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Tokunga, Mikio  
Institute of Health Science, Kyushu University

Hashimoto, Kimio  
Kyushu Institute of Technology

Isogai, Hirohisa  
Kyushu Institute of Technology

Taki, Toyoki  
Daiich University of Economic

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# Diagnostic Methods for Athletes' Psychological Competitive Abilities and Psychological States before and during Competition

Mikio TOKUNAGA, Kimio HASHIMOTO\*  
Hirohisa ISOGAI\*, and Toyoki TAKI\*\*

## Abstract

The author, et al. had developed the Diagnostic Inventory for Psychological Competitive Ability (DIPCA. 2, for junior high school students - adults) to determine the mental strength of athletes, and the Diagnostic Inventory for Psychological Performance (DIPP. 1) to determine their psychological state during a competition. We had analyzed the correlation between these two diagnostic methods and competitive performance (self evaluation of ability and competition results) and reported their efficacy.

In this study, we developed a diagnostic method to determine the psychological state before a competition, analyzed the relationship between the psychological competitive ability, the psychological state before competition and the psychological state during competition, and discussed the diagnostic method.

**Key words:** athletes, psychological competitive ability, trait, state, diagnostic methods

(Journal of Health Science, Kyushu University, 20 : 15–20, 1998)

### 1. Diagnostic method for psychological competitive ability (DIPCA.2)

The DIPCA.2 Inventory was developed to diagnose athletes' psychological competitive abilities as a trait.

Questions comprised 48 items for 12 factors, which were patience, tenacity, volition for realization of potential, volition for winning, self discipline, ability to relax, concentration, confidence, decisiveness, ability to predict, judgement, and cooperation. Total scores range between 48 and 240 (Fig.1).

Subjects were 118 male judo players selected for the 1993 world championship by the All Japan Judo Federation (AJJF). There were 5 groups; namely, 22 finalists, 20 semi-finalists, 22 college-age finalists, 26 high school finalists, and 28 junior high school

finalists. 'Finalists' refers to those who qualified at the highest level, and the 'semi -finalists' are those ranked next. The DIPCA.1 was given to the subjects during the period of December 18th to 24th, 1993.

Scales and total scores for the top level athletes selected by AJJF in 5 above -mentioned groups were compared. The diagnoses were as follows:

1) Comparison of psychological competitive ability by group showed that the finalists were best, followed by the semi -finalists, college -age finalists, and high school finalists. The junior high school finalists had the lowest score. It was elucidated that psychological competitive ability varies depending on performance level and years of experience (Fig.2).

2) When differences among the groups were

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Institute of Health Science, Kyushu University, Kasuga 816-8580, Japan

\* Kyushu Institute of Technology, Iizuka 820-8502, Japan

\*\* Daiich University of Economic, Dazaifu 818-0197, Japan

compared, no significant difference was noted between the finalists and semi-finalists. However, the three groups of semi-finalists, high school finalists and junior high school finalists were significantly inferior to the finalists. Between them there were significant differences, particularly in concentration and confidence. The three groups demonstrated less

patience, volition for realization of potential, self discipline, ability to predict, and decisiveness.

All five groups commonly showed high scores and no differences in tenacity or volition for winning. No significant differences were noted in the ability to relax, cooperation, self discipline or decisiveness, with all commonly showing low tendencies in these areas.

3) When the judo players were compared with athletes of other sports, the finalists presented higher psychological competitive ability. Yet, other groups were not necessarily superior. It could be assumed that the judo players were characterized by higher scores in volition for realization of potential, but lower scores in the ability to relax, self discipline and cooperation.

4) Individual total judgement for psychological competitive ability found that more finalists were judged as 'excellent' or 'superior.' However, a significant number of players in every group were judged as 'fair' or 'poor.' This indicated that there were many players with psychological disadvantages (Fig.3).

These results lead us to the conclusion that psychological aspects must be strengthened with emphasis placed on training for improved ability to

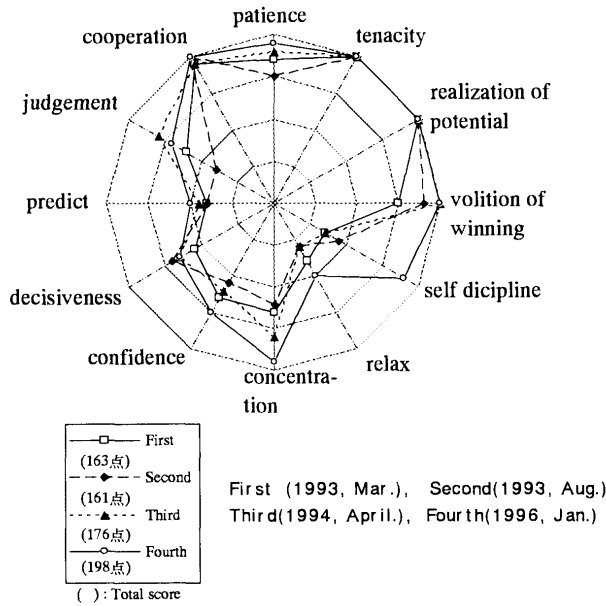


Fig.1. Change of psychological competitive ability (individual score) (DIPCA.2)

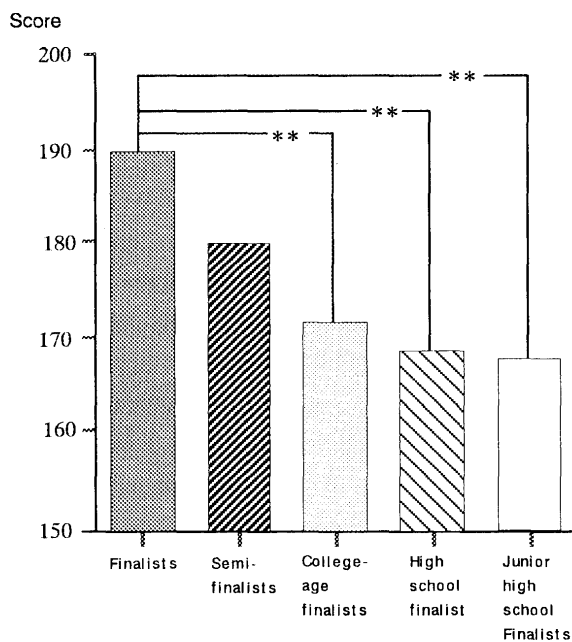


Fig.2. Total scores for the psychological competitive ability of the qualifying finalists of the All Japan Judo Federation (\*\*p<.01) (DIPCA.2)

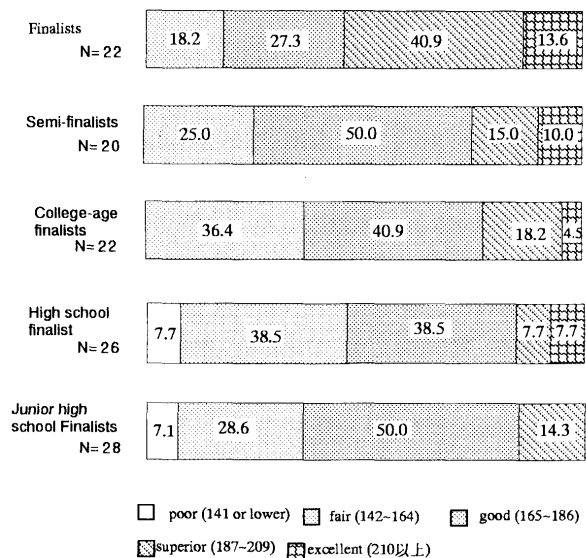


Fig.3. Judgement of total scores of the qualifying finalists selected by All Japan Judo Federation (DIPCA.2)

relax, self discipline and decisiveness, and that more research be done regarding the concept of cooperation.

## 2. Diagnostic method for psychological state before competition (DIPS-B.1)

We prepared the Survey for Psychological State before Competition to analyze athletes' mental preparedness for practice before competition and for actual competition. Questionnaires comprised 20 items with 5 possible answers ranging from 'Not at all' to 'Exactly.' The contents of the questions were made to correspond to the 12 scales in the DIPCA. 2. We used the 10 factors of patience, tenacity, volition for realization of potential, volition for winning, ability to relax, concentration, self discipline, confidence, ability to predict (strategy), and cooperation. Each scale comprised two questions, and the total scores fell between 20 and 100. The survey period was from June to August 1996. Subjects were 246 sports club members (high school students, college or university students, and society members), and the survey period was several months to 1 or 2 days before the competition.

We conducted the factor analysis (normal varimax method, orthogonal varimax rotation) to analyze the scale structure of question items. Five factors

presented 1.000 or higher eigenvalues. Thus, we specified five factors and conducted another factor analysis. Cumulative contributions were 60.7%. These factors were as follows: Volition for competition (patience, tenacity, volition for realization of potential, and volition for winning), Ability to relax, Cooperation, Confidence and strategy, Concentration.

We compared of total scores by group. With these diagnostic methods, the psychological state of an individual or a team can be determined (Fig.4).

## 3. Diagnostic method for psychological state during competition (DIPS-D.2)

To analyze whether athletes could compete in a desirable psychological state, we prepared the Survey on Psychological State during Competition. There were 10 question items, each having 5 possible answers from 'Not at all' to 'Exactly.' The total scores were between 10 and 50. The questions were representative ones corresponding to the 12 scales in the DIPCA.2. The survey was conducted at the end of competition. For the college or university students who participated in an important baseball game or other competitions, their scores of psychological competitive ability, and psychological state before and during the game were individually compared. From the thus obtained results, psychological traits of a team or an individual can be diagnosed.

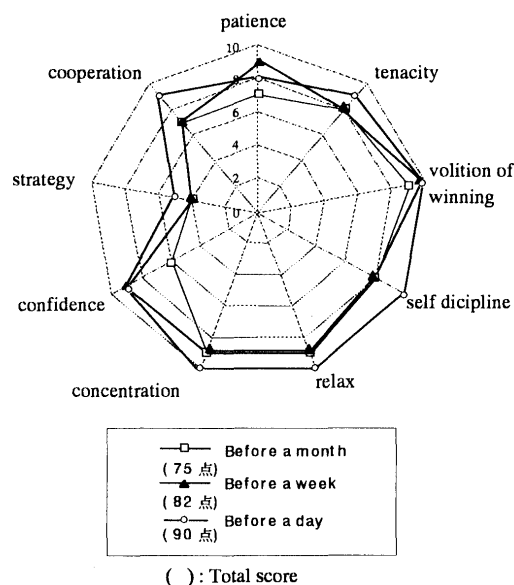


Fig.4. Chang of psychological state before competition (individual score) (DIPS-B1)

## CONCLUSIONS

Diagnostic methods corresponding to each situation are necessary to analyze the psychological traits of athletes. The Diagnostic Inventory for Psychological Competitive Ability is effective to know their 'traits.' The Survey on Psychological State before Competition and the Survey on Psychological State during Competition are essential to understand their 'states' (Fig.5, Fig.6).

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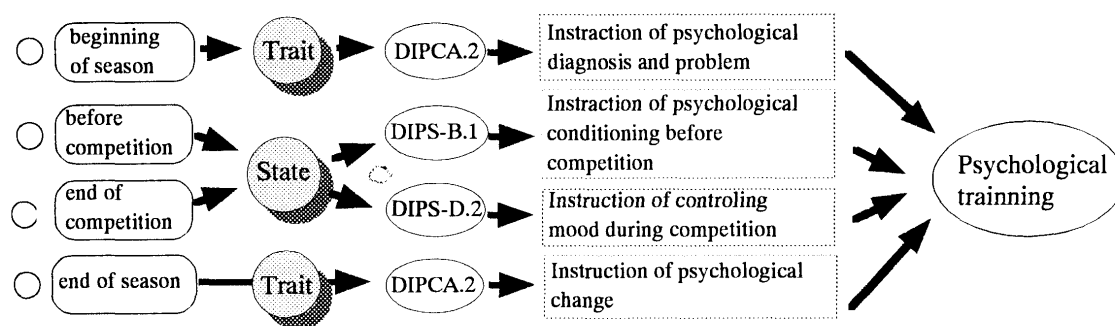


Fig.5. Application of diagnostic method for psychological competitive ability

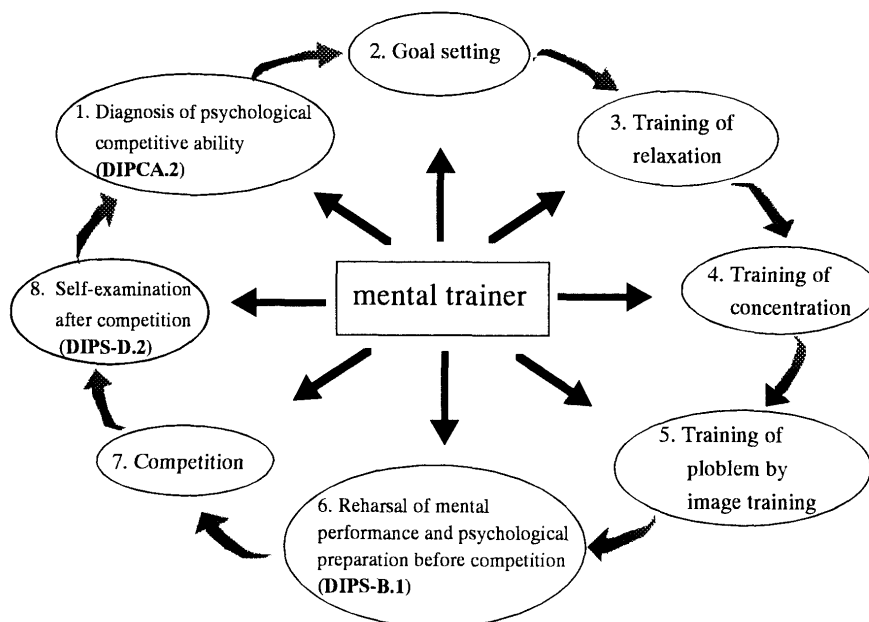


Fig.6. Program of psychological training

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## Appendix

### Diagnostic Inventory of Psychological Competitive Ability for Athletes (DIPCA. 2)

1. I can perseveringly compete even in difficult situations.
2. The more major games I'm in, the greater fighting spirit I have.
3. I compete with the attitude of going to the limits of my abilities.
4. Before a game, I think "I'm not going to lose."
5. I'm not able to control myself whenever there is a game.
6. I get nervous worrying too much about winning or losing.
7. I'm unable to make calm moves.
8. I have confidence I can display my abilities even under pressure.
9. I can make decisive moves just at the right time.
10. Every strategy of mine proves successful.
11. I am a person of sound judgment.
12. I value teamwork.
13. When I lose, I blame it, on others and bad-mouth those who made errors.
14. I display perseverance.
15. Whenever there is a game, a fighting spirit begins to stir in me.
16. I go into a game with the thought, "I'll try hard

for myself.”

17. Before a game, I think “I want to win by all means.”
18. I'm so nervous I can't make any of the right moves.
19. I get emotionally upset whenever there's a game.
20. I lose my cool at times.
21. I have confidence in my personal abilities.
22. I have determination (resolve) in a game.
23. I can change strategy quickly.
24. I can judge of the game flow quickly.
25. During games I and other teammates or partners encourage each other.
26. I lose a game, I always make a lot of excuses for losing.
27. I can play tough in a game.
28. The tougher the opponent, the greater the fight I have.
29. I compete with a personal objective in mind.
30. Whenever I lose a game, I become a “sore loser.”
31. I am slow to change my feelings.
32. I get uneasy before a game.
33. Whenever there's a game, the crowds make me upright and I can't think clearly.
34. I have confidence that I will achieve my personal objectives.
35. I can make decisions without fear of making a mistake.
36. I think of all possible strategies in order to win.
37. I can make accurate decisions at crucial moments.
38. There is a spirit of unity with other teammates.
39. I make any foul plays, I obey the referee's decisions.
40. I can sufficiently endure physical pain and exhaustion.
41. Whenever there is an important game, I get all hyped up.
42. I have plenty of personal drive.
43. Winning the game, not the essence of the game, is most important to me.
44. My face gets stiff and my hands and legs start shaking.
45. I feel pressure whenever there's a game.
46. Thinking about winning or losing makes me

uptight and I can't think clearly.

47. I have confidence I can make my own moves anytime.
48. I can make quick decisions even in difficult situations.
49. My predictions are pretty accurate.
50. I can make cool decisions even in difficult situations.
51. During games I and my teammates or partners cooperate well with each other.
52. I applaud excellent moves, whether they be by one's own teammate or by the opponent.

Rating : 1) Not at all 2) Seldom so 3) Occasionally so 4) Frequently so 5) Always so

#### **Diagnostic Inventory of Psychological State before Competition (DIPS-B.1)**

1. I can endure hard practice.
2. I get all hyped up.
3. I practice with the attitude of going to the limits of my abilities.
4. I want to win the next game by all means.
5. Before a game, I can't live as I normally do.
6. I get nervous about winning or losing.
7. Before a game, I can't concentrate on practicing.
8. I have confidence I can display my abilities.
9. I get various information to prepare for the game.
10. During practice my teammates and I cooperate well with each other.
11. I patiently do everything necessary to achieve good game results.
12. I have a fighting spirit for a game.
13. I practice with the thought, “I'll do my best.”
14. Winning the next game is more important than performance to me.
15. My physical condition (sleeping well, having a good appetite, bowel movement) is not as good.
16. I feel anxious about the next game.
17. I feel restless, as I do before a game.
18. I have confidence that I'll achieve my goals in the next game.
19. I make an accurate strategy for a game and I confirm it by visualizing it.
20. I value teamwork.

Rating : 1) Not at all 2) Seldom so 3) Occasionally so 4) Frequently so 5) Always so

### Diagnostic Inventory of Psychological State during Competition (DIPS-D.2).

1. I was able to fight to the end without giving up.
2. I had a lot of fighting spirit in me.
3. I competed with the feeling I would achieve my personal objectives.
4. I had a strong will to win.
5. I competed as usual without losing my own self-control.

6. I competed without getting too nervous thinking about winning or losing.
7. I was able to concentrate on the game.
8. I was confident of myself.
9. My game strategy and situational decisions went well.
10. Between and during the game, I encouraged and cooperated with my teammates quite well.

Rating : 1) Not at all 2) Somewhat 3) Neither 4) Moderately so 5) Very much so

### 要約

筆者らはスポーツ選手の心理的競技能力を診断する方法を検討してきた。

その第1は精神力の内容とその診断法である。「精神力」という言葉が意味する内容を明らかにするために調査を繰り返し行い、因子分析の結果、競技場面で必要な一般的傾向として「競技意欲」「精神の安定・集中」「自信」「作戦能力」「協調性」の5因子を抽出した。さらに、その内容を分類し忍耐力、闘争心、自己実現意欲、勝利意欲、自己コントロール能力、リラックス能力、集中力、自信、決断力、予測力、判断力、協調性の12尺度を抽出した。

このようにして「精神力」を診断する質問紙として、「心理的競技能力診断検査 (DIPCA.2, 中学生～成人用)」を開発した。これらの能力は競技レベルが高い選手、経験年数の長い選手、実力発揮度の高い選手、競技成績が優れている選手ほど高い得点を示すことが明らかにされた。

第2は試合前の心理的コンディショニングの診断法である。ある大会に備え、数ヵ月前から身体的コンデ

ィショニングは当然ながら、心理的準備ができていなければならない。同様の統計的手続きを経て、日常生活や練習の中で必要とされる内容として、忍耐力、闘争心、自己実現意欲、勝利意欲、リラックス度、集中度、自信、作戦思考度、協調度を抽出した。そして心理的コンディショニングを診断する質問紙として「試合前の心理状態診断検査 (DIPS-B.1)」を作成した。

第3は、競技中の心理状態の診断法である。試合中の心理状態をチェックする質問紙として「試合中の心理状態診断検査 (DIPS-D.2)」を作成した。試合中の心理状態が50点に近くなることが望ましく、実力発揮度の高い選手ほど得点が高いことが明らかにされている。また、「特性」としての心理的競技能力や「状態」としての試合前の心理状態が優れている選手は試合中の心理状態が優れていることも明らかである。

以上のように、精神力は「特性」としての「心理的競技能力」、状態」としての「試合前の心理状態」や「試合中の心理状態」として捉えることが重要であり、それぞれを診断し、それを高めることが必要である。