Survival analysis method-based national traditional sports events development and inheritance research

He Xiao

Physical Education Department, Hubei University of Automotive Technology, Shiyan 442002, Hubei, (CHINA)

ABSTRACT

China has played more and more important roles in international stage, Chinese traditional culture has gradually attracted people's attention, from which it contains national traditional sports events. Before that, these sports events show disappearance sign. In order to let people to better understand Chinese national sports events development status, the paper takes Hunan province and Guangdong province as research objects, relies on fifty-eight kinds of traditional sports events data, uses survival analysis method to analyze the two place traditional sports event development status. Obtained conclusion is that sports events that to be forgotten are Bashan dance, North ga, beating spinning top, funeral dance, rod creep, horizontal bar resisting, Yajia, kicking shuttle-cock, ancient wrestling, bamboo basket, bamboo ring basket, push-and-pull, flying pebbles, stilt walk, swinging, rope skipping, playing cards, cock throwing, rubber band skipping. Optimal developed sports events are bundle beating, Maogusi dance, Miao martial arts, wood shooting, boundary cock penalty, festive lantern jumping, roulianhua, table jumping, straw dragon dance, Gong chicken snatching, water float, spine resisting, squeezing oil residue.

© 2014 Trade Science Inc. - INDIA

KEYWORDS

National traditional sports;
Survival analysis;
Traditional poor survival;
Mathematical model;
Development and inheritance.

INTRODUCTION

In recent years, world globalization has been increasing. Chinese traditional culture seriously lost. China is a country that composed of multiple nationalities living together over vast area while some live in individual concentrated communities. It has a profound long history of above five thousand splendid civilization and consanguinity transmission. China always is particular about respecting each national cultures, languages, traditional festivals. Such as, the Dai nationality's water-sprinkling festival, the Hui nationality's Islam and other

national features. Of course, among them it also includes national traditional sports events. National traditional sports events not only have thick interestingness, but also stand for several generations' national people wisdoms. National traditional sports events intact reservation is the reflection of national soft power. Current world is not only just combating about economic strength such hard indicator, but also more about culture, education and other soft power fighting. In contemporary, we advocate economic globalization, cultural diversity. National sports events good inheritance is helpful for country's intangible cultural heritage reser-

FULL PAPER

vation, and more helpful for world culture exchanging.

National traditional sports events are constantly challenged by foreign sports events. People gradually keen on golf, tennis, rock climbing and so on foreign sports events. However, nobody cares Chinese traditional sports events. With digitalization, information age incoming, minority breaks away from secluded circumstances. But, they have gradually been assimilated by foreign things, lost interests in their own national sports events. Chinese traditional culture faces the severe test. Though partial nationalities will regularly host traditional sports events competitions, the youth has no interests in them.

In order to let more people to get full understanding that national traditional sports events face the lost testing, the paper works on researching on national traditional sports events survival problems. Use true and reasonable data information to transmit such risk conditions to people.

MODEL ESTABLISHMENT

By far, though traditional sports events are still carrying on, overall development is not optimistic. Sports event has gradually developed into a kind of service industry, more and more investors select sports events investment. However, no traditional sports events is included among them, on the contrary mostly are foreign sports events, such as, golf, tennis, rock climbing and other sports entertainment events. Traditional sports events interestingness, entertainment has features that other events cannot replace. Thereupon, it is clear that traditional sports event poor development main cause is insufficient awareness of people. In order to upgrade people emphasis on traditional sports events, the paper will intuitional show traditional sports development status with data and diagram, as Figure 1.

Figure1 : The schematic view of some traditional sports

Data processing

The paper original data is from "Chinese national traditional sports events layering evaluation system and development strategic research", as TABLE 1.

In TABLE 1, fifty-eight national traditional sports events data source form is through releasing questionnaire in the way of unregistered, inviting national traditional sports experts, coaches, athletes to score on their familiar events, above table selects event scores, event mentioned frequency, events merit degrees, whether events are forgotten or not ("0" represents" forgotten", mentioned frequency is less than five times, "1" represents "unforgotten", mentioned frequency is no less than five times) as original data.

Survival analysis

Survival analysis method common distribution includes index distribution, extreme value distribution, Weibull distribution and logarithmic distribution.

(1) Index distribution

Index distribution is a kind of widely spread successive type. It has widely application in queuing theory and reliability theory as well as other fields. Index distribution basic form is:

$$S(t) = e^{-\lambda t}$$
$$f(t) = \lambda e^{-\lambda t}$$
$$h(t) = \lambda \tag{1}$$
$$\Lambda(t) = \lambda t$$

Survival time is $t(t \geq 0)$; distribution function is $f(t)$; risk function is $h(t)$; accumulative risk function is $\Lambda(t)$; Parameter is $\lambda(\lambda > 0)$. By formula, it is clear that in index distribution, $h(t)$ is a constant, it will not change as survival time changes, it is up to λ. When λ value is larger, it represents risk rate is higher, survival rate is lower, on the contrary it shows survival rate is higher, and risk rate is lower.

(2) Extreme value distribution

The distribution represents maximum value or minimum value probability distribution. Basic form is as following:

$$S(t) = \exp\left[-\exp\left(\frac{t-u}{b}\right)\right](-\infty < t < +\infty)$$

$$f(t) = b^{-1}\exp\left[\left(\frac{t-u}{b}\right) - \exp\left(\frac{t-u}{b}\right)\right](-\infty < t < +\infty) \tag{2}$$

FULL PAPER

TABLE 1 : Each kind of traditional sports events original data

Event	No.	Scores	Sports events merits	Frequency	Forgotten or not
Board shoes athletics	1.00	6.38	2.00	2.00	0.00
Dragon-boat racing	2.00	6.29	2.00	2.00	0.00
Bundle beating	3.00	6.28	1.00	1.00	0.00
Bashan dance3	4.00	6.19	5.00	16.00	1.00
North ga	5.00	6.13	5.00	9.00	1.00
Beating spinning top	6.00	6.08	5.00	19.00	1.00
Tall racing	7.00	6.07	2.00	2.00	0.00
Bamboo stick jumping	8.00	6.06	2.00	2.00	0.00
Maogusi dance	9.00	5.96	1.00	1.00	0.00
Miao martial arts	10.00	5.92	1.00	1.00	0.00
Funeral dance	11.00	5.91	5.00	7.00	1.00
Wood shooting	12.00	5.88	1.00	1.00	0.00
Boundary cock penalty	13.00	5.86	1.00	1.00	0.00
Flower-drum beating	14.00	5.81	3.00	3.00	0.00
Rod creep	15.00	5.81	5.00	5.00	1.00
Waving dance	16.00	5.80	3.00	3.00	0.00
Tall lantern	16.00	5.80	2.00	2.00	0.00
Festive lantern jumping	17.00	5.77	1.00	1.00	0.00
Bamboo-horse riding	18.00	5.75	4.00	4.00	0.00
Flower-drum beating 2	19.00	5.71	3.00	3.00	0.00
Chuk-guk	20.00	5.68	2.00	2.00	0.00
Horizontal bar resisting	21.00	5.67	5.00	7.00	1.00
Roulianhua	22.00	5.64	1.00	1.00	0.00
Table jumping	23.00	5.63	1.00	1.00	0.00
Archery	24.00	5.61	4.00	4.00	0.00
Yajia	25.00	5.60	5.00	6.00	1.00
Shuttle cock kicking	26.00	5.60	5.00	13.00	1.00
Dragon playing	27.00	5.59	3.00	3.00	0.00
Ancient wrestling	28.00	5.58	5.00	6.00	1.00
Cast pot	29.00	5.54	2.00	2.00	0.00
Bamboo basket	30.00	5.53	5.00	7.00	1.00
Yangko	31.00	5.48	4.00	4.00	0.00
Needle threading racing	32.00	5.48	2.00	2.00	0.00
Cane swinging	33.00	5.48	2.00	2.00	0.00
Bowing	34.00	5.47	3.00	3.00	0.00
Bamboo ring basket	35.00	5.47	5.00	10.00	1.00
Duck chasing	36.00	5.46	3.00	3.00	0.00
waist-embracing wrestling	37.00	5.46	2.00	2.00	0.00
Push-and-pull	38.00	5.39	5.00	17.00	1.00
Flying pebbles	39.00	5.35	5.00	7.00	1.00

Event	No.	Scores	Sports events merits	Frequency	Forgotten or not
Straw dragon dance	40.00	5.31	1.00	1.00	0.00
Stilt walk	41.00	5.28	5.00	13.00	1.00
Hunting	42.00	5.18	2.00	2.00	0.00
Pearl-ball game	43.00	5.18	2.00	2.00	0.00
Ball thrown	44.00	5.15	3.00	3.00	0.00
Linen knotting racing	45.00	5.08	2.00	2.00	0.00
Swinging	46.00	5.00	5.00	9.00	1.00
Rope skipping	47.00	5.00	5.00	13.00	1.00
Mongolian wrestling	48.00	4.95	3.00	3.00	0.00
Playing cards	49.00	4.80	5.00	11.00	1.00
Lang boat stilting	51.00	4.69	3.00	3.00	0.00
Cock throwing	52.00	4.57	5.00	9.00	1.00
Horizontal bar flight performance	53.00	4.54	3.00	3.00	0.00
Gong chicken snatch	54.00	4.37	1.00	1.00	0.00
Water float	55.00	4.39	1.00	1.00	0.00
Rubber band jumping	56.00	4.26	5.00	8.00	1.00
Spine resisting	57.00	4.02	1.00	1.00	0.00
Squeezing oil residue	58.00	3.46	1.00	1.00	0.00

(3) Weibull distribution

The distribution is deducing its distribution parameter on the basis of probability value; the distribution way is widely applied in survival analysis. Its basic form is as following:

$$S(t) = e^{-(\lambda t)^\beta}$$
$$f(t) = \lambda \beta (\lambda t)^{\beta-1} e^{-(\lambda t)^\beta}$$
$$h(t) = \lambda \beta (\lambda t)^{\beta-1} \tag{3}$$
$$\Lambda(t) = (\lambda t)^\beta$$

Shape parameter is β. If $\beta > 1$, $h(t)$ is monotone increasing function; if $\beta < 1$, $h(t)$ is monotone decreasing function; if $\beta = 1$, is constant.

(4) Logarithmic distribution

Logarithmic distribution is describing risk rate non-monotone changed survival time distribution. Its form is as following:

$$f(t) = \frac{\lambda \alpha t^{\alpha-1}}{(1 + \lambda t^\alpha)^2}$$
$$F(t) = 1 - \frac{1}{1 + \lambda t^\alpha}$$
$$S(t) = \frac{1}{1 + \lambda t^\alpha} \tag{4}$$
$$h(t) = \frac{\lambda \alpha t^{\alpha-1}}{1 + \lambda t^\alpha}$$
$$\Lambda(t) = \ln(1 + \lambda t^\alpha)$$

Among them, $\lambda > 0$, $\alpha > 0$. If $\alpha > 1$, risk rate is firstly increasing and then decreasing; if $0 < \alpha < 1$, risk rate is diminishing.

Survival analysis method includes parameters method, non-parameter method and semi-parameter method. Life table method is a kind of important non-parameter estimation method; it widely applies into medical statistics, demography and insurance as well as numerous fields' research.

In general, we hope to investigate two time phases time distribution, such as employment duration (time that staff from being hired to leaving company). But these data generally include cases without recording their second time events (such as, after investigation ending, they are still company working staff). Such special case occurrence causes are as following:

① To some cases, it hasn't occurred before researched events ending

② To other cases, it cannot track its state before researched events ending;

③ To partial cases or due to uncorrelated to research such reasons, they cannot continue.

Above these cases are collectively known as investigated cases, they let this kind of research not to fit

FULL PAPER

for t test or linear regression and other traditional computational method.

Follow-up life table method is such kind of data's statistical method. Basic concept of life table[12] is dividing observed intervals into relative small time interval. To every interval, uses all staff that observe at least for the duration calculated the interval occurred events terminate probability. In the following, use probability that estimates on every interval to estimate full probability of the event occurrence at different time points.

Analyze SPSS computed result

By Figure 2, Figure 3 it can get that optimal development sports events are bundle beating, Maogusi dance, Miao martial arts, wood shooting, boundary cock penalty, festive lantern jumping, roulianhua, table jumping, straw dragon dance, Gong chicken snatching, water float, spine resisting, squeezing oil residue. Good developed sports events are board shoes athletics, dragon-boat racing, tall racing, bamboo stick jumping, waving dance, Chuk-guk, cast pot, needle threading racing, cane swinging, waist embracing wrestling, hunting, pearl-ball game. So-so developed sports events are flower-drum beating, tall lantern, flower-drum beating 2, dragon playing, bowing, duck chasing, ball thrown, Mongolian wrestling, and land boat stilting, horizontal bar flight performance. Poor developed are Yangko, archery, bamboo-horse riding. Sports events to be forgotten are Bashan dance, North ga, beating spinning top, funeral dance, rod creep, horizontal bar resisting, Yajia, kicking shuttle-cock, ancient wrestling, bamboo basket, bamboo ring basket, push-and-pull, flying
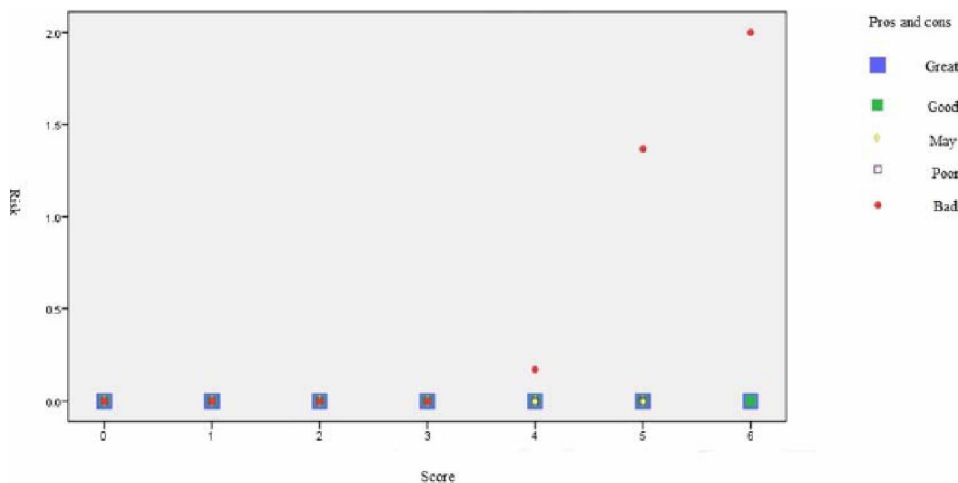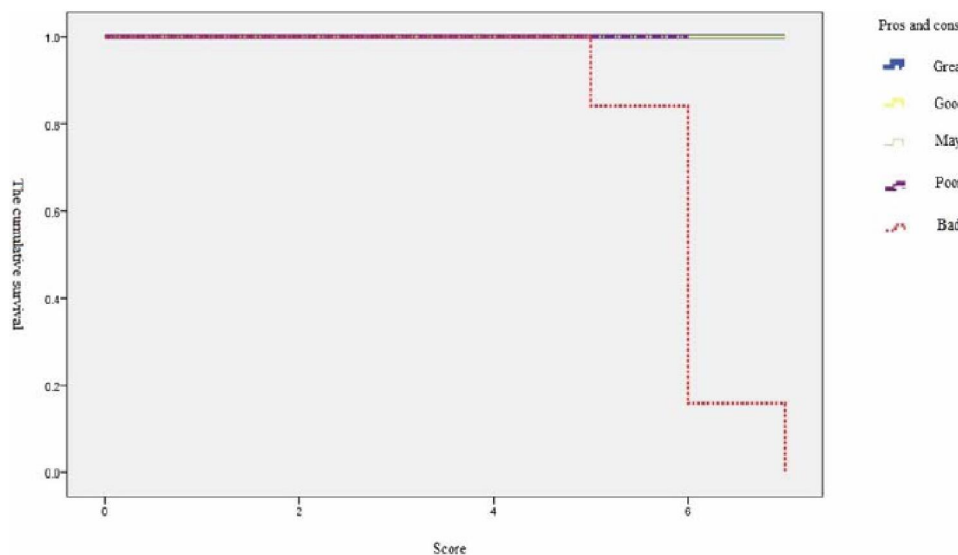

Figure 2 : The risk function

Figure 3 : The survival function

FULL PAPER

pebbles, stilt walk, swinging, rope skipping, playing cards, cock throwing, rubber band skipping.

From Figure 4, it is clear that above one third traditional sports events development status are not good, optimal developed sports events haven't arrived at one fourth of totals. Thereupon, traditional sports events should be taken serious by people.
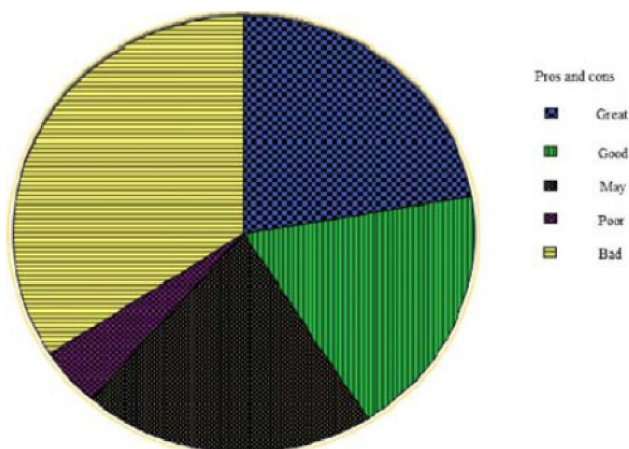

Figure 4 : The pie of traditional sports development

CONCLUSION

The model relies on lots of actual data, uses computer software SPSS to process with data. The method has stronger operability. The model not only can predict one moment each kind of sports events development status, it can also analyze each phase sports events development status. In survival analysis, life tale analysis method has strong adaptability in sports field. The model obtained result has certain rationality, which has certain guiding significances in traditional sports events development. But the model used data is from Hunan province and Guangdong province national sports events statistics. To some extent, obtained result has certain constraints.

Survival analysis method is a main mathematical tool to look for most survival objects from numerous objects; it can help us to objectively look for target object from numerous objects. The model applied fields are very widely, such as "Commercial bank risk pre-warning research", "Listed company financial risk pre-warning research" and other issues. The paper applies survival analysis method into sports fields' traditional events survival problems, and analyzes SPSS handling results,

obtained survival events and forgotten events accuracy is high, rationality is strong. By the paper established model, it is clear that sports events to be forgotten are Bashan dance, North ga, beating spinning top, funeral dance, rod creep, horizontal bar resisting, Yajia, kicking shuttle-cock, ancient wrestling, bamboo basket, bamboo ring basket, push-and-pull, flying pebbles, stilt walk, swinging, rope skipping, playing cards, cock throwing, rubber band skipping.

REFERENCES

[1] Lu Xu-Tao, Hong Hao; Survival and Development of National Traditional Sports Major under the Background of Globalization. Journal of Chengdu Physical Education Institute, **37(9)**, **(2011)**.

[2] Zhao Jin; On the Modernization Dispute of National Traditional Sports. Sports Sciences Researches, **15(3)**, 14-17 **(2011)**.

[3] Ye Xiang-Wen; The Cultural Ecological Perspective of Heritage of National Traditional Sports. Bulletin of Sport Science & Technology, **19(1)**, 112-113, 125 **(2011)**.

[4] Zhao Jin, Wang Jian; Exploration of the way to the inheritance and development of traditional national sports. Journal of Physical Education, **16(8)**, **(2009)**.

[5] Li Rongzhi, Yu Chonggan; Sports Globalization and Descent of China Traditional Sports. Sports Culture Guide, **4**, 84-86 **(2007)**.

[6] Chen Lixin; The Research Status and Prospects of Sport Globalization at Home and Abroad. Sports & Science, **30(4)**, **(2009)**.

[7] Guo Li; Studies of the Ways of Inheriting and Passing on of the Ethnic Traditional Sports in China. Journal of Southwest China Normal University (Natural Science), **33(6)**, **(2008)**.

[8] Hu Yonggang; Cultural Confusion and Coping Mechanism of Martial Arts in Context of Globalization. Journal of Shenyang Sport University, **28(4)**, 110-113, 128 **(2009)**.

[9] Wang Gang; Concerns of National Traditional Sports: Current Status, Problems and Reflections. Journal of Capital College of Physical Education, **20(2)**, 1-4 **(2008)**.