rounds	S-subject	Cognitive behavioral routine	Yes	Yes	-
36	1	Elite wrestler	Seasonal performance	Case	Covert modeling	No	No	+
Behavioral								
22	7	Youth swimmers	Racing turns	S-subject	Feedback	Yes	No	+
22	6	Youth swimmers	Swimming stroke	S-subject	Feedback	Yes	Yes	+

\* Number of study in reference list.

Cognitive interventions were those that focused on developing and/or restructuring thoughts that guide performance. Cognitive-behavioral interventions included cognitive development and restructuring as well as a behavioral plan or routine that was systematically practiced by subjects. Behavioral interventions involved the use of systematic feedback to shape performance behaviors. Nine of the 12 interventions reported that the treatment was effective in enhancing performance, although causality could only be inferred in seven of the nine interventions. Eight (67%) of the studies used a single subject design while four (33%) used a group design with treatment and control groups. Five studies used college athletes, three used elite athletes, three used youth athletes, and one used club athletes. In contrast to Greenspan and Feltz's (18) finding, more of the interventions (75%) used a remedial approach in which intervention was individualized based on needs of the athletes as compared to a general educational approach. Sixty-seven percent of the studies employed multimodal interventions as opposed to using one type of intervention such as imagery, yet only one study compared the efficacy of different treatments.

Ten of the 12 interventions (92%) employed a control with the two not using controls employing a narrative case study description of intervention. Although there certainly is a place in the literature for narrative case studies of intervention programs, these case studies fall short of providing qualitative description from the subjects to provide a basis for evaluating the treatment effects. Only half of the studies employed a manipulation check that provided support for the treatment effects. The need for manipulation checks in intervention research is especially crucial due to the subjective nature of how individuals respond to interventions. Also, most of the manipulation checks that were reviewed were minimal, such as interviewing subjects about how they felt about the treatments. Finally, only three studies (25%) examined the maintenance of treatment effects over time.

An example of a single subject design intervention is the research study by Kendall et al. (24) conducted with

four female college basketball players to improve their defensive performance skills. The study employed a single subject multiple baseline across individuals design which requires that a stable pretreatment assessment of the dependent variable (performance of a specific defensive skill in competition) is maintained. After a stable pretreatment assessment was apparent for each subject, the intervention of imagery, relaxation, and self-talk was sequentially applied to each subject. Performance was assessed via video analysis of each player's performance of defensive skill in competition. Two experts assessed performance and interrater reliability met the criterion for accurate assessment. The intervention was administered to each subject during a 5-d interval free from competition. The intervention consisted of imagery, relaxation, and self-talk that was appropriate for the desired skill outcome. After the initial intervention training, the subjects engaged in individual training for the remainder of the season. Subjects' mental training was monitored through weekly evaluations of their logbooks that included subjects' ratings of mental training for that week. Treatment effects were found across subjects and manipulation checks included an evaluation questionnaire immediately following the treatment phase as well as a social validation questionnaire at the completion of the study.

An example of a group design intervention study is Crocker et al.'s (8) application of cognitive-affective stress management training with 27 elite volleyball players. Sixteen players in the treatment group participated in eight 1-h intervention modules (approximately 1 wk apart) that included relaxation training, self-instructional training, induced affect, and coping responses. Players were given assignments after each module that were evaluated at the next session. Dependent variables included competitive trait anxiety, state cognitive anxiety, state somatic anxiety, self-statements in response to a stressor, and performance in volleyball serve reception. The results indicated that the treatment group emitted fewer negative thoughts in response to stressors and performed better than the control group. No differences be-

tween groups were found on any of the anxiety measures. A weakness of the study is that no manipulation check was used to evaluate subjects' perceptions of the treatment.

Overall, this review of intervention research in sport psychology provides support for the efficacy of various methods of psychological intervention with athletes. Trends that emerged in this review include a greater use of single subject designs, increased adoption of an educational/remedial approach to individualize treatment to subjects, and an emphasis on cognitive restructuring and the development of cognitive-behavioral routines. Weaknesses apparent in the research include a lack of appropriate manipulation checks and the failure to examine the maintenance of treatment effects over time. These problems are discussed further in the next section.

### Problems in Intervention Research

As in any research area, limitations are apparent in intervention research in sport psychology. The studies reviewed in this paper were high in external validity because athletes were used as subjects, intervention took place as part of the athletes' routines, and performance was measured on a competitive skill that was relevant and important to subjects. Clearly, the plea for intervention research in ecologically valid settings has been answered as more and more studies appear of this type. However, it is important to balance the need for external validity with the precision and control necessary to infer causality between treatment effects and the subsequent results of the study.

**Need for controls.** To control for placebo effects and infer causality between treatment and the dependent variable(s), research designs should utilize control groups. To further control for placebo effects, control groups should engage in some type of activity (motivational control) rather than having no contact or engaging in any type of activity (simple control). A good example of an effective control was the use of an attention-control group by Weinberg and colleagues (45) in which specific instructions and an attentional-cognitive strategy was provided to control subjects with the strategy being practiced during the 6-wk period treatment period. Single-subject designs like the Kendall et al. (24) study reviewed previously are useful as they evaluate treatment effects using intra-subject control. Bryan (3) has provided an informative explanation of the use of single-subject designs in sport psychology.

**Need for manipulation checks.** Along with proper controls, intervention research in sport psychology should employ extensive manipulation checks of the treatment. Fifty percent of the studies reviewed in this paper and 80% of the studies reviewed by Greenspan and Feltz (18) did not adequately assess the degree to which subjects perceived they were affected by different components of the treatment. The need for these manipulation checks in intervention research is crucial due to the sub-

jective nature of how individuals respond to interventions. In most studies, subjects were asked to rate the effectiveness of the treatment, but more extensive assessment is needed to provide greater confidence in treatment effects and support for internal validity. A good example is the detailed manipulation check used by Weinberg and colleagues (45) in which they employed 11-point Likert scales to measure such responses as amount of relaxation attained, vividness of images, perspective of images, and perceived physiological responses.

**Need for maintenance data.** Another problem in intervention research is the lack of data examining the maintenance of treatment effects over time. This is particularly important due to the educational approach of psychological skills training in which the objective is to teach mental skills that become well learned and implemented into the psycho-behavioral routines of athletes. Most sport psychology specialists abhor the notion of "quick fixes" in sport psychology intervention, so it seems critical that we begin to evaluate the effects of our intervention for a period of time after the initial treatment. A good example of accounting for maintenance is the study conducted by Hazen and colleagues (22) in which the effects of a videotaped feedback package were examined during training and then during a maintenance phase.

**Need for specific treatment descriptions.** Another problem in evaluating sport psychology intervention research is the lack of specific descriptions of treatments. Interventions should be described in enough detail for readers to understand the type and extent of each treatment. For example, instead of reporting that five cognitive restructuring sessions were held, the explanation of treatment could briefly describe the content of each session, the length of each session, and the length of the entire treatment period. Appropriate examples of specific treatment description are Elko and Ostrow's (14) explanation of the content of six modules in their rational-emotive education program and Crocker and colleagues' (8) specific reporting of content in their eight module structure of stress management training. Also, authors should make detailed accounts of their treatment procedures available upon request.

**Possible bias in published research.** Greenspan and Feltz (18) express concern over the high percentage of intervention studies that report positive results. It may be that publication bias toward positive results exists or that researchers are less willing to submit what they perceive to be "negative" results for publication. The old adage of "nonsignificant results are not necessarily insignificant" seems appropriate here. Researchers (and journal reviewers) should be encouraged to focus on using sound scientific guidelines in conducting intervention research and then reporting whatever outcomes emerge from the interventions. Although some may feel the credibility of the field will be compromised if treatment effects are not found, on the contrary the credibility

of the field will suffer if our published research is biased in reporting only positive results.

**Other problems.** Other problems that have been identified in the literature include the lack of heterogeneity of subjects used in intervention research, possible confounding by moderator variables, and a lack of research that compares the efficacy of different treatments. Most intervention research has been conducted with college athletes, probably because they are the most proximal sample available to researchers. Clearly, intervention studies are needed using subjects of different ages, sport types, and sociocultural backgrounds. Both situational and individual moderator variables are problematic in examining psycho-behavioral treatment effects in sport. Future directions for research that account for these variables is discussed later in this paper. Finally, there is a need for research that examines the effectiveness of different types and combinations of intervention strategies. In both the Greenspan and Feltz (18) review and the follow-up review conducted for this paper, the greatest percentage of studies employed a multimodal approach by using more than one intervention technique. Clearly, multiple strategies are preferred by sport psychology practitioners, yet research is needed to clarify the most effective integration of these strategies.

### Other Research Approaches to Intervention

The research reviewed in the previous sections has focused on the causal effects of sport psychology interventions on athletic performance. There is another body of research that should be recognized that also examines the efficacy of sport psychology interventions. This area of research includes descriptive and correlational studies including accounts of mental skills and strategies leading to excellence, responses to and perceptions of sport psychology interventions, sport psychology consultation effectiveness, and coaching effectiveness through mental skills training.

Descriptive research that demonstrates relationships between certain mental skills/strategies and performance excellence provides sport psychology specialists with useful knowledge about target cognitions and behaviors in intervention. Orlick and Partington (32) identified common elements of success as well as factors that interfered with optimal performance as perceived by 235 Canadian Olympic athletes using both qualitative and quantitative assessment techniques. This study provides an indication of the mental components of excellence that are necessary for successful performance in elite sport.

Another important area of intervention research involves responses to and perceptions of sport psychology interventions. Gould and colleagues (17) found in two studies with elite wrestlers that a psychological intervention program was effective in changing athletes' knowledge, perceived importance, and use of psychological strategies. This study provides a detailed description of

the psychological skills training program. Sullivan and Hodge (42) examined elite coaches' and athletes' perceptions of importance and use of various psychological skills and strategies. Their findings indicate support for the use of psychological interventions to enhance sport performance.

Research has also examined the effectiveness of sport psychology consultants in providing psychological intervention programs with athletes. Gould and colleagues (16) evaluated Olympic sport psychology consultants to examine effective characteristics of these individuals as perceived by coaches, athletes, administrators, and the consultants themselves. Coaches, athletes, and administrators evaluated consultant effectiveness favorably. Similarly, Partington and Orlick (33) interviewed elite coaches who identified positive and negative characteristics of consultants. Overall, the results indicated that the coaches viewed sport psychology intervention as effective and helpful. Partington and Orlick (33) provide additional information about successes in sport psychology consulting and educational implications derived from their data.

A useful extension to the sport psychology intervention literature involves intervention with coaches. Hall and Rodgers (19) developed and conducted a mental skills training program for figure skating coaches designed to aid coaches in implementing psychological techniques with their skaters. Both coaches and their athletes evaluated the training program as valuable. Future research in this area is warranted to evaluate the effectiveness of psychological intervention with coaches.

### FUTURE DIRECTIONS FOR SPORT PSYCHOLOGY INTERVENTION RESEARCH

As stated in the introduction, the intriguing notion eliciting psycho-behavioral change in individuals has spawned the developing area of applied sport psychology. Although some disagreement is apparent, overall support exists for the value and effectiveness of sport psychology intervention. However, the critical evaluation of intervention techniques in sport psychology should continue and even escalate to establish scientific and public credibility for the field. In this section, some suggestions for future directions in sport psychology intervention research are offered.

### Integration of Science and Practice

The appropriate integration of science and practice is the subject of debate in most academic areas and sport psychology is no exception (29,41). Current debate in the literature challenges the positivistic model as the sole means of developing knowledge in sport psychology. The positivistic model embodies a one-way relationship between research-tested theory and practice. In this model, practitioners assume a secondary role as appliers rather than developers of knowledge. Psychologists are begin-

ning to reject positivism as the sole foundation for the generation of knowledge in their field and argue that the development of knowledge consists of many methods (23).

Hoshmand and Polkinghorne (23) suggest a revised relationship between science and practice that is interdependent and involves mutual feedback between scientists and practitioners. Practitioners need to be skilled in adapting research findings into methods of practice, yet likewise researchers need to understand the specific context of sport and how theories operate within this context. For example, sport psychology practitioners should be aware of bioinformational theory which asserts that for imagery to be effective, response propositions (individual responses to specific stimuli) of the individual must be activated to result in psychophysiological changes in the body and thus improved performance (26). Intervention in arousal regulation should account for reversal theory which rejects arousal as a unidimensional construct and indicates that high levels of arousal do not necessarily inhibit performance. But there is also a type of research, called reflective research (38), which is conducted by practitioners in the field as they attempt to clarify patterns of understanding that are developed in practice. Both types of research approaches are important due to inherent differences in conceptual and practical knowledge. As Mahoney (27) states, "knowing" the laws of motion influencing the balance of a moving bicycle is not the same as "knowing how" to ride one. Mahoney also states that to fully understand human change processes, we need to embrace a broader, more human, sense of science. Researchers in sport psychology should expand upon traditional research methodologies to embrace qualitative and idiographic techniques to assess psycho-behavioral change via sport psychology interventions (29,41).

### **Accounting for Individual and Situational Moderators**

Much research on sport psychology interventions does not account for moderator variables, both individual and situational, that influence the effects of different treatments. The fact that sport researchers cannot replicate the strong link between goal setting and enhanced performance found in organizational settings can probably be attributed to the unique nature of sport situations and individual differences in the commitment and motivation to achieve goals (4). Burton's extensive model of goal setting in sport which includes goal orientations, goal setting styles, different responses to goals, and motivational consequences of goals emphasizes the complexity of the goal setting process in sport. Self-esteem of subjects would also seem to be an important individual moderator variable in intervention research, while trait anxiety seems likely to mediate the effects of arousal regulation strategies. Another intriguing individual difference likely to influence intervention effects is self-regulatory style which

describes the extent to which individuals rely on external social cues vs internal cues to regulate behavior (25). It may be that many equivocal findings become clearer when we begin to study the effects of various treatments on different types of individuals, instead of assuming that all individuals will be affected similarly. Obviously, this is the intent with idiographic research in which unique characteristics of a person are examined in relation to psychological intervention effects.

Related to the need for accounting of individual differences in response to interventions, sport psychology interventions should also be contextualized within the unique environment of sport. The psycho-behavioral processes encompassing goal-directed behavior in sport differs dramatically from the psycho-behavioral processes regulating achievement behavior in work settings. An example of this is illustrated by Burton (5) in his work in arousal regulation. Burton refuses to use the term stress management with athletes, rather his approach is based on the pursuit of optimal performance states. He feels that stress management is a term that does not convey the goal of self-regulation that athletes need. Another example of contextualizing interventions involves cognitive-behavioral intervention techniques in which behavioral routines are planned and practiced to make the intervention more automatic and useful.

### **Appropriate Training Models**

The future of applied sport psychology with regard to the successful validation of intervention techniques will be greatly influenced by the training models used to prepare professionals in sport psychology. One of the objectives of the AAASP certification program is to promote quality control by certifying individuals who have the training and experience needed to perform in a competent and ethical manner. Clearly, graduate study in sport psychology should provide and integrate training in basic research, application, and evaluation research. Many prospective students in sport psychology assert that they want to study in an "applied" program and are not interested in research. Frankly, this is an unacceptable objective. Although graduate programs differ in their offerings and emphases, all sport psychology professionals should have the appropriate training to understand the importance of science-practice integration and also to be capable of engaging in sound evaluation of their interventions with athletes. Hopefully, the preparation of sport psychology professionals will include the needed integration of competencies in both research and practice. Based on Mahoney's (27) analogy cited earlier, professional preparation in sport psychology should teach students to ride the bike, to determine the most effective riding technique, and to understand why they are riding.

Address correspondence to: Robin S. Vealey, Department of Physical Education, Health, and Sport Studies, Phillips Hall, Miami University, Oxford, OH 45056.

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