The psychology of olympic excellence and its development

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ABSTRACT This review (1) identifies key psychological characteristics associated with athletic excellence; (2) presents a pyramid model of peak performance that summarizes current psychology of excellence research; and (3) discusses a current psychology of excellence research project that focuses on how psychological talent is developed in Olympic champions. Specifically, the author's studies focusing on how mental preparation and cognitive strategies influence athletic and motor performance, general psychological characteristics associated with athletic success, and anxiety and coping in elite athletes are discussed and factors influencing peak performance identified. Psychology of excellence lessons derived from coaching education projects, athlete mental training consultations, and sport science and administrative experiences are also examined. Hardy, Jones, and Gould's (1996) pyramid model of peak performance that organizes specific peak performance factors into a coherent whole is then presented. Finally, the author and his colleagues' (Gould, Dieffenbach, & Moffett, 2002) current research that identifies the psychological characteristics of 10 of the United States most successful Olympians is discussed. Besides identifying key psychological characteristics such as optimism, high levels of intrinsic motivation, and the ability to focus, this study identifies strategies that these athletes, their coaches, and families identified as influencing their mental development. These included: coach influences; family influences; exposure to high-level athlete models; and personal growth and maturity. It is concluded that two decades of psychology of athletic excellence research forms a strong base for guiding professional practice and stimulating future research. The importance of linking sport psychology research and practice is also emphasized.

Key words: Elite athletes, Mental preparation, Olympic performance excellence.

Introduction

When most individuals think of the Olympic Games, visions of the memorable performances of great athletes come to mind. In Greece, for example, I trust that the Sydney Games gold medal winning performances of track and field stars Kenteris Konstantinos and Thanou Ekaterini, weight lifters Kakiasvilis Akakios and Dimas Pyrros, and Taekwando fighter Mouroutsos Michalis will be etched in the memories of Greek people for years to come. I am also sure that many great Greek athletes are now training diligently in the hope of fulfilling their dreams of earning a medal at home in Athens in 2004. It is no surprise, then, that a major thrust of modern sport psychology has been the search for a better understanding of how psychological factors influence athletic performance, especially elite athletic performances like those seen at the Olympic Games.

For the last 20 years, I have been interested

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in the psychology of athletic excellence, both as a researcher and practitioner of applied sport psychology. While my journey is far from complete, I have learned a great deal by blending my research and practical experiences in this area. I would like to share with you what I have learned. This paper has three major purposes. These include: (1) to briefly describe 20 years of research and professional practice experience focused on identifying the key psychological ingredients needed for athletic excellence; (2) to present a pyramid model of peak performance that summarizes current research and thinking in the area; and, (3) to discuss my latest research that focuses on how psychological talent is developed in Olympic athletes. In accomplishing these general purposes, I also hope to demonstrate the importance of linking sport psychology research and practice, identify future research directions, and outline implications for practice.

While my focus will be on the research my colleagues and I have conducted since 1980, my ideas are not necessarily unique. They have been greatly influenced and shaped by the work of other investigators like Yuri Hanin, Lew Hardy, Graham Jones, Michael Mahoney, Rainer Martens, Terry Orlick, Ron Smith, Robin Vealey and Bob Weinberg, as well as practitioners such as Gloria Balague, Cal Boterill, Sean McCann, Shane Murphy, Bob Rotella, and Ken Ravizza. Additionally, my work would not have been possible if not for the tremendous efforts of the numerous doctoral students I have collaborated with in this time period. Their tireless efforts, boundless enthusiasm, and good humor have been a key to any success I have achieved.

Lastly, my work can be better understood by knowing my orientation to the field. My background and training is in physical education and while I am best known as a sport psychology researcher, I view myself more as an educator who uses the science of psychology to help athletes and coaches than as a psychologist or sport scientist per se. While I appreciate the value of basic science, basic research is not what I want to do. Hence, almost all my research has been driven by an interest in answering practical questions for those working in the field, using any method or theory that will facilitate answering those questions. My theoretical bias is much more social psychological and cognitive behavioral than physiological. Additionally, while I have a strong belief in research and the research process, I am equally committed to understanding professional practice knowledge generated from those working in the field. In fact, I have found that some of my richest learning experiences have come from the coaches and athletes I have had the opportunity to interact and consult with.

Twenty years of psychology of excellence research and practice

I have spent the last year thinking about what to include in this article. To fulfill the aims of this paper, I content-analyzed the psychology of excellence research my colleagues and I have conducted, looking for patterns, trends and identifying major conclusions. I employed the same process in examining my consulting and administrative work. By briefly reviewing this work, I hope to provide some findings of interest and lessons learned, as well as give you a glimpse of the evolution of my knowledge development.

Psychology of excellence research

Between 1980 and the present I have authored or co-authored 20 plus psychology of excellence research studies. Three lines of research are evident when these studies are examined. These included: (1) studies focusing on how mental preparation and cognitive strategies influenced athletic and motor performance; (2) general psychological characteristics associated with athletic success; and (3) anxiety and coping in athletes. Each of these lines of research will be summarized below.

Mental preparation and cognitive strategies research. In the early 1980s colleagues Bob Weinberg, Alan Jackson, and I conducted a series of studies that examined how mental preparation or psych-up strategies influenced athletic or motor task performance (Gould, Weinberg, & Jackson, 1980; Weinberg, Gould, & Jackson, 1980a, 1980b, 1981; Weinberg, Smith, Jackson, & Gould, 1984). These studies were fairly simple in their orientation, instructing participants to employ various mental preparation or cognitive strategies such as using imagery, preparatory arousal, or relaxation just prior to performing various motor, strength, or athletic tasks. Reflecting the dominant paradigm of the time, these studies were typically carried out in highly controlled laboratory conditions in an effort to draw causal inferences.

Our results clearly revealed that the mental preparation or cognitive strategies employed by the participants led to changes in motor task performance. However, no one strategy was found to be consistently facilitative and any performance enhancement effects were dependent on the nature of the task.

While the results of these early studies are obvious by today's standards, at the time, they were important because they validated the notion that what an athlete thought clearly affected his or her performance. They also shattered our illusion that simple relationships existed between the types of cognitive strategies employed and performance effects. Rather, it became clear that while cognitive strategies were important influences on performance, they were dependent on such factors as the nature of the task and individual differences. Most importantly, we began this line of research because we wanted to scientifically verify what athletes often reported, "that psyching-up facilitated their performance." Hence, for me, it was the start of a pattern of research that would focus on practically driven concerns of athletes and coaches.

Psychological characteristics associated with athlete success. My second line of psychology of performance excellence research began in 1981 and is still going on today. In it, my colleagues and I have attempted to identify the psychological characteristics of more and less successful elite athletes. It was originally spurred by the U.S. Olympic gymnast research of Mahoney and Avener (1977), and later greatly influenced by Orlick and Partington's (1988) classic study of mental factors associated with athletic success in Canadian Olympic athletes.

We began this research by examining psychological characteristics associated with National Collegiate Athletic Association (NCAA) Big Ten conference wrestling success (Gould, Weiss, & Weinberg, 1981), and later moved on to interview studies examining an outstanding Olympic coach (Kimiecik & Gould, 1987), a female professional bowler (Gould & Finch, 1990), and more versus less successful Olympic wrestlers (Gould, Eklund, & Jackson, 1992a, 1992b). The Big Ten wrestling study showed that more versus less successful athletes could be discriminated between based upon their psychological characteristics and strategies such as self-confidence, anxiety management, and motivation. However, reanalyzing our data in a follow-up investigation, the late Steven Heyman (1982) demonstrated that these factors are reciprocally intertwined. That is, he found that previous performance success is just as likely to discriminate between more and less successful athletes as are psychological factors such as confidence or commitment. Caution then, must be used in drawing conclusions about the role psychological factors play in athletic success.

The case interviews were important in several ways. First, they demonstrated to me the importance of studying individuals in some depth, as opposed to focusing solely on the dominant nomothetic research orientation of the time. They also allowed me to see the value of collecting qualitative interview data, as numerous insights were evident beyond what would have been available if we solely relied on existing quantitative measures. For example, in the interview

conducted with legendary swim coach James "Doc" Counsilman (Kimiecik & Gould, 1987), I was greatly influenced by Coach Counsilman's statement that the "science of coaching" focuses on the general principles that evolve through our research, while the "art of coaching" is knowing when and with whom to apply these principles. Similarly, in my interview with professional bowler Michelle Mullens (Gould & Finch, 1990), I was fascinated by her notion that the mental preparation an athlete needs to consistently be in the top ten performers of the sport is somewhat different than what is needed to be the best and win. Finally, the Olympic wrestling research demonstrated the utility of examining success relative to one's own past performances and the importance of looking for trends across individuals as well as athlete-specific idiographic findings.

Another important lesson learned from this line of research came from the evaluation research we conducted to determine if providing one week camps that involved both sport science and psychology training sessions to U.S. national team wrestlers had any perceived influence on performance (Gould, Petlichkoff, Hodge, & Simons, 1990). Interestingly, while we found that knowledge changes occurred as the result of our mental training efforts, many were short-lived and behavioral changes were much harder to elicit. Moreover, some of our data suggested that athlete-reported behavioral changes were most likely to occur when we took mental lessons out of the classroom and incorporated them in on-the-mat activities.

Lastly, our current research examining mental factors influencing the performance of US Olympic athletes and coaches who had participated in the Atlanta and Nagano Games (Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999; Gould, Greenleaf, Dieffenbach, Lauer, Peterson, & McCann, 1999; Gould, Greenleaf, Guinan, Dieffenbach, & McCann, 1999; Gould, Greenleaf, Chung, & Guinan, 2002; Gould, Greenleaf, Guinan, & Chung, 2002; Greenleaf, Gould, & Dieffenbach, 2001) has been most informative. These studies involved assessing a wide array of physical, social, and psychological performance influences and their effects on all US athletes and coaches using surveys, individual interviews, and focus group interviews. Athletes and coaches reported that a number of psychological factors such as confidence in oneself and teammates, adhering to one's mental preparation routine, strong team cohesion and harmony, and coaching trust had important influences on performance. However, the most important finding from this study was the general conclusion reached. Specifically, it was concluded that:

"Successful Olympic performance is a complex, multifaceted, fragile, and long-term process that requires extensive planning and painstaking implementation. It seldom happens by chance and can easily be disrupted by numerous distractions. Attention to detail counts, but must also be accompanied by flexibility to deal with numerous unexpected events." (Gould, Greenleaf, Guinan, Medbery, Lauer, Chung, & Peterson, 1998, pp. 9-10).

I often think of this concluding statement and its meaning when designing studies and interventions. For me, it shows that the high performance world of elite athletes and coaches is multivariate and complex and our attempts to understand this world must be more sophisticated and multileveled than they have been to date.

Anxiety and coping in athletes. A third line of investigation that I have been involved in has focused on studying anxiety and coping in athletes. I began this line of research in 1983 when Thelma Horn, Janie Spreemann, and I (Gould, Horn, & Spreemann, 1983a, 1983b) studied stress sources in junior elite wrestlers and went on to examine stress sources in elite collegiate wrestlers (Gould & Weinberg, 1985), National Champion figure skaters (Gould, Jackson, & Finch, 1993) and injured elite ski racers (Gould, Udry, Bridges, & Beck, 1997b; Udry, Gould, Bridges, & Beck, 1997). Overall, we found that

elite athletes experience considerable stress, with fear of failure and concerns about social evaluation being major stress sources. It is also interesting to note that we found that defending a national title is more stressful than initially achieving it, and the primary cause of stress for injured athletes are social concerns like isolation from one's team and physical inactivity concerns and not physical injury per se.

Closely associated with the stress source research were the studies Eileen Urdy, Suzie Tuffey, Jim Loehr, and I conducted on burnout in junior tennis players (Gould, Tuffey, Udry, & Loehr, 1996, 1997; Gould, Udry, Tuffey, & Loehr, 1996). We verified Smith's (1986) contentions that junior tennis burnout was stress related and resulted from an interaction of personal and situational factors. For some young athletes it was primarily driven by their perfectionistic personalities, for others environment pressure from coaches or parents, and still others from physical overtraining. Recommendations for preventing and/or coping with burnout included: playing for your own reasons, balancing tennis with other life pursuits, finding ways to make the game fun, and taking time off to relax. It was suggested that parents involve players in decision making, provide empathy and support, and provide an optimal amount of "pushing."

With my colleagues, I have also examined the anxiety-athletic performance relationship, initially finding little support for multidimensional anxiety theory predictions (Gould, Petlichkoff, Simons, & Vevera, 1987) in shooters. Later research focused on testing Hanin's (1995) individualized zones of optimal function predictions with multivariate anxiety (Gould, Tuffey, Hardy, & Lochbaum, 1993). Our current research is focusing on identifying the range of emotions associated with optimal performance in athletes (Gould, Medbery, Dieffenbach, Lauer, Hardy, & Jones, 1999).

Finally, we began to explore the coping strategies elite athletes used to deal with the stress they experienced. Strategies elite athletes used to cope with performance anxiety (Gould, Eklund, & Jackson, 1993), the pressure of defending a national title (Gould, Finch, & Jackson, 1993) and recovering from season-ending ski injuries (Gould, Udry, Bridges, & Beck, 1997a) were all examined.

Overall, these studies have led us to conclude that elite athletes experience considerable stress from a variety of performance and nonperformance sources. Coping must also be viewed as a complex process influenced by the personality of the athlete and the situations they compete and train in. Coping strategies used by athletes vary widely from athlete to athlete, but are similar to those identified in the general psychology literature. The same coping strategies are not used for all stress sources, however. Elite athletes also use both adaptive and maladaptive coping strategies. Finally, a number of arousal regulation strategies can be employed to achieve an optimal zone of emotional functioning that leads to best performance (Gould & Udry, 1994).

Professional practice experiences

As I was developing as a sport psychology researcher in the last two decades, I was also fortunate to have a number of professional practice experiences that have greatly influenced my development as a scholar and consultant. As was the case with my research experiences, I retrospectively content-analyzed these and identified three general contexts and lessons derived from these experiences (although there was no planned organization to these from the start). These included: (1) coaching education lessons; (2) athlete mental training consultation lessons; and (3) sport science and coaching administrative lessons.

Coaching education lessons. Some of the most valuable mental training lessons I have learned have come from interacting with coaches while I served as a coaching educator. This began with my USA Wrestling coach education

involvement which took place from 1980 to 1992, followed by 10 years of coaching education involvement across a number of sports through the US Olympic Coaching Development Committee, and for the last three or four years with the US Tennis Association. By conducting sport psychology coaching clinic sessions, my scientific results were put to the test and numerous ideas for future studies have been identified.

Athlete mental training consultation lessons. In addition to educating coaches, I have served as a mental training consultant with elite athletes. Over the years I have worked with elite figure skaters (1981-1991), junior wrestlers (1982-1989), World and Olympic wrestlers (1984-1992), World Cup skiers (1992-1998), and with a driver and pit crew in professional auto racing (1995-1996, 1999-present). While my primary duties in these contacts focused on advising athletes as to optimal mental skills training, working with these high caliber performers has been invaluable in providing insights into their psychological make-up. I have also been able to gain a first hand perspective on the stresses these athletes experience and what research principles do or do not work in the real world of elite sport. Finally, I have been able to better understand elements that contributed to successful performance enhancement consultations (See Table 1).

Sport science and coaching administrative lessons. A third set of professional practice experiences that has influenced my development involved sport science and coaching committee duties as a member or chair of a committee. These included membership on the US Olympic Coaching Development Committee (1985-1996) and the US Olympic Athlete Performance Group (1996-2000). I also chaired the USA Wrestling Science and Medicine Committee (1982-1986) and the US Olympic Sport Science and Technology Committee (1996-2000). Serving on these committees gave me an appreciation of the need to integrate sport psychology with the other sport sciences and within the total competition and training program of the athlete. For better or worse, I also was able to understand the political reality of working within large sport organizations and barriers to implementing knowledge. Finally, I grew to understand that having scientifically valid and useful sport psychology knowledge is not enough. Effective implementation systems must be developed for disseminating that knowledge. And developing such systems takes considerable effort and planning.

Professional practice experiences, then, have taught me a great deal. In addition to the points already mentioned, several more general lessons emerged. First, I learned to listen to the athletes and coaches and identify practical issues that could be studied, such as sources of stress in

Table 1
Consulting lessons learned (based on Gould, 2001)

1. Recognize how difficult it really is to achieve World-class athletic success.
2. Do not try to do too much or be too helpful when working at major competitions.
3. Make efforts to fit in with teams.
4. Work to create a positive social emotional climate at major competitions.
5. At major competitions minimize questioning in front of athletes.
6. Recognize that coaches and athletes are very sensitive at major competitions.
7. Remember that minor remarks can unknowingly influence athletes.
8. Help athletes avoid energy-reducing distractions.
9. Be aware of the need to develop athlete and coach trust.
10. Remember that coach support is critical.

national champions, the psychological ramifications of being injured, and the need to identify causes of burnout. Second, these experiences brought to light the complexity and multivariate nature of the practical world of athletes and coaches and the need to consider a wide array of factors when intervening. Third, I realized that an intervention or research finding can be scientifically interesting and useful, but of little practical use because it is not politically accepted by the athletic community. Finally, I am better able to understand how athletes and coaches think – both their language and what they will accept.

The pyramid model of peak performance

Towards the end of the 20 year period I just described, I was struggling a great deal as a scientist-practitioner. I had learned much from my research and professional practice experiences, but I did not have my lessons well-organized in a parsimonious fashion. In addition, in 1996 I co-authored a text, *Understanding psychological preparation for sport: Theory and practice of elite performers*, with Lew Hardy and Graham Jones of the United Kingdom and through them became exposed to a vast amount of interesting European sport psychology literature in the area. My co-authors also had a wonderful grasp of the general psychological research that facilitated my development as a scholar. However, this too contributed to the information overload I was experiencing.

Luckily this state of affairs would be remedied by the formulation of a psychological preparation for peak performance model that was first developed with Nicole Damarjian (Gould & Damarjian, 1999) and later greatly refined thanks to the efforts of Lew Hardy and Graham Jones (Hardy, Jones, & Gould, 1996). This model is depicted in Figure 1.

The model consists of five sets of factors, all of which reciprocally interact to influence athlete performance. Specifically, the top of the pyramid represents a task-specific ideal performance

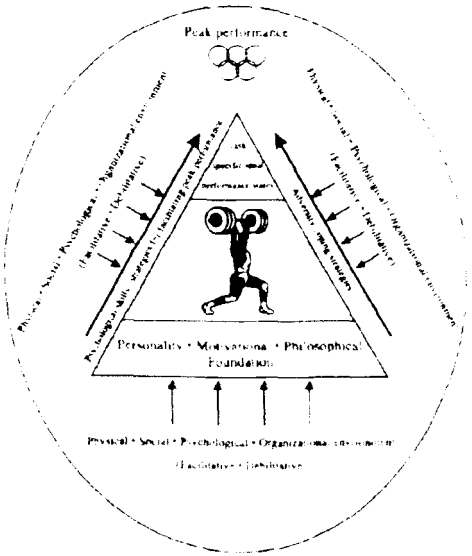

Figure 1
The Pyramid Model of Peak Performance

state that ultimately leads to peak performance (represented by the Olympic rings at the top of the figure). This ideal performance state results from three sets of internal factors: (1) fundamental personality, motivational and philosophical characteristics and dispositions (the base of the model); (2) psychological skills/strategies for facilitating peak performance (the left side of the model); and (3) coping with adversity strategies (the right side of the model). The area contained in the circle surrounding the pyramid is the physical, social, psychological, and organizational environment in which the athlete performs and trains. Each of the main components of the model is briefly discussed below. However, for a more detailed discussion the reader is referred to Hardy, Jones, and Gould (1996).

Fundamental personality, motivational, and philosophical characteristics

The base of the model contains the personality and motivational characteristics and dispositions of the athlete, such as his or her level of trait confidence, goal orientations, trait anxiety, and attentional style. Based on the current research we are conducting in our laboratory, I would also include dispositions such as perfectionism (Frost & Henderson, 1991), hope (Snyder, 2000), and optimism (Seligman, 1991). Although relatively unexplored in the sport domain, all three have been shown to have important influences on human behavior. Also included in this section of the model is one's philosophical orientation. Experienced consultants like Ravizza and Hanson (1995) and Orlick (1989) have emphasized the importance of the athlete understanding his or her reasons for athletic involvement. Thus, the 'meaningfulness' of the sport experience for the athlete is seen as a critical component of athletic success.

This element of the model is critically important because while our understanding of personality in sport is far from complete (Vealey, 1992), one's basic motives, disposition, and philosophical orientation influences what tasks he or she chooses to participate in as well as the direction and intensity of his or her efforts. Moreover, virtually all the other variables contained in the model are influenced in some way by these foundational characteristics. Finally, most of these orientations are developed in childhood so this section of the model emphasizes the need for those interested in elite performance to be very concerned with the psychological development that takes place in the youth sports experience.

Psychological characteristics for facilitating peak performance

The left side of the pyramid depicts psychological strategies that sport psychology researchers have found to help facilitate peak performance. Included in these are such factors as focusing on process or performance goals at the time of competition, using imagery, the employment of relaxation techniques, and the development of and adherence to specific mental preparation routines. Top performers consistently prepare themselves for peak performance and while they may not use all the factors listed in this component of the model, they would employ many of them as part of their normal mental preparation (Gould, Guinan, Greenleaf, Medbery, & Peterson, 1999). It should also be noted that while the employment of these strategies does not ensure success, their use increases the probability of success by helping create an ideal performance state.

Coping with adversity strategies

A common mistake I made early in my consulting and research career was to focus sole attention on peak performance strategies. However, as I gained applied experiences with elite competitors I recognized the need to learn to

deal with adversity. This realization was further verified in my research on stress sources in elite performers (e.g., Gould & Jackson, 1993; Gould, Jackson, & Finch, 1993). Elite performers must cope with stress resulting from their own and others' performance expectations, the media, injury, time demands, and general life concerns. Hence, elite athletes must not only possess psychological skills and strategies for facilitating peak performance, but must also have the skills needed to cope with adversities that could interfere with achieving their ideal performance state. This section of the model, then, depicts a variety of coping skills elite performers must possess and, ironically, contains many of the same skills and strategies (e.g., imagery, process goal setting, relaxation) that are contained in the psychological skills for facilitating peak performance model component. The way in which these skills and strategies are used when coping is quite different, however. In addition, some of our research (e.g., Gould, Eklund, & Jackson, 1993) suggests that to cope effectively during competition these coping skills must be so well learned that they become automatized – something we seldom stress enough in applied sport psychology.

The task-specific ideal performance state

Sport psychological research (Gould, Tuffey, Hardy, & Lochbaum, 1993; Hardy et al., 1996; Hanin, 2000) has consistently shown that for optimal performance to occur elite athletes must achieve an ideal performance state. This individual recipe of emotions, or zone of optimal functioning is comprised of a complex multivariate mixture of cognitions, emotions, and physiological states. The most likely common elements included in this recipe are arousal, activation, mood, cognitive and somatic anxiety, level of self-efficacy, and perceptions of control. Finally, this ideal performance state is most likely task- and individual specific but is influenced by the three previously discussed sets of internal model factors.

The physical, social, psychological, and organizational environment

A common mistake we make as mental training consultants is that we focus so much attention on helping elite athletes achieve their optimal psychological states that we fail to remember that these individuals do not live in a vacuum. Rather, elite athletes compete and train in a physical, social, psychological, and organizational environment that can both facilitate and disrupt their psychological status. For example, our stress-source research over the years and more recent Olympic-athlete-performance-influence research shows that Olympians are affected by any number of organizational and environmental stressors such as national sport governing body politics, team selection controversies, bad officiating, lack of finances, and family/friend concerns (Gould et al., 1993; Gould et al., 1999). We must recognize and consider these factors when planning interventions or designing investigations. For this reason, the pyramid model is incased in the physical, social, psychological, and organizational environment that constantly influences it.

The pyramid model for peak performance was not designed for empirical test. Rather, it is a heuristic model that can be used in several ways. First, it is a good way to organize the large body of existing psychology of peak performance research. Yet, it allows one to consider the range of factors affecting elite athlete performance. While the full model would be impossible to test, portions of it can be examined. Second, the model can be used to guide professional practice. For example, when I consult with athletes, I find it useful to keep the model in the back of my mind and organize what I am hearing or observing relative to the model's key components. In this way I can get an idea of what skills an athlete

may or may not possess and what we need to focus on. At times, I have also found it useful to show a very simple version of the model to athletes or coaches for the purpose of having them consider what mental skills are needed for peak performance and in an effort to solicit their opinions relative to what areas they need to develop (Gould, 2001). Besides providing me with information, this also helps give the athlete a clear picture of where we are going in our mental skills development work.

The development of psychological talent in elite athletes

Although much remains to be discovered regarding the psychology of athletic excellence, I am very pleased to see how much we have learned in the two short decades that I have been involved in this area of research. We have certainly come a long way since the initial studies my colleagues and I conducted relative to determining whether psyching up facilitated physical performance.

The issue that my students and I have recently turned our attention to is gaining a better understanding how outstanding athletes psychologically develop and what factors influence their development. Are these outstanding performers genetically programmed, parented and/or coached in certain ways, or are they quick learners?

To examine these issues and thanks to the support of the US Olympic Committee we are in the process of conducting a study that focuses on the process of psychological talent development in Olympic Champions. Participants in the study include 10 of America's most successful Olympic performers (six males and four females). As a group these athletes have won 28 gold, three silver, and two bronze Olympic medals and countless World Championships in nine different sports (three winter Olympic and six summer Olympic sports). Hence, these were some of the top performers in the world. In-depth retrospective telephone interviews, ranging from 60 to 150 minutes, were conducted with the athletes. In addition, all the athletes completed a battery of psychological tests which included: the Sport Anxiety Scale (Smith, Schultz, Smoll, & Ptacek, 1995); the Cognitive Hardiness Scale (Norwack, 1990); the Multidimensional Perfectionism Scale (Frost & Henderson, 1991); the Sport Motivation Scale (Pelletier, Tuso, Fortier, Vallerand, Briere, & Blais, 1995); the Athletic Coping Skills Inventory-28 (Smith, Smoll, & Schutz, 1990); the Test of Performance Strategies (Thomas, Murphy, & Hardy, 1999b); the Trait Hope Scale (Snyder, Cheavens, & Michael, 1999); the revised Life Orientation Scale (a measure of optimism) (Scheier, Carver, & Bridges, 1994); and the Task and Ego Orientation in Sport Questionnaire (Chi & Duda, 1995).

This investigation has two major purposes: (1) to identify the psychological attributes and characteristics of these outstanding performers; and (2) to determine what factors influenced the development of these psychological attributes and skills. While this is certainly an exploratory study because of the lack of research in this area, this does not mean its conceptualization and interpretation has been unguided by existing literature on talent development. In the sport area, the classic work of Bloom (1985) and the more recent work of Csikszentmihalyi, Rathunde, and Whalen (1993), Côte (1999), and Durand-Bush and Salmela (2001) were critical in this regard. An abundance of literature on general talent development such as Howe's (1999) book on *The Psychology of High Ability* and Ericsson's (1996) work on the importance of deliberate practice in skill learning was also used to guide this project.

Our interview questions focused on factors thought to influence the psychological development of these champion athletes. Specifically, the athlete interview guide began with general questions about the athlete's career (e.g., when the athlete began participating and competing in

the sport, what support they received from parents and coaches). Next, the focus of the interview questions turned to the athlete's mental skill strengths (stimulated by a discussion of the results of various psychological inventories administered before the interview). Finally, questions focused on how the athlete developed these strengths relative to each of Bloom's (1985) career phases (the early, middle, and later years), as well as specific questions focusing on issues identified in the Csikszentmihalyi et al.'s (1993) talented teen research. For example, Csikszentmihalyi et al. (1993) found that talented teens were more work-oriented and less focused on socializing than their peers during their teenage years.

Finally, in addition to the 10 athletes interviewed, a significant other (e.g., one of the athlete's parents or siblings), as well as a coach who was identified as being very involved in the athlete's career was also interviewed. These individuals responded to the same general questions as the athletes. This allowed us to triangulate findings across sources, an important criterion for establishing trustworthiness in qualitative data analysis (Hardy, Jones, & Gould, 1996). It also provided additional perspectives and sources of information about the athletes' psychological development.

Currently, our investigative team is in the process of analyzing the results. Preliminary findings, however, are very interesting. Relative to the athletes' psychological strengths, as a group, they are very optimistic, exhibited high levels of hope, were very determined and committed, exhibited high levels of intrinsic motivation, and exhibited a tremendous ability to focus. These findings support previous research on psychological characteristics of successful athletes (Hardy, Jones, & Gould, 1996; Orlick & Partington, 1988; Williams & Krane, 2001) in that the ability to cope with and control anxiety, confidence, the ability to concentrate and block out distractions, competitiveness, high levels of intrinsic motivation, hard work ethic, and the ability to set and achieve goals were found to characterize these champions. In addition, high trait hope (the ability to begin and continue along selected goal pathways) (Snyder, 2000) and adaptive versus maladaptive perfectionism (Rice & Mirzadeh, 2000) are new variables identified as important. Although a good deal of consistency has been exhibited across the group of 10 athletes, they are all unique in their own ways and no two athletes were alike. Finally, as might be expected, all the athletes exhibited a good deal of physical ability for their sport, although they were not always the most physically gifted of their peers.

In terms of their athletic development, the athletes tended to follow Bloom's (1985) three phases of development. Specifically, they initially participated for fun and fell in love with their sport at an early age. They then entered a middle phase where they showed talent, became more committed and involved, and received specialized coaching. Finally, in the elite stage, these athletes worked many hours striving for excellence while further perfecting their skills. We also found that many of these individuals had early exposure and contact with high-level competitors in their sport which provided both inspiration and various forms of vicarious learning. It was also noted that in those instances where these athletes were unsuccessful at young ages, they understood the reasons for their lack of success (e.g., played up an age division) and drew inspiration from any defeats.

Families were critical in the psychological development of these athletes. They transported their children, attended practices and often were involved in the sport organization itself (e.g., serving as timers, officials, administrators). Participation was clearly supported and encouraged, but seldom was "pressure to win" emphasized. In fact, we often found that while the parents were very supportive and wanted their child to be successful, when they did win no big deal was made of winning – they treated the athlete as they always had and equal to other

siblings in the family. Families typically emphasized a belief in the child's ability to succeed or a "can do" attitude. They also modeled a hard work ethic in the things they did themselves. It was also clear that while sport participation was supported and encouraged, it was not the only activity emphasized by the family. Families did not view sport involvement as their child's entire life. Rather they provided clear expectations that the athletes would do well in or finish school and made sure they were working toward a career path. Finally, siblings often played a major role in the athletes' psychological development. They served as important role models and often trained with the Olympian as they were growing up.

This is not to say that all 10 athletes had ideal parents or followed these group trends exactly as specified. In one case, an athlete had a parent who focused solely on winning and who failed to show any psychological support. However, the other parent of this athlete showed total support and unconditional love. This same athlete experienced severe clinical depression and adjustment problems for a significant period of his or her athletic career. Thus, having the psychological skills needed to perform well in sport, did not always mean an athlete had a well-adjusted life outside of sport. Interestingly, the athlete, the parent interviewed and the athlete's coach all felt that sport provided a safe refuge for this individual and, in many ways, may have saved his or her life.

Our results, so far, verify Côte's (1999) recent research that demonstrates the importance of examining family influences on elite athlete sport achievement. Most importantly, we found that the role of the family in youth sports involvement is a complex one. Like Côte (1999), we also found that parents were critical in providing opportunities for children to enjoy sport, that athletes made a commitment to one or two sports in the specializing or middle years, that parents made considerable financial and time commitments to their children, and that parents played a critical role in helping their children cope with setbacks encountered in higher sport training. However, our findings differed from Côte's (1999), in that, we did not find the Olympians to be recognized as gifted at an early age (although all were successful to some degree), that younger siblings exhibited jealoucy toward the talented athlete, that parents treated the gifted athlete differently from their siblings, or that another child acted as a role model for work ethic (although we found that someone modeled a hard work ethic). Additional research is needed to further explore these differences.

Coaches also played a critical role in the psychological development of the athlete. First, for most of the participants, a coach recognized their potential and showed special interest in them. They also provided good technical coaching early in their careers. Most of the coaches also demonstrated superior emotional intelligence, reading their athletes' psychological strengths and needs and reacting accordingly. As was the case with the parents, this general trend does not imply that all the coaches that these athletes were exposed to in their careers exhibited these tendencies. Some ineffective and negative coaches were identified, however, they were in the minority.

Finally, a wide variety of strategies were discussed relative to the development of these athletes' mental skills and characteristics. Some of these included: coach influences; family influences; exposure to high-level athlete models; and personal growth and maturity. Coaching influences included modeling important characteristics such as determination and hard work, teaching psychological skills such as visualization and goal setting, and providing athletes with multiple types of support (e.g., technical, social). Families (e.g., parents, siblings) influenced athlete development through modeling (e.g., demonstrating optimism), positive expectations (e.g., an "if you are going to do it, do it right" attitude), various kinds of support and encouragement (e.g., financial support) and optimal parent push (e.g., listening to and

respecting athlete's wishes, not pressuring athletes to win). Athlete's psychological development was also influenced by exposure to various forms of elite level athletics including coaches who had been Olympians and teammates competing at elite levels. Finally, the natural process of maturity for the development of psychological growth of psychological talent was identified.

Of course, this study's strengths and weaknesses must be recognized in interpreting these findings. Strengths included the elite nature of the participants (some of the most successful US Olympians of all time), triangulation of findings across data sources (athlete, coach, significant other) and methods (interviews, survey assessments), the three person consensus data verification procedure, and the wide scope of the study. Limitations included the small sample (especially relative to the quantitative measures), the retrospective nature of the data which might have been influenced by memory bias and attribution effects, and the fact that no comparison group of equally experienced but less successful Olympians was examined.

Although preliminary, these findings demonstrate that an outstanding athlete's psychological development takes place over a long-term process and is influenced by a variety of people and factors. Thus, these findings support the earlier work of Bloom (1985) and Csikszentmihalyi et al. (1993), and clearly show that talent development is a long-term process that involves both the talented person and a strong support system.

Conclusions

During two decades of psychology of athletic excellence research we have come a very long way and have learned much to help individuals in the quest for Olympic excellence. We have identified many of the key psychological factors needed to achieve athletic excellence, and researchers around the world are examining how sport psychologists can train these skills and attributes. Lessons for guiding effective consultations have also begun to emerge and we clearly are much better prepared today to provide performance-enhancement consultations. Hence, we can help coaches and athletes identify and develop key psychological skills such as confidence, concentration and focus, intrinsic motivation, and achievement motivation and goal accomplishment. Some of us are also starting to explore the broader development of psychological skills, building on the classical work of Bloom (1985) and Csikszentmihalyi et al. (1993), and identifying the practices of coaches, parents and significant others contribute to the development of psychological talent. Certainly, much more needs to be known, but we can be proud of the progress made to date. We can also be confident that we have a solid data base to guide professional practice in the area. Psychology of athletic excellence research, then, can form a strong base for guiding professional practice and stimulating future research as we enter this new millennium.

References

Bloom, B. S. (1985). *Developing talent in young people.* New York: Vallantine.

Chi, L., & Duda, J. (1995). Multi-sample confirmatory factor analysis of the task and ego orientation in sport questionnaire. *Research Quarterly for Exercise and Sport, 66,* 91-98.

Côte, J. (1999). The influence of the family in the development of talent in sport. *The Sport Psychologist, 13,* 395-417.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure.* New York: Cambridge.

Durand-Bush, N., & Salmela, J. H. (2001). The development of talent in sport. In R. N. Singer, R. N. Hausenblas, & C. M. Janell (Eds.), *Handbook of sport psychology* (2nd ed., pp. 269-289). New York: Wiley.

Ericsson, K. A. (1996). *The road to excellence:*

The acquisition of expert performance in the arts and sciences, sports, and games. Mahwah, NJ: Erlbaum.

Frost, R., & Henderson, K. J. (1991). Perfectionism and reactions to athletic competition. *Journal of Sport and Exercise Psychology, 13,* 323-335.

Gould, D. (2001). Sport psychology and the Nagano Olympic Games: The case of the U.S. Freestyle ski team. In G. Tenenbaum (Ed.), *The practice of sport and exercise psychology: International perspectives* (pp. 40-67). Morgantown, VA: Fitness Information Technology.

Gould, D., & Damarjian, N. (1999). Mental skills training in sport. In B. C. Elliot (Ed.), *Applied sport science: Training in sport. International handbook of sport science* (Vol. 3, pp. 69-116). Sussex, England: Wiley.

Gould, Dieffenbach, K., & Mottett, A. (2002). Psychological characteristics and their development in Olympic Champions. *Journal of Applied Sport Psychology, 14, 177-209.*

Gould, D., Eklund, R. C., & Jackson, S. A. (1992a). 1988 U.S. Olympic wrestling excellence I: Mental preparation, precompetitive cognition and affect. *The Sport Psychologist, 6*(4), 358-382.

Gould, D., Eklund, R. C., & Jackson, S. A. (1992b). 1988 U.S. Olympic wrestling excellence II: Thoughts and affect occurring during competition. *The Sport Psychologist, 6*(4), 383-402.

Gould, D., Eklund, R. C., & Jackson, S. A. (1993). Coping strategies used by U.S. Olympic wrestlers. *Research Quarterly for Exercise and Sport, 64*(1), 83-93.

Gould, D., & Finch, L. (1990). Sport psychology and the professional bowler: The case of Michelle Mullen. *The Sport Psychologist, 4*(4), 418-430.

Gould, D., Finch, L., & Jackson, S. A. (1993). Coping strategies utilized by National Champion figure skaters. *Research Quarterly for Exercise and Sport, 64*(4), 453-468.

Gould, D., Greenleaf, C., Chung, Y., & Guinan, D. (2002). *A survey of U.S. Atlanta and Nagano Olympians: Factors influencing performance. Research Quarterly for Exercise and Sport, 73,* 175-186.

Gould, D., Greenleaf, C., Dieffenbach, K., Lauer, L., Peterson, K., & McCann, S. (1999). *Positive and negative factors influencing U.S. Olympic athletes and coaches: Nagano Games assessment.* Final grant report submitted to the U.S. Olympic Committee Sport Science and Technology Division. Colorado Springs, Colorado.

Gould, D., Greenleaf, C., Guinan, D., & Chung, Y. (2002). *A survey of U.S. Olympic coaches: Factors influencing athlete performances and coach effectiveness. The Sport Psychologist, 16,* 229-250.

Gould, D., Greenleaf, C., Guinan, D., Dieffenbach, K., & McCann, S. (2001). Pursuing performance excellence: Lessons learned from Olympic athletes and coaches. *Journal of Performance Excellence, 4,* 21-43.

Gould, D., Greenleaf, C., Guinan, D., Medbery, R., Lauer, L., Chung, Y., & Peterson, K. (1998). Factors influencing Atlanta Olympian performance. *Olympic Coach, 8*(4), 9-11.

Gould, D., Guinan, D., Greenleaf, C., Medbery, R., & Peterson, K. (1999). Factors affecting Olympic performance: Perceptions of athletes and coaches from more and less successful teams. *The Sport Psychologist, 13,* 371-395.

Gould, D., Horn, T., & Spreemann, J. (1983a). Competitive anxiety in junior elite wrestlers. *Journal of Sport Psychology, 5,* 58-71.

Gould, D., Horn, T., & Spreemann, J. (1983b). Sources of stress in junior elite wrestlers. *Journal of Sport Psychology, 5,* 159-171.

Gould, D., & Jackson, S. A. (1993). Life at the top: The experiences of U.S. National Champion figure skaters. *The Sport Psychologist, 7,* 354-374.

Gould, D., Jackson, S. A., & Finch, L. (1993). Sources of stress in National Champion fi-

gure skaters. *Journal of Sport and Exercise Psychology, 14,* 134-159.

Gould, D., Medbery, R., Dieffenbach, K., Lauer, L., Hardy, L., & Jones, G. (1999, September). *Identifying the range of emotions involved in sport achievement striving.* Paper presented at the Association for the Advancement of Applied Sport Psychology Conference, Williamsburg, VA.

Gould, D., Petlichkoff, L., Hodge, K., & Simons, J. (1990). Evaluating the effectiveness of a psychological skills educational workshop. *The Sport Psychologist, 4,* 249-260.

Gould, D., Petlichkoff, L., Simons, J., & Vevera, M. (1987). The relationship between Competitive State Anxiety Inventory-2 subscale scores and pistol shooting performance. *Journal of Sport Psychology, 9,* 33-42.

Gould, D., Tuffey, S., Hardy, L., & Locbaum, M. (1993). Multidimensional state anxiety and middle distance running performance: A test of Hanin's (1980) zones of optimal functioning hypothesis. *Journal of Applied Sport Psychology, 5*(1), 85-95.

Gould, D., Tuffey, S., Udry, E., & Loehr, J. (1996). Burnout in competitive junior tennis players. II: Qualitative analysis. *The Sport Psychologist, 10,* 341-366.

Gould, D., Tuffey, S., Udry, E., & Loehr, J. (1997). Burnout in competitive junior tennis players. III. Individual differences in the burnout experience. *The Sport Psychologist, 11,* 257-276.

Gould, D., & Udry, E. (1994). Psychological skills for enhancing performance: Arousal regulation strategies. *Medicine and Science in Sport and Exercise, 26*(4), 478-485.

Gould, D., Udry, E., Bridges, D., & Beck, L. (1997a). Coping with season-ending injuries. *The Sport Psychologist, 11,* 379-399.

Gould, D., Udry, E., Bridges, D., & Beck, L. (1997b). Stress sources encountered when rehabilitating from season-ending ski injuries. *The Sport Psychologist, 11,* 361-378.

Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996). Burnout in competitive junior tennis players. I: A quantitative psychological assessment. *The Sport Psychologist, 10,* 322-340.

Gould, D., & Weinberg, R. S. (1985). Sources of worry in successful and less successful intercollegiate wrestlers. *Journal of Sport Behavior, 8*(2), 115-27.

Gould, D., Weinberg, R. S., & Jackson, A. (1980). Mental preparation strategies, cognition and strength performance. *Journal of Sport Psychology, 2,* 329-339.

Gould, D., Weiss, M. R., & Weinberg, R. S. (1981). Psychological characteristics of successful and nonsuccessful big ten wrestlers. *Journal of Sport Psychology, 3,* 69-81.

Greenleaf, C., Gould, D., & Dieffenbach, K. (2001). Factors influencing Olympic performance: Interviews with Atlanta and Nagano U.S. Olympians. *Journal of Applied Sport Psychology, 13,* 179-209.

Hanin, Y. L. (1995). Individual zones of optimal functioning (IZOF) model: An idiographic approach to performance anxiety. In K. Henschen & W. Straub (Eds.), *Sport psychology: An analysis of athlete behaviors* (pp.103-119). Longmeadow, MA: Movement Publications.

Hanin, Y. L. (2000). *Emotions in sport.* Champaign, IL: Human Kinetics.

Hardy, L., Jones, J. G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice of elite performers.* Sussex, UK: Wiley.

Heyman, S. R. (1982). Comparison of successful and unsuccessful competitors: A reconsideration of methodological questions and data. *Journal of Sport and Exercise Psychology, 4,* 295-300.

Howe, M. J. A. (1999). *The psychology of high abilities.* New York: New York University Press.

Kimiecik, J., & Gould, D. (1987). Coaching psychology: The case of James "Doc" Councilman. *The Sport Psychologist, 1*(4), 350-358.

Mahoney, M. J., & Avener, M. (1987). Psychology of the elite athlete: An exploratory study. *Cognitive Therapy & Research, 1,* 135-141.

Norwack, K. M. (1990). Coping style, cognitive hardiness, and health status. *Journal of Behavioral Medicine, 12,* 145-158.

Orlick, T. (1989). Reflections on sport psychology consulting with individuals and team sport athletes as summer and winter Olympic Games. *The Sport Psychologist, 3,* 358-365.

Orlick, T., & Partington, J. (1988). Mental links to excellence. *The Sport Psychologist, 2,* 105-130.

Pelletier, L., Tuso, K., Fortier, M., Vallerand, R., Briere, N., & Blais, M. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The Sport Motivation Scale (SMS). *Journal of Sport and Exercise Psychology, 17,* 35-53.

Ravizza, K., & Hanson, T. (1995). *Heads-up baseball: Playing the game one pitch at a time.* Lincolnwood, IL: NTC Contemporary Publishing Co.

Rice, K. G., & Mirzadeh, S. A. (2000). Perfectionism, attachment, and adjustment. *Journal of Counseling Psychology, 47*(2), 238-250.

Seligman, M. E. P. (1991). *Learned optimism.* New York: Knopf.

Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology, 67,* 1063-1078.

Smith, R. (1986). Toward a cognitive-affective model of athletic burnout. *Journal of Sport Psychology, 8,* 36-50.

Smith, R. E., Schutlz, R. W., Smoll, F. L., & Ptacek, J. T. (1995). Development and validation of a multidimensional measure of sport-specific psychological skills: The Athletic Coping Skills Inventory-28. *Journal of Sport and Exercise Psychology, 17,* 379-398.

Smith, R. E., Smoll, F. L., & Schutz, R. W. (1990). Measurement and correlates of sport-specific cognitive and somatic trait anxiety. *Anxiety Research, 2,* 263-280.

Snyder, C. K. (Ed.). (2000). *Handbook of hope: Theory, measures, and applications.* San Diego, CA: Academic.

Snyder, C. K., Cheavens, J., & Michael, S. T. (1999). Hoping. In C. R. Snyder (Ed.), *Coping: The psychology of what works* (pp. 205-251). New York: Oxford University Press.

Thomas, P. R., Murphy, S. M., & Hardy, L. (1999). Test of performance strategies: Development and preliminary validation of a comprehensive measure of athletes' psychological skills. *Journal of Sport Sciences, 17,* 1-15.

Udry, E., Gould, D., Bridges, D., & Beck, L. (1997). Down but not out: Athlete responses to season-ending injury. *Journal of Sport and Exercise Psychology, 19,* 229-248.

Vealey, R. (1992). Personality and sport: A comprehensive view. In T. S. Horn (Ed.), *Advances in sport psychology* (pp. 25-59). Champaign, IL: Human Kinetics.

Weinberg, R. S., & Gould, D. (1999). *Foundations of sport and exercise psychology* (2nd ed.). Champaign, IL: Human Kinetics.

Weinberg, R. S., Gould, D., & Jackson, A. (1980a). Cognition and motor performance: Effect of psyching-up strategies on three motor tasks. *Cognitive Therapy and Research, 4*(2), 239-245.

Weinberg, R. S., Gould, D., & Jackson, A. (1980b). The influence of cognitive strategies on the tennis serving performance of high and low ability players. *Perceptual and Motor Skills, 50,* 663-666.

Weinberg, R. S., Gould, D., & Jackson, A. (1981). Relationship between duration of psych-up interval and strength performance. *Journal of Sport Psychology, 3,* 166-170.

Weinberg, R. S., Smith, J., Jackson, A., & Gould, D. (1984). Effects of association, dissociation and positive self-talk strategies on endurance performance. *Canadian Journal of Applied Sport Sciences, 9,* 25-32.

Williams, J. M., & Krane, V. (2001). Psychological characteristics of peak performance. In J. M. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance* (4th ed., pp. 162-178). Mountain View, CA: Mayfield.