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Relationship between Psychological-Competitive Ability and Competitive Performance in Japanese Athletes

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Introduction

It is very important for coaches and athletes to understand an athlete's psychological-competitive ability as a personal trait, because it will frequently influence one's competitive performance or mental state in competition. Two diagnostic tests which examine the "mental power" and "psychological performance" of athletes were developed by the authors (1989, 1990) : "The Diagnostic Inventory of Psychological Competitive Ability (DIPCA)", which measures mental power, and "The Diagnostic Inventory of Psychological Performance (DIPP)", which measures both the mental state and psychological performance during competition.

The purpose of this study was to confirm the utility of these two scales by analyzing the relationship between the psychological-competitive ability (DIPCA) and competitive performance.

Key words : Athletes, Psychological-competitive ability, Psychological performance, Degree of competing to the best of one's ability, Results of competition.
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Method

Subjects

Male and female athletes from Fukuoka Prefecture who participated in the 1990 Japan National Athletic championships ("TOBIUME KOKUTAI") were studied as subjects. Detailed questionnaires designed to measure both the DIPCA and DIPP were administered to all the athletes from Fukuoka Prefecture, and 380 male and 223 female athletes completed them, which comprised 57.1% of all total subjects.

Measurements

Psychological Competitive Ability ; DIPCA :

The Diagnostic Inventory of Psychological-Competitive Ability for Athletes (DIPCA), consisting of 5 factors and 52 items as developed by Tokunaga and Hashimoto (1989), was used in order to examine the psychological-competitive ability of the athletes. The items consisted of a 5-point self-rating scale.

Psychological Performance ; DIPP :

The Diagnostic Inventory of Psychological Performance in Competition (DIPP), measuring perceived mental state and performance in competition as developed by Tokunaga and

Hashimoto (1990), was used in order to assess psychological performance. The DIPP consisted of 10 items in which each item was scored on a scale of 1 to 5 points.

The athletes own competitive results

The results of the competition should not only be evaluated as a record of victory and defeat, but also as to whether or not the athletes were able to perform to the best of their ability. In this study, the degree that an athlete was able to perform to the best of their ability as well as their place in the final competition were both evaluated. The athletes ability to reach their peak performance was evaluated subjectively on a 5-point self-rating scale consisting of "satisfactory", "somewhat satisfactory", "undecided", "not very satisfactory", "not satisfactory at all" as to whether or not the athletes were able to perform at their peak performance levels.

Questionnaire

In addition, many other characteristics of the athletes as well as other variables related to participation in the National Championships were examined by questionnaire.

Procedures

The athletes were asked to complete the questionnaires and the two scales, DIPCA and DIPP, within one month after the end of the summer and autumn competitions. The summer meet was carried out from September 9th to 12th in 1990, while the autumn meet was from October 21st to 26th. The questionnaires were handed out and administered to all Fukuoka prefecture participants for both competition.

Data Analysis

After the scores from both DIPCA and DIPP scales were taken, the totals were calculated. The higher the score, the greater the psychological-competitive ability and thus the better the psychological performance during the competition. Both a multiple regression analysis and ANOVA were computed to clarify the relation-

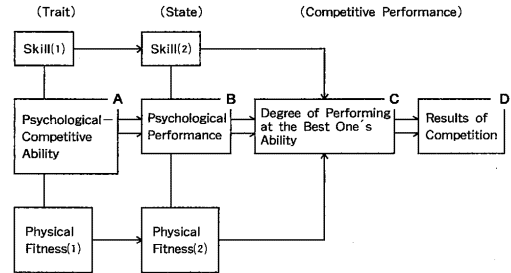


Fig 1. Relationship between psychological-competitive ability and competitive performance.

ship between A and D as shown in Figure 1.

Results

The relationship between DIPCA, DIPP and competitive performance

Psychological performance : DIPP

The DIPP score refers to the level of mental state and performance during competition. Therefore, the higher the score, the better the psychological-competitive performance during the competition. Based on the DIPP score, three psychological performance groups, high, moderate and low, were identified. The profile of these three groups is shown in Figure 2. The result of ANOVA indicated that there were significant differences among the groups on the mean score for the five DIPCA's subscales; The high performance group on DIPP indicated a higher mean score than the moderate or low group on all the DIPCA subscales, while the low performance group indicated a low mean score.

In addition, in order to establish which DIPCA's subscale score, as an independent variable, predicted DIPP as a criteria, a multiple regression analysis was performed. The results of the analysis indicated that there was a significantly high multiple correlation coefficient $R^2=0.628$, $p<.001$). This suggests that the psychological performance of athletes during athletic competitions can be predicted by measuring DIPCA before the competition.

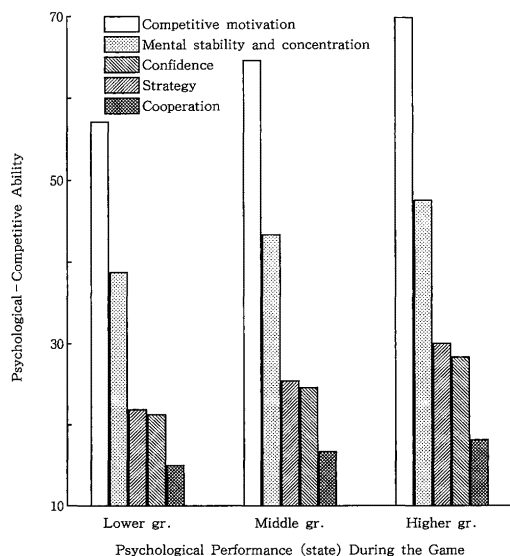


Fig 2. Relationship between psychological-competitive ability and psychological performance.

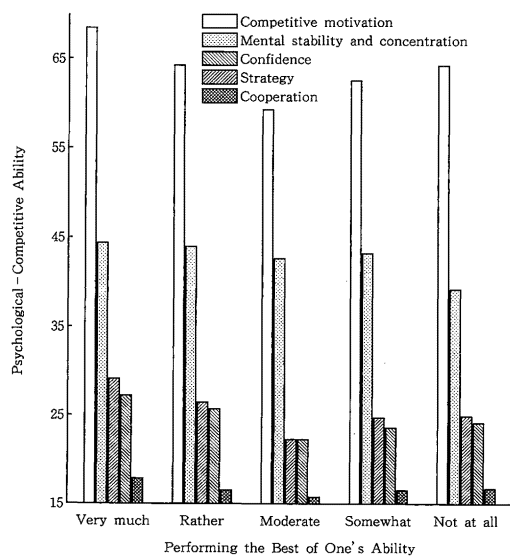


Fig 3. Relationship between psychological-competitive ability and the degree of performing at the best of one's ability.

Results of the competition

The result of the relationship between DIPCA and the degree of performing at one's peak ability is shown in Figure 3. The results of ANOVA indicated that there was a significant difference between the DIPCA subscale score and the degree of performing at one's peak

ability. The athletes who considered that they had their ability level had a higher mean score than the other athletes for all the DIPCA's subscales. These results thus suggested that DIPCA can be utilized as a measurement for predicting whether or not an athlete will be able to perform at the best of their ability. The results of the competitions were ranked into 5 groups (1st : the winner group ; 2nd : the second place group ; 3rd : the third and fourth place group ; 4th : the group from fifth to eighth place ; 5th : the group finishing lower than ninth place) were classified based on their ranking in their respective events. The relationship between DIPCA and the results of the competition is shown in Figure 4. The results of ANOVA indicated that there was no significant difference among them, however, the 1st group had slightly higher scores for psychological-competitive ability than did the others.

Relationship between DIPP and competitive performance

The degree of performing at the best of one's ability.

The DIPP during the competition was

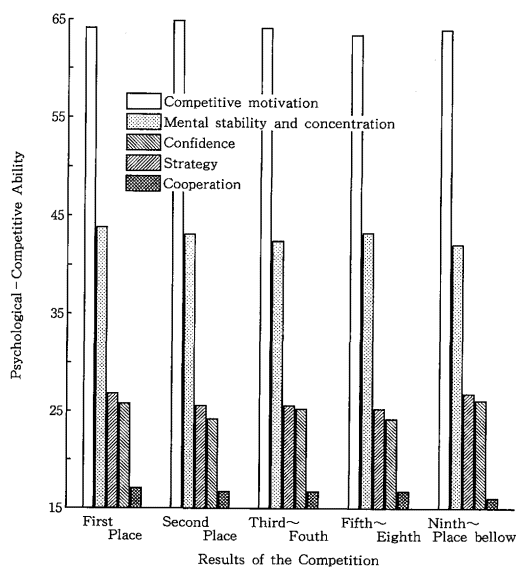


Fig 4. Relationship between psychological-competitive ability and results of the competition.

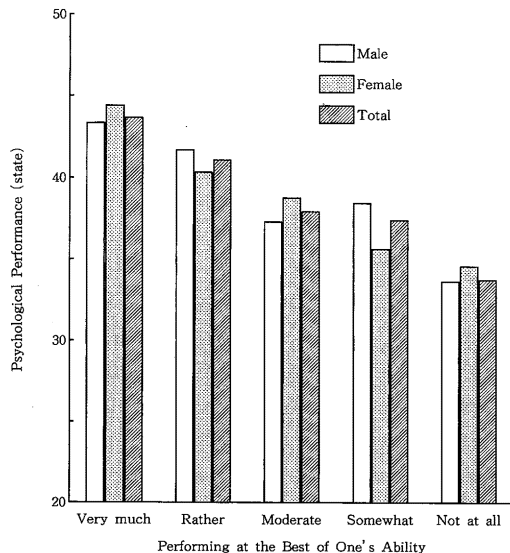


Fig 5. Relationship between psychological performance and degree of performing at the best of one's ability.

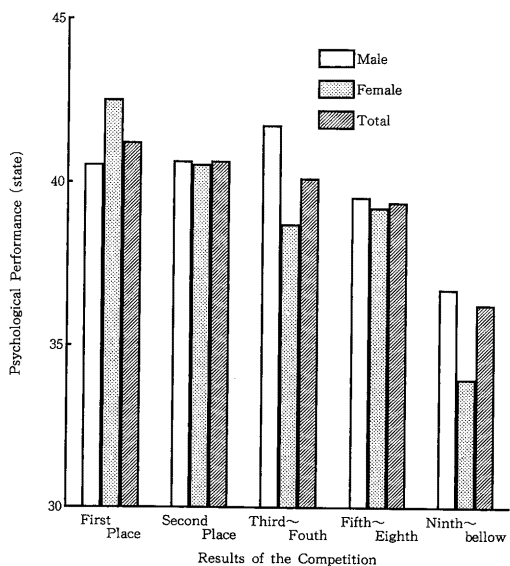


Fig 6. Relationship between psychological performance and results of the competition.

compared to the degree of performing at the best of one's ability as shown in Figure 5. The athletes who were able to perform at their best had the highest score, while the athletes who were unable to do so had a low score on the DIPP. The results of ANOVA indicated that

there was a significant difference between the DIPP score and the degree of performing at the best of one's ability (Male : $F=21.620, p<.001$, Female : $F=17.727, p<.001$) and these findings were irrespective of sex. Therefore the athletes who performed at the best of their ability, also demonstrated a better psychological state and performance during the competition than did the others.

Evaluating the athletes competitive results.

DIPCA was compared to the different ranking groups of the competitions as shown in Figure 6. The winner group showed a higher score on the DIPP, while the group of athletes finishing lower than ninth place showed a low score. The results of the ANOVA indicated that there was a significant difference between the DIPP and the athletes place after the competition ($F=8.102, p<.001$). Both the male and female athletes demonstrated the same tendencies (male : $F=4.766, p<.001$, female : $F=6.869, P<.001$). Therefore, it is considered that the athletes who placed high in the various competitions showed a good psychological state while competing.

The relationship between the degree of performing to the best of one's ability and the ranking of the game and the athletes actual

	Very much	Rather	Moderate	Somewhat	Not at all
First Place	43.4%	37.4%	11.1%	3.1%	3.1%
Second Place	30.0	30.0	19.0	12.0	9.0
Third~Fourth	23.0	33.0	11.0	29.0	4.0
Fifth~Eighth	14.9	32.3	13.3	29.7	9.2
Ninth below	11.1	16.7	12.5	36.1	23.6

Fig 7. Relationship between results of the competition and degree of performing at the best of one's ability.

placing in the competition

The relationship between the degree of performing to the best of one's ability and the athletes actual placing in the competition is shown in Figure 7. The 1st and 2nd groups indicate a higher degree of performing to the best of one's ability than the athletes who finished poorly. The results of the ANOVA showed that there was a significant difference ($F = 89.595, P < .001$) between performing at the best of one's ability and the athletes place in the competition. Therefore, it is suggested that athletes who perform at the best of their ability can thus finish higher in their respective competitions.

Discussion

The Psychological - competitive ability (DIPCA) of the athletes was closely related to the psychological performance (DIPP) as a mental state during the competition. As for the athletes place in the competition, there was a significant relationship between the DIPCA and the degree of performance to the best of one's ability, but this had such relationship regarding their place in the competition. These results mean that the DIPCA as a psychological trait of athletes can thus predict the DIPP for their psychological state and the degree of performing at the best of one's ability, but cannot directly predict the athletes eventual place in the competition. Therefore, the utility of the DIPCA for measuring mental power as a trait was recognized for the athlete's mental state or the degree of forming at the best of one's ability.

The DIPP was closely related to the degree of performing at the best of one's ability and was significantly related to the athletes own placing in the competition. These results suggest that athletes who have a better psychological state during the competition will be able to perform better in competition.

Furthermore, there was a significant relationship between the degree of performing at the

best of one's ability and the athlete's place in the competition. From these results, it was indicated that the degree of performing at the best of one's ability was the mediator connecting the DIPP with the athlete's final place in the competition. It is thus very important for athletes to be in the best possible psychological state during the competition. Regarding this point, Garfield (1980) and Loehr (1987) have indicated the importance of peak performance feeling (Garfield, 1980) or their ideal performance state (Loehr, 1987) when competing. In this study, the higher the DIPP score was the higher the degree of performing at the best of one's ability and the higher the finish in the competition. In addition, it was also confirmed that the DIPP score could be better predicted by the DIPCA.

In conclusion, a higher psychological state (DIPP) during athletic competition can be obtained by enhancing the athlete's psychological-competitive ability (DIPCA) as a psychological trait. In addition, a better psychological state will normally provide for a better competitive performance, a higher degree of performing at the best of one's ability and a better finish in the competition. Therefore, this study suggested that both the DIPCA as a psychological trait and the DIPP as a psychological state were useful in predicting the psychological state and competitive performance for athletes.

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Appendix 1. Diagnostic Inventory of Psychological-Competitive Ability for Athletes (DIPCA. 1)

1. I can perseveringly compete even in difficult situations.
2. The more major competition 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 competition, I think "I'm not going to lose."
5. I'm not able to control myself whenever there is a competition.
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 competition, a fighting spirit begins to stir in me.
16. I go into a competition with the thought, "I'll try hard for myself"
17. Before a competition, 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 competition.
20. I lose my cool at times.
21. I have confidence in my personal abilities.
22. I have determination in a competition.
23. I can change strategy quickly.
24. I can judge of the game flow quickly.
25. During the competition I and other teammates or partners encourage each other.
26. When I lose a competition, I always make a lot of excuses for losing.
27. I am tough during a competition.
28. The tougher the opponent, the greater the fight I have.
29. I compete with a personal objective in mind.
30. Whenever I lose, 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 competition, the crowds make me nervous 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. When I commit a foul, 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 competition, not the essence of competing, 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 nervous 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 the competition 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 oppo-
nent.

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

**Appendix 2 . Diagnostic Inventory of Psycho-
logical Performance in Competition
(DIPP).**

- 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 competi-
tion.
- 8 . I was confident of myself.
- 9 . My game strategy and situational decisions
went well.
- 10 . During the competition, I encouraged and
cooperated with my feammates quite well.

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