

## Mental Links to Excellence

Terry Orlick

University of Ottawa

John Partington

Carleton University

This study included 235 Canadian Olympic athletes who participated in the 1984 Olympic Games in Sarajevo and Los Angeles. Individual interviews were carried out with 75 athletes and a questionnaire was completed by another 160 to assess their mental readiness for the Olympic Games and factors related to mental readiness. Common elements of success were identified, as well as factors that interfered with optimal performance at the Olympic Games. Statistically significant links were found between Olympic performance outcome and certain mental skills.

This investigation assessed the level of mental readiness and mental control experienced by Canadian athletes at the 1984 Olympic Games. A large-scale study was undertaken involving 235 Canadian Olympians who participated in the 1984 Olympic Games in Sarajevo or Los Angeles. It was a two-stage study involving an interview sample and a questionnaire survey sample.

### Method

#### Subjects

**Interview Sample.** The 75 athletes in the interview sample included 38 females and 37 males. They represented 17 Winter and Summer Olympic Game sports, which involve a range of competitive demands such as artistry, contact, control, endurance, risk, speed, and strength. The sample includes 13 Olympic gold, 3 silver, and 1 bronze medalist, as well as 3 world champions. In addition to highly successful performers, other athletes were included in the interview sample who had been identified by coaches as either inconsistent in international competition or as failing to achieve at the level expected of them at the Olympics.

**Survey Sample.** The 160 athletes in the survey sample represented 31 sports, of which 23 were Summer Games events. Of the survey sample, 57% were males. Some 82 % of the total sample represented individual sports, though many of these athletes competed in team events such as pairs figure skating, cycling teams, and paddling and rowing events including crews of 2, 4, and 9 ath-

**About the Authors:** Terry Orlick is with the School of Human Kinetics at the University of Ottawa, 35 McDougal, Ottawa, Canada, K1N 6N5. John Partington is with the Department of Psychology at Carleton University, Ottawa, Canada K1S 5B6.

letes. Represented were Alpine skiing, archery, athletics, basketball, bobsled, boxing, canoeing, cross-country skiing, cycling, diving, equestrian events, fencing, field hockey, figure skating, gymnastics, ice hockey, judo, luge, rhythmic gymnastics, rowing, shooting, ski jumping, soccer, speed skating, swimming, synchro swimming, volleyball, water polo, weight lifting, wrestling, and yacht racing. Athletes representing each sport ranged in number from 1 to 11, the median being 5 athletes per sport. The survey sample included 10 Olympic medalists (5 silver and 5 bronze). In all, 23 % of the survey sample placed fifth or better in their field, while 15 % ranked in the lowest quartile of their respective fields.

#### Instruments

Two assessment measures were developed for the purposes of this study: The Athlete Interview Guide and the Athlete Readiness Form.

**Athlete Interview Guide.** This measure (a) explores factors associated with the athlete's physical, technical, and mental readiness, (b) examines his or her background in mental training, (c) delves into the details of the athlete's mental state at the Olympics, as well as at the previous best and least successful international competitions, (d) documents the role others played in the athlete's mental readiness, such as coaches and sport psychology consultants, (e) invites recommendations to improve athlete mental readiness, (f) and provides the athlete an opportunity to air post-Olympic feelings (Partington & Orlick, 1986).

**Athlete Readiness Form.** This measure was designed to yield data from a mailed survey that would be comparable to what we had obtained from our interview sample. The questions and format were based on our experience in conducting the 75 interviews, as well as on a qualitative analysis of the interview transcripts. This enabled us to identify important mental constructs, such as attentional focus and imagery, and also made it possible for us to operationalize these constructs vividly by using terms and examples familiar to athletes. The questionnaire comprised a series of questions, most of which invited both quantitative ratings as well as explanatory comments (Partington & Orlick, 1986).

#### Design

The first phase of the study involved conducting intensive interviews. This was considered appropriate for the following reasons: (a) Interviews provide an opportunity for the open searching and probing necessary to explore new topics, such as elite athletes' personal mental preparation strategies. (b) Interviews enable the investigators to learn and understand the terms athletes use to discuss mental preparation topics. (c) Interviews scheduled at the athletes' convenience increase the likelihood they will participate in the study.

The interview study was designed to provide opportunities to collect detailed qualitative information that would allow us to make within-subject and between-subject comparisons. The within-subject option was provided by items in the Athlete Interview Guide, which asked for descriptions of and comparisons between Olympic as well as previous best and worst international performances. The between-subject option was provided by sampling the athletes representing different levels of performance.

The second phase of the study involved a mailed questionnaire, which enabled us to reach athletes in remote parts of the world and thereby provided

a larger, more representative sample at a relatively low cost. Moreover, the fact that it was mailed provided an additional guarantee that the study results would be free from possible interviewer bias. Finally, since the questionnaire survey was conducted after completing our interview study, we were able to frame our questions about athletes' mental skills, especially concerning imagery, much more precisely.

#### *Procedure*

Interviews were conducted from 4 to 10 months following the Los Angeles Olympics. To arrange each interview, the Director General of Sport Canada sent a personal letter to the athlete. The letter explained the purpose and significance of the study, assured confidentiality, and alerted the athlete that one of the two investigators would telephone him or her to determine a convenient time and place for the interview. Her letter began as follows:

As part of the overall evaluation of the high performance system in Canada following the 1984 Winter and Summer Olympics, Sport Canada is assessing current and future requirements in the general area of sport psychology. Specifically, we are interested in learning how athletes feel about their own personal states of "mental readiness" at major competitions such as the Olympic Games.

The findings from this assessment will help Sport Canada, coaches, athletes, sport scientists, and administrators to make improvements in the Canadian sport system, which are relevant because they are based on the documented experiences of athletes.

In our subsequent telephone contacts, we explained what we would be discussing in the interview and then arranged for a meeting with the athlete. Every athlete contacted agreed to take part in the interview, though two of them then failed to show at the prearranged time and place.

Interviews were generally conducted at the athlete's home or training site following a workout. Before the interview began, we explained that a tape recorder was necessary to enable us to make a typed transcript for later review by the investigators. We also confirmed that the interview material would remain confidential and would not be quoted without the athlete's prior written permission. Every interview was recorded in its entirety and transcribed word for word.

The amount of time spent with each athlete ranged between 1 1/2 hours to over 3 hours. The actual interview time ranged from 45 minutes to 2 hours. The extra time spent with athletes was used either to help them air feelings they had kept to themselves for months since the Olympics, listen to their future plans, or answer their questions. In most cases we were the first people to talk to them in detail about their Olympic experiences and their lives after the Olympics.

**Controls for Bias.** The potential for interviewer bias was addressed in several ways. First, use of the Athlete Interview Guide structured the interview and ensured that all topics were treated in a standard way and in a particular order. Second, Partington always interviewed those athletes for whom Orlick had served as consultant. Third, Partington had no vested interest in sport psychology consulting at that time, and in fact had reservations toward that realm of practice.

Fourth, direct observational checks to monitor interviewer bias were made early in the study. Specifically, Partington sat as a silent observer throughout Orlick's first two interviews. The initial quality control measure for both Partington and Orlick came in the form of interviewee feedback from two pilot interviews. At the conclusion of these interviews, each athlete was asked, "How did you think the interview went?" "Did you feel you could tell your story fully?" "Did I lead you or influence your responses in any way?"

The monitoring for bias continued throughout the study by each investigator listening to the other's interview tapes. Absence of bias was inferred from the following indices: (a) the fact that the interviewer adhered to the standard format and questions in the Athlete Interview Guide; (b) the fact that athletes in the pilot phase reported they were in no way influenced or biased by the interviewer; (c) the fact that the interviewee (the athlete) would insist on making sure the interviewer clearly understood his or her experience or perspective, for example, "No, it wasn't quite like that (following a probe), let me explain"; and (d) the fact that after copy-edited interview transcripts were sent to 20 athletes for review, they confirmed that these authentically represented their accounts and perceptions of what had actually transpired.

The interviewers found these athletes to be highly self-directed, autonomous, and sometimes assertive in presenting their responses and clarifying their views. We independently came to the conclusion that it would be extremely difficult, if not impossible, to manipulate the responses of these high level Olympic achievers.

Our impressions are supported by previous research with high performance athletes. Rychta (1982) found that athletes who were involved at a high performance level tended to be independent minded and acted according to their own principles, and that the longer the athlete was at the top level the more independent minded she or he was likely to be. Werthner-Bales (1985) found that athletes ranked in the top six in the world expressed their views in a self-directed manner and appeared to be almost immune to interviewer bias. When asked at the conclusion of an extensive interview whether they felt they had been influenced by the interviewer, all 28 athletes reported they felt they had not been influenced in any way (Werthner-Bales, 1985).

The level of motivation, commitment, self-direction, and attention to detail that characterized Olympic athletes responding to questions about the essence of their life (e.g., the Olympic Games) stands in marked contrast to the orientation of subjects in typical studies in cognitive and social psychology. These latter studies are usually conducted using college freshman subjects who have little interest in or commitment to the topic of the investigation other than gaining the necessary credits to pass an introductory course. We frequently found that when Olympic athletes thought back to when they approached the line in their Olympic final, as they recounted their experience, their bodies tensed up and they reported "feeling" that experience at that very moment (e.g., including sweating, anxiety, increased heart rate, and more rapid breathing).

On the other hand, typical studies of the social psychology of the psychological experiment show that subjects can be easily manipulated and often reconstruct their memories to fit their performance outcome. Retrospection on the part of our Olympic athlete subjects was entirely different. They were recalling the

most important experience of their life and they did so with extreme detail. This

process was likely enhanced by the fact that many of the athletes in this study kept a daily log in which they recorded their feelings and focus during training sessions, and especially following every major competition.

#### *Questionnaire Survey*

The questionnaire was first mailed in June 1985 and again in September 1985 to all Canadian athletes who had participated in the 1984 Olympic Games, excluding those 75 who had been interviewed. The survey package contained the following items: (a) a letter of introduction similar to that prepared for the interview survey from the Director General of Sport Canada, (b) a letter from the investigators explaining the contents of the package and assuring confidentiality, (c) the Athlete Readiness Form, and (d) a stamped and addressed return envelope. Both English and French copies of the two letters and survey form were included. The return rate was 75 %.

## **Data Analysis**

Typed verbatim interview transcripts were qualitatively analyzed. The numerical questionnaire data were quantitatively analyzed using a series of multiple regressions, and the comments sections were reviewed for the possibility of being content coded.

#### *Qualitative Analyses*

Following completion of the 75 interviews, a set of 12 interview transcripts were independently identified by the investigators as providing the most detailed descriptions of the highest quality mental preparation and the best Olympic mental readiness. The 12 athletes whose transcripts were selected were all Olympic gold or silver medalists and/or world champions. These transcripts were read several times by each investigator, paying particular attention to identifying mental factors and situational factors associated with success. Each investigator independently listed common "success elements" and conditions for success that were evident in the 12 transcripts. Our lists were then combined and refined to provide prototypes of mental factors and situational factors associated with success. These prototypes then served as a tentative framework for reviewing other interview transcripts in our sample.

The following questions were used as a guide: Will the success elements found in these transcripts also be found in the transcripts of other medalists? Will these elements also be present in the specific segments of transcripts from less successful athletes when describing their best-ever competitive performance? Similarly, for the failure elements or performance blocks, we asked, will the failure conditions found in athletes' transcripts who did not do well at the Olympics also be present in the specific segments of transcripts from Olympic medalists when describing their worst-ever competitive performance? This cross-referencing procedure within and between transcripts confirmed the success and failure elements.

#### *Quantitative Analyses*

Most of the questionnaire data were generated in the form of nominal and ordinal categories and numerical ratings. The major exception was a question asking

athletes to describe their attentional focus before and during their Olympic and previous best-ever international competitions. These latter descriptions were classified independently by the two investigators into one of three categories: very effective, partially effective, or ineffective. We were "blind" to the athletes' identities and to the particular competitive event, but were informed about the type of sport, since this was important for deciding what kind of focus would be desirable. Our practice judgments resulted in 19 out of 20 agreements. Successive reliability checks yielded perfect interjudge agreement on each set of 20 judgments. To avoid fatigue effects, we never judged more than 20 records in one session.

The main set of quantitative analyses involved a series of stepwise multiple regressions using obtained Olympic percentile rank in the athletes' respective fields as the performance criterion, and the following sets of predictors: readiness factors, helpfulness of others, amount and quality of imagery, and attentional focus. Predictor variables were entered in single steps 'from best to worst in terms of which explained the greatest amount of variance. Each of these regression analyses was conducted for the total sample, as well as for males and females separately.

## **Results and Discussion**

#### *Interview Study*

All of the material presented in the following section is based upon qualitative analysis of Olympic athlete interview transcripts. Representative interview quotes are presented throughout this section to illustrate the bases upon which statements or categories were formulated.

All of the best athletes interviewed (i.e., Olympic and world medalists) were incredibly committed individuals with clearly established goals for success. For a significant period of time prior to the Olympic Games, everything in their entire life had revolved around training and competing. Their athletic goal was the most important goal in their life.

Everything I do, whether it is weights, or running, or the normal training things, or the leisure activities I do, it is all geared toward how it's going to affect my paddling. Everything is opportunity/cost. If I go out to a movie instead of going hiking as my leisure activity, what is the cost of that? If I go to the movies instead of a hike, does that help or hurt my paddling? I've got to judge that. I've always thought this way. Ever since I saw John Wood win a silver medal, I wondered, does he dream all the time about being the best in the world? I have always dreamed about doing that. Maybe that's different from other people. (Highly successful Olympian-canoeing)

A striking result of this study was the consistency of certain success elements for virtually all of our best performers in all sports. An overview of each success element follows under the headings Quality Training and Mental Preparation for Competition.

**Quality Training.** A common element of success for all the best athletes was quality training. The best athletes had discovered that the way to establish the winning patterns they wanted to draw upon in the competition was to train with the highest degree of quality. Consequently, they mentally prepared for train-

ing by imagining or thinking about what they wanted to accomplish the night before, the morning *of*, and on the way to training. Before arriving at the training site they had already committed themselves to their best effort in accomplishing those goals.

When I'm training, I'm focused. I train to the best of my ability. By focusing all the time on what you're doing when you're training, focusing in a race becomes a by-product. Training with intensity is just a matter of digging in. You say, "I'm here to train, and I'm not going to waste my time! If I don't train that way, I'm going to be the ultimate loser, no one else." When I say I've done my best and worked my hardest, I feel good about that. If I'm going to be second or third, it's going to be because someone else has superior ability. I have to accept that too, but I'm not going to question my training. That's the last thing I want to question. Knowing how to focus gives you that little extra push when you have to push in the everyday sessions. As much as I feel flat getting into the workout, and I may be flat for part of it, I'll recognize the fact that I can do it. I ask myself in a positive sense, why am I here? At that point it becomes a mind game. I'm here because I want to be the best I can be. (Highly successful Olympian-kayak)

To prepare myself to do quality runs in training, I make sure I am in good physical shape, and I make sure when I do my free skiing that I try to make good turns. When I get to the starting gate, it is almost a race run. I have thought about the course, I have prepared mentally for the run, my boots are done up the way they should be, I'm concentrating, and I make a good run. I don't screw around because I only get a few runs a day. That's it. Plus, if you are not concentrating when you are going downhill, you don't just bump your head on the end of the pool, right? ... You have to be continually aware. (Highly successful World Cup participant-Alpine skiing)

I've seen a lot of girls train, and I've seen them think of practice only as practice. They go out on the floor and do repetition after repetition, you know, "Oh well, it's only practice, it doesn't matter." What I've learned to do is, if I'm going to take the energy and go out on the floor to do a routine, it's got to count, and so I'd be better off to go out and do 4 perfect routines than to do 20 that are just mediocre. It's quality, not quantity. When I walk out around the floor in practice, that's what I would do at a competition. At a competition, I wouldn't just sort of drag myself onto the floor, get into position, wait around, talk, and then go. Once I decide to do my routine, I set the mood exactly, as closely as it could be to competition. (Highly successful Olympian-rhythmic gymnastics)

**Clear Daily Goals.** The best athletes had clear daily goals. They knew what they wanted to accomplish each day, each workout, each sequence or interval. They were determined to accomplish these goals and focused fully on doing so.

I would write what I wanted to do and say to myself, "What am I going to do in this training session?" I wouldn't just get on the line and pump rounds down the range, but would actually go to the line with an intent, a goal, even if it was just to make sure everything was smooth. When I go to the line,

and set everything up, and take the gun in my hand, I also mentally go through my shot-plan checklist before I shoot. This strategy started out very mechanically with a physical list of words which I have on the shooting table, and which I read exactly. These words represented every single step involved in shooting a shot. Then I reduced these to key words so that I could go through the list faster. Finally I didn't need a list anymore. I would usually write one word to emphasize what I wanted, such as "trigger" or "smooth." Then this shot-plan rehearsal became a mix of simple verbal reminders and images which I ran before each shot. (Highly successful Olympian-pistol shooting)

My coach wrote up every single one of my dives on a piece of paper, all the bad things about my dive and all the good things about my dive. I read his corrections every day, before every workout. I set a goal to change something on that piece of paper every day. Even if part of the dive was bad, I knew something was better. That's why it wasn't boring for me to do the same dive 100 times, because each time I looked at it in a different way. One time I focused on my hands, then my head, my feet, et cetera. For me the dive is good, but there's always something to improve. (Highly successful Olympian-springboard diving)

**Imagery Training.** These athletes had very well developed imagery skills and used them daily. They used imagery to prepare themselves to get what they wanted out of training, to perfect *skills* within the training sessions, to make technical corrections, to imagine themselves being successful in competition, and to see themselves achieving their ultimate goal.

I did my dives in my head all the time. At night, before going to sleep, I always did my dives. Ten dives. I started with a front dive, the first one that I had to do at the Olympics, and I did everything as if I was actually there. I saw myself on the board with the same bathing suit. Everything was the same. I saw myself in the pool at the Olympics doing my dives. If the dive was wrong, I went back and started over again. It takes a good hour to do perfect imagery of all my dives, but for me it was better than a workout. I felt like I was on the board. Sometimes I would take the weekend off and do imagery five times a day. I felt like I was on the board and I did each dive so many times in my mind. (Highly successful Olympian-springboard diving)

I actually shoot in imagery because it is important not just to hold up the gun but also to imagine the shot going off. You want to make up your mind before you raise the gun that this shot is going to go extremely well, so I imagine firing. I see myself inside myself, shooting in regular motion. I can feel the initial pressure of the trigger, and then I'm looking at the sight, and then the shot goes off itself. The shot has to break by itself because if you think about it going, you are going to disturb the gun. You have trained your reflexes to come back through the trigger positively. When I do mental imagery I see the rear sight as two light bars, and the front sight is really sharp. I usually look at the center, or a little bit to the left of the center, of the top of the front sight. Then I can see the target as a fuzzy grey blob. I'm not

conscious of my hand, I'm just concentrating on that small part of the sight. Right now with my eyes open, I can see the sights hovering around the middle of the 25-meter target. I see the bullet going slow motion through the middle of the target, cutting the paper through the "X" ring, and the paper starts to fly, all in ultra-slow motion. For months I did this, virtually every time before I fired on the line. I would sit down and do several raises and shots in my mind. I would do it for 5 minutes, 15, or anything up to about 30 minutes.

As for success imagery, I would imagine to myself, "How would a champion act? How would a champion feel? How would she perform on the line?" This helped me find out about myself, what worked and didn't work for me. Then as the actual roles I had imagined came along, and I achieved them, that in turn helped me believe that I would be the Olympic champion. (Highly successful Olympian-pistol shooting)

We did a lot of imagery during training sessions, especially as the competition approached. When we were doing compulsory figures in practice, a minute before doing certain ones the coach would say, "Okay, you are going to do a 'best one.' You are going to do a whole compulsory figure." So before we went out there and did it, we would sit on the edge of the pool and picture ourselves doing it, and how it feels. You picture yourself doing it right on, perfectly. Then go out there and do it. Doing a lot of imagery was the major difference in our preparation last year, not just the duet, but also the compulsory figures. About half an hour before we actually did a competition routine we would go through the routine once together on dry land doing the movements. The two of us would do the movements, moving our arms, and feeling the moves while the tape was playing our music. (Highly successful participant-synchro swimming)

The refined performance imagery these successful athletes had developed involved an inside view, as *if* the athlete was actually doing the skill, and feeling he action.

My imagery is more just feel. I don't think it is visual at all. When I'm watching it on video I look visually at it and then I get this internal feeling. When I'm actually doing it I get the same feeling inside. It is a very internal feeling that is hard to explain. You have to experience it, and once you do, then you know what you are going after. I can even get a feeling for an entire program. Sometimes in a practice I get myself psyched into a program that will win the Olympics, like I won the long program last year. I step on the ice and go to my starting position and I get this feeling, "I'm at the Olympic Games," and I sort of get the whole program flashed before my eyes and I get this internal feeling of how this program will be, and usually I'm fresh and usually it will be a perfect program. I don't just step out there in training and just say, here we go, another program. (Highly successful Olympian figure skating)

In mental imagery, you have to see how the apparatus is coming down. If the club is coming down this way, I would grab it this way in my imagery. Sometimes I would think about the last time I actually did it, "Why did I

miss that one move? Okay, I know what happened, I pulled the body in too close to the apparatus and it knocked my shoulder and it went off. Okay, now how do I avoid that?" Then I try to see myself doing it correctly in imagery. I can actually see the apparatus coming down; I can see the stripe on the club as it rotates the same way you'd see it when you're doing the routine, that's the best way. Sometimes you look at it from a camera view, but most of the time I look at it as what I see from within, because that's the way it's going to be in competition. It is natural because I do the routines so many times that it's drilled into my head, what I see and how I do it. So if I think about a certain part of my club routine, or my ribbon routine, I think of it as the way I've done it so many times, and that's from within my body. (Highly successful Olympian-rhythmic gymnastics)

It became very clear through our interviews that even the best athletes did not initially have good control over their mental imagery. They perfected this mental skill through persistent daily practice.

It took me a long time to control my images and perfect my imagery, maybe a year, doing it every day. At first I couldn't see myself, I always saw everyone else, or I would see my dives wrong all the time. I would get an image of hurting myself, or tripping on the board, or I would "see" something done really bad. As I continued to work at it, I got to the point where I could see myself doing a perfect dive and the crowd yelling at the Olympics. But it took me a long time. I read everything I had to do and I knew my dive by heart. Then I started to see myself on the board doing my perfect dive. But some days I couldn't see it, or it was a bad dive in my head. I worked at it so much it got to the point that I could do all my dives easily. Sometimes I would even be in the middle of a conversation with someone and I would think of one of my dives and "see" it. (Highly successful Olympian springboard diving)

**Simulation Training.** The best athletes made extensive use of simulation training. They approached training runs, routines, plays, or scrimmages in practice as *if* they were at the competition, often wearing what they would wear and preparing like they would prepare.

We didn't believe in the quantity idea: the more you do the better you get. Instead of coming in and saying, we're going to do three short programs, or we're going to do two longs, which gets you more into the mind set of "I've just got to get through it," we said, "We are going to do one of each, and they're going to be good," because that's all you do at the competition. You've only got one whack and you had better do it. We always used to think, let's just do it once and get it right that one time, as if it were a competition. I think that helped a lot. Every day we would run through the short and long program once. Our off-ice program was quite comparable to what everyone else in the sport was doing. The quality we brought to our practice performance was the major difference. (Highly successful participant-pairs figure skating)

race to be an effort, I wanted it to be very powerful, all my strength would be moving the boat. I knew that in order to have that power I had to be relaxed and I had to be very strong. You can be powerful but tense, and the boat won't go. You windmill and you stay on the spot and dig yourself into a hole. I wanted to feel the power, the boat coming up, lifting and going. (Highly successful Olympian-pairs kayak)

2. Competition focus plan-The best athletes had taken the time to discover what kind of focus worked best for them in competition. They had developed a refined plan to draw upon this focus during the competition. In almost all cases the best focus was one that kept the athlete connected to what he or she was doing (his or her job). In contrast, the worst focus was one in which the athlete was dwelling on factors over which he or she had no direct control, such as other competitors, final outcome, or other distractions.

My focus was very concentrated throughout the race. We have a start plan, and in it I concentrate *only* on the first few strokes. I've found that if I concentrate beyond that, those first strokes won't be strong enough. Then I concentrate on the next little bit of the race. Then we come to the 250, and I say, "Poof!" and we put in an extra burst to get the boat up and moving again. Then it's getting to the end, we have to really push. I said, "I'm not going to die from this, I'm just going to have to go as hard as I can. This is the last time I'll ever race, I have to give it everything," and I also had to say, "But you have to be powerful, you've got to use everything." Almost every 3 seconds or so towards the end I'd have to say, "Relax," and I'd let my shoulders and my head relax, and I'd think about putting on the power, and then I'd feel the tension creeping up again so I'd think about relaxing again, then power, relax . . .

I look ahead down the lane. The last 100 meters is marked with red buoys and I knew how many buoys ahead of that to start our finish, because we had practiced for the course. When it was time for the very last part of the finish, we just go all-out power, forgetting style and everything else. Crossing the line, the thing I remember was just letting the emotion go, and being able to say, "That's it, it's over!" I just knew that we'd gone our very hardest. (Highly successful Olympian-pairs kayak)

3. Competition evaluation-The best athletes had developed a procedure for extracting the important lessons from every competitive experience. They continually adapted or refined their mental approach based upon these lessons. If the performance was excellent, they noted the mental factors associated with that best performance. They integrated this information into their plan for subsequent competitions. If the performance was off, they tried to assess why, paying particular attention to their mental state or focus before and during the competition. They were extremely good at drawing out the important lesson and then letting the performance go, especially if it was less than their best. Many of the best athletes used their diaries, logs, or some other postcompetition evaluation procedure to write down the lessons learned. Some went back to these notes to help direct their focus for subsequent competitions.

Another way my training differs is that we always do our workouts head to head, two or three canoes at a time. We often get a little bit of a race situation created in our practices. Others tend to do a lot of work on their own, them against the stopwatch. In a sport where we are racing head to head, where they don't keep world records, and where so much depends on the conditions, time is important, but it is not so much a factor as beating the other people in the race. So we do all our workouts together, we all line up together, we all go together. And it is sort of "dog eat dog." Somebody might get washed out, or cut off, or something, but when it is happening you learn to fight to stay ahead. You develop small skills, like learning how to "ride someone's wash," but more important than that, you learn to get the most out of yourself with other people around you. Quite often people who go out and do a workout alone may be very in tune with their own body; they know exactly what pace they are on, and everything like that, but when it comes to a race with other boats around them, they don't race to what the race dictates. (Highly successful Olympian-canoeing)

**Mental Preparation for Competition.** In addition to mentally preparing for quality training, the best athletes had developed systematic procedures for drawing upon their strengths in important competitions. This included a precompetition plan, a competition focus plan, a procedure for competitive evaluation, and a plan for dealing with distractions.

1. Precompetition plan-The best athletes had well established and well practiced precompetition procedures they attempted to follow consistently. Most precompetition plans included the use of mental imagery, warming up well physically, positive thoughts, and reminders to focus on what had previously worked well. By following a well developed, refined, and well practiced precompetition plan, the athletes maintained a constructive focus going into the event.

We have a set warm-up, we know exactly how much time it takes and exactly what things we're going to do. Immediately before the race I was thinking about trying to stay on that edge, just letting myself relax, and doing a lot of positive self-talk about what I was going to do. I just felt like we couldn't do anything wrong. It was just up to us. I said, "There's nothing that's affecting us in a negative way, the only thing now is to do it, and we can do it . . . I just have to do my best."

At previous Olympics, the enormity of the situation I was in would get me down. I'd say, "My God, here we are at the Olympics!" I didn't do that this time. I felt, we're just going to go and do it, we're going to give it our best. I kept talking to myself a lot, and trying to keep in sight what I was going to do. I wanted to keep in mind what I had to do to paddle well. I knew that we could think about what it all meant in larger terms much later. All I had to think about now was doing it, and doing the best we could. I was thinking all kinds of positive things, like I could do well, I was going to be good, I was feeling strong, how we had worked so hard, and our boat was fast, and things like that; all positive, trying to feel like I wanted to feel. That was something we'd practiced and had been in my race plan. I concentrated on that a lot. I wanted to have that powerful feeling. I didn't want the

In the last 3 years it has become more important to identify as closely as possible where I've screwed up, and then to work on that in practice to make sure it doesn't happen again. I also use *cue* words more explicitly now. I sit down and look at a race plan before I go out and use a certain point in the race, within 5 meters, as a point of kicking in, and really charging in the last 150 meters. I have cue words for this. I have to pick out a few alternatives in case a section of the race doesn't go well. I'll sit back now after a race and I'll analyze it with a fine-tooth comb, whereas before I might have said, "damn it, I lost." I would have just figured that I softened up at the half-way point. "Well next time I'm not going to soften up," I'd say. I wouldn't be sleeping peacefully at night until I'd made up for it. But now I can sit down and go over the race with a fine-tooth comb, and I can pick a stroke here and there that may have affected the outcome of the race. When I do that, and I find out I missed the fifth stroke off the line, or the stroke was still short and it should be long, or my transition wasn't as good as it should be, I can go back and work on that phase of my race and get the kinks out. I think it is very valuable to do that. By analyzing my race, stroke for stroke, figuring out what I did wrong, I can put together a more perfect race. The idea is you try and recall exactly what happened in the race and gain from it. I'm always repeating the plan in practice, and working on certain points that I can identify as screw-ups in a previous race. There's a base through the whole race that's close to perfection. That's what you are looking for. (Highly successful Olympian-canoeing)

4. Distraction control-For the success elements discussed thus far, virtually *all* of our best athletes had a common strength. However, in terms of mental skills for dealing with distractions or setbacks, there was a greater variation. Those athletes who performed at their highest level consistently had excellent strategies for getting back on track quickly when things didn't go well, or when faced with distractions. Those who were less consistent appeared to need more work in this area to improve the consistency of their high level performance.

I started to shift away from the scoreboard a year and a half before the Olympics because I knew that every time I looked at the scoreboard, my heart went crazy. I couldn't control it. I knew that I dove better if I concentrated on my diving instead of concentrating on everyone else. It was harder to get ready for 10 dives than for 1 dive so I decided to stop looking at everyone else, just be myself and focus on preparing for my next dive. I decided not to talk to my coach on deck because that was the best way for me to concentrate on my event. Between dives at a meet, using a Walkman was the best way of shutting out everything. I knew I could win, but I had to dive well. I stopped saying, "This diver's doing this, so she's going to miss this one," or "if she misses one, I'm going to win." I started saying, "I won't miss anything." At the Olympics I really focused on my diving instead of on other divers. That was the biggest change in those 2 years. Before that I used to just watch the event and watch the Chinese, and think, "Oh, how can she do that? She's a great diver." I thought, "I'm as good as anyone else, so let's stop talking about them." That was an important step in my career be

cause that day I realized I was as good as anyone else. Since that day, I never wanted to watch them in the pool because they had different techniques. My technique worked for me and I didn't want to see anybody else. (Highly successful Olympian-springboard diving)

If the routine was good, you have basically 3 minutes to hug your piano player, hug your coach, jump around for joy, and then it's back to zero. You've got to get back to zero. And if you had a bad routine, you've got to get back to zero again. No matter what, you can't let one good or bad routine ride. You can't say, "Okay, I was great in that one. I'm going to do great in this one," because the chances are you won't. Or, "I did so bad." You just have to say, "Okay, that's forgotten. It's totally forgotten." That's it. Go out and do the next one and pretend that the next one is the first routine of the day and it is going to count. Otherwise, you are never going to pull back again. You're always going to be too involved in the other routines, and they're finished. You can't do anything about it. You can't do anything about the score you're getting. You can't do anything about why you dropped that one move or how great it was; it's over and done with. Sometimes it's really hard to make yourself forget it, but the more you try, then the better you're going to get at it in the future. (Highly successful Olympian-rhythmic gymnastics)

Once I push out at the start, I am focused on where I am at the time. A lot of it is "line" in downhill. You don't go right at the gate, you've got the line that you have been running all week and you just say, "Okay, I've got to stay high here, I have to go direct here, I have to jump this jump," just so I am thinking of each obstacle as it comes. If I make a small mistake, often it doesn't even register for me until the end, when I'm at the bottom. At the time you are still thinking, "forward, speed, momentum." You don't carry the mistake down the hill. It is shelved until later while you try and compensate. Often those mistakes will mean just running them out, and it really won't cost you that much time if you don't panic, if you just let it turn out and get back on track. (Highly successful participant-Alpine skiing)

*Learning the Elements of Success.* It was clear from our study that Olympic champions did not begin their sports careers with all of these success elements. They learned quality training, simulation training, quality imagery, daily goal setting, precompetition planning, competition focus planning, competition evaluation procedures, and distraction control.

As a result of listening to others and themselves-watching, talking, reading, experimenting, practicing, performing, thinking, experiencing, recording, and evaluating-each athlete recognized the importance of these elements. Each then began to develop, implement, and refine his or her own unique plans.

I started visualizing in 1978. My visualization has been refined more and more as the years go on. That is what really got me the world record and the Olympic medals. I see myself swimming the race before the race really happens, and I try to be on the splits. I concentrate on attaining the splits I have set out to do. About 15 minutes before the race I always visualize

the race in my mind and "see" how it will go. I see where everybody else is, and then I really focus on myself. I do not worry about anybody else. I think about my own race and nothing else. I try to get those splits in my mind, and after that I am ready to go. You really know if you are on the splits by that time because you have spent so much time training on different kinds of strategies, so you know what time you are actually going, without the clock being there. You are really swimming the race. You are visualizing it from behind the block. In my mind, I go up and down the pool, rehearsing all parts of the race, visualizing how I actually feel in the water. (Highly successful Olympian-swimming)

In discovering the proper tension level, I was on a continuing evolution the whole time I skied, but I think I really hit the key after 4 or 5 years on the Canadian team. I found out there was a difference between winning and losing and took a while to zero in on it. It wasn't conscious until one time I went to far. Then I really noticed I'd gone overboard. I was way too nervous and I just blew the race. I thought, "Gee, I have to find that balance in there." Then I honed in pretty quickly. The way I did it, once I had an idea it was there, was to get really hyper for a race, and find out what reaction I got. Then be really laid back and see what the reaction was. Once you find out the outside limits you can get to, you can get quickly to the middle.

Learning from your mistakes is probably one of the biggest things influencing real excellence. And the sense of the ridiculous is another thing. You have to know when this is just ridiculous. Everyone is so intense about ski racing, but let's be realistic. These are just grown men, flopping down the hill at 80 miles an hour, on plastic and wood sticks, and this is ridiculous. If you can have a little balance in your perspective, take a step back occasionally, you'll be okay. If you learn from your mistakes and eliminate distractions, it really will help. The challenge, ultimately, is establishing consistency and consistent behavior. (Highly successful participant-Alpine skiing)

Many of these highly successful athletes felt that they could have reached the top much sooner if they had worked on strengthening their mental skills earlier in their careers. Some mentioned they had had the same technical and physical skills honed to perfection 4 years before becoming world champions, but they had not yet learned how to hold their best focus in important competitions. These athletes said that it was not until their focusing skills were refined that their dreams became a reality.

I look at what we won with this year, and we did virtually the same stuff technically that we did 5 years ago. We did no other major triples or anything, but we learned how to mentally get ourselves through the program. I think a lot more time has to be spent on getting kids ready mentally, finding out what they need to do mentally to be successful. I think a lot of kids have the physical skills to skate with the best of them. But whether or not they've got the mental skills is another question. They need to know what will work for them and what they need to do to make it work for them. Everyone keeps pushing, physically pushing. But are they mentally pushing as well?

I don't think they are. That's why kids who look like they should be good, just aren't. I think postcompetition evaluation is a real critical factor. Sitting down and learning about the kid instead of just coming back in and saying, "Well you missed your double axle, let's do some more." I think the mental set is probably the biggest area for improvement. People grow and change over time but there has to be a faster way. (Highly successful participantpairs skating)

Finally, it is important to note that most of the athletes who performed to potential at the Olympic Games worked out programs, problems, and strategies *together* with their personal coach. These athletes respected their coaches, and their coaches respected them. Their coaches individualized training programs and feedback based upon the athlete's personal needs and input. Creating an atmosphere of mutual trust, mutual respect, and a genuine concern for individual athletes appeared to be an important advantage for helping Olympians to achieve their highest level of excellence.

The coach cares a great deal about the people that train under him. The biggest part was the mutual respect that's there. I remember one piece, well before the Olympics, the boat was going but it wasn't going great. A few of the guys were kind of frustrated and they looked to him for the answer. He just said, "It looks fine from out here. I can't tell you anything unless I get in that boat. You guys have rowed long enough, you tell me what's going on. What do you think?" That kind of respect for us just pumps you up, because you think, well, here's someone that's definitely working with us, not just sitting up on the chair and saying, "Okay, do this, and do this, and do this." He's saying, "Let's work together." And I know for a fact that if anything happened at the Olympic final, if the Americans would have caught us, say, he would have blamed himself. He would have said, "I didn't train them properly." And we would have been doing the same thing, saying, "No, it's our fault." Whereas I think a lot of coaches would rather stand back and say, "You guys blew it. You choked." (Highly successful Olympian-rowing)

My coach was there all the time. If I had a physical problem, he called the doctor. If there was a problem with my apartment or car, he was there. He was really with me for the last 2 years. It's really important to feel that your coach is going through what you are going through. I would go in the pool and feel really tired that day. He would understand and say, "Okay, today we'll do this." He adapted to me. I would choose what I wanted to do. We worked it out together all the time.

He never looked for the glory, he just wanted me to do well. He really cared about me. He wanted the best for me. He said, "Well, if that's what you need to win, go for it." I really appreciated that. (Highly successful Olympian-springboard diving)

In terms of performance at the 1984 Olympic Games it was clear that those athletes who had the most "success elements" evident in their transcripts had the best Olympic performances. Those who had fewer success elements in oper-

the race in my mind and "see" how it will go. I see where everybody else is, and then I really focus on myself. I do not worry about anybody else. I think about my own race and nothing else. I try to get those splits in my mind, and after that I am ready to go. You really know if you are on the splits by that time because you have spent so much time training on different kinds of strategies, so you know what time you are actually going, without the clock being there. You are really swimming the race. You are visualizing it from behind the block. In my mind, I go up and down the pool, rehearsing all parts of the race, visualizing how I actually feel in the water. (Highly successful Olympian-swimming)

In discovering the proper tension level, I was on a continuing evolution the whole time I skied, but I think I really hit the key after 4 or 5 years on the Canadian team. I found out there was a difference between winning and losing and took a while to zero in on it. It wasn't conscious until one time I went to far. Then I really noticed I'd gone overboard. I was way too nervous and I just blew the race. I thought, "Gee, I have to find that balance in there." Then I honed in pretty quickly. The way I did it, once I had an idea it was there, was to get really hyper for a race, and find out what reaction I got. Then be really laid back and see what the reaction was. Once you find out the outside limits you can get to, you can get quickly to the middle.

Learning from your mistakes is probably one of the biggest things influencing real excellence. And the sense of the ridiculous is another thing. You have to know when this is just ridiculous. Everyone is so intense about ski racing, but let's be realistic. These are just grown men, flopping down the hill at 80 miles an hour, on plastic and wood sticks, and this is ridiculous. If you can have a little balance in your perspective, take a step back occasionally, you'll be okay. If you learn from your mistakes and eliminate distractions, it really will help. The challenge, ultimately, is establishing consistency and consistent behavior. (Highly successful participant-Alpine skiing)

Many of these highly successful athletes felt that they could have reached the top much sooner if they had worked on strengthening their mental skills earlier in their careers. Some mentioned they had had the same technical and physical skills honed to perfection 4 years before becoming world champions, but they had not yet learned how to hold their best focus in important competitions. These athletes said that it was not until their focusing skills were refined that their dreams became a reality.

I look at what we won with this year, and we did virtually the same stuff technically that we did 5 years ago. We did no other major triples or anything, but we learned how to mentally get ourselves through the program. I think a lot more time has to be spent on getting kids ready mentally, finding out what they need to do mentally to be successful. I think a lot of kids have the physical skills to skate with the best of them. But whether or not they've got the mental skills is another question. They need to know what will work for them and what they need to do to make it work for them. Everyone keeps pushing, physically pushing. But are they mentally pushing as well?

I don't think they are. That's why kids who look like they should be good, just aren't. I think postcompetition evaluation is a real critical factor. Sitting down and learning about the kid instead of just coming back in and saying, "Well you missed your double axle, let's do some more." I think the mental set is probably the biggest area for improvement. People grow and change over time but there has to be a faster way. (Highly successful participant-pairs skating)

Finally, it is important to note that most of the athletes who performed to potential at the Olympic Games worked out programs, problems, and strategies *together* with their personal coach. These athletes respected their coaches, and their coaches respected them. Their coaches individualized training programs and feedback based upon the athlete's personal needs and input. Creating an atmosphere of mutual trust, mutual respect, and a genuine concern for individual athletes appeared to be an important advantage for helping Olympians to achieve their highest level of excellence.

The coach cares a great deal about the people that train under him. The biggest part was the mutual respect that's there. I remember one piece, well before the Olympics, the boat was going but it wasn't going great. A few of the guys were kind of frustrated and they looked to him for the answer. He just said, "It looks fine from out here. I can't tell you anything unless I get in that boat. You guys have rowed long enough, you tell me what's going on. What do you think?" That kind of respect for us just pumps you up, because you think, well, here's someone that's definitely working with us, not just sitting up on the chair and saying, "Okay, do this, and do this, and do this." He's saying, "Let's work together." And I know for a fact that if anything happened at the Olympic final, if the Americans would have caught us, he would have blamed himself. He would have said, "I didn't train them properly." And we would have been doing the same thing, saying, "No, it's our fault." Whereas I think a lot of coaches would rather stand back and say, "You guys blew it. You choked." (Highly successful Olympian-rowing)

My coach was there all the time. If I had a physical problem, he called the doctor. If there was a problem with my apartment or car, he was there. He was really with me for the last 2 years. It's really important to feel that your coach is going through what you are going through. I would go in the pool and feel really tired that day. He would understand and say, "Okay, today we'll do this." He adapted to me. I would choose what I wanted to do. We worked it out together all the time.

He never looked for the glory, he just wanted me to do well. He really cared about me. He wanted the best for me. He said, "Well, if that's what you need to win, go for it." I really appreciated that. (Highly successful Olympian-springboard diving)

In terms of performance at the 1984 Olympic Games it was clear that those athletes who had the most "success elements" evident in their transcripts had the best Olympic performances. Those who had fewer success elements in operation had poorer performances compared to what was realistically expected of them.

It is also important to note that when successful 1984 Olympians described their own previous worst international performances, some of the success elements evident for them at the Olympics were missing for that previous poor international performance. Poor performance by virtually all athletes appeared to be predicated by a lack of application of certain success elements in preparation for and/or during that particular competition.

**Performance Blocks.** Many of the athletes we interviewed did not perform to potential at the Olympic Games despite the fact that some had a very strong track record. They were expected to do well, wanted to do well, but fell far short of the mark. A careful analysis of their interview transcripts revealed three major blocks that interfered with their performances at the Olympic Games: (a) changing patterns that worked, (b) late selection, and (c) getting blown away by distractions.

1. Changing patterns that work-This was one of the greatest obstacles to performance. Individuals and teams who failed to perform well had often changed patterns that had been successful in the past. Some athletes had done extremely well at the international level during the pre-Olympic year but dramatically increased their training load for the Olympic year. Some adopted totally foreign training programs, others doubled or tripled their mileage, in some cases still doing extremely heavy work immediately prior to the Games. This, combined with the overall stress of the Olympics, left many of them completely exhausted when the time came for them to compete. They were physically drained, mentally fatigued, and in some instances injured. The overload was introduced without considering what had worked best for that athlete in the past, and without an adequate monitoring system to check for signals of overtraining.

I found that we were doing too much technical and too much physical work in that last 2 weeks before the Olympics. I think we were cramming too much, like for an exam or something, for myself anyways. I only have to take a limited number of jumps and I have a pretty good feeling. I think we started doing too much too late. We trained on-site in the morning and the afternoon and after that went to the gym, for 2 weeks straight. I got to the Olympics and I was kind of worn out already, physically and mentally. If an athlete is doing well and they have a good program set for physical and mental preparation, they should stay on it. If you're on top, just stay on it, maybe make a few minor changes here and there for refinement. Don't make any big changes. (Olympic athlete)

The training program I did when I had my best year was completely revolutionized in preparation for Olympics. My training was changed so much, I did so much work that I still have physical problems that resulted from that overwork. It was a complete waste of time. When I look back, it makes sense that if you find a training program that works for you, you mustn't go away from it. (Olympic athlete)

Last-minute changes were sometimes made in game plans which resulted in putting athletes into unfamiliar patterns that were not as well practiced. In some instances coaches totally changed their preevent input to athletes. They did not

follow the constructive, supportive, and task-oriented patterns that had worked well in the past. This created an unfamiliar and uncomfortable distraction for some athletes.

2. Late selections-The mental and physical preparation of some athletes was directly affected because of late selection decisions by associations and/or coaches. Some athletes were involved in several days of head-to-head competition at the Olympic site the week before the Games. The ones who finally made the team were both relieved that they would not be sent home (like their less fortunate teammates) and emotionally drained. They had nothing left for the actual event, and in certain cases competed injured due to the long and arduous process of late selection.

Athletes who were selected for some teams at a reasonable time did not know whether they were actually going to compete until the last moment. One coach first informed an athlete that she was playing, then during the warm-up told her that she was not playing, and then moments before the start of the game told her she was playing. It was difficult for this athlete to prepare properly when she did not know what she was preparing for, and when she had doubts about the coach's belief in her capacity. Late selections and late decisions with respect to the role that an athlete was expected to play on the team served to block mental preparation, created self-doubt, and often led to emotional drain.

The final selection wasn't made until 3 weeks before the Olympics. Everybody likes to feel they have a position, then you don't have to worry about someone stealing it, or worry about having to learn a new position. I think that switching position is good beforehand, but once you've selected your team, then people should train in that position so they get to know all the variations. We had several players who played every position, I mean everywhere. People were changed for a set play which we had been practicing and practicing. I thought, "Oh my goodness, here's a very important set play we have been practicing, and now we have a different set of people who haven't practiced it together." (Olympic team athlete)

In our best year the team was picked 6 months before the World Championships and we trained as a unit. So by that time you knew who was going to start and who wasn't going to start, and who was on the team and who wasn't. That worked and helped our unity. We were among the top three in the Worlds. If you've got a good thing going, why change it? Prior to L.A. we were carrying extra players and some of those players were going to be dropped. No matter how well you know that is the situation, it is really hard when people are dropped late, especially if they are friends of yours and have been on the team for a long time. When those players were cut from the team before L.A., it took us down emotionally. It was really difficult, a trauma for some of us because you become a family. When something is severed like that it is really hard to recover. It took a long time. If it had to happen it might have been better to say to the coach, "Cut the people early and let's get on with it." (Olympic athlete)

3. Blown away by distractions-The largest percentage of athletes who did not perform to capacity at the Olympic Games had trained well but were blown

away by distractions at the Olympics. The hype of the whole event, the Olympic village, the ceremonies, the star athletes, the crowds, the media, and the overall expectations they felt took their toll.

We were uptight because of the new situation, the fact that it was the Olympics, and that people expected us to do very well. This was a different situation for us. The media and other outside people were suddenly showing a lot of interest. Prior to the Olympics nobody even paid any attention to us. We were sort of playing like separate uptight individuals on the court, not like a full team. There wasn't really a lot of team awareness or team cohesion. (Olympic team athlete)

These athletes had prepared well for performing their physical skills but they were not prepared for the multitude of distractions. In the face of these distractions, many lost their best focus. When they stepped into the arena these athletes were often focused on the crowd, on the cameras, on the possible outcome, on self-doubts, or on the strength of their competitors. They did not direct and hold their focus on the task, on their job.

### **Questionnaire Survey Study**

This section complements and extends what was learned from the previous qualitative analysis of athletes' interview transcripts. Reported here are quantitative analyses of questionnaire data from a wider sample of athletes and sports. These quantitative results demonstrate statistically strong links between mental readying practices and Olympic performance outcome.

Results are reviewed that are statistically significant and which we consider to be practically useful. It is recognized that the squared multiple coefficients indicate that the variables involved may have only accounted for a range of 8 % to 32 % of the variance in achieved Olympic rankings. However, in this article we are interpreting significance as it applies to the mental skills and practices of an elite athlete sample in the context of fiercely selective international competition. In our "laboratory" of Olympic and world championships, the difference between achieving "gold" and placing 8th in the field can often be measured in centimeters, milliseconds, strides, and strokes. It only takes a very small edge to win.

Everybody basically has the same tools, within a certain leeway. But there's only one individual that wins, the one with the most desire and best focus. Very small differences create a very large edge towards winning. (World champion)

The questionnaire survey results are presented in the order in which they were obtained from the questionnaire. Each battery of variables is considered separately, starting with the importance of the state of mental readiness relative to technical and physical readiness, followed by effects of social supports including peers, coaches, and consultants, and finally reviewing the contribution of mental skills such as the quality and control of mental imagery, and specific features of attentional focus before and during competition.

**Readiness.** Consider first the relative importance of the state of mental readiness. Athletes were asked to think back to how they felt *just before* their final event or most crucial heat at the 1984 Olympics, and to rate their degree of physical, technical, and mental readiness at that moment on a scale of 0 to 10 with 10 representing 100% ready and 0 representing 0% ready (see Table 1).

Mental readiness was rated lowest of the three readiness factors, and athletes' ratings varied most on this factor, as shown by the size of the standard deviation. Stepwise linear regression of the three readiness variables indicated that the highest and only significant predictor of Olympic percentile rank was the mental readiness variable ( $r=.40$ ,  $p < .0001$ ). Only 7% of the athletes rated themselves as 100% ready for Olympic competition on all three factors.

**Helpfulness of Others.** When asked to rate on a 10-point scale, with 10 representing much help and 1 representing little help, the amount of help toward their mental readiness that athletes reported receiving from four types of resource people, average judgments were as shown in Table 2. Stepwise regression revealed that the "other person" variable yielded the only significant prediction to Olympic percentile rank ( $r=.32$ ,  $p < .05$ ) from this set of variables. When analyzed separately by sex, this finding held only for males ( $r=.57$ ,  $p < .001$ ).

**Table 1**

**Means and Standard Deviations  
of Athlete Ratings for the Olympic Games**

Readiness factors	<i>M</i>	<i>SD</i>
Physical	8.46	1.58
Technical	8.44	1.55
Mental	7.88	2.36

**Table 2**  
**Amount of Help Toward Mental Readiness  
as Reported by Athletes**

Resource people	<i>M</i>	<i>SD</i>
Other person	8.32	2.41
Sport psychologist	7.85	1.80
Personal coach	7.54	2.98
On-site coach	6.93	2.74

*Note.* On a scale of 1-10, 10 = 100% ready.

One third of the written comments on this question illustrated that other athletes had an important impact on athlete readiness (e.g., "my teammates' success made me want it even more").

Most noteworthy from the above was the coach's rather peripheral role in helping the athlete become mentally ready for competition. Some reasons for this may be found in the athletes' responses to the following items, which we had included because of the potentially central role coaches can play in athletes' lives by virtue of their daily access to the athletes.

Athletes were asked what their personal and on-site coaches did or said prior to the Olympics that helped or hindered their performance. Comments about *personal coach* helpfulness included the coach expressing confidence in the athlete, saying positive things like "You look good, you can do it," and getting the athlete to think of the Olympics as any other race. Also mentioned was coaching style such as having individualized practices, setting reasonable goals, planning strategy with the athlete, and being well organized.

Comments about *on-site coach* helpfulness included personal behaviors such as remaining calm and not overly instructive, being helpful to, supportive of, and confident in the athlete, as well as attitudes such as keeping the athlete's goals in perspective and treating the Olympics like any other event.

What the athletes reported their *personal coaches* doing that hindered their mental readiness included lack of responsibility, organization, and preparation for technical and mental readiness; poor communication and little feedback to the athlete; being negative about the athlete's weakness; adding pressure by predicting where the athlete should place at the Olympics (without consulting with the athlete); overemphasis on Olympic results, which led to overtraining; and creating the general impression that his or her (the coach's) "neck is on the line."

Reported deficits of *on-site coaching* included the following: coach was nervous and preoccupied, didn't give athlete any freedom, didn't understand the athlete, had a different technique than the personal coach, had unrealistic goal expectations, gave negative feedback, created friction between teammates, didn't prepare the athlete mentally, and reminded the athlete that his or her neck was on the line.

**Mental Imagery.** Some 99% of athletes in this sample reported using mental imagery as a preparation strategy. On average, athletes estimated that during training they did preplanned systematic performance imagery at least once a day, 4 days per week, for about 12 minutes each time. In the last few hours at the Olympic site some reported doing this kind of imagery for 2 to 3 hours. Similarly, athletes reported engaging in a daydreaming type of imagery that was not preplanned, 2 or 3 times a day, and more as the Olympics approached (i.e., at least 5 days a week, and for an average of 8 minutes each time). Some athletes slipped into this type of imagery for 2 to 3 hours in the last few hours before competition.

For male athletes the quality of mental imagery was related directly to performance, in terms of Olympic percentile rank. Specifically, if the athlete's imagery is of high quality, that is, if he "feels" in imagery as he does when actually performing, and if he can easily control his imagery, then his imagery correlates with *successful* Olympic performance (feeling imagery,  $r=.26$ ; feeling plus control,  $r=.41$ ,  $p < .005$ ). This was based on stepwise linear regression analysis using as predictors the four quality-of-imagery variables: inside view, video view, feeling, and control.

For female athletes, neither the quantity nor quality of their imagery related to their actual Olympic ranking. We examined this relationship further by regressing imagery against the criterion of their rating of mental readiness to compete at the Olympics. These additional analyses showed that the quantity of their imagery did relate to their reported mental readiness. The frequency of their "success imagery" in the year prior to the Olympics, combined with their amount of preplanned, on-site imagery, provided a very strong prediction of their mental readiness for competition (success imagery,  $r=.58$ ; success imagery plus preplanned, on-site imagery,  $r=.72$ ,  $p < .005$ ).

In short, the quality of performance imagery by males related directly to their Olympic achievement, while for females, doing outcome imagery throughout the year about being successful at the Olympics, coupled with time spent in preplanned, systematic performance imagery at the competition site, helped them to feel ready for competition, without necessarily directly influencing their outcomes.

**Attentional Focus.** Athletes' mental readiness, in terms of their focus of attention and feeling state prior to and during competition, proved to be a significant predictor of their Olympic percentile ranking. For the total sample, focus during competition was a significant correlate ( $r=.25$ ,  $p < .005$ ). Analyses separately by sex showed that attentional focus immediately before competition proved to be the best and only predictor for males ( $r=.28$ ,  $p < .05$ ), while for females it was focus during the event ( $r=.38$ ,  $p < .01$ ). These findings were based on stepwise regression analyses using as predictor variables the two attentional focus items: focus before, and focus during the competition.

These analyses were based on our judgments of athletes' written reports about their focus. In the questionnaire survey, athletes were asked to describe their thinking / feeling / focus before, as well as during, their final Olympic performance. More specifically, athletes were asked to "think of that event and tell us what you were focused on, thinking about, saying to yourself, and how you were feeling immediately *before* the start of the event." They were then asked to "tell us next, what you were paying attention to, and most aware of during that event." We also asked them to describe their preevent and within-event focus at their previous best international performance, for comparison purposes.

Working independently, we were able to reliably rate their preevent and within-event focus descriptions into three levels: very effective, partially effective, and ineffective.

1. Very effective-This level of focus was characterized by a full focus on the immediate task, performing with high intensity and appropriate arousal, competing with clear and ever-present awareness of executing the task or plan without distraction, and accompanied by confidence, determination, positive self-talk, or marked feelings of power and control.

In order to give you a clearer understanding of what is meant by this category, examples drawn directly from athlete questionnaires about their focus before and during competition are presented below:

Before the start I was focusing on relaxing, on breathing calmly. I felt activated but in control since I'd been thinking about what I was going to do in the race all through the warm-up. I used the period just before the start

to clear my mind, so when we did actually start the race all my thoughts about what I would be doing in the race could be uncluttered. I felt aggressive, powerful, and most of all in control because I knew our crew was capable of performing up to our expectations.

Before the start of the game I was focusing on what I had to do to contribute to the success of the team by running my job through my mind. I felt very confident and relaxed before the game. Everyone knew what they had to do and were equally confident that they could achieve our goal of a gold medal. I've never really experienced this kind of positive attitude. Everyone was so confident and no one had any doubts in our abilities. After constantly reminding each other that we *could* win, we *believed* that we were undefeatable and no one could stop us.

The plan or program was already in my head. For the race I went on automatic, like turning the program on cruise control and letting it run, I just swam. I was aware of the effort I was putting in and also of my opponent's position in relation to me. I swam the race always thinking about the intermediate goals of the race (e.g., where I wanted to be at a certain turn, etc.). Things seemed to flow easily, yet aggressively. I just let myself go and monitored the events and made inputs when required.

I was focused on just myself. When it was time to get up and ready for my next dive, I ran through what my next dive was. I told myself to relax throughout the entire meet. I took one dive at a time. After it was over, good or bad, it was forgotten. I didn't know how well or poorly I was doing or especially how anyone else was doing. I had a good time cause I felt no pressure on myself.

**2. Partially effective-**This level involved some of the elements mentioned above, yet lacked that special quality of completeness and confident determination that characterized the excellent level. The athlete quotations below illustrate this level for attentional focus before and during the event.

I had a really satisfied and happy feeling because I was happy to be there-it was a beautiful, sunny day and my teammates were such a nice group of people. I had no preset goals. I just wanted to show well in my match.

I was thinking "nothing to lose," "must give 100%." If 100% is given then I'll be satisfied." But just prior to my match my strategies were not totally clear, I was not totally focused. I was thinking about too many things.

I was thinking about making each part of the race good. I was thinking fairly confidently about a good performance but not a fantastic or amazing performance. I hung back a little too far.

Early in the game I was totally focused on executing my job and things went really well but, as the game progressed, I started thinking about the mistakes we made. At that point my focus was primarily on the negative aspects of our team's play.

**3. Ineffective focus-**This level involved attention to things other than what the athlete was supposed to focus on to guide performance at that moment, such as looking at other competitors, thinking ahead much further down the course, pool, track, or program, thinking about current scores, standings, and possible outcomes, and generally being distracted from the job at hand. The quotations below portray what we mean by ineffective focus before and during competition:

I was thinking about things I did wrong in previous games. I was lacking confidence. I was worried about what the coach was expecting from me or what I thought he wanted from me. I didn't really want to play: fed up!

I was thinking about what was wrong with my girl friend. Something was wrong. I spent the day wandering around the village trying to call her and ask. I was still worrying about her before the event.

I was most aware of my nervousness. My coach didn't help me there, he increased it if anything. I tried to focus on my dives but was easily distracted by others around me, the competition, the crowd, the cameras, et cetera. It was difficult for me to focus or stay in control. I was agitated the whole time I was out there.

I was totally overwhelmed from the minute the gun went off. I lost all concentration. I didn't hear the split times. I was thinking things like "I've lost contact," "I'll get blown away if I make the final." I was extremely distracted and had a very difficult time concentrating on my technique. I did too much thinking, but not thinking about the right things-like tactics and concentration on my running, pace and fighting back when tired.

By utilizing the classification standards outlined above, the proportional breakdown of our questionnaire sample evidenced that only a very few athletes in the survey had a truly excellent Olympic focus, as seen in Table 3.

After reading and listening to hundreds of athletes describe what they were thinking about just before their event and what they were focused on during their event, it became clear that on-site focus is an extremely powerful variable affecting performance. In our opinion, on-site focus is the most important index of the degree to which an athlete has integrated or automated mental control procedures.

**Table 3**

**Athletes' Olympic Focus**

	Before (%)	During (%)
Very effective	5	3
Partially effective	41	37
Ineffective	54	60

### Conclusions

Results from quantitative analysis of the broader sample of athletes and sports in the questionnaire survey confirmed most of the inferences drawn from qualitative analysis of the interview transcripts. The following conclusions may be drawn from an integration of the interview and questionnaire survey findings:

1. Mental readiness is an extremely important factor influencing an athlete's performance. In fact, of the three major readiness factors rated by the athletes—mental, physical, technical—mental readiness provided the only statistically significant link with final Olympic ranking.
2. A large percentage of Olympic athletes did not perform to potential at the Olympic Games because they were not prepared well enough for the distractions they faced.
3. Mental readying is derived from a number of learned mental skills that must be continually practiced and refined for an athlete to perform to potential and on a consistent basis.
4. Attentional focus and the quality and control of performance imagery were the most important statistically significant athlete skills directly related to high level performance at the Olympic Games.
5. The following common elements of success were operational for the best athletes (i.e., Olympic medalists and world champions) in virtually all sports: (a) total commitment to pursuing excellence, (b) quality training that included setting daily goals and engaging in regular competition simulation and imagery training, and (c) quality mental preparation for competition, which included a refined competition plan, a competition focus plan, an ongoing postcompetition evaluation procedure, and a plan for dealing with distractions.
6. The three major performance blocks that interfered with high level performance at the Olympic Games were (a) changing patterns that work, (b) late selection, and (c) an inability to refocus in the face of distractions.
7. Coaches could play a more meaningful role in helping athletes with their mental readiness for major events.

This study gives a clear indication of the mental components of excellence that are necessary for performing to potential at high profile events such as the Olympic Games. It pinpoints the mental skills that need to be developed and refined for consistent high level performance. It also clearly illustrates the tremendous body of knowledge that can be tapped by an in-depth examination of a nation's best athletes. We encourage those interested in helping athletes nurture these specific skills to read additional athletes' accounts about their mental readying (Orlick, 1986; Orlick & Partington, 1986), and to be guided by athletes' and coaches' prescriptions for effective consulting (Orlick & Partington, 1987; Partington & Orlick, 1987a, 1987b).

### References

- Orlick, T. (1986). *Psyching for sport: Mental training for athletes*. Champaign, IL: Human Kinetics.

### 130 • Orlick and Partington

- Orlick, T., & Partington, J. (1986). *Psyched: Inner views of winning*. Ottawa: Coaching Association of Canada.
- Orlick, T., & Partington, J. (1987). The sport psychology consultant: Analysis of critical components as viewed by Canadian Olympic athletes. *The Sport Psychologist*, 1, 4-17.
- Partington, J., & Orlick, T. (1986). *Documenting athlete readiness for the 1984 Olympics and evaluating sport consulting-Final report*. Ottawa: Coaching Association of Canada.
- Partington, J., & Orlick, T. (1987a). The sport psychology consultant: Olympic coaches' views. *The Sport Psychologist*, 1, 95-102.
- Partington, J., & Orlick, T. (1987b). The sport psychology consultant evaluation form. *The Sport Psychologist*, 1, 309-317.
- Rychta, T. (1982). Sport as a human personality development factor. In T. Orlick, J. Partington, & J. Salmela (Eds.), *Mental training for coaches and athletes* (pp. 101-102). Coaching Association of Canada.
- Werthner-Bales, P. (1985). *Retirement experiences of Canada's successful elite amateur athletes: An exploratory study*. Unpublished master's thesis, University of Ottawa.

### Acknowledgment

Appreciation is extended to Sport Canada and the Coaching Association of Canada for funding this study.

*Manuscript submitted: September 1, 1987*

*Revision received: December 10, 1987*