慶應義塾大学学術情報リポジトリ
Keio Associated Repository of Academic resouces

Title	On statistical variances of winning techniques
Sub Title	
Author	山内, 賢(Yamauchi, Ken)
Publisher	慶應義塾大学体育研究所
Publication year	1990
Jtitle	体育研究所紀要 (Bulletin of the institute of physical education, Keio university). Vol.30, No.1 (1990. 12) ,p.77- 78
JaLC DOI	
Abstract	
Notes	Abstract
Genre	
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AN00135710-00300001-0077

慶應義塾大学学術情報リポジトリ(KOARA)に掲載されているコンテンツの著作権は、それぞれの著作者、学会または出版社/発行者に帰属し、その権利は著作権法によって保護されています。引用にあたっては、著作権法を遵守してご利用ください。

The copyrights of content available on the KeiO Associated Repository of Academic resources (KOARA) belong to the respective authors, academic societies, or publishers/issuers, and these rights are protected by the Japanese Copyright Act. When quoting the content, please follow the Japanese copyright act.

On Statistical Variances of Winning Techniques in Sports

By *Ken Yamauchi**

There are many kinds of sports. To discuss the competing phenomenon in a mathematical science method, there are two ways; one is in the sense of probability, and the other is in the sense of determination. The former is solved by using a differentical equation, and the latter is based on a statistical analysis.

The purpose of this research is introducing the definition of statistical variances and the arithmetic method which is essential for concluding the winning techniques and coaching methods.

To make this easier, we have brought up KARATE as a model.

In this analysis, we are using a new technique of variance formula, which is as follows;

X: mean value

x_i: variable ($1 \leqq i \leqq 2k-1$, k is the winning technique)

f_i: frequency

$$n=\sum_{i=1}^{2k-1} f_i \tag{1}$$

$$X=\left(\sum_{i=1}^{2k-1} f_i x_i\right)/n \tag{2}$$

$$S^2=\left(\sum_{i=1}^{2k-1}(x_i-X)^2 f_i\right)/n \tag{3}$$

Among the data, form (3) has no interdependence between each $\sum_i f_i$

(Proof)

If $\sum_{i=1}^{2k-1} f_i=n$, $\sum_{i=1}^{2k-1} f_i'=n'$.

$$f_i=nf_i'/n' \tag{4}$$

$$S'^2=\left(\sum_{i=1}^{2k-1}(x_i-X)^2 f_i'\right)/n' \tag{5}$$

Substitute form (4) for form (5).

* Assistant of the Institute of Physical Education, Keio University.

$$(5)=\left(\sum_{i=1}^{2k-1}(x_i-X)^2(n'f_i/n)\right)/n'$$

$$=\left(\sum_{i=1}^{2k-1}(x_i-X)^2 f_i\right)/n$$

$\therefore$ form (3)=form (5)

Using forms (1), (2), (3), we can make it help to promote our coaching methods by analyzing the techniques which are often seen in the competing phenomenon.