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短　報

Psychological and Physical Traits of Female University Kendo Players

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This study aimed to investigate the relationship between psychological and physical traits in 7 female university kendo players using measures of reaction times in response to light and sound stimuli. The experiment was conducted with 7 participants who competed in the 40th All-Japan Female Students KENDO Championship. The stimuli were light (red) and sound（1,000 Hz pure tone). Reactions were measured as simple reaction times, including the time for the partial-body reaction（a key press) and whole-body reaction（a forward step).

key words: female university kendo players, psychological traits, physical traits

Purpose

"Ichigan Nisoku Santan Shiriki（一眼二足三胆四力）" is a phrase that presents four elements essential for kendo training in order of importance. According to the All-Japan Kendo Federation (2022), "the first of these elements is the functioning of the eyes, the second is footwork, the third is a strong mind that is not upset by anything, and the fourth is bold waza（技）and the physical strength to execute such waza."

Shinzato et al.(2022) performed the Yatabe-Guilford Personality Inventory (Y-G), State-Trait Anxiety Inventory-Form JYZ (STAI), and Diagnostic Inventory of Psychological-Competitive Ability for Athletes (DIPCA) to examine relationships between "efforts towards matches" and "psychological changes in the players" among 7 kendo players who participated in the All Japan Female Students KENDO Championship. The results showed an increase in the Y-G Type D value, changes in the STAI anxiety tendency, increases in scores of the DIPCA factors including "volition for competition" and "mental stability and concentration" among the 7 kendo players.

Therefore, this study aims to investigate the changes in psychological traits of female students in a university kendo team during the process of being selected as regular players, as well as to measure their physical traits, in order to clarify whether a relationship can be found between these two indicators among regular players.

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Method

Participants

Among 30 female students in a university kendo team in Tokyo, 7 kendo players (mean age 20.6 years, *SD*=1.4) who participated in the 40th All Japan Female Students KENDO Championship (held on November, 14, 2021, in Kasugai City, Aichi) were included in this study. They were selected based on a comprehensive evaluation of the results of in-club selection matches as well as practice matches against other universities.

Measures

The Diagnostic Inventory of Psychological Competitive Ability for Athletes (DIPCA) was used to measure psychological traits. The scale measures "mentality," defined as psychological competitive ability required for sports matches, with five factors and 12 subscales.

The following measures were used to assess physical traits.

(1) Reaction time：whole-body reaction in response to light stimuli (performed "fumikomi（踏み込み）")

(2) Reaction time：partial-body reaction in response to light stimuli (performed "a key pressing")

(3) Reaction time：whole-body reaction in response to sound stimuli (performed "fumikomi")

(4) Reaction time：partial-body reaction in response to sound stimuli (performed "a key pressing")

Procedure

(1) The DIPCA was performed on July 19, October 10, 17, 24, 31, November 7 and 14, 2021. It was performed on all members of the female kendo team (30 participants) on July 19, and on 7 representative players on other dates. All the dates were Sundays. Participants answered the scale at the same hour in the same place, except on November 14, when they answered it while traveling from the championship venue.

(2) All reaction time measurements were completed on March 13, 2022. Light stimulus (red) and sound stimulus (1,000 Hz, 60 dB) were used as response stimuli to assess response time. The participants were instructed to respond as quickly as possible to each of the 10 stimuli. The responses were whole-body responses (forward step：when a stimulus was presented, the right foot was raised from the mat as quickly as possible and step forward) and partial-body responses (key press：when a stimulus was presented, press a key as quickly as possible). The Whole-Body Reaction Type II (Takei Scientific Instruments Co., Ltd. T.K.K.1264b) was used to measure reaction time.

Ethical considerations

The study was approved by the research ethical committee of Nippon Sport Science University. (021-H071). The research plan was explained to all the kendo team members (including 7 representative players) and informed consent was obtained. The authors declare no conflict of interest relevant to this study.

Table 1 Results of the whole-body and partial-body reactions to light and sound stimuli

	n	Light Stimulation (Whole Reaction) ms	Light Stimulation (Partial Reaction) ms	Sound Stimulation (Whole Reaction) ms	Sound Stimulation (Partial Reaction) ms		DIPCA Volition for Competition	Mental Stability and consentration	Confidence	Strategic ability	Cooperation
Player 1	9	222.1	197.2	228.1	201.7	July-19	71	45	26	27	19
						November-14	72	48	29	28	20
Player 2	10	243.6	193.8	219.9	195.9	July-19	72	45	35	34	20
						November-14	72	48	29	29	20
Player 3	9	207.6	193.7	215.2	161.6	July-19	69	44	31	32	20
						November-14	62	48	27	27	16
Player 4	9	241.1	193.3	257.7	169.4	July-19	73	34	28	23	20
						November-14	63	40	20	23	20
Player 5	9	251.4	181.0	244.9	178.2	July-19	70	29	24	27	20
						November-14	68	39	27	30	20
Player 6	9	246.7	195.1	236.5	181.1	July-19	68	45	31	29	20
						November-14	69	44	27	30	20
Player 7	9	236.5	163.2	227.6	157.4	July-19	69	30	30	29	20
						November-14	58	44	17	20	15

Table 2 Correlation of Reaction Time (Lights and Sounds)

	Light-Stimulation (Whole Reaction)	Light Stimulation (Partial Reaction)	Sound Stimulation (Whole Reaction)	Sound Stimulation (Partial Reaction)
Light Stimulation (Whole Reaction)	1.00			
Light Stimulation (Partial Reaction)	−0.23	1.00		
Sound Stimulation (Whole Reaction)	0.60	−0.01	1.00	
Sound Stimulation (Partial Reaction)	0.17	0.59	−0.10	1.00

Results and Discussion

Table 1 shows the results of the whole-body and partial-body reactions to light and sound each average stimuli of the excluding outliers 7 participants (The number of Kendo players who did not respond was n=9), and a comparison between the results of the DIPCA measured on two dates that were four months apart (July 19 and November 14). The average reaction time was calculated from the excluding outliers of 7 participants.

A one-way analysis of variance (ANOVA) was performed with standard scores transformed from the reaction times as the dependent variable of the 7 participants with regular player as the independent variable. No significant differences were observed among the four measures of reaction time and DIPCA factors. Table 2 shows the Pearson's product-moment correlations between the whole-body and partial responses to light and sound stimuli. Although Pearson's product-moment correlation coefficient between the whole-body reaction times of the light and sound stimuli was r=.60, and the coefficient between the partial-body reaction times of the two stimuli was r=.59, the non-correlation tests revealed no significance for either correlation. Although some participants had outstanding reaction times to the light stimulus, the limited number of participants in this study may have contributed to the statistically non-significant results. At the same time, although the measurement of the sound stimulus was attempted, no significant trend was observed.

Given the teachings of kendo "Ichigan Nisoku Santan Shiriki" representative players may be more related to the ability to react faster with sharpened senses than non-representative players. In other words, high processing speed of information captured by "Ichigan (sense of vision)" is required in representative players. During kendo matches, players must read their opponents' minds and accurately judge the situation, while keeping their eyes on the opponent. Training in vision, which is the most essential element of kendo, may lead to the development of kendo players (increasing each player's ability).

Because this study was submitted as a short report, the average value of 7 kendo players was displayed. Qualitative analysis of the points will be further studied. In the future, we will compare regular and non-regular athletes and repeatedly measure their dynamic visual acuity to examine whether competitiveness in kendo can be improved by acquiring the "single-lens" element.

References

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