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The Acquisition and Development of Cognitive Skills and Strategies: I. Making the Butterflies Fly in Formation

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This study presents the first in a series of two articles extending previous findings that elite performers, compared to nonelite performers, interpret their preperformance cognitive and somatic anxiety symptoms as more facilitative than debilitating to performance (Jones, Hanton, & Swain, 1994; Jones & Swain, 1995). In-depth interview techniques were employed to investigate the cognitive skills and strategies underlying elite swimmers' interpretations of their prerace thoughts and feelings. Participants were 10 male elite swimmers who consistently maintained facilitative interpretations. Data were drawn from verbatim transcripts and were inductively content analyzed. Four general dimensions traced the acquisition and development of the cognitive skills and strategies underlying facilitation from early competitive experiences to the present day. It was concluded that participants' skills and strategies were acquired via natural learning experiences and various educational methods. These results extend the research literature on facilitative anxiety by identifying and clarifying the mechanisms underlying the phenomenon.

Orlick (1986), in a popular quotation, explained Olympic basketball coach Jack Donohue's words: "It's not a case of getting rid of the butterflies, it's a question of getting them to fly in formation" (p. 112). Specifically, if individuals can learn to direct their thoughts and feelings toward focusing on what they must do to improve sporting performance, precompetition nervousness and anxiety may not decrease their performance. However, the concept of elevated anxiety levels in the

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sport psychology literature has traditionally been viewed as detrimental toward performance. This view of competitive anxiety as being debilitating conflicts with research in other areas of psychology that has demonstrated positive consequences of high anxiety (e.g., Alpert & Haber, 1960).

Despite Mahoney and Avenier's (1977) findings that certain performers viewed their anxiety as a stimulant for performance, the notion of competitive anxiety as enhancing performance did not attract further interest until recently. During this period, researchers employed the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens, Burton, Vealey, Bump, & Smith, 1990) to measure cognitive and physiological symptoms deemed to reflect the intensity of cognitive and somatic anxiety. In 1991, Jones introduced the notion of *direction* into the sport psychology literature as a result of dissatisfaction with this "intensity alone" approach. Specifically, the CSAI-2 measures the intensity of cognitive and physical symptoms and fails to measure the nature of the individual's interpretation of those symptoms in terms of whether they are facilitative or debilitating to performance (i.e., direction). The CSAI-2 was modified by Jones and Swain (1992) to accommodate this weakness via inclusion of a directional response scale (see Jones, 1995, for a detailed review).

Recent research employing the modified CSAI-2 has addressed directional perceptions with reference to several individual difference variables, both person-oriented and situational, including competitiveness (Jones & Swain, 1992), performance (Jones, Swain, & Hardy, 1993), expectancy of goal achievement (Jones & Hanton, 1996), and skill level (Jones, Hanton, & Swain, 1994; Jones & Swain, 1995). The latter two studies are particularly pertinent in the context of the current study. Jones et al.'s (1994) findings showed no differences in the intensity of preperformance cognitive and somatic anxiety symptoms between elite and nonelite swimmers, but the elite performers interpreted both cognitive and physiological states as more facilitative. This study also involved the creation of an independent variable derived from each individual's cognitive and somatic anxiety direction scores. Specifically, swimmers were dichotomized into those who had negative scores ("debilitated") and those who had positive scores ("facilitated") on the cognitive and somatic direction variables. Interestingly, there were significantly more facilitators (85%) than debilitators (15%) in the elite group ($p < .01$) and more debilitators (53%) than facilitators (47%) in the nonelite group ($p < .01$).

These quantitative studies support the notion that competitive anxiety is not necessarily debilitating, and emphasize the need to distinguish between intensity and direction dimensions of competitive anxiety symptoms. However, the precise mechanisms underlying sports performers' differing interpretations of similar anxiety intensity levels are not well understood and should be addressed so that sport psychologists can aid athletes in achieving optimal preperformance psychological states (Jones et al., 1994).

The majority of early sport psychology research on elite performers adopted a quantitative perspective in which comparisons were made with less elite performers (e.g., Gould, Weiss, & Weinberg, 1981; Mahoney, Gabriel, & Perkins, 1987; see Hardy, Jones, & Gould, 1996, for a review). A detailed discussion of these studies is beyond the scope of this paper, but general findings suggest that more highly skilled performers possess greater motivation and confidence levels, superior concentration skills, fewer thoughts of failure, and better internal

kinesthetic imagery ability. These elite individuals have been shown to cope more efficiently with their competitive anxiety; however, this is in terms of intensity and not directly the interpretation of anxiety levels.

In contrast to these quantitative investigations of elite athletes, several studies have demonstrated that qualitative interviews can generate valuable information (e.g., Gould, Eklund, & Jackson 1992a, 1992b, 1993; Gould, Finch, & Jackson, 1993; Jackson, 1992; Orlick & Partington, 1988; Scanlan, Ravizza, & Stein, 1989; Scanlan, Stein, & Ravizza, 1991). These researchers examined factors such as sources of stress, coping strategies, experiences of being a national champion, flow states, precompetition psychological preparation and affect, and thoughts during competition. No interview studies have directly addressed the directional interpretations of anxiety symptoms; however, tenuous links with direction were uncovered in Gould et al.'s (1992a) study of 20 U.S. Olympic wrestlers. Inductive analysis revealed that prior to the wrestlers' best matches, a general dimension emerged: *optimal prematch mental state descriptors*. Subthemes of this dimension included *positive expectancies*, *heightened effort*, *commitment*, and, interestingly, *heightened arousal intensity*. Quotations within the heightened arousal intensity theme related to a positive interpretation of the precompetition symptoms that were experienced. For example, some wrestlers reported feeling "nervous but not pressured"; others felt "nervous and confident."

In another study, Jackson (1992) examined flow experiences of 16 U.S. national champion figure skaters. A dimension, *positive precompetitive and competitive affect*, emerged from the data where the skaters expressed that controlling nervousness and turning it into energy and, especially important in the context of the present study, "having good stress" were important factors for generating a flow state (Csikszentmihalyi, 1990).

Such qualitative findings partially support the quantitative findings that elite performers do interpret their precompetition anxiety states as facilitative.¹ However, the precise processes and mechanisms by which these performers have acquired the ability to interpret anxiety symptoms as facilitative have not been previously addressed. Therefore, the purpose of this study was to examine how elite male competitive swimmers, who were currently competing, have acquired the cognitive skills and strategies that enable them to interpret their prerace thoughts and feelings as facilitative. How do these performers make the butterflies they experience prior to competition "fly in formation" and work positively toward performance? Because detailed descriptive information of "rich" quality was required to fully understand these mechanisms, interview techniques were considered the most appropriate method of inquiry. Also, because there are by definition relatively few performers of this standard, these techniques were further deemed particularly pertinent.

Method

Participant Selection Criteria

Competitive swimmers had to meet certain criteria for inclusion in the study. A total of 13 participants² were initially contacted, informed of the nature of the study, and invited to participate, and each subsequently provided informed consent. Addressing the research question by employing the same criteria as Jones et

al. (1994), we verified that the elite level performers interpreted both precompetitive cognitive and somatic anxiety symptoms as facilitative to performance. To ensure that the elite competitors' interpretations were clearly facilitative, a two-step procedure was implemented prior to requesting participation in the full interview. First, all participants completed a modified trait version of the CSAI-2 (Jones & Swain, 1995), which included intensity and direction scales. This was based on Albrecht and Feltz's (1987) modification of the CSAI-2, where each item is answered in terms of how the individual usually feels, to create a dispositional or trait measure (the Competitive Trait Anxiety Inventory-2 [CTAI-2]). The questionnaire included nine items in the cognitive anxiety and somatic anxiety subscales, with *self-confidence* excluded for the purpose of this study. The response scales required each participant to rate the intensity with which each cognitive and physiological symptom was usually experienced before competition, on a scale from 1 (*not at all*) to 4 (*very much so*), resulting in scores between 9 and 36 in each subscale. The direction scale, which was completed immediately following each response on the intensity scale, required the participant to rate the degree to which the experienced intensity of each symptom was either facilitative or debilitating to subsequent performance, on a scale from -3 (*very debilitating*) to 3 (*very facilitative*), with possible scores ranging from -27 to 27. In total, 10 of the 13 elite participants reported positive scores on both direction dimensions.³

Scores for these participants ranged from 3 to 14 for the interpretation of cognitive anxiety and 4 to 14 for somatic anxiety. Intensity scores for these participants ranged from 19 to 25 for cognitive and 18 to 25 for somatic anxiety, equating to the 53rd to 87th percentile for cognitive anxiety and 67th to 95th percentile for somatic anxiety (Martens et al., 1990). The remaining 3 participants reported a combination of facilitative and debilitating interpretations for the two modes of anxiety and were thus eliminated from further participation. The second step was to conduct a brief discussion of the questionnaire results with each participant to ensure that the inventory was interpreted correctly and that the individuals did indeed hold facilitative interpretations of their anxiety symptoms.

Participants

Participants who met the selection criteria were 10 male swimmers, age 19-27 (M age = 22, $SD = 3.13$). On average, swimmers had 9.2 ($SD = 3.5$) years of national standard experience. Of the 10 participants, 3 were gold or silver medal winners at major championships, including Olympic Games, European Championships, and Commonwealth Games. All participants had competed internationally and were nationally ranked in the top 10 for their respective competitive events at the time of the study.

Instrumentation

Involvement Progression Questionnaire. So that the interview would address the swimmers' thoughts and feelings in precise time periods, each participant's career required a developmental template. Therefore, a sport-specific involvement progression questionnaire was developed, based closely on Bloom's (1985) work and successfully adapted to sport by Scanlan et al. (1989). The progression was subdivided into three phases and enabled tracking each participant's career from initial exposure to swimming through to the present day. The involvement

progression was discussed during the initial contact with participants and completed and reviewed at the time of the full scheduled interview. Phase 1 centered around initial exposure to the sport and was characterized by group lessons and other activities. The mean duration of time spent in this initial phase was 3.8 years ($SD = 1.93$). Phase 2 was characterized by greater commitment to swimming, including competitive events and neglecting other activities (M years = 4.2, $SD = 1.4$). Phase 3 became the main focus of the interview, where swimmers competed at the highest levels, including major championships (M years = 8.6, $SD = 2.27$). Complete dedication was the central characteristic of this phase, with swimmers training upward of 25 hr/week in the pool.

Interview Guide and Questions. Findings from quantitative research into directional perceptions of anxiety provided the rationale and stimulus for the majority of the questions in the guide.⁴ The interview guide was pilot tested on national standard swimmers ($n = 10$), and minor refinements were made. The pilot study also allowed the interviewer to practice and refine interview techniques and skills. The interview, which was divided into six interrelated sections that progressed through the swimmers' careers from initial involvement to the present day, was based on each individual's completed involvement progression questionnaire and included the following:

- Introductory comments and instructions
- Initial experiences in swimming
- Increased commitment and early competitive experiences
- Total commitment (junior and senior competitive experiences)
- Current experiences and mental skills utilized
- Advice and recommendations regarding restructuring debilitating interpretations

In each section, the interview addressed competition-related cognitive and physiological symptoms and probed swimmers' interpretations of those symptoms for performance.

Procedures

A standardized format was used for the interview schedule, where each participant was taken through an identical set of questions, each of which was asked in the same way. However, the presentation of topics varied with the flow of the interview, with pertinent issues developed where appropriate. As recommended by Patton (1980), a priori probing rules for clarification, elaboration, and general probes were established before the interview. For example, to obtain responses that were as consistent as possible in terms of depth and complexity a maximum of two elaboration probes were used per question throughout the interview session.

All interviews were conducted by the same author, providing a constant across the study. The interviewer was a competitive swimmer with a background in the sport and was therefore familiar with the sport-specific terminology and experiences.

Participants were asked to maintain perspective in the phase of the interview that was being discussed. To facilitate recall, two orienting instructions were provided and reinforced at appropriate times throughout the interview (see Scanlan et al., 1989). First, questions were asked about competing not only at the present time but also in the past when swimmers were not of elite status. If recall was

problematic, participants were asked to take their time, and if they still could not remember, to tell the interviewer rather than guess. The second orienting instruction explained that the participants could draw upon all aspects of their swimming careers in an attempt to create an overall experience.

All interviews were conducted in person and away from the competitive swimming environment. Interviews lasted approximately 60 min, were tape recorded in their entirety, and transcribed verbatim, yielding over 250 typed pages.

Data Analysis

Inductive content analysis, as recommended by Patton (1980) and successfully adapted to sport by Scanlan, Gould, and their colleagues, was adopted in this study. Content analysis is a procedure that allows the investigator to organize raw data into interpretable and meaningful themes and categories and allows these to emerge from the quotations. Specifically, the process begins with clustering quotes around common threads, which become the emergent themes. The analysis continues to develop until further common threads cannot be located to create a higher level theme. The specific procedure adopted in this study incorporated seven steps:

1. Transcripts were read and reread by the authors to ensure familiarity with the content.
2. Raw data themes (i.e., quotes or paraphrased quotes) from the transcripts were reread to ensure that all quotations made intuitive sense.
3. Raw data themes were then compiled in list form, combining the responses across all participants.
4. Inductive content analysis was then conducted to identify common themes from the lists of subsectioned raw data. Second level themes were labeled *higher order themes* and the highest level themes *general dimensions*.
5. A deductive analysis was conducted to provide a validity check in verifying that all themes and dimensions were present in the transcripts.
6. The numbers of citations in each dimension were calculated for a frequency analysis.
7. The researchers' individual biases were controlled using a consensus validation procedure (i.e., each stage of the analysis was completed independently and then discussed before progressing to the next level).

A third, independent researcher, who had experience in these procedures, confirmed the analysis throughout each stage.

Results

Results derived from the content analysis are presented by simultaneously examining the responses from all 10 swimmers. The number of participants providing raw data themes that fell into higher order themes and dimensions are presented in Table 1. Specifically, 107 raw data themes emerged from the transcripts, which were abstracted into 18 higher order themes and 4 general dimensions.

The general dimensions and associated higher order themes are represented hierarchically in Figures 1, 2, 3 and 4 (a, b, c, and d). Representative quotations from the transcripts are interspersed amid the results to clarify and illustrate the analysis points.

Table 1 Number of Swimmers Providing Raw Data Themes Falling Into Major Categories

Dimension/ Higher order theme	Number of citations
Early unwanted negative experiences	10
Negative competition cognitions	8
Negative somatic feeling states	7
Learned at young age nerves can be positive	10
Accept feelings	10
Require feelings	4
External persuasion	5
Early race preparation	10
Positive cognitive labeling	6
Precompetition routine	10
Mental imagery	10
Goal setting	10
Prerace routine	10
Rationalization	10
Thought and feeling control	9
Dissociation tactics	6
Cognitive denial	4
Internal focusing	8
External focusing	3
Positive imagery	7
Physical strategies	10
Relaxation strategies	5

Early Unwanted Negative Experiences

Figure 1 presents a total of 13 raw data themes concerning the initial undesired negative thoughts and feelings experienced, which were organized into two higher order subthemes, two higher order themes, and one dimension, *early unwanted negative experiences*, which arose from the following higher order themes: *negative competition cognitions* and *negative somatic feeling states*. Negative competition cognitions included swimmers' references to competition and preparation concerns. Examples of these thoughts were reflected in the following comments:

I just started to wonder if I had done the right amount of training, whether I had trained hard enough, and I would have flashes of doubts about this.

I was always worried about letting the team down. I wanted to do well and win my own race, but that was to get good points for the team.

Specifically, typical worries centered around the competition itself, including fears of finishing last in the race and worries about making racing mistakes.

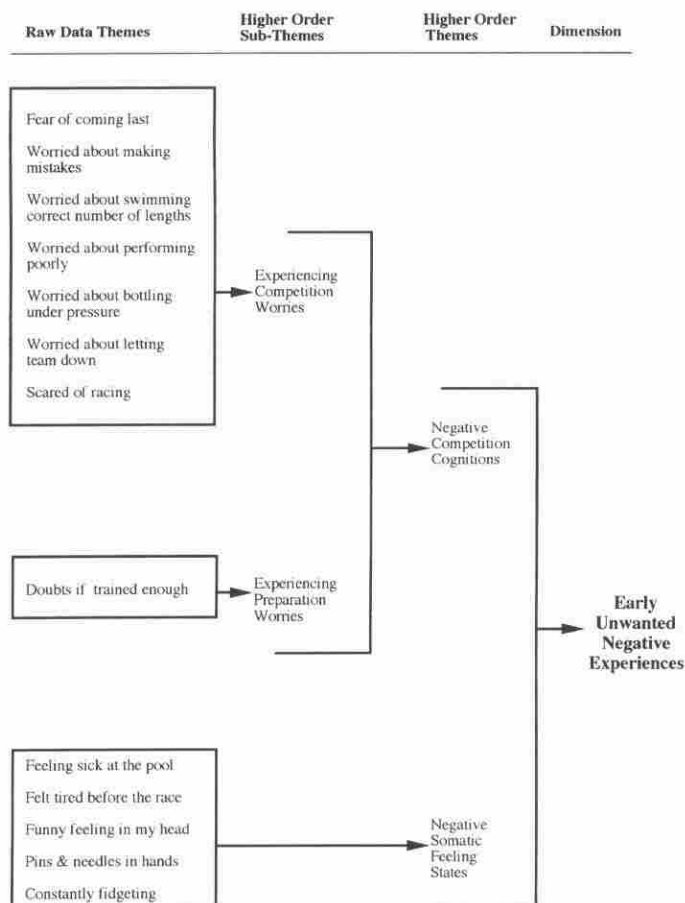


Figure 1 — Inductive content analysis: Early unwanted negative experiences.

References to descriptors of common physical discomfort emanated from the second higher order theme, *negative somatic feeling states*. These included sentiments such as feeling sick at the competition venue, feeling tired before racing, and constantly fidgeting. One swimmer expressed how he felt before the race: "Every single time I was stood behind the blocks ready to swim I would get really bad pins and needles in my hands and fingers. I didn't like it at all."

Learned at Early Age Nerves Can Be Positive

This dimension was interpreted from a total of 18 raw data themes reporting that nerves can be perceived positively in the younger years. These raw data themes were organized into five higher order themes. One of these, *early race preparation facilitation*, contained complementary higher order subthemes (see Figure 2).

Swimmers expressed that they accepted their prerace symptoms even though they were relatively inexperienced. One swimmer commented: "I just took the attitude that there is no point in worrying about it now, because there is nothing you can do about it, it's too late. . . . You just have to get on with it." Interestingly, these athletes mentioned that they also required the symptoms, claiming that they

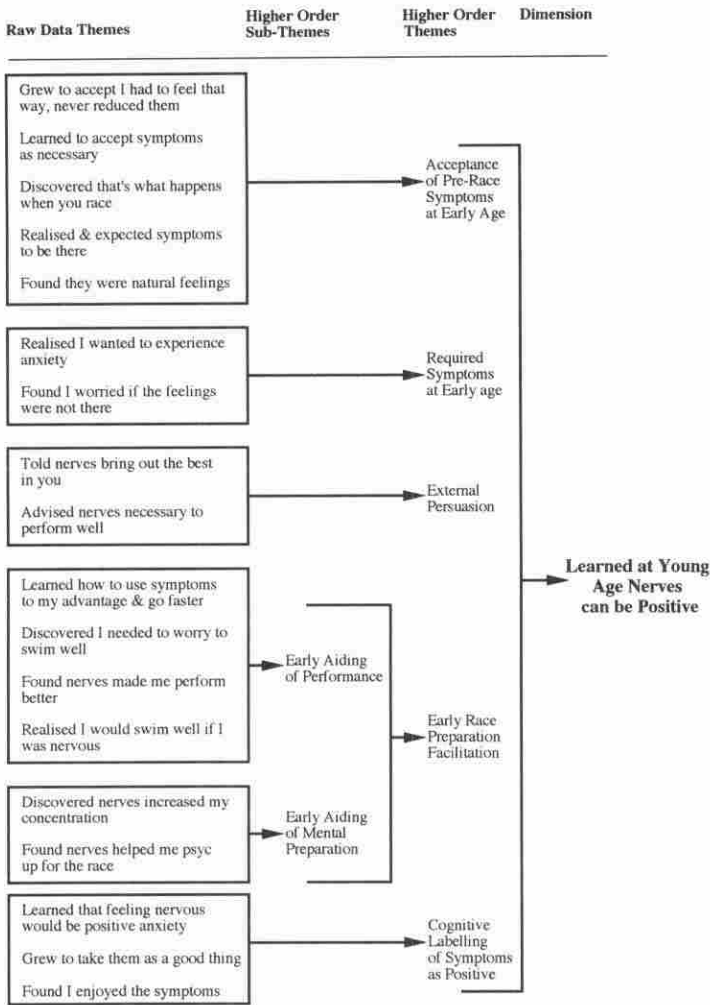


Figure 2 — Inductive content analysis: Learned at early age that nerves can be positive.

wanted to feel the way they did and were more concerned if the feelings were not present prior to the race. The presence of these symptoms therefore acted as an indication of readiness to race:

I mean you have to get nervous to swim well. . . . If you're not bothered about it, if you're not nervous you're not going to swim well. . . . I think the nerves bring out the best in you, and I soon realized that I wanted to feel this way.

Persuasion via significant others emerged as the primary method of educating swimmers about the positive properties of their symptoms in the early years. Swimmers were told by coaches, parents, and older, more experienced swimmers that nervous feelings can bring out the best in you and are necessary to perform well. A raw data theme abstracted into the dimension was reflected in sentiments such as the following:

I remember my first reasonably big meet; it was a League final. I was driving there with my dad, and I said I was nervous; I said I had butterflies in my stomach. He said that's a really good thing because that will get the adrenaline flowing. Obviously when you're young you haven't got any idea what adrenaline is, and he said it was a good thing, so I took it as read that it was a good thing. . . . I was feeling this thing in my stomach, but it was a good thing so I took his word for it.

The higher order theme, *early race preparation facilitation*, contained two supplementary subthemes. *Early aiding of performance* included references to the discovery of needing to worry to swim well and the realization that the performer would swim faster if he was nervous prior to the race. With reference to somatic symptoms, one swimmer indicated: "Although I had the butterflies in my stomach just like every other kid, I realized that whenever I did and whenever the greater the occasion, I always seemed to swim faster."

These findings were complimented by the swimmers reporting that when they were in a nervous state they were able to concentrate more on the upcoming race, subsequently facilitating their "psych-up" strategies. One swimmer spoke of the increased concentration as a result of his prerace symptoms:

I discovered the symptoms helped me psych up for races. If you knew the nerves were there the adrenaline would flow and make me perform better . . . concentrate harder. They [the symptoms] would make me concentrate on the race . . . help me prepare to swim fast . . . to get off the blocks quickly, get in the pool and swim fast.

Cognitive labeling of symptoms as positive emerged as the final higher order theme, where swimmers stated how they learned that feeling nervous would be a form of "positive anxiety." They developed to interpret the symptoms as a good thing and something that they enjoyed:

I found that the more I raced the more I enjoyed it. What I mean is that I started to look forward to Saturdays when I would be racing, I liked feeling nervous once I got used to it. It gave me a buzz, especially at a bigger meet. Swimming just wouldn't have been the same without them.

Precompetition Routine

Figure 3 illustrates a total of 12 raw data themes concerning the *precompetition routine* that the swimmers developed and now follow to maintain facilitative interpretations. Subsequently, these raw data themes were organized into seven higher order subthemes and two higher order themes. It is important to highlight that these are strategies that the swimmers adopt prior to actual competition. Therefore, the temporal patterning is relatively broad.

Mental imagery strategies⁵ emerged as the first higher order theme in the analysis, which was further abstracted into two subthemes illustrating training and skill practice imagery. As part of the training imagery that swimmers followed, they utilized a very specific form of imagery while actually training in the water, therefore simulating the environment closely. Interestingly, one swimmer expressed how he is unable to image his entire race initially, but that the event in his mind becomes complete and clear as the major championship approaches:

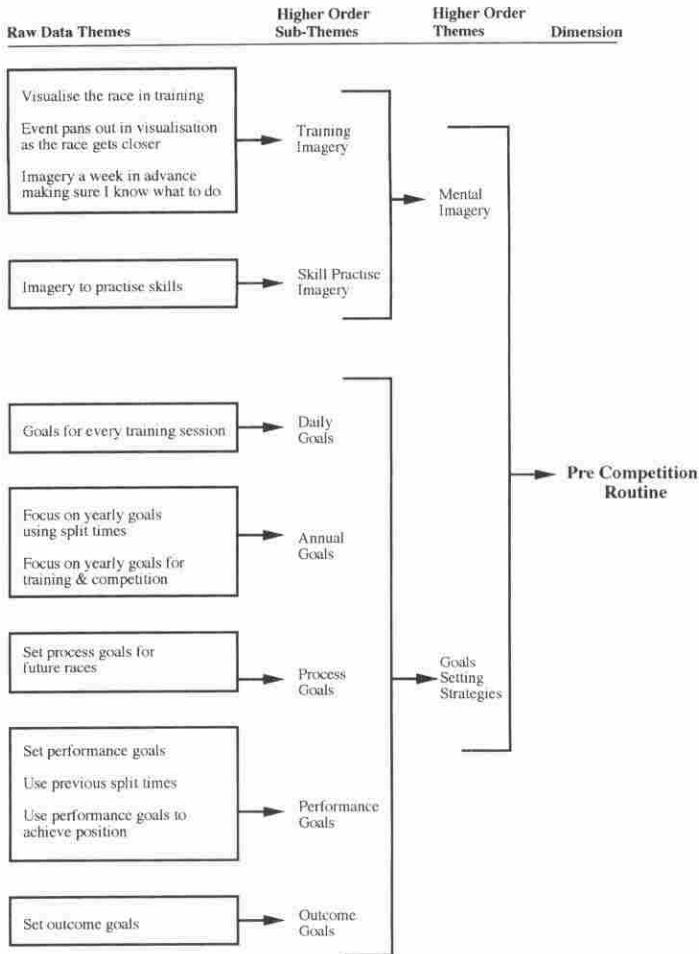


Figure 3 — Precompetition routine: Inductive content analysis.

As I get closer and closer to the event or closer to race day, so my event seems to pan out. It becomes a lot more clear, and whereas it might have been just the first 50, it establishes itself into a full 200 breaststroke with stroke count, feel of the event, adrenaline surge, and I see myself doing the whole event and achieving exactly what I want to achieve.

Swimmers also reported that they used this psychological skill to prepare for the competition by making sure they knew what they wanted to do, not only at the venue of the competition but also in the race itself.

Goal setting emerged as the second strategy adopted by participants prior to the competition. These strategies were comprehensive and extremely detailed, with participants reporting that they spent a considerable amount of time planning with their coaches their goals for training and competition. These programs were typically initiated by establishing yearly annual goals based on the performance times

achieved in the previous competitive performances. Daily goals for each training session were also set. Swimmers reported using process goals as a means of achieving performance times and, subsequently, outcome positions:

If someone was to say you can go 2:10, that's a fast time. I really don't know if I can do that, but if you break the race down into four individual one-length swims, then it becomes more believable. Then you think that I have actually split that time before and I have actually come back (the last length) in that time, so what I have to do is find an improved split for the second length, and it becomes more believable, and that's how I go about my goal setting.

Preace Routine

The general dimension, *prerace routine*, represents a total of 64 raw data themes concerning the actual prerace routine that the elite swimmers followed. These raw data themes were organized into 16 higher order subthemes and 9 higher order themes.

This was an extremely detailed analysis containing a significant amount of rich information; therefore, this section will focus primarily on one higher order theme, *rationalization of thoughts and feelings*, which relates most directly to this study.

All participants reported how they rationalized their precompetition thoughts and feelings as part of their prerace routines. These results supported the higher order themes that emerged from the data regarding how the participants learned that nerves could be positive when they were developing and gaining experience in the sport. The main difference between these two dimensions related to skill acquisition. Specifically, when they were younger, participants either learned for themselves or were informed by significant others about the positive properties of experiencing the symptoms they felt before a race. Conversely, quotations in this *prerace routine* dimension concerning what participants have learned to do and now commonly adhere to doing are in the present tense. This rationalization skill has therefore been refined with the experience gained in the sport. Figure 4a presents four subthemes presenting how prerace thoughts and feelings are accepted. Themes abstracted into this dimension were reflected in sentiments such as the following:

The way you feel before a big race is just something that you can't avoid. If you want to make it in this sport you have to accept the feelings and just get on with it. . . . Worrying about feeling sick or tense is just a waste of time.

Requirement of the symptoms was described as being very important for the upcoming race. For example, the swimmers spoke about how they need and like the nerves to be present because they signify the importance of the race and the competition:

If I didn't have those kind of feelings before a race I wouldn't feel that the race was important. I need them to get myself psyched up to perform well. . . . I interpret them that they have to be there in order for me to swim well.

Following from this, it is evident that the participants use these nerves in a facilitative manner toward their upcoming races. One champion swimmer illustrated this point relative to the delicate line he perceives between positive and negative states prior to the race:

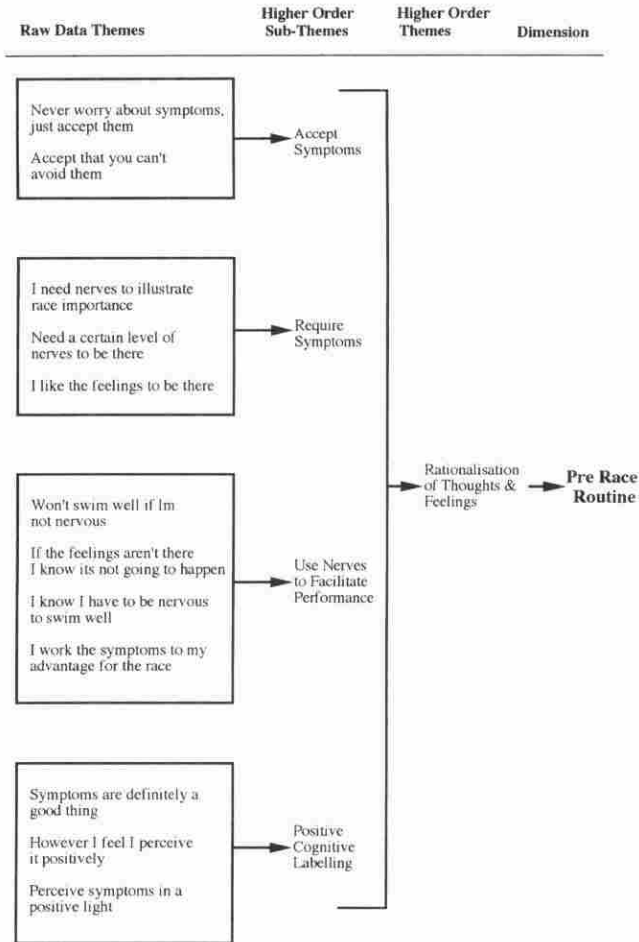


Figure 4a — Prerace routine: Inductive content analysis.

There is a very fine line between anxiety and excitement . . . and I think probably when I do my best performances I am very close to that line. . . . I think I usually am in a pressure situation, very close to that line.

Participants in this study cognitively labeled their prerace symptoms as very positive. Representative remarks reported that the way the swimmers felt before the race was “definitely a good thing” and perceived and interpreted by them in “a positive light.” Unusually, but interestingly, one swimmer expressed that regardless of how he felt, he always perceived his feelings positively:

I’ve learnt now, however I feel it’s a good thing. . . . If I’m at a meet and I’m not nervous and it’s quite an important meet I will say, “Good, I’m not nervous.” And that works exactly the same if I am very nervous before the race. . . . Whatever I feel, I try and perceive it positively.

Figures 4b, 4c, and 4d illustrate the other strategies that the swimmers use approximately 30–60 min prior to the race as part of an overall package that helps maintain facilitative interpretations. For the purposes of this paper these dimensions will only be discussed briefly.

Swimmers expressed considerable control over their thoughts and feelings via self-talk strategies, positive thinking, and controlling cognitive activation and arousal, which formed a psychological package to maintain facilitative interpretations. For this subtheme, swimmers described how they decided for themselves the correct time to start thinking about the race and become activated for performance. Prior to this, they would dissociate by forgetting about the upcoming performance by talking to friends and family about anything but the upcoming race. Swimmers stated that they denied the importance of the race to help maintain a

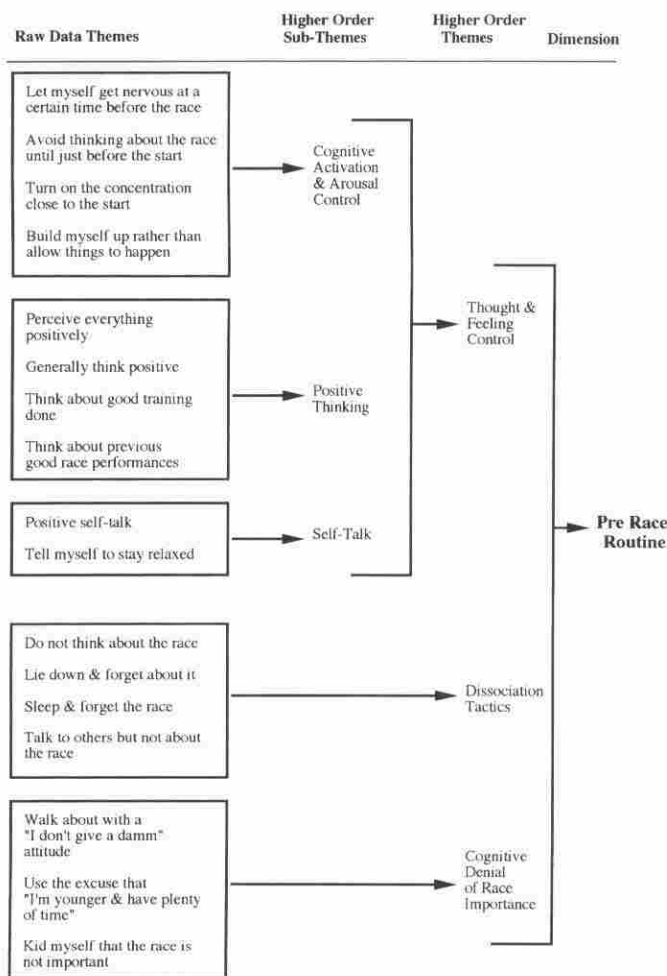


Figure 4b — Prerace routine: Inductive content analysis.

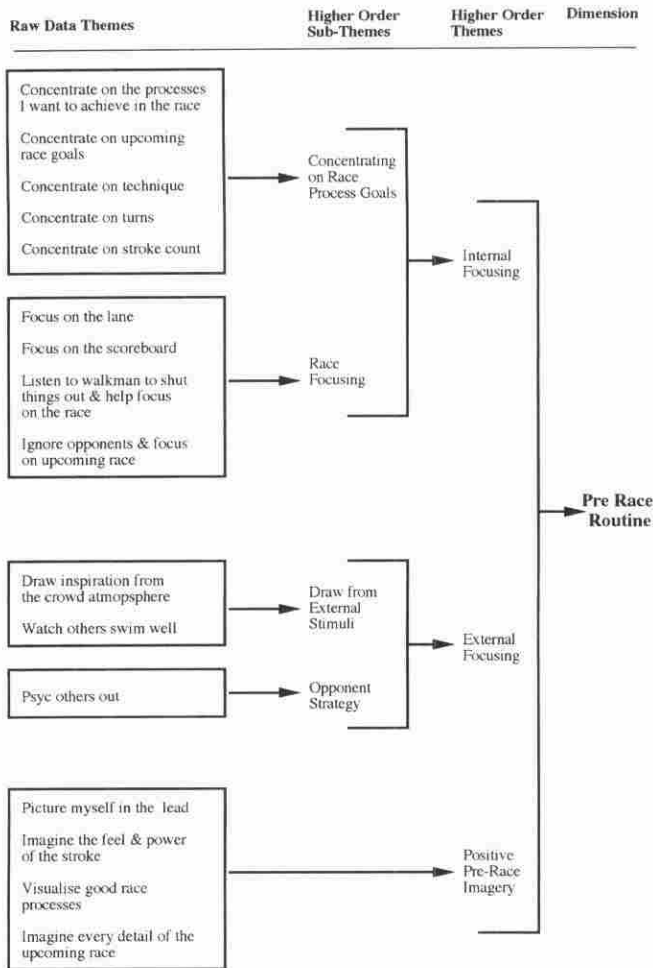


Figure 4c — Prerace routine: Inductive content analysis.

positive outlook. Examples of such related to walking about the poolside with a “don’t give a damn” attitude or repeating to themselves that their upcoming race really was not that important.

Internal focusing strategies were also reported, concentrating on factors that were within personal control (Figure 4c), for example, focusing on the process goals they had set for the race, such as achieving a fast and dynamic start. The second subtheme included strategies to ignore opponents in order to focus on their own race, such as listening to a Walkman and concentrating on neutral factors (e.g., the scoreboard), or using tunnel vision (i.e., focusing down the lane). The swimmers adopted *external focusing* strategies, such as trying to psych out the opposition and drawing inspiration not only from friends in the crowd but also the atmosphere of the audience. *Positive prerace imagery* skills included swimmers picturing themselves in a winning position and how powerful their stroke would feel during the race.

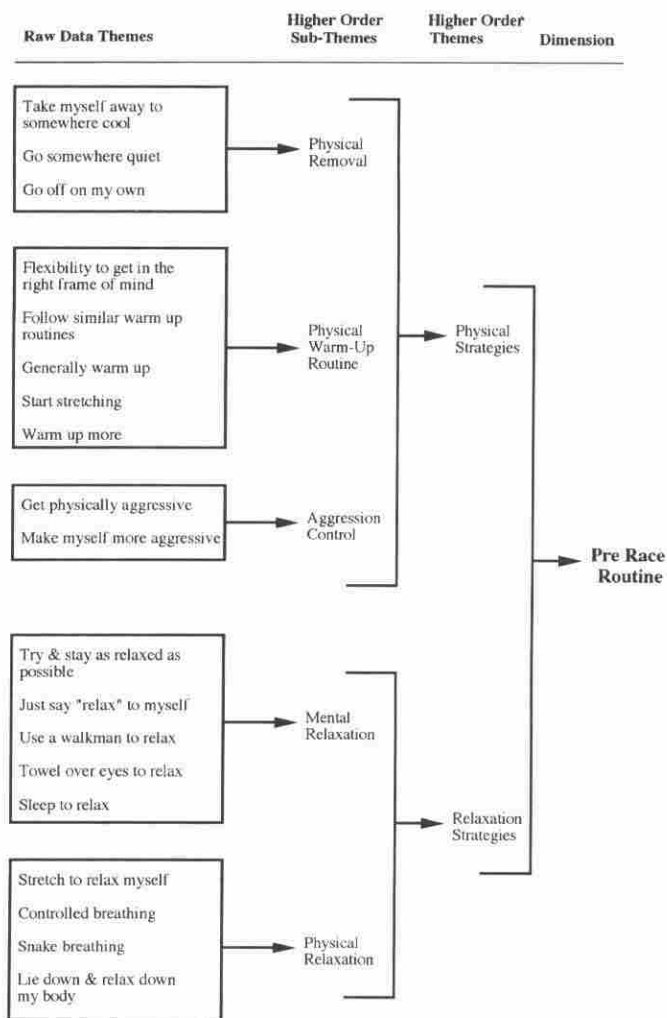


Figure 4d — Prerace routine: Inductive content analysis.

Not surprisingly, participants reported using certain *physical strategies*, in view of the fact that all elite athletes perform a routine physical warm-up prior to competing. Additionally, several swimmers in this study reported leaving the venue for a while and going off on their own, or attempting to make themselves more aggressive prior to the race. Finally, the swimmers did report using either a mental or physical relaxation strategy prior to their upcoming race. These included sleeping, using a walkman, stretching, and controlled breathing techniques. This was not in attempt to reduce undesired prerace symptoms but simply to stay generally relaxed.

Following the main sections of the interview, participants were asked to offer advice for swimmers suffering from debilitating precompetition anxiety symptoms. Differing advice was offered, including keeping the sport in perspective, not

taking swimming too seriously, trying not to worry about opponents, and therefore concentrating solely on your own performance. However, swimmers offered one consistent piece of advice with regard to altering the perception of prerace feelings from negative to positive. All of the performers in the sample explained how they would draw upon not only their own personal experiences of how they felt before a race but also the experiences of other swimmers to help them understand the reasons for feeling the way they did. The specific advice focused around attempting to demonstrate how the thoughts and feelings prior to racing are a natural part of the sport and provide an indication that the swimmer is ready to compete. Two champion swimmers remarked: "I would try and explain to them that they need these sort of feelings to help them, as it means that they are concerned about the race," reassuring the swimmer by saying: "Don't worry, its only your body preparing to race."

Discussion

The research question for this study emanated from previous research into directional perceptions, which showed differences between elite and nonelite performers in anxiety interpretations despite no differences in anxiety intensity levels. The purpose of this study was to examine how elite performers have acquired the cognitive skills and strategies that enable them to interpret their precompetition anxiety as facilitative of performance. This question was examined via the use of interview techniques and inductive content analysis procedures.

Our findings indicate that the performers did not interpret precompetition anxiety as facilitative toward performance from the first time they started competing. The swimmers typically worried about the training that they had completed and if it was sufficient to race well. Also, worries emerged relating to actually performing in the race, such as not coping with pressure, letting the team down, and making mistakes in front of the spectators. They also experienced somatic symptoms, such as feeling sick and tired prior to competing. However, these mental and physical symptoms were not welcomed in the younger years; they were unwanted, not enjoyed, and interpreted negatively toward the upcoming race.

As swimmers developed and gained experience, they learned that the symptoms they were experiencing prior to competition could be positive and actually aid them in the race itself. This altered interpretation was the result of two primary influences. The first involved listening to significant others and taking advice on the way they felt prior to a race. Swimmers' parents, coaches, and older, more experienced competitors all played a part in this development. These important individuals explained that the nerves they previously interpreted as negative were indeed necessary to perform optimally. Therefore, the swimmers were essentially educated in certain psychological techniques. Second, following the advice of these people, the swimmers then started to accept the way they were feeling as a necessary and natural part of competing. When they realized that the nerves were a good thing, they did not try to reduce the symptoms but, conversely, wanted them to be there and indeed worried if symptoms were not present before a race. The swimmers conveyed that they now enjoyed feeling nervous prior to competition and indeed looked forward to feeling this way. Further, through these natural learning experiences, they developed the ability to make use of prerace nerves to aid performance and mental preparation.

As the swimmers progressed in status, they developed and now follow refined precompetition and prerace routines. They highlighted that the skills they now use collectively form a complete mental preparation package that facilitates the maintenance of interpreting prerace symptoms as positive. Swimmers explained how all of the skills fit together as a jigsaw and that no one skill was more important than others. Specifically, the swimmers developed a precompetition routine that is practiced and implemented prior to the competitive race. This routine involves the use of mental imagery and goal-setting strategies. Swimmers reported how using imagery, for example, 1 week in advance to simulate the competition maintains the facilitative interpretation of symptoms on the day via reducing uncertainty and doubt. This was mentally rehearsed previously and provided swimmers with the confidence of being completely prepared. Goal-setting techniques were reported as being extremely important to this end. Specifically, swimmers reported that the goals set provided a focus for each competitive race in terms of the race processes and performances as a means of achieving the desired outcome. This reiterates Jones and Hanton's (1996) findings, which supported a control process model predicting how performers with favorable expectancies of goal achievement reported more facilitative anxiety interpretations compared to individuals with negative or uncertain goal attainment expectancies. Specifically, goals that are intrapersonal (i.e., performance and process goals) and deemed to be within personal control were associated with more facilitative interpretations of anxiety than goals perceived as outside personal control, such as race outcomes, which also depend on the performances of others.

Swimmers provided significant detail about prerace routines. However, in terms of the research question for this study, the most important aspect of this routine related to rationalizing thoughts and feelings before the race, which was reported by all 10 swimmers. As already stated, participants conveyed that as young competitors they were told that nerves can be positive. They accepted this advice and started to interpret their prerace states more positively. Now that the swimmers are more experienced, a similar pattern emerged from the findings. Specifically, they accept the way they feel, make use of prerace nerves, and do not try to reduce the associated symptoms. They explained how nervousness illustrates the importance of the race; if symptoms are absent, then a good performance is unlikely. Therefore, all of the swimmers went so far as to say that elevated prerace mental and physical symptoms are a positive factor for a good performance.

These findings show, therefore, that mental skill acquisition involved gradual developmental stages. Specifically, performers developed facilitative interpretations by taking advice from more experienced individuals and via the natural learning experiences, such as racing at different competitive standards, at home and abroad, and against different opponents. Additionally, although these findings suggest a gradual progression over the course of the swimmers' careers, causality between psychological skill development and elite status cannot be assumed. This particular line of inquiry, although difficult to address, provides a challenge for future researchers (Jones, 1995).

When swimmers were asked to offer advice for performers who interpret their anxiety symptoms as debilitating, their responses were extremely consistent. All 10 swimmers suggested that they would recall their own and others' experiences and try to explain why such thoughts and feelings are experienced prior to a race. Therefore, it appears essential that young performers are informed precisely

why they experience various symptoms in pressure situations. This may aid the younger performer suffering from debilitating anxiety states and also prevent debilitating anxiety occurring in the first instance. The interviews indicated that these skills have been developed over the years, refined, and extensively practiced. Although there was close agreement between the swimmers on the strategies, individual differences were also evident in how these skills were acquired. Indeed, by nature of the qualitative methodology employed in the study, it was not surprising that unique and individual responses were generated in that the themes and dimensions in the inductive analysis were allowed to actually emerge from the transcripts.

Findings from this study are consistent with other qualitative research on elite athletes (Gould et al., 1992a, 1993; Orlick & Partington, 1988) concerning the adoption of refined precompetition plans that performers closely and consistently follow. Further, our results highlight that the swimmers use these skills as part of an overall mental preparation package, which they perceive as contributing significantly toward maintaining facilitative interpretations of their pre-race thoughts and feelings. Interestingly, Gould, Finch, and Jackson (1993), who studied elite figure skaters, reported the use of thought control strategies prior to competing, including rational self-talk strategies. However, although the current investigation has some common findings with previous qualitative research, other researchers did not directly measure facilitative and debilitating interpretations of anxiety symptoms. In view of the specific focus on anxiety interpretations, results of the current investigation are therefore somewhat unique and not simply a replication that elite performers adopt a well-constructed mental skills program.

Despite the wealth of information gleaned from this study, two limitations should be considered in interpreting the findings. The first relates to the retrospective nature of the interviews, which challenged swimmers to remember details of thoughts and feelings from important past sporting experiences. The authors recognize the concerns surrounding memory decay and recall concerns; however, efficient bounding techniques and orienting instructions facilitated this process. Also, Lincoln and Guba (1985) pointed out that retrospection is a legitimate vehicle for obtaining information, particularly when remembering important life events, such as major swimming championships. Second, hierarchical content analysis is essentially descriptive and does not allow direct causality to be established. Therefore, we suggest exercising caution when considering findings in view of the necessity to subjectively interpret the emergent patterns from the interviews.

In summary, the elite performers in this study developed effective strategies over time, which they now use for interpreting pre-race thoughts and feelings as facilitative. The swimmers have learned how to make the butterflies "fly in formation" and work for them positively in competitive situations. Further, there are important practical implications emanating from this study with reference to cognitive restructuring strategies in performers debilitated by their anxiety symptoms.

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Notes

¹Caution is advised in the interpretation of these findings since a direct comparison with nonelite performers—the central aim of the quantitative studies—was not addressed within the interview studies.

²Initial selection was based upon the aim to achieve the most elite sample possible. Competitive swimming was chosen to continue the line of research utilized by Jones et al. (1994).

³A negative score on the direction scale denoted a state of debilitation, whereas a positive score denotes a state of facilitation.

⁴A copy of the interview guide is available from the author.

⁵Participants were asked in the interview about the mental skills that they use prior to competition and before a race, with reference to maintaining facilitative interpretations of thoughts and feelings. All 10 swimmers reported that these skills collectively form a mental preparation package that complemented maintaining facilitative interpretations.

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