Psychological Characteristics of Successful and Nonsuccessful Elite Wrestlers: An Exploratory Study

Pamela S. Highlen and Bonnie B. Bennett
University of Western Ontario

Elite wrestlers \( (N = 39) \) were given a standardized questionnaire during final competition for positions on three Canadian World Wrestling teams. The questionnaire specifically focused upon psychological factors affecting both their training and competition. For data analysis, questionnaire items were combined into 17 factors. Both t-tests and simple discriminant function analyses for qualifier/nonqualifier competitive status revealed that self-confidence was the most important factor distinguishing the two groups. For the discriminant function analysis, Imagery and Factors Affecting Performance were the only factors which did not contribute to group differences. Explanations and implications of these results for sport psychology are discussed.

Although the effects of psychology on the elite athlete’s performance have long been recognized, the systematic investigation of psychological factors affecting competitive sports has, for the most part, been ignored. Fortunately, however, an increasing number of psychologists and sports specialists are conducting research within this domain. To date, investigations have dealt with both open- and closed-skill sports. According to Gentile (1972) open-skill activities like wrestling, badminton and hockey are those in which skills are primarily executed in an ever-changing, interactive environment. Therefore, in open-skill activities, the athlete attempts to develop a repertoire of patterns that match particular environmental stimuli that are encountered during the execution of that skill (e.g., performing a back hand swing in response to a serve). In contrast, closed skills, such as gymnastics, high-jumping, and diving, are defined as occurring when the environmental surroundings remain constant (Gentile, 1972). Thus, in performing these skills, the athlete strives to produce consistent movement patterns.

Some investigators have maintained that athletes’ personalities differ depending on the type of sport. Morgan (1968) reported that elite North American wrestlers (open skill) were characterized by extraversion and stability and that extraversion was positively correlated with performance. In contrast, similar re-

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Requests for reprints should be sent to Pamela S. Highlen, Department of Psychology, University of Western Ontario, London, Ontario N6A 5C2 Canada.
search with the closed-skill sport of marathon running revealed that these runners were more introverted than wrestlers and that extraversion, neuroticism, anxiety, and depression scores were not correlated with performance (Morgan & Costill, 1972).

Although personality traits may be helpful in selecting elite athletes, such information has little utility for training these athletes to maximize their performance. Therefore, research identifying situational rather than trait differences between successful and unsuccessful elite athletes seems more promising.

Research on behavioral states of world-class wrestlers and oarsmen, as well as marathoners, have been cited by Morgan (1974). As measured by the Profile of Mood states, the successful elite athletes tend to be less anxious, depressed, and confused and possess more "psychic vigor" than their less successful counterparts. Furthermore, research on cognitive mediators differentiating successful from unsuccessful elite athletes has also been conducted. Recently, Morgan (1978) reported that world-champion marathon runners use associative (i.e., keeping in touch with their bodies) rather than disassociative techniques (i.e., distracting thoughts and images) during races. Nonworld class marathon runners, however, use disassociative strategies to improve their performance. Therefore, in terms of the closed-skill sport of marathon running, it appears that the cognitive strategies employed depend upon the caliber of athlete.

Finally, Mahoney and Avener (1977) conducted an exploratory study examining situational factors distinguishing between successful and unsuccessful elite athletes. Using the closed-skill sport of gymnastics, they found different cognitive patterns for U.S. Olympic qualifiers and nonqualifiers. Specifically, the successful gymnasts were more self-confident, had a higher frequency of gymnastic dreams, and "talked to themselves" more extensively during training and competition. In addition, they found that qualifiers experienced greater anxiety prior to competition than the nonqualifiers; however, this pattern reversed during actual performance. This study is of special interest because it identified specific cognitive factors which, after experimental scrutiny, might be useful in developing psychological training strategies to help unsuccessful elite athletes improve their performance.

However, do such situational psychological differences apply across open- and closed-skill sports? The personality research cited earlier suggests that differences exist between open- and closed-skill elite athletes. Therefore, the major purpose of this exploratory study was to examine specific psychological factors which might differentiate successful and unsuccessful elite athletes in the open-skill sport of wrestling. Factors characterizing both groups of elite wrestlers were also of interest.

**Method**

**Sample**

In June, 1977, 40 elite wrestlers, comprising the top 10% of all Canadian wrestlers, were invited to the University of Western Ontario in order to compete
for positions on three National teams. These three teams were to represent Canada at the World Games, the F.I.S.U. World Student Games, and the Pan American Wrestling Championship. This sample of elite wrestlers ranged in age from 18 to 32. In accordance with the Canadian Amateur Wrestling Association's rules, wrestlers were only allowed to participate on two of the three teams.

These wrestlers competed in a round-robin tournament, with the winners of each weight class being chosen to participate in the more prestigious World and/or Student Games. The second-place finishers were chosen to represent Canada at the Pan American Championship.

At an organizational meeting held on the first evening of the try-outs the wrestlers completed a standardized questionnaire which addressed specific psychological factors affecting both their training and competition. They were informed that the questionnaire was designed to help provide a better understanding of individual differences in athletes' training and competition strategies, and they also were assured that their responses would remain confidential. Each wrestler independently completed the form, and the investigators answered any questions which arose. After the three teams had been chosen, the 40 wrestlers were classified as qualifiers or nonqualifiers. Qualifiers were defined as wrestlers who were chosen to participate in at least one of the international events. Nonqualifiers were those wrestlers who failed to make any of the teams. Twenty-four wrestlers qualified and 16 did not. However, one of the nonqualifier's questionnaire was unscorable and, therefore, eliminated from the analysis.

Wrestling Questionnaire

The questionnaire was adapted from an inventory developed by Mahoney and Avener (1977), which examined psychological factors affecting finalists for the 1976 U.S. Olympic Gymnastics Team. Additional items were formulated based on discussions with the wrestling coach. The purpose of this inventory was to assess specific categories of behavior and cognitive processing which might be employed by these athletes as they prepared for and engaged in high-caliber wrestling competition.

Twelve factors, consisting of two or more individual items, were developed. For each factor, the range of scores and an example item are presented: (a) Self-confidence (2 to 22), "Relative to other college and Canadian wrestlers in your weight class, how self-confident would you rate yourself?"; (b) Thoughts under various wrestling conditions (7 to 46), "Right before any major competition, what are you thinking about? (Please rank these 1 to 5 with 1 = most frequently thought about and 5 = least frequently thought about): strategy, your anxiety level, the outcome of the match, the opponent, the outcome of the tournament."; (c) Factors affecting performance (3 to 23), "My chances for making the National Team depend on (Please rank these 1 to 5 with 1 = most likely to affect performance and 5 = least likely to affect performance): the draw, maxi-

1Copies of the questionnaire and scoring procedures are available from the authors upon request.
mizing my performance, other wrestlers not doing their best, injury, refereeing.”; (d) Dreams (7 to 21), “How often do you dream about some aspect of wrestling?”; (e) Role performance (3 to 33), “How does being the favorite affect your performance?”; (f) Self-talk (4 to 44), “To what extent do you ‘talk to yourself’ (either silently or out loud) in your training and competition?”; (g) Imagery (5 to 55), “When you are trying to picture something mentally (e.g., take-down), how much difficulty do you have in getting the image to do what you want it to? That is, is it easy or difficult for you to control your mental pictures?”; (h) Anxiety associated with major competitions (6 to 66), “Rate your usual anxiety one week prior to an important competition.”; (i) Distraction (1 to 11), “I drink alcohol.”; (j) Negative self-thoughts (1 to 11), “It stimulates negative self-thoughts (I’m not going to do very well.)”; (k) Blocking (1 to 11), “I block it (don’t think about it).”; (l) Coping (1 to 11), “It stimulates positive self-thoughts (this edge I have will help me perform better).”

Examples of other items also included in the inventory are: (a) “How many hours per week do you spend in training?”; (b) “How close do you think you are at present to reaching your maximum athletic potential?” (1 to 11); (c) “How would you rate your ability to concentrate your attention on a specific wrestling movement or sensation (to the extent that you can block out everything else)?” (1 to 11); (d) From very structured and unorganized to very unstructured and disorganized, “How would you describe your overall lifestyle?” (1 to 11); (e) “When you are trying to ‘psych yourself up’ for a match, do you emphasize reassurance (e.g., ‘this will be easy’) or challenge (e.g., ‘you’re going to have to work at it’)?” (1 to 11).

**Data Analysis**

Data were analyzed by a variety of procedures which provided information characterizing the entire sample of elite wrestlers (descriptive data), as well as factors differentiating the qualifiers from the nonqualifiers. Since “there is no necessary relationship between the results of multivariate and univariate tests of the same hypothesis” (Finn, 1974, p. 308), both t-tests (univariate) and discriminant function analyses (multivariate) were performed to identify factors distinguishing qualifiers from nonqualifiers. For factors consisting of multiple items in the discriminant analyses, separate t- and χ² tests were conducted for specific item comparisons between qualifiers and nonqualifiers on continuous and discrete data, respectively. Point bi-serial correlations also were performed and reported as supplementary information.

**Results**

Before presenting results that differentiate the qualifiers from the nonqualifiers, descriptive data characterizing the entire sample of elite wrestlers will be briefly highlighted.

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²Factors i-l were methods for dealing with anxiety associated with major competition.
Elite Wrestlers

Regarding their chances for making the National Team, 80% of the wrestlers ranked maximizing their performance first in terms of importance. Several (43%) also stated that lack of national and international experience was most responsible for their poorer performances in major competition. Both anxiety (19%) and inadequate preparation (19%) were the other major reasons given for poor past performance. Thus, 81% of the wrestlers attributed poor performance to these three factors. In addition, some interesting patterns regarding thoughts between rounds of a major competition emerged and are reported in Figure 1. As depicted in this graph, the immediate rather than the ultimate outcome was consistently of greater concern to the wrestlers regardless of amount of winning or losing. The coaches' assessment only assumes importance when the elite wrestlers are losing a match. When a match is close, regardless of winning or losing, the immediate outcome assumes greatest importance. However, when winning by many points, the wrestler's personal assessment predominates, whereas the coaches' assessment along with the immediate outcome are attended to most closely when the wrestler is losing by many points.

![Figure 1-Percentage of elite wrestlers' first-ranked thoughts between rounds of a major competition.](image)

Furthermore, responses to items within the imagery, dreams, and self-talk clusters were quite similar for both groups. In addition, response scores for all of these clustered items were in the middle range, thus indicating that the wrestlers only employed dreams, imagery, and self-talk to a moderate degree.

Using Pearson r's, intercorrelations among the major factors also were examined along with relevant specific interitem correlations. Role performance
was positively related to concentration \((r = .62)\), coping responses to anxiety \((r = .50)\), imagery \((r = .42)\), thoughts \((r = .41)\), and negatively related to negative self-thoughts \((r = -.44)\). Role performance consisted of three items: how being the favorite, being evenly matched, and being the underdog affected performance. Interestingly, the only item highly correlated for each of these three roles was ease in controlling mental images. Being favored was positively associated with greater exercise, imagery before and during competition, and fewer negative self-thoughts. Self-confidence, positive self-thoughts, and vividness of imagery were highly associated with being the favorite and being evenly matched. Therefore, it appears that being able to control mental images is the most relevant factor related to wrestlers’ performing well, regardless of role. Use of imagery was associated with concentration \((r = .53)\), fewer negative self-thoughts \((r = -.42)\), increased self-talk \((r = .41)\), and more positive self-thoughts \((r = .35)\). Interestingly, higher anxiety was related to more time spent in training \((r = .42)\). Finally, ability to concentrate on specific wrestling moves was related to self-confidence \((r = .47)\), as well as to the specific coping items of positive self-thoughts, both 1-week \((r = .51)\) and 1 day \((r = .45)\) prior to competition.

**Differences Between Qualifiers and Nonqualifiers**

Given the large number of questionnaire items \((N = 143)\) in comparison to the small sample size \((N = 39)\), related items were combined into the following 12 factors: Confidence, Distracting Responses to Anxiety, Thoughts, Blocking Responses to Anxiety, Role Performance, Anxiety Level, Self-talk, Negative Self-thought Responses to Anxiety, Dreams, Coping Responses to Anxiety, Imagery, and Factors Affecting Performance. Qualifiers and nonqualifiers also were compared on five additional separate items: Maximizing Potential, Hours in Training, Concentration, Psych-up/Reassurance or Challenge, and Lifestyle.

Means and standard deviations for these variables are presented in Table 1. Two-tailed \(t\)-tests were performed, and only two comparisons were significant (see Table 1). Qualifiers were more confident, \(t(37) = 4.06, p < .001\), and believed they were closer to reaching their maximum athletic potential, \(t(37) = 3.31, p < .002\), than the nonqualifiers.

Since univariate tests do not take into account the relationship among variables, a discriminant function analysis was also performed on the 17 variables. However, because two of the multiple-item factors were discrete, rank-order data (i.e., Thoughts and Factors Affecting Performance), values were assigned to each choice within these items based upon what we thought would most positively affect performance. The wrestlers’ first-ranked choices were then assigned scores corresponding to these predetermined values; these two composite scores, therefore, consisted of a summation of first-rank choices within each factor.

The value of group centroids (mean discriminant scores for each group) for qualifiers and nonqualifiers was .96 and \(-1.53\), respectively. Only Imagery and Factors Affecting Performance did not contribute to the discriminant analysis. The discriminant function obtained for the remaining 15 factors differentiated
the qualifiers and nonqualifiers, Wilks $\Lambda = .392$, $\chi^2(15) = 27.51$, $p < .03$. Refer to Table 1 for the entry order of the 15 variables and their corresponding standardized discriminant function coefficients.

Since 12 of the discriminant factors involved multiple items, specific item comparisons between qualifiers and nonqualifiers are reported whenever such comparisons increase an understanding of the results. Of course, multiple $t$- and $\chi^2$ tests on the data increase the chances of committing Type 1 errors; therefore, these findings should be interpreted with caution. Also, point bi-serial correlations will be reported when such information elucidates the results.

**Confidence.** As can be seen in Table 1, self-confidence was clearly the most important discriminating factor between the two groups. Qualifiers reported being more confident about their wrestling abilities as well as having fewer self-doubts than did the nonqualifiers.

**Maximum potential.** The second most distinguishing factor involved how close the wrestlers thought they were to reaching their maximum potential. Qualifiers reported being closer to their maximum potential than the nonqualifiers.

**Distracting responses to anxiety.** Qualifiers reported greater use of distraction than did the nonqualifiers. However, because this factor included social contacts, drinking alcohol, and sexual activities, these items were examined separately. Interestingly, the only significant difference was for drinking alcohol 1 week prior to competition, $t(34.16) = 2.56$, $p < .02$, with qualifiers drinking more alcohol than nonqualifiers.

**Hours in training.** Surprisingly, qualifiers reported spending fewer hours per week in training than nonqualifiers.

**Thoughts.** Nonqualifiers obtained higher scores for first-ranked choices than qualifiers. On five of the seven separate items in this cluster, nonqualifiers had higher scores than the qualifiers; however, none of the $t$-tests were significant.

**Blocking responses to anxiety.** Qualifiers reported blocking (not thinking about) anxiety more than nonqualifiers 1 week, 1 day, and 1 hour prior to competition. The point bi-serial correlation was .23. However, when $t$-tests were conducted to ascertain when this difference occurred, we found that qualifiers were only able to block anxiety better than nonqualifiers 1 hour prior to major competition, $t(37) = 2.07$, $p < .05$.

**Concentration.** Not surprisingly, qualifiers were better able to focus their attention on specific wrestling moves than were the nonqualifiers.

**Role performance.** Qualifiers, regardless of whether they were considered the favorite, the underdog, or evenly matched, reported that their role affected their performance more positively than did the nonqualifiers, with the point bi-serial $r = .22$.

"Psych-up." On an 11-point scale, nonqualifiers reported emphasizing challenge (11) more than reassurance (1) when "psyching" themselves up for a match to a greater extent than did the qualifiers.

**Anxiety level.** As expected, qualifiers reported less anxiety both prior to and during a major competition than the nonqualifiers. Anxiety patterns for quali-
Table 1—Means, Standard Deviations, t-tests, Standardized Discriminant Function Coefficients, and Correlations Between Discriminant Scores and Variable Raw Scores For Qualifiers and Nonqualifiers on the Seventeen Questionnaire Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Qualifier</th>
<th>Nonqualifier</th>
<th>Qualifier</th>
<th>Nonqualifier</th>
<th>t*</th>
<th>Standardized discriminant function coefficient</th>
<th>Correlation between discriminant score and variable raw score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>t</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence</td>
<td>15.38</td>
<td>11.20</td>
<td>3.27</td>
<td>2.88</td>
<td>4.06**</td>
<td>1.139</td>
<td>.70</td>
</tr>
<tr>
<td>Maximum potential</td>
<td>7.13</td>
<td>5.27</td>
<td>1.68</td>
<td>1.75</td>
<td>3.31*</td>
<td>.758</td>
<td>.61</td>
</tr>
<tr>
<td>Distracting</td>
<td>3.50</td>
<td>3.07</td>
<td>1.46</td>
<td>1.28</td>
<td>.95</td>
<td>.180</td>
<td>.20</td>
</tr>
<tr>
<td>responses to anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours in training</td>
<td>16.92</td>
<td>19.67</td>
<td>5.41</td>
<td>10.01</td>
<td>-.98</td>
<td>- .030</td>
<td>-.23</td>
</tr>
<tr>
<td>Thoughts</td>
<td>45.46</td>
<td>46.27</td>
<td>6.07</td>
<td>7.01</td>
<td>-.38</td>
<td>-.055</td>
<td>-.08</td>
</tr>
<tr>
<td>Blocking</td>
<td>5.05</td>
<td>3.97</td>
<td>2.14</td>
<td>1.84</td>
<td>1.60</td>
<td>.167</td>
<td>.32</td>
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<tr>
<td>responses to anxiety</td>
<td></td>
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</tr>
<tr>
<td>Concentration</td>
<td>7.42</td>
<td>6.40</td>
<td>2.38</td>
<td>2.61</td>
<td>1.25</td>
<td>-.258</td>
<td>.26</td>
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<tr>
<td>Role performance</td>
<td>20.54</td>
<td>18.53</td>
<td>3.62</td>
<td>4.52</td>
<td>1.53</td>
<td>.119</td>
<td>.31</td>
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<tr>
<td>Psych-up</td>
<td>7.71</td>
<td>8.13</td>
<td>1.99</td>
<td>1.92</td>
<td>-.66</td>
<td>-.121</td>
<td>-.14</td>
</tr>
<tr>
<td>Anxiety level</td>
<td>33.25</td>
<td>38.27</td>
<td>8.20</td>
<td>11.65</td>
<td>-1.58</td>
<td>-.025</td>
<td>-.32</td>
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<tr>
<td>Self-talk</td>
<td>24.79</td>
<td>24.40</td>
<td>4.85</td>
<td>4.91</td>
<td>.24</td>
<td>.032</td>
<td>.05</td>
</tr>
<tr>
<td>Variable</td>
<td>M Qualifier</td>
<td>M Nonqualifier</td>
<td>SD Qualifier</td>
<td>SD Nonqualifier</td>
<td>t*</td>
<td>Standardized discriminant function coefficient*</td>
<td>Correlation between discriminant score and variable raw score*</td>
</tr>
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<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>Negative self-thought responses to anxiety</td>
<td>3.54</td>
<td>4.73</td>
<td>2.15</td>
<td>2.42</td>
<td>-1.60</td>
<td>.048</td>
<td>-.32</td>
</tr>
<tr>
<td>Life style</td>
<td>4.29</td>
<td>4.60</td>
<td>2.31</td>
<td>2.69</td>
<td>-.38</td>
<td>-.041</td>
<td>-.08</td>
</tr>
<tr>
<td>Dreams</td>
<td>17.38</td>
<td>16.93</td>
<td>2.62</td>
<td>2.52</td>
<td>.52</td>
<td>-.026</td>
<td>.11</td>
</tr>
<tr>
<td>Coping responses to anxiety</td>
<td>5.99</td>
<td>5.57</td>
<td>1.77</td>
<td>1.80</td>
<td>.72</td>
<td>-.045</td>
<td>.15</td>
</tr>
<tr>
<td>Imagery</td>
<td>35.38</td>
<td>34.87</td>
<td>8.72</td>
<td>7.40</td>
<td>.19</td>
<td>-.025</td>
<td>.04</td>
</tr>
<tr>
<td>Factors affecting performance</td>
<td>17.04</td>
<td>16.40</td>
<td>5.38</td>
<td>4.37</td>
<td>.39</td>
<td></td>
<td>.14</td>
</tr>
</tbody>
</table>

*Variables are presented in the order of entry into the step-wise discriminant analysis.

*All t-tests are two-tailed with 37df for each. Pooled variance estimates were used for all tests except for Hours in Training where a separate variance estimate was employed.

*There are no coefficients for Imagery and Factors Affecting Performance since these two variables did not enter the original discriminant function.

*Discriminant scores were derived from an overall discriminant analysis which included all 17 variables.

*p < .002

**p < .001
fiers and nonqualifiers are presented in Figure 2. As can be seen from the graph, qualifiers consistently reported lower anxiety both prior to and during major competition. Anxiety during competition decreased for both groups; however, it is interesting to note that anticipatory anxiety during a tournament was higher than when the wrestlers were actually performing.

![Figure 2 - Anxiety of qualifiers and non-qualifiers before and during major competition.](image)

_Self-talk._ Taken as a cluster, as well as considering each item separately, self-talk scores were similar for both groups. Therefore, as shown in Table 1, self-talk along with the remaining four factors contributed minimally to distinguishing between the two groups.

**Negative self-thought response to anxiety.** As expected, qualifiers reported fewer negative self-thoughts 1 week, 1 day, and 1 hour prior to competition than nonqualifiers. When negative self-thought data were classified into high, medium, and low categories for qualifiers and nonqualifiers, the strength of the relationship was $\Delta = .23$, $\chi^2(2) = 5.65$, $p < .06$. By examining the frequencies within cells, the largest difference was clearly in the low category; 63% of the qualifiers versus 27% of the nonqualifiers were low in negative self-thoughts. When separate $t$-tests were conducted on the continuous negative self-thought data, the only significant difference occurred 1 hour prior to competition, with qualifiers reporting fewer negative self-thoughts than nonqualifiers, $t(37) = -2.11$, $p < .04$. 
Life style. When asked to describe their overall life style, qualifiers reported
their style to be slightly more structured and organized than the nonqualifiers.

Dreams. Overall, qualifiers scored higher on this category than did non-
qualifiers. However, since none of the tests for individual items were significant,
specific differences cannot be ascertained. It is important to note also that
dreams were of negligible value in the discriminant analysis.

Coping responses to anxiety. Qualifiers employed slightly more coping re-
sponses than nonqualifiers; however, this factor added the least to the discrimi-
nant analysis. Therefore, the coping mechanisms (i.e., positive self-thoughts,
rationalizing, and exercise) appear to be comparable for both groups.

As a test of the adequacy of the derived discriminant function for these 15
factors, a classification analysis (using equal prior probabilities) was conducted.
A correct classification was obtained for 96% of the qualifiers and 73% of the
nonqualifiers. For the entire sample, 87% of the wrestlers were properly catego-
rized. However, when all possible step-wise discriminant analyses were con-
ducted, we found that using the first four or the first six factors resulted in the
same classification rate. Thus, in terms of parsimony, Confidence, Maximum
Potential, Distracting Responses to Anxiety, and Hours in Training were as
effective in correctly classifying qualifiers and nonqualifiers as the entire list of
15 factors.

It must be noted that as the numbers of variables plus 1 approaches the total
sample size, the expected value of $R^2$ approaches 1 (Timm, 1975). Therefore,
this high classification rate may have been spuriously inflated because our vari-
able to subject ratio was approximately 1:2. Since Cooley and Lohnes (1971)
recommend employing at least 3 to 5 times as many subjects as there are vari-
ables and since our sample comprised the total population of elite Canadian
wrestlers, we could only reduce the number of variables to test the adequacy of
the original discriminant analysis. The following procedure was used to reduce
the number of variables. First, an overall discriminant analysis using all 17 vari-
ables was conducted to obtain each subject’s discriminant score. These scores
were then correlated with each subject’s raw score on each of the 17 variables.
These correlations are reported in Table 1. The choice of variables to enter into
the subsequent discriminant analyses was determined by the rank-order magni-
tude of these correlations. To meet the recommended 3-5:1 subject to variable
ratio, only the top 7 to 12 of the 17 variables were considered. Therefore, six dis-
criminant analyses were conducted. Since the discriminant analysis employing
nine variables produced the best classification prediction, only these results will
be briefly mentioned. The entry order of these variables was: Confidence, Maxi-
mum Potential, Distracting Responses to Anxiety, Hours in Training, Blocking
Responses to Anxiety, Concentration, Anxiety Level, Negative Self-thought Re-
sponses to Anxiety, and Role Performance. The resulting discriminant function
differentiated the qualifiers from the nonqualifiers, Wilks $\Lambda = .436$, $\chi^2(9) =
27.00$, $p < .001$. These results virtually replicate those found in the original
analysis. Only Thoughts and Psych-up did not enter into the new analysis,
whereas Anxiety Level and Negative Self-thought Responses to Anxiety moved
into the top nine variables for this supplemental analysis. Furthermore, the new
classification analysis correctly classified 96% of the qualifiers, 80% of the non-qualifiers, or 90% of all wrestlers. Therefore, these findings provide some evidence for the validity of the findings generated from the original discriminant analysis.

Supplemental Findings

Several items not included in the discriminant analysis provided additional information distinguishing the two groups of wrestlers. In terms of first-ranked factors responsible for better performances in major competition, 44% of the qualifiers chose adequate preparation, in contrast to only 13% of the non-qualifiers. The majority of non-qualifiers (60%) reported that being at their physical peak (i.e., no injuries, feeling good) was most responsible for their better performances, in contrast to 22% of the qualifiers. Also, 1 hour prior to major competition, a nonsignificant trend indicated that qualifiers withdrew more from others than the non-qualifiers, t(37) = 1.87, p < .08. Finally, during actual competition a nonsignificant trend indicated that non-qualifiers focused more of their attention on the audience than the qualifiers, t(17.34) = -1.60, p < .13.

Discussion

This study's primary purpose was to identify psychological factors that differentiate between successful and unsuccessful elite wrestlers. Given the exploratory nature of this investigation, we cannot conclude that any of these factors actually cause successful performance. However, the results do suggest specific psychological dimensions that warrant closer examination.

Clearly the strongest finding is that qualifiers were more confident than non-qualifiers, which is consistent with Mahoney and Avener's (1977) results for elite gymnasts. As might be expected, the second most important factor was that qualifiers reported being closer to reaching their maximum potential than non-qualifiers. These two factors, both independently and in combination, accounted for the largest differences between the two groups.

In terms of general anxiety, qualifiers consistently reported less stress both prior to and during competition. This finding corroborates previous research on elite wrestlers (Morgan, 1974), but partially conflicts with Mahoney and Avener's (1977) research on gymnasts. This inconsistency may, however, be related to differences in data analysis procedures or possibly to differences between open-skill (wrestling) and closed-skill (gymnastics) sports.

Some of our most interesting findings dealt with anxiety patterns and methods for coping with stress. As Epstein and Fenz (1962) suggest, changes in anxiety patterns, as well as the athletes' coping responses, may be more informative than knowing their absolute level of anxiety. Our results support this contention. Anticipatory anxiety both prior to and during major tournaments was clearly higher than anxiety actually experienced during competition. Therefore, methods for dealing with anticipatory anxiety may be of greater interest.
and importance. It will be remembered that 1 hour prior to competition, qualifiers withdrew more from others, were able to more effectively block their anxiety, and had fewer negative self-thoughts than nonqualifiers. Based on these results, specific training strategies could be devised and experimentally tested to ascertain their efficacy for helping wrestlers deal with anxiety. Although actual performance anxiety was lower than anticipatory stress for both groups, qualifiers still experienced less anxiety than nonqualifiers during competition. Our results further indicated that qualifiers exhibited greater concentration on specific moves and tended to focus less attention on the audience than the nonqualifiers. Thus, another important factor characterizing the successful elite wrestler is his ability to focus attention exclusively on his performance. Using positive self-thoughts, exercise, and rationalization (i.e., “others are just as anxious as I am”)—all coping responses to anxiety—did not clearly differentiate the two groups. However, all wrestlers reported using these techniques “some of the time,” which suggests that these coping behaviors are within the elite wrestler’s repertoire and are employed for dealing with stress. The final and rather surprising finding for anxiety data indicated that as the number of hours spent in training increased so did anxiety. Although this characterized both groups of wrestlers, qualifiers spent fewer hours in training than nonqualifiers. Due to the correlational nature of the data, we cannot say whether anxious wrestlers train more or more time in training increases anxiety. Likewise, this relationship also could be explained by other factors. However, these variables warrant further experimental manipulation to determine whether in fact a cause-effect relationship exists.

Perhaps the most striking difference between our results and those of Mahoney and Avener (1977) involves the importance of imagery, dreams, and self-verbalizations. These three factors clearly distinguished the Olympic gymnasts from the nonqualifiers, whereas these variables were of negligible importance in differentiating the two groups of wrestlers in our study. In fact, all wrestlers reported using imagery, dreams, and self-talk only to a moderate degree. This striking inconsistency may be due to basic differences between wrestling and gymnastics. As previously mentioned, wrestling is an interactive sport involving primarily open-skills, whereas gymnastics is an individual sport involving closed-skills. Therefore, it may be more difficult to visualize (in dreams and behavior rehearsal) actual wrestling performance involving an opponent. The gymnast, on the other hand, has an easier task: visualizing his individual performance in the absence of an adversary. The self-verbalization data, however, are more difficult to understand. One possible explanation is that it may be easier to assess one’s performance and hence verbally process it in noninteractive sports.

As stated previously, the supplementary classification analysis correctly categorized 96% of the qualifiers and 73% of the nonqualifiers. Anecdotal information from the coach on the five misclassified wrestlers illuminates these results. The one qualifier who was misclassified did not in fact win his weight class. However, he was selected because of previous difficulties encountered with the actual winner on past national teams. Therefore, this qualifier by our
definition was actually a nonqualifier. Of the four incorrectly classified nonqualifiers, the first was not a student and by definition could only qualify to participate in the World Games—the most prestigious of the three; thus, his chances for making the team were greatly reduced. According to the coach, the second had all of the psychological characteristics to do well, but he was a "late starter" and therefore lacked the necessary skills to make the team. The third was a very experienced wrestler in a highly competitive weight class. His performance was characterized as being just under the championship threshold level. The last misclassified nonqualifier considered himself a recreational wrestler and had no aspirations for making the national team. This background information on the misclassified wrestlers, then, adds some face validity to the potency of the questionnaire's discriminatory power.

Descriptive characteristics for both groups of elite wrestlers are less striking. However, they do constitute empirical evidence for situational parameters which may affect the elite wrestler's performance. Since lack of national and international experience was the most common reason given for poorer past performance, it seems important to increase opportunities for elite wrestlers to compete in high caliber events. Some additional findings also are suggestive of specific coaching strategies as well. Since elite wrestlers are most concerned about the coaches' assessment when they are losing a match, coaching under these conditions apparently assumes a critical role. Likewise, role performance (as the favorite, underdog, or evenly matched) was reported as positively affecting performance for those wrestlers who were better able to control mental images. Similarly, greater use of imagery was related to greater concentration on specific wrestling moves during competition. Therefore, training in both of these skills may enhance the elite wrestler's performance. However, these variables warrant experimental manipulation before such strategies can be said to positively affect performance.

Results from this study have several important implications for subsequent research on wrestlers, as well as for sport psychology in general. First, the results suggest some promising variables for controlled experimental scrutiny. For instance, interventions for improving concentration and for dealing with counterproductive anxiety could be devised and tested. Incorporation of such strategies into training programs, however, should await empirical verification of their efficacy. Therefore, experimental research is a necessary precursor to the actual application of ideas suggested by this study. Second, development of psychometrically sound instruments based on situational rather than trait psychological factors seems extremely important for both predictive and training purposes. Based on the results of this study, the questionnaire employed may have the potential to achieve these purposes. However, additional research is needed on the instrument itself—such as cross-validation using new samples of elite wrestlers—before claims regarding its predictive validity can be made. Finally, the rather striking differences between our results for wrestling, an open-skill sport, and those reported for gymnastics, a closed-skill sport, suggest an avenue for research within the broader domain of sport psychology. Research on elite athletes using the dichotomous typology of open- and closed-skill sports may be
more productive than searching for common psychological denominators across all sports, or conversely developing a unique psychology for each sport. Therefore, research directly comparing open- and closed-skill sports is recommended to test the viability of this typological approach.

References

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