

- Morgan, W.P. (1985). Selected psychological factors limiting performance: A mental health model. In D.H. Clarke & H.M. Eckert (Eds.), *Limits of human performance*. Academy Papers no.18. Champaign, IL: Human Kinetics.
- Morgan, W.P., O Connor, P.J., Ellickson, K.A., & Bradley, P.W. (1988). Personality structure, mood states, and performance. *International Journal of Sport Psychology*, 19, 247-263.
- Morgan, W.P., Brown, D.R., Raglin, J.S., O Connor, P.J., & Ellickson, K.A. (1987). Psychological monitoring of over-training and staleness. *British Journal of Sports Medicine*, 21, 107-114.
- Morgan, W.P., & Johnson, R.W. (1978). Personality characteristics of successful and unsuccessful oarsmen. *International Journal of Sport Psychology*, 9, 119-133.
- Morgan, W.P., & Pollock, M.L. (1977). *Psychological characterization of the elite distance runner*. Annals New York Academy, 301, 382-403.
- Renger, R. (1993). A review of the Profile Mood States (POMS) in the prediction of athletic success. *Journal of Applied Sport Psychology*, 5, 78-84.
- Vanden Auweele, Y., De Cuyper, B., Van Mele, K., & Rzewnicki, R. (1993). Elite performance and personality: from description and prediction to diagnosis and intervention. In R.N. Singer, M. Murphey, & L.K. Tennant (Eds.), *Handbook of research on sport psychology*. New York: Macmillan.

VARIATIONS OF SEVERAL AFFECTS ACCORDING TO AGE AND GOALS

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Key words: Goal, Affective responses, Developmental perspective

INTRODUCTION

For attributional's theorists (Frijda, 1986; Roseman, 1984; Weiner, 1985, 1986) the way people infer causes to explain their success and failure is not without consequences on their affective responses. Weiner (1986) indicates that individuals explain outcomes in terms of competence, effort, task difficulty and luck. Moreover, some affects are related to specific causal ascriptions (Weiner, Russell & Lerman, 1978, 1979). For example, if a subject explains his winning by exhibiting a great competence, he would be prider than if he considers himself as a lucky winner. This, however, involves that these notions have to be clearly differentiated one another. Nicholls (1984, 1989, 1990; Nicholls & Miller, 1984), who has more particularly studied the relationship between effort and ability, indicates that, contrary to adults, children consider imperfectly these concepts. Below 10 years old, children report more exerted effort when competence is perceived as high, or conversely, that is, use a co-variation shema (Kun, 1977). It's near 12 years old that effort and competence are perfectly differentiated. So, adolescents are able to report less exerted effort when competence is perceived as high, and conversely, that is, use a compensation shema (Kun, 1977). This developmental perspective involves that attribution-dependant affects vary according to age (Jagacinski & Nicholls, 1984).

Moreover, many research provide empirical support to the relevance of distinction between two major goal perspectives (for review, see Duda, 1992). Indeed, as Nicholls (1984, 1989) suggests, individuals could give themselves either task-orientation or ego-orientation goal. Task-oriented people are focused on the activity for its own sake and tend to exert optimal effort to improve their ability. Ego-oriented people, on the other hand, are focused on the social comparison of their outcomes and tent to exert the least effort possible to reach success. Task-oriented subjects use the less differentiated conception of ability whereas ego-oriented individuals use the more differentiated conception of ability. Stemming from this perspective, researches in sport setting indicate that 1) according to age, people give themselves different goals (e.g., Brunel, in press; Thill & Brunel, in press); 2) people refer to the more or less conception of ability according to the goal pursued (e.g., Brunel, 1993, Thill & Brunel, 1995); 3) people likewise use the more or less conception of ability when we manipulate goal perspectives (e.g., Brunel & Thill, 1991, 1993; Thill & Brunel, in press).

In sum, attributions vary not only according to the goal pursed, but also according to age. So, it seems that attribution-dependant affects may also vary according to age and goals.

METHOD

The aim of these studies was to assess a possible dependance between: 1) the genetic development of some affects (pride, guilty and embarassement) and the genetic development of the concept of competence; 2) The genetic development of these affects and the nature of the induced goal.

Subjects and Task

Through experimental design, three studies were realised among different age groups (Mean age S1: 8.37; S2: 13.27; S3: 23.18). In each study, thirty-two soccer players volunteered to participate at penalty kicks. The task consisted of 10 penalty kicks into a soccer goal divided at each extremity by six spaces (0.75 m x 0.60 m each), that is, we asked these players to shoot 11 meters far from the goal. We gave different values to the cases (1, 3, 5, 7 and 10 points) according to their location into the goal, that is the scores varied orderly to the difficulty of the shot. So people could reach 100 points.

Conditions

The three studies involved a 2 (type of induced involvement: ego versus task) X 2 (type of feedback: positive versus negative) design. In task-involvement conditions we told subjects to shoot to experiment something new and to find out more about that novel task. We clearly indicated that there was no matter of competition. In ego-involving conditions we brought out that they had to shoot to score higher than other players, and to win this competition-test.

Standardized feedback were provided in each condition following every third trials: 1) positive verbal statements (e.g., "It seems that your results are better than that of your playmates") or negative verbal statements (e.g., "It seems that your results are worse than that of your playmates") in ego-involving conditions; 2) positive verbal statements (e.g., "It seems that your improvement is quite quick) or negative verbal statements (e.g., "It seems that your improvement is quite slow) in task-involving situations.

Procedure

Each participant completed the experiment individually alone with the experimenter. During a first phase without instructions, subjects engaged into 10 practice trials. After matching their scores, they were randomly assigned to one of the four experimental conditions. Then, after a second set of 10 penalty kicks they answered questionnaires.

Measure

To assess their affective responses, we asked subjects to place a vertical line in a two-ended ten centimeter's space labelled from "not at all" to "very high" affect considered. With this method, one collects numerical variables affording the use of ANOVA.

RESULTS

Results of the different studies are summerized in table 1

TABLE 1. Means and Standard Deviations for the three studies

		Ego involvement		Task involvement	
		FB +	FB -	FB +	FB -
Study 1	Pride	M 5.97 SD 2.42	M 4.26 SD 2.71	M 5.65 SD 1.26	M 3.07 SD 2.44
	Embarassement	M 2.74 SD 1.74	M 4.54 SD 2.64	M 3.39 SD 1.80	M 5.29 SD 2.47
	Guilt	M 4.12 SD 2.89	M 4.56 SD 2.00	M 4.02 SD 1.78	M 4.22 SD 2.94
Study 2	Pride	M 5.19 SD 2.17	M 2.37 SD 1.45	M 2.21 SD 1.79	M 2.52 SD 1.09
	Embarassement	M 2.74 SD 1.28	M 4.29 SD 2.37	M 2.06 SD 2.11	M 4.28 SD 1.73
	Guilt	M 5.45 SD 1.76	M 4.15 SD 2.82	M 3.65 SD 2.13	M 5.82 SD 2.65
Study 3	Pride	M 5.06 SD 2.98	M 4.35 SD 2.62	M 4.52 SD 1.99	M 3.51 SD 2.07
	Embarassement	M 1.89 SD 2.21	M 3.74 SD 1.74	M 2.94 SD 1.23	M 3.07 SD 2.86
	Guilt	M 4.40 SD 2.24	M 3.75 SD 2.73	M 2.63 SD 1.60	M 4.91 SD 2.95

Manipulation Check

After the second set of penalty kicks, subjets were asked to assess 1) their competence perceptions and 2) the level of effort involved.

Firstly, individuals reported significantly higher competence perceptions after positive verbal feedback than after negative verbal statements. Thus, the feedback manipulation induced opposite competence perception as intended.

Secondly, in study 1, subjects refer to the less differentiated conception of ability independantly of the goal assigned, that is they report high exerted effort when competence feedback is induced, and conversely, since $F(1,28)=38.889$, $p<.001$. In study 2 and study 3, people use the more differentiated conception of ability in ego-involving conditions whereas they use the less differentiated conception of ability in task involving situations. Indeed, results indicate a significant induced involvement (ego vs. task) X feedback (positive vs. negative)

interaction since $F(1,28)=12.234$, $p<.005$ (study 2) and $F(1,28)=14.143$, $p<.001$ (study 3). So, as intended, people refer to the more or less conception of ability according to age and goals.

Pride

A 2 X 2 analysis of variance (ANOVA) revealed a significant main effect of allocated feedback, since $F(1,28)=16.93$, $p<.001$ (study 1) and $F(1,28)=10.95$, $p<.005$ (study 2). It appears that subjects who receive positive verbal statements feel prider than these who receive negative verbal statements. More detailed planned pairwise comparisons indicate that either in ego-involving conditions or in task-involving conditions, people who receive competence feedback feel prider than the others (cf. fig 1)

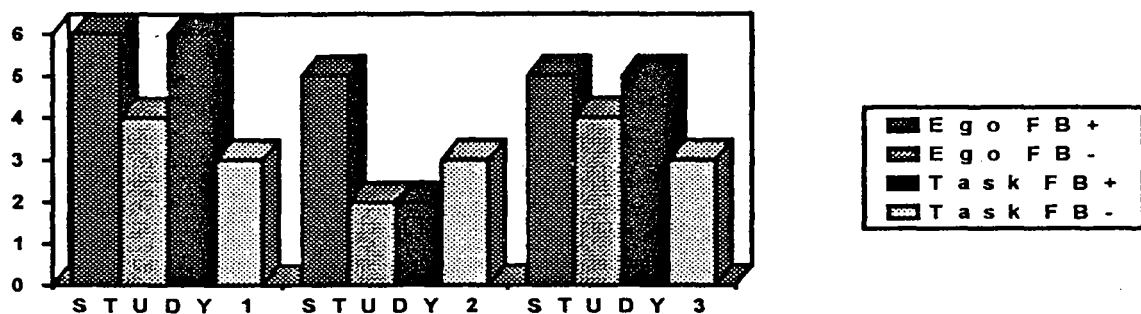


Fig 1 : Feeling of pride according to induced goal and allocated feedback

Embarassement

A 2 X 2 analysis of variance (ANOVA) revealed a significant main effect of allocated feedback, since $F(1,28)=6.79$, $p<.05$ (study 1) and $F(1,28)=5.15$, $p<.05$ (study 2). Indeed, subjects who receive negative verbal statements seem more embarassed than these who receive positive verbal statements. Planned pairwise comparisons confirm that this result is observed independamment of the induced goal (cf. fig 2).

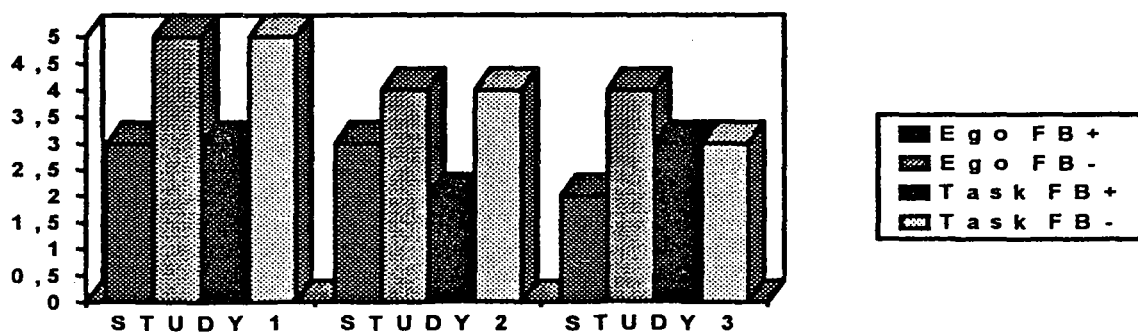


Fig 2: Feeling of embarassement according to induced goal and allocated feedback

Guilty

A 2 X 2 ANOVA revealed a significant induced involvement X verbal statement interaction since $F(1,28)=11.09$, $p<.005$ (study 2) and $F(1,28)=6.65$, $p<.05$ (study 3). Main effect were not observed. These results suggest that guilty depends both on the goal provided and the allocated feedback. Indeed, in the both studies, positive feedback lead to high guilty in ego-involving conditions and low guilty in task-involving situations while negative verbal statements lead to low guilty in ego-involving conditions and high guilty in task-involving situations (cf. fig 3).

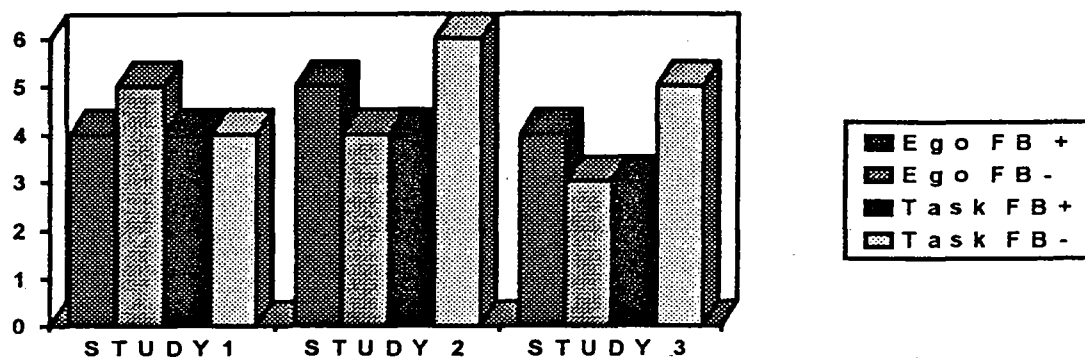


Fig 3 : Feeling of guilty according to induced goal and allocated feedback

GENERAL DISCUSSION

These results indicate that affects taken into account vary according to the genetic development of the subject and the nature of the goal pursued. When individuals have not yet reached the most differentiated conception of ability, they feel pride when they apply high efforts. By acquiring the conception of competence as capacity, subjects infer low effort when competence is induced and, hence, feel pride. Nevertheless, they feel guilty to have displayed low effort. Many studies indicate that the concept of guilty comes from a sense of transgression of ethical standard, self-worth (e.g., Wicker, Payne & Morgan, 1983) or appears when subjects perceive causes of their outcomes as controllable (Graham & Weiner, 1986; Weiner & Graham, 1984). Subjects feel themselves as personally responsible of their results (Izard, 1977). In achievement situation, effort represents one of the most controllable causes. Hence, guilty appears since subjects apply low effort. According to the competence conception people refer to, feedback is not perceived in the same way. When individuals are ego-involved, competence feedback leads to ascription of low effort and increases the feeling of guilty (Jagacinski & Nicholls, 1984). On the other hand, when individuals are task-involved, the same

positive verbal statement leads to attribution of high effort and reduces the feeling of guilty (Jagacinski & Nicholls, 1984).

Concerning embarrassment, it seems that it results of a low perceived ability whatever the competence conception considered.

CONCLUSION

By acquiring the most differentiated conception of ability, upper 10-12 years old, subjects have to face the following dilemma: Displaying important efforts leads to perception of low competence, reduces embarrassment and pride but increases guilty (Brown & Weiner, 1984). Generally, athletes prefer exhibit great competence. Nevertheless, they recognize that efforts are virtuous (Nicholls, 1976; Sohn, 1977) and are rewarded by trainers (Weiner, 1981). Contrary to ego-involving situations where effort represents a double edge-sword (Covington & Omelich, 1979), it seems that task-involving situations are optimally motivational because, instead of competence, they point out the role of effort in performance and generate more positive affects.

REFERENCES

- Brown, J., & Weiner, B. (1984). Affective consequences of ability versus effort ascriptions: Controversies, resolutions and quandaries. Journal of Educational Psychology, 76, 146-158.
- Brunel, P.C. (1993). Les conceptions de la compétence en fonction de l'âge et des buts. Leurs effets sur les cognitions et les performances. Thèse de Doctorat de l'université de Clermont-Ferrand. Non publiée.
- Brunel, P.C. (in press). Différenciation des conceptions d'effort et de compétence chez le sportif. Sciences et Techniques des Activités Physiques et Sportives.
- Brunel, P.C., & Thill, E.E. (1991). Conceptions de l'effort et de la compétence chez des footballeurs de haut niveau. Communication présentée aux IV Journées Internationales de l'Association des Chercheurs en Activités Physiques et Sportives, Lille.
- Brunel, P.C., & Thill, E.E. (1993). La motivation en contexte sportif : les effets des buts sur les cognitions et les conduites. Science et Motricité, 19, 43-52.
- Covington, M.V., & Omelich, C.L. (1979). Effort: The double edge-sword in school achievement. Journal of Personality and Social Psychology, 71, 169-182.
- Duda, J.L. (1992). Motivation in sport setting: A goal perspective approach. In G.C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 57-91). Champaign, IL: Human Kinetics.
- Frijda, N.H. (1986). *The emotions*. New-York, Cambridge University Press.
- Graham, S., & Weiner, B. (1986). From attribution theory to developmental psychology: A round trip ticket? Social Cognition, 4, 152-179.

- Izard, C.E. (1977). Human emotions. New-York, Plenum Press.
- Jagacinski, C.M., & Nicholls, J.G. (1984). Conceptions of ability and related affects in task involvement and ego involvement. Journal of Educational Psychology, 76, 909-919.
- Kun, A. (1977). Development of the magnitude covariation and compensation schemata in ability and effort attributions of performance. Child Development, 48, 862-873.
- Nicholls, J.G. (1976). Effort is virtuous but it's better to have ability: Evaluative responses to perceptions of effort and ability. Journal of Research in Personality, 10, 306-315.
- Nicholls, J.G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice and performance. Psychological Review, 91, 328-348.
- Nicholls, J.G. (1989). The competitive ethos and the democratic education. Cambridge, Harvard University Press.
- Nicholls, J.G. (1990). What is ability and why are we mindful of it? A developmental perspective. In R.J. Sternberg & J. Kolligan Jr (Eds.) *Competence considered* (pp. 11-40). New Haven, Yale University Press.
- Nicholls, J.G., & Miller, A.T. (1984). Development and its discontents: The differentiation of the concept of ability. In J.G. Nicholls (Ed.) *Advance in motivation and achievement: The development of achievement motivation* (pp. 185-218). Greenwich, JAI Press.
- Roseman, I.J. (1984). Cognitive determinants of emotions: A structural theory. In P. Shaver (Ed.) *Review of personality and social psychology* (pp. 11-36). Beverly Hills, Sage.
- Sohn, D. (1977). Affect-generating powers of effort and ability-self attributions of academic success and failure. Journal of Educational Psychology, 69, 500-505.
- Thill, E.E., & Brunel, P.C. (1995). Ego-involvement versus task-involvement: Related conceptions of ability, effort and learning strategies among soccer players. International Journal of Sport Psychology, 26, 81-97.
- Thill, E.E., & Brunel, P.C. (in press). Social cognitive perspectives on motivation in sport. In S.J.H. Biddle (Ed.) *Exercise and sport psychology: A european perspective*. Champaign, Human Kinetics.
- Weiner, B. (1981). The role of affects in sport psychology. In G.C. Roberts & D.M. Landers (Eds.) *Psychology of motor behavior and sport*. Champaign, Human Kinetics.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotions. Psychological Review, 92, 548-573.
- Weiner, B. (1986). An attributional theory of motivation and emotions. New-York, Springer-Verlag.
- Weiner, B., & Graham, S. (1984). An attributional approach to emotional development. In C. Izard, J. Kagan & R. Zajonc (Eds.) *Emotion, cognition and behavior* (pp. 167-191). Cambridge University Press.

Weiner, B., Russell, D., & Lerman, D. (1978). Affective consequences of causal ascriptions. In J.H. Harvey, W.J. Ickes & R.F. Kidd (Eds.) *New direction of attribution research* vol 2 (pp 58-88). Hillsdale, Erlbaum.

Weiner, B., Russell, D., & Lerman, D. (1979). The cognition-emotion process in achievement related contexts. Journal of Personality and Social Psychology, 37, 1211-1220.

Wicker, F.W., Payne, G.C., & Morgan, R.D. (1983). Participant description of guilt and shame. Motivation and emotion, 7, 25-39.

EFFECTS OF HEAT STRESS AND TIME ON TASK ON REACTION TIME¹.

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Key-words: Heat stress, time on task.

INTRODUCTION

Several studies have shown that heat stress caused a deterioration in cognitive performance, and that the magnitude of this deterioration was related to the duration of the exposure to high temperature. Particularly in sustained attention tasks, to which some sports activities could be compared, performance decrements were observed under heat stress, and these decrements became more important with the prolongation of the exposure (Mackworth, 1950; Mortagy & Ramsey, 1973). Nevertheless these observations have often been realised without control group, so it was impossible to distinguish between the effect of heat stress, and the effect of time on task.

The aim of the present experiment was to test the hypothesis of an interaction between heat stress and time on task. Such an interaction was evidenced in a tracking task by Beshir, El-Sabagh & El-Nawawi. (1981), in a protocol including ambient temperatures of 20°C, 26°C and 30°C. Nevertheless this experiment was also designed to test an hypothesis concerning the work/rest ratio effect, and a visual analysis of the results seems to indicate that this interaction was mainly located in the last measurement of each work session, suggesting a possible interference of motivational processes. We think that an appropriate test of this interaction hypothesis require to face subjects with a continuous task. Moreover, the subjects have to ignore the exact duration of the test.

According to Hancock (1986), performance alterations are due to dynamic variations in body core temperature. This hypothesis could explain that performance decrements do not appear under a critical threshold in ambient temperature (approximately 29-30°C; Mackworth, 1950; Pepler, 1958). It has also been established that performance decrements do not appear before 20-30 minutes of exposure (Hohnsbein, Piekarski, & Kampmann, 1983; Mackworth, 1950; Pepler, 1958; Wilkinson, 1969). According to Hancock (1986) this half-hour could represent a period of temporary resistance of the organism's homeostasis. An analysis of the evolution of body temperature, under thermal stress, appears necessary to a better understanding of performance alterations.

¹ This experiment had been performed at the National Institute for Sport and Physical Education, Paris.

METHOD AND PROCEDURE

14 subjects (mean age: 36.3; SD: 8.9) volunteered in this experiment. A climatic chamber was used, which allowed to control ambient temperature and relative humidity. The subjects were successively submitted to two conditions: (1) 20°C E.T.² (23°C dry temperature, 50% relative humidity) and (2) 38°C E.T. (42°C dry temperature, 70% relative humidity). Air velocity was negligible. In each condition the subjects were submitted to the climate during 30 minutes before the beginning of the experiment.

Subjects had to perform in each condition a binary choice reaction time task. This task was presented on a computer, connected to two joysticks. At each trial, a preparation signal appeared 0.5 second before the response signal. The response signal corresponded to the highlighting of one of two squares, horizontally aligned on the screen. Subjects have to respond to the left signal by titling the left joystick on the left, and conversely for the right signal and the right joystick. Response time were recorded by the computer.

This task was performed continuously for 45 minutes, from the 30th minute of exposure to the climate. Response time and errors were collected for statistical treatments for the 60 trials performed from the 30th, 45th, and 60th minutes of exposure. The order of climate conditions was systematically controlled between subject. The subjects were not informed before the experiment of the exact duration of the test.

Reaction time data were treated by a two-factor analysis of variance (climate x time on task), with three levels of repeated measurement on the second factor.

Oral temperature were measured in the 38°C session at the entrance in the climatic chamber, and after 30, 45 and 60 minutes of exposure. Data were processed by a one-way analysis of variance with 4 levels of repeated measurement.

² Effective temperature (E.T.) was proposed by Houghten et Yagloglou (1923) for assessing heat stress. It combined in a global index dry temperature, relative humidity and air velocity.

RESULTS

Mean data are represented in figure 1. Results indicated a significant effect of climate ($F_{1,13}=27.362$, $p<.001$), and a significant effect of time on task ($F_{2,26}=5.498$, $p<.01$). The linear trend for time on task was significant ($F_{1,13}=6.727$, $p<.02$). There was no interaction effect ($F_{2,26}=.003$).

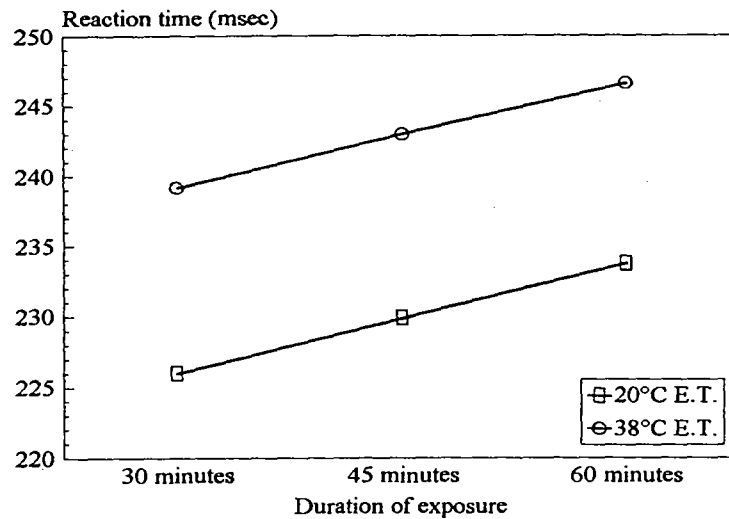


Fig. N°1: Mean Reaction time, according to Time on Task and Climate Condition.

The analysis for oral temperatures revealed a significant effect of duration of exposure ($F_{3,39}=48.268$, $p<.001$). Post-hoc analysis showed that there was a significant raise in oral temperature during the first 30 minutes of exposure. But there was no differences between subsequent measurements.

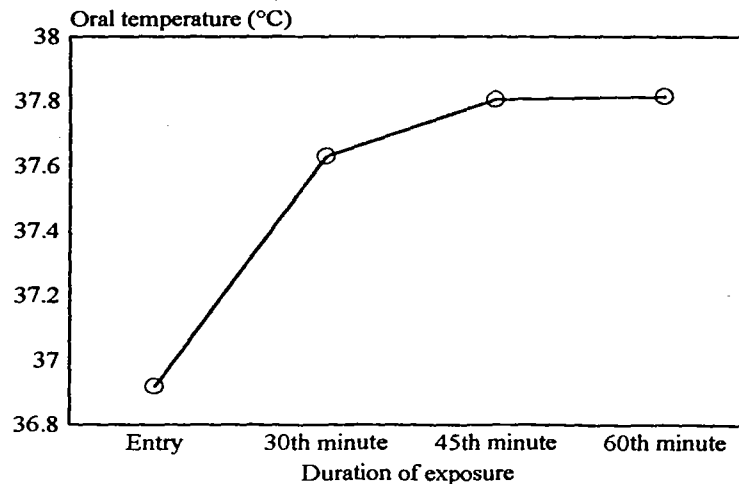


Fig. N°2: Mean Oral Temperature, according to the Duration of the Exposure to Heat Stress.

DISCUSSION AND CONCLUSIONS

The observed deterioration of performance is consistent with the results reported by Mortagy and Ramsey (1973) with similar exposure durations. Nevertheless these results indicate that, respective to the studied range of exposure duration, the effect of heat stress and the effect of time on task are independent. These results contradict those by Beshir, El-Sabagh & El-Nawawi. (1981), and suggest that the duration of exposure does not constitute *per se* a determinant factor of the decrease of performance.

Nevertheless this result could be dependent on our experimental conditions (i.e. nature and duration of the task). Longer exposures, particularly associated with physical exertion, could result in important dehydration and have a specific effect on performance (Epstein et al., 1980).

REFERENCES

- Beshir, M.Y., El-Sabagh, A.S., & El-Nawawi, M.A. (1981). Time on task effect on tracking performance under heat stress. Ergonomics, 24, 95-102.
- Mackworth, N.H. (1950). Researches on the measurement of human performance. Medical Research Council Special Report Series 268. London: Her Majesty's Stationary Office.
- Mortagy, A.K. & Ramsey, J.D. (1973). Monitoring performance as a function of work/rest ratio schedule and thermal stress. American Industrial Hygiene Association Journal, 34, 474-480.
- Hancock, P. (1986). Sustained attention under thermal stress. Psychological Bulletin, 99, 263-281.
- Hohnsbein, J., Piekarsi, C., & Kampmann, B. (1983). Influence of high ambient temperature and humidity on visual sensitivity. Ergonomics, 26, 905-911.
- Epstein, Y., Keren, G., Moisseiev, J. Gasko, O., & Yachin, S. (1980). Psychomotor deterioration during exposure to heat. Aviation, Space and Environmental Medicine, 51, 607-610.
- Pepler, R.D. (1958). Warmth and performance: an investigation in the tropics. Ergonomics, 1, 63-88.
- Wilkinson, R.T. (1969). Some factors influencing the effect of environmental stressors upon performance. Psychological Bulletin, 72, 260-272.

EFFECTS OF HEAT STRESS AND PHYSICAL EXERTION ON SIMPLE AND CHOICE REACTION TIME¹

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Key-Words: Heat stress, exertion, thermal comfort, core temperature, cognitive processes.

INTRODUCTION

The effects of heat stress on performance have been mainly studied in the industrial and military contexts (Hancock, 1986; Parsons, 1993; Yaglou & Minard, 1957). Few studies have specifically focused on the problems of heat stress in sports, especially in the cognitive domain. Nevertheless, climate could represent a major stressor in many sports events, especially for outdoor activities.

Sports situations are characterized by simultaneous high demands on the physiological and cognitive resources of the individual. Generally the effects of stressors on each system of resources have been studied separately. As physiological and cognitive processes appear to have important mutual influences (Tomprowski & Ellis, 1986), a more comprehensive approach seems necessary.

The effects of exercise on cognitive processes have been mainly approached, in recent years, through the study of reaction time tasks (Delignières, Brisswalter & Legros, 1994; Legros, Delignières, Durand & Brisswalter, 1992; Paas & Adam, 1991). These studies have shown that exercise led to a decrement of simple reaction time, but to an enhancement of choice reaction time, especially with collective and combat sports experts. These contrasting effects seemed related to a complex interaction between a specific influence of exercise on some cognitive processes (Arcellin, Delignières & Brisswalter, this volume), and a mental effort mobilization under exertion (Delignières, Brisswalter & Legros, 1994).

Several hypotheses have been proposed to explain the detrimental effects of heat stress on cognitive processes. According to Hancock (1986), the influence of a dynamic change of body core temperature is determinant, and could explain most of the experimental results. On the other hand, some authors have emphasized the influence of subjective thermal discomfort (Allnut & Allan, 1973; Epstein *et al.*, 1980).

¹ This experiment had been performed at the National Institute for Sport and Physical Education, Paris, where both authors were working. We thank the French Federation of American Football for its help in this experiment.

The specific effects of heat stress on physiological processes have been widely studied (for a review, see Karvonen, 1992). It has been shown that high ambient temperature increased the physiological reactions to exertion (Powers & Howley, 1985). In a preliminary study, we have observed that the realization of a pedalling task corresponding to 50% of the maximal aerobic power (MAP) at 20°C, led at 38°C to physiological reactions corresponding to 80% of the MAP.

The aim of the present experiment was to analyze the combined influences of heat stress and exertion on cognitive processes.

METHOD

8 male subjects (mean age: 18.2, SD: 1.5) were involved in this experiment. They were all members of the French Federation of American Football.

A climatic chamber was used, which allowed to control ambient temperature and relative humidity. The subjects were submitted to two conditions: (1) 20°C E.T.² (23°C dry temperature, 50% relative humidity) and (2) 38°C E.T. (42°C dry temperature, 70% relative humidity). Air velocity was negligible. In each condition the subjects were submitted to the climate during 30 minutes before the beginning of the experiment.

The pedalling task was performed on an *Ergomeca* cycloergometer. To provide subjects with feedback regarding pedalling rate, a screen displaying the number of revolutions per minute was positioned in front of them. The experimental device could be adapted to the morphology of each subject, in the aim of a maximal standardization of the test.

Reaction time tasks were performed on a computer, connected to two joysticks, mounted on the ergometer handlebar. The subject placed his forearms on special supports on the handlebar (Figure 1). Subjects had to respond to the highlighting of squares drawn on the screen. Two conditions were used (simple reaction time and four-choice reaction time). In the first condition subjects had to respond by tilting the right joystick to the left. For the choice reaction time, four squares were horizontally aligned on the screen. The subjects responded to the two left signals by tilting the left joystick to the left or to the right, and conversely for the two right signals with the right joystick. There was no preparation signal: each stimulus

² Effective temperature (E.T.) was proposed by Houghten et Yagloglou (1923) for assessing heat stress. It combined in a global index dry temperature, relative humidity and air velocity.

appeared 1100 ms after the preceding response. Response time and errors were recorded by the computer.

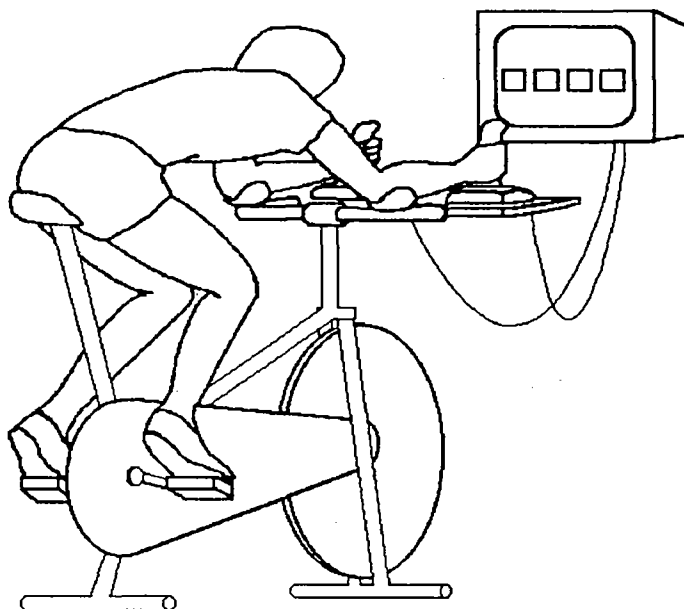


Fig. N°1: Experimental Device.

The protocol was divided into three sessions, distributed among different days. During the first session the individual maximal aerobic power (MAP) of each subject was assessed, according to a triangular protocol derived from those described by Patton, Vogel and Mello (1982). Pedalling frequency was held constant at 75 rev.min⁻¹. The load was progressively increased by 0.5 kg (37.5 watts) each minutes. The first step was performed at 37.5 watts. The highest load entirely performed for a minute allowed an estimation of the maximal aerobic power. During this first session the subjects performed for familiarisation 3 blocks of 20 trials on each RT tasks.

During session 2, with an effective temperature of 20°C, subjects performed RT tasks (1) at rest, (2) concurrently with the pedalling task at 50% of their individual MAP, and (3) concurrently with the pedalling task at 80% of their individual MAP. The pedalling frequency was fixed at 60 rev.min⁻¹. RT tasks were performed from the second minute of exertion, after the subject have reach a physiological steady state.

During session 3, with an effective temperature of 38°C, subjects performed RT task concurrently with the pedalling task at 50% of their individual MAP. The order of the sessions

2 and 3, and within each session, the order of the two RT tasks were systematically varied between subjects. The three sessions took place at the same time of the day, of each subject.

Heart rate was recorded continuously, and oral temperature was measured at the entry in the climate chamber, and at the beginning of each RT test. Finally, an assessment of subjective thermal comfort was requested at the end of session 3. Subjects had to rate their feeling of discomfort according to a 15-point category scale, labelled from "extremely comfortable" to "absolutely unbearable".

RESULTS

Oral temperatures are reported in table 1. Data were submitted to a one-way analysis of variance, with 6 level of repeated measurement. This analysis revealed a significant main effect of experimental conditions on oral temperature ($F_{5,35}=27.74$, $p<.001$). Post-hoc analysis indicated that oral temperature did not vary within the 20°C condition, and was equivalent at the entry in the climate chamber in the 38°C. After 30 minutes of exposure to heat stress, a significant raise in oral temperature was observed, but there was no difference between oral temperature at rest and under exertion.

TABLE 1: Mean Oral Temperatures.

20°C E.T.			38°C E.T.		
Rest	50% MAP	80% MAP	Entry	Rest	50% MAP
37.10	36.85	37.07	36.95	38.13	38.27
(0.31)	(0.43)	(0.48)	(0.65)	(0.50)	(0.67)

Note: Data were obtained at the beginning of each RT test, and at the entry in the climate chamber for the 38°C condition (standard deviation in brackets)

Heart rate data are reported in table 2. Data were submitted to a one-way analysis of variance, with 5 levels of repeated measurement. This analysis revealed a significant main effect of experimental conditions ($F_{4,28}=67.07$, $p<.001$). Post-hoc analyses showed that there was no difference at rest in heart rate between the two climate conditions. At 20°C, there was a significant difference between rest and 50% MAP, and a significant difference between 50% MAP and 80% MAP. For an exertion of 50% MAP, heart rate was significantly higher at 38°C

Heat stress, exertion and reaction time

than an 20°C. But there was no difference in heart rate between 50% MAP at 20°C and 80% MAP at 38°C.

TABLE 2: Mean Heart Rate (Standard Deviation in Brackets).

20°C E.T.			38°C E.T.	
Rest	50% MAP	80% MAP	Rest	50% MAP
87.19 (23.14)	163.94 (17.25)	172.75 (21.36)	86.50 (12.43)	172.13 (21.50)

Note: Data were collected at the beginning of each RT session.

Mean RT data are reported in table 3. RT data were processed at equivalent physiological solicitation (80% MAP at 20°C ET vs 50% at 38°C ET). Data were submitted to a three-way analysis of variance (task: simple RT vs choice RT, heat stress: 20°C vs 38°C, and exertion: rest vs pedalling). Results indicated a significant main effect of task ($F_{1,7}=152.86$, $p<.001$), and an interaction exertion X task ($F_{1,7}=117.23$, $p<.001$): simple RT deteriorated under exertion, but choice RT was significantly improved. No other effect or interaction was significant.

TABLE 3: Mean Performance (msec) for Simple Reaction Time Task (SRT) and Choice Reaction Time Task (CRT), according to Climate and Exertion (Standard Deviation in Brackets).

	20°C E.T.			38°C E.T.	
	Rest	50% MAP	80% MAP	Rest	50% MAP
SRT	220.34 (11.61)	235.14 (18.07)	236.30 (21.13)	226.10 (11.23)	245.86 (11.45)
CRT	353.46 (22.24)	340.83 (23.40)	331.56 (23.14)	226.10 (30.50)	245.86 (31.04)

Error data were submitted to a similar analysis, which revealed no main effect and no interaction between factors.

With the aim to assess the influence of physical fitness on the effects of heat stress, partial correlations were computed between VO₂max and each performance measurement at 38°C, controlling for the influence of their 20°C counterpart. None of the correlations did reach significance (SRT, rest: $r=.025$; SRT, exertion: $r=-.038$; CRT, rest: $r=.569$; CRT, exertion, $r=.056$).

The same procedure was used to assess the influence of subjective thermal comfort. Significant partial correlation were obtained for simple reaction time (SRT, rest: $r=.844$, $p<.01$; SRT, exertion: $r=.901$, $p<.01$), but not for choice reaction time (CRT, rest: $r=.213$; CRT, exertion: $r=-.377$). This result indicated that for simple reaction time, the decrement in performance was related to the thermal discomfort.

DISCUSSION

The increase of oral temperature observed after an exposure of 30 minutes to the 38°C E.T. climate is a classical result in heat stress studies. It is more surprising to not obtain neither a main effect of exertion, nor an interaction between effort and climate. We hypothesize that the increase in ventilation during exertion could induce a reduction of the observed oral temperature.

As suggested by our pre-experimental observations, heat stress seemed to widely enhance the physiological reactions of the organism to exertion. This result in accordance with specific literature shows that even with fit young people, hot climates have a strongly detrimental effect on physiological performances.

The effects of exertion on simple and choice reaction time are consistent with those previously described with similar protocols (Brisswalter, Legros & Delignières, 1994; Delignières, Brisswalter & Legros, 1994). No main effect was obtained for heat stress, nor interaction between heat stress and exertion. Generally the exposure to such climate lead to significant decrements in performance (see for example Delignières, this volume). As in this experiment subjects were young football experts, we could suppose that physical condition play a major role in the moderation of the effects of heat stress (Parsons, 1993). Nevertheless our results showed that within the group, differences in physical condition are not related to the magnitude of performance decrement.

Finally, this experiment showed a relation between performance alteration and subjective discomfort, but uniquely for simple reaction time. This result is still difficult to explain, but it is clear through reaction time data that simple and choice reaction time are differently affected by stressors. We have shown recently that the enhancement of choice reaction time under exertion could be explained by the investment of extra resources (Delignières, Brisswalter & Legros, 1994). But this increase in mental effort, revealed by ratings of perceived difficulty, did not lead to similar effects in simple reaction time tasks. We suppose, in accordance with Sanders (1983)'s model, that simple and choice reaction time are controlled by different energetical reservoirs. Within this frame of reference, our results suggest that subjective thermal comfort has a specific rather than general effect on cognitive processes.

REFERENCES

- Arcellin, R., Delignières, D. & Brisswalter, J. (this volume). Interference between physical exertion and different stages of information processing.
- Allnut, M.F., & Allan, J.R. (1973). The effects of core temperature elevation and thermal sensation on performance. Ergonomics, 16, 189-196.
- Brisswalter, J., Legros, P., & Delignières, D. (1994). Interactions entre processus cognitifs et physiologiques: effet du niveau d'effort et du niveau de condition physique des sujets. Science et Motricité, 23, 25-31.
- Delignières, D. (this volume). Effects of heat stress and time on task on reaction time.
- Delignières, D., Brisswalter, J. & Legros, P. (1994). Influence of physical exercise on choice reaction time in sport experts: the mediating role of resource allocation. Journal of Human Movement Studies, 27, 173-188.
- Epstein, Y., Keren, G., Moisseiev, J. Gasko, O., & Yachin, S. (1980). Psychomotor deterioration during exposure to heat. Aviation, Space and Environmental Medicine, 51, 607-610.
- Hancock, P. (1986). Sustained attention under thermal stress. Psychological Bulletin, 99, 263-281.
- Karvonen, J. (1992). Environmental adaptation and physical training. In J. Karvonen, P.W.R. Lemon & I. Iliev (Eds.), *Medicine in Sports, Training and Coaching* (pp. 49-68). Basel: Karger.

Heat stress, exertion and reaction time

- Legros, P., Delignières, D., Durand, M. & Brisswalter, J. (1992). Influence de l'effort physique sur le temps de réaction simple et de choix chez des basketteurs de haut-niveau. Science & Sports, 7, 9-14.
- Paas, F.G.W.C., & Adam, J.J. 1991. Human information processing during physical exercise. Ergonomics, 34, 1385-1397.
- Parsons, K.C. (1993). Human thermal environments, Londres, Taylor & Francis.
- Patton, J.F., Vogel, J.A. & Mello, R.P. (1982). Evaluation of a maximal predictive cycle ergometer test of aerobic power. European Journal of Applied Physiology, 49, 131-140.
- Powers, S.K. & Howley, E.T. (1985). Blood lactate concentrations during submaximal work under different environmental conditions. Journal of Sports Medicine, 25, 84-89.
- Sanders, A.F. (1983). Towards a model of stress and human performance. Acta Psychologica, 53, 64-97.
- Tomporowski, P.D. & Ellis, N.R. (1986). Effects of Exercise on Cognitive Process: A Review. Psychological Bulletin, 99, 338-346.
- Yaglou, C.P., & Minard, D. (1957). Control of heat casualties at military training centers. A.M.A. Archives of Industrial Health, 16, 302-316.

COMPETITIVE TRAIT ANXIETY: A STUDY WITH YOUNG TRACK AND FIELDS COMPETITORS

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Key Words: Trait anxiety, youth competition, track and fields.

INTRODUCTION

Competitive Trait Anxiety

Competitive trait anxiety as the predisposition to perceive some situations as threatening or not and answer to these situations with different levels of state anxiety (Martens, 1977 and Martens et alli, 1990).

To coaches and even athletes is very important to know about one's tendency to be more or less anxious to avoid negative influences of this psychological variable in performance. The competitive anxiety is basically expressed by cognitive reactions - mental component of anxiety - (cognitive anxiety) and by somatic reactions - fisiological and afective component of anxiety (somatic anxiety). The cognitive anxiety is caused by negative expectations of success or by negative self evaluation. It is conceptualized by worries, fears, negative thoughts, inability to concentrate and concerns about performance. The somatic anxiety is concerned with autonomic ativation and physiological arousal and can be expressed by increased heart rate, shakness, sweating, sicking and tense muscles.

All these factors make anxiety a very interesting field for investigation in all the levels of sports. But one of these fields is specially fundamental due to its importance to the correct development of individuals. These fields are concerned to youth sports, competition and its relationship with anxiety.

Anxiety and Competitive Youth Sport

Competition is an evaluative and comparative process where an athlete or team performance is compared with a specific goal or standard (Smith, 1983; Martens et alli, 1990).

The main purpose of an athlete in a competition is to reach the best result, that often is expressed by the victory. Reaching this goal requires intensive preparation to face the demands, that can be higher according to the level of formalization, organization and importance of the competition (Smith, 1983). The demands of a competitive sportive situation can be physical, technical, tactical, psychological and social. So, for a competition the athlete must be prepared to face the challenges of all these situational demands and performance in

Competitive trait-anxiety...

high degree of excellence to reach the best final result. Besides to be prepared in all these aspects, there are other factors that can act in the whole process which include the knowledge of some theoretical factors of the sport which requires cognitive development to be achieved (De Rose Jr., 1985; Fernandes et al., 1991).

The complexity of the competitive process and its demands are a very important motive to discuss the involvement of children with competition. Some questions appear to be answered: Do children have to compete? When they must begin competing? What is the role of adults in this process? Which are the benefits and damages of competition for children?

Competitive youth sport evokes three basic demands: demonstration, comparison and evaluation. Demonstration shows the level of competence of the young athlete and this factor is too important to adolescents. Comparison is the most correct information that a youngster can get about his performance. The information are given by the people involved in the competitive process or by self observation of peers behavior. In evaluation there is a judgement of athletes actions through some reactions like disappointment, spectators manifestations, etc.. (Scanlan, 1986a; Scanlan 1986b; Passer, 1988)

All these three demands when acting together become a major stressing factor for some young athlete. But not every youngster that is involved in sport competition feel these situations as stressing factors. Ryan (1988), showed in his studies that competitive sport was not one of the most stressing activities among children who participated in the study. According to Scanlan (1986a) stress is present when self esteem is threatened, based in the evaluation that children make of the competitive situation.

According to Roberts (1980), only after the age of 12 children should be involved in formalized competition, because only after this age they will be ready to face the demands of the competitive sport and deal with it in an appropriated way. There are many components of the demands that appear in competitive sport for children that increase the level of competition complexity. Malina (1986 and 1988) points some of these components: physical, motor, perceptual, social, emotional and intelectual. Depending on the stage of development of youngster some of these aspects can be present, or not. So, if the young athlete is not filling all the requirements or if the demands are higher than the resources to face them the athlete won't be ready to compete.

The umbalance between demands and athlete's resources can be the most negative point of competition for children, causing some physical (injuries and diseases), psychological

Competitive trait-anxiety...

(emotional problems, high levels of anxiety, decrease of interest and motivation, high levels of expectancy) and social consequences (evasion, isolation).

When all those factors are not controlled, the youth competition can be an important source of stress becoming an inhibition factor for the participation of young and children in the competitive process.

All the aspects considered before and a specific necessity of more and better researches concerned to sport psychology in Brazil, motivated the "Group of Studies and Research in Sport Psychology of the University of Sao Paulo" to develop a project named "Children, Sport and Anxiety", which produced some studies in this field. The main purpose of the whole project is to stabilish a psychological profile of the young athlete concerning some variables as stress, anxiety, competitiveness and motivation.

This study has set as specific purposes:

- 1-To stabilish the levels of competitive trait-anxiety of track and fields young athletes;
- 2- To identify the diferent kinds of anxiety reactions (cognitive or somatic) and its intensity; and
- 3- To compare the reactions between boys and girls.

METHODS AND PROCEDDURES

The project "Children, sport and anxiety" has been developed within the "Olympic Project" that is a union of public institution (University of Sao Paulo) and private enterprise (Xerox of Brazil). Since 1992 about 500 youngsters from 9 to 17 years old, in two sports - track and fields and judo - are receiving orientation from coaches, physicians, psychologists and nutricionists to compete in regional or national level.

This study was made with 59 girls and 45 boys, track and fields athletes, in the age of 10 to 14, that had been competing at least once in regional competitions.

It was used the Sport Competition Anxiety Test (Martens, 1977), translated and adapted to portuguese (De Rose Jr. and Rosamilha in De Rose Jr., 1985).

The data analysis was made by descriptive statistics (means and standard deviations), Student t-Test and non parametric statistics (Spearman Rank Correlation).

RESULTS

After the analysis of SCAT's answers the main results of the present study are shown in the following tables.

TABLE 1: Means and Standart Deviations of Competitive Trait-Anxiety Levels for Boys and Girls.

Group	Mean	sd
boys	20.86	3.85
girls	21.76	3.67

There was no significant differences between both groups, accordint to Student t-Test ($t = 1.20$; $t_c = 1.98$; $p < 0,05$).

TABLE 2: Rank and Means of the Competitive Trait-Anxiety Responses - Boys

Rank	Response	Mean
1	Before I compete I feel relaxed	2.42*
2	Before I compete I am calm	2.26*
3	Just before I compete I notice my heart beats faster than normal	2,27
4	Before I compete I am nervous	2,22
5	I get nervous wanting to start the game	2,18
6	Before I compete I feel uneasy	2,16
7	Before I compete I worry about not performing well	2,09
8	When I compete I worry about making mistakes	2,04
9	Before I compete I usually get uptight	1,96
10	Before I compete I get a funny feeling in my stomach	1,29

TABLE 3: Rank and Means of the Competitive Trait-Anxiety Responses - girls.

Rank	Response	Mean
1	Before I compete I am nervous	2,51
2	Before I compete I am calm	2.36*
2	Before I compete I feel relaxed	2,36*
4	Just before I compete I notice my heart beats faster than normal	2,31
5	I get nervous wanting to start the game	2,25
6	Before I compete I worry about not performing well	2,22
7	Before I compete I feel uneasy	2,19
8	When I compete I worry about making mistakes	2,17
9	Before I compete I usually get uptight	2,03
10	Before I compete I get a funny feeling in my stomach	1,32

* - According to the norms for using SCAT these items must have an inverse interpretation. So as closer to 3, less the athlete feels calm and relaxed.

Comparing the rank of the responses of both group by the use of Sperman's Correlation Rank result shows a high level of agreement and correlation ($r_s = .91$; $p < 0.01$).

DISCUSSION AND CONCLUSIONS

In order to discuss the findings of the present study it was used basically studies developed with young athletes in Brazil in order to keep some specific characteristics of the sample and from sportive reality of this country.

Table 1 shows that the level of anxiety for girls is a little higher than boys but not significant. This a tendency supported by other studies made in Brazil with young athletes of basketball, judo and track and fields. These studies also revealed that after puberty the difference between girls and boys increased and became significant. Another findings are that the average, both for boys and girls, was similar to the cited reports (De Rose Jr. et alli, 1993; Bastos et alli, 1994, De Rose Jr. and Vasconcellos, 1994 and Monteiro et alli, 1994).

Another interesting consideration that can be done is concerned about the kind of sport and the level of anxiety. As an individual sport track and fields, at the age from 10 to 18, presents higher levels of anxiety than basketball, that is a team sport. The means ranging 19-21 are supported by a classical study developed by Simon and Martens (1979) and in Brazil by De Rose Jr. and Vasconcellos (1994).

Concerning to the type of reactions of competitive trait-anxiety (cognitive or somatic) it was clear expressed by a $r_s = .91$ that there were no differences about the perception of boys and girls about those responses, with small changes in the rank of the responses. This result is supported by similar studies done by Lapa et alli (1993) and De Rose Jr. and Vasconcellos (1994) showing no differences between boys and girls in the same age range. The means of each response also can be understood as moderate to high anxiety (in the scale 1 to 3, where 2 is considered as moderate), demonstrating that somatic responses as being nervous, not being calm or relaxed, should be expressed through a cognitive interpretation of the demands of competitive process.

All the results identified and the considerations made must be understood within a specific sportive reality of a country (Brazil) that is just begining in sport psychology researches and with some limitations to the realization of this partticular study. But it is sure that this is a very importante step in the development of this area of investigation and too many things must be done to increase and improve the competitive proccess for children and young athletes.

REFERENCES

- Bastos, M.A. et alli. (1994) A relação entre ansiedade-traço competitiva e esporte infanto-juvenil. I Congresso de Iniciação Científica da EEFUSP, S.Paulo, Anais, p.22.
- De Rose Jr. D. e Vasconcellos, E.G. (1994) Comparação dos níveis de ansiedade-traço competitiva entre jovens atletas de esportes individuais e coletivos. XIX Simpósio Internacional de Ciências do Esporte, S.Paulo, Anais, p.74.
- De Rose Jr. D. et alli (1993) Ansiedade-estado competitiva em jovens atletas. III Bial de Ciências do Esporte, Poços de Caldas, Anais, p.25.
- De Rose Jr., D. (1985) Influência do Grau de Ansiedade-Traço no Aproveitamento de Lances-Livres. São Paulo, EEFUSP, Dissertação de Mestrado.
- Fernandes, A.C. et alli (1991) O que se entende por alta competição? Revista Treino Desportivo, 20, 13-21.
- Lapa, L.Z. et alli (1993) Correlação entre ansiedade-estado somática e cognitiva em atletas infantis. II Congresso Interno do Instituto de Psicologia da USP, Anais, p.f2.
- Madden,C.C. et alli (1990) The influence of perceived stress on coping with competitive basketball. International Journal of Sport Psychology, 21, 21-35.
- Malina, R. (1986) Readness for competitive youth sport. In M.P.Weiss and D.Gould (eds.), The 1984 Olympic Scientific Congress Proceedings, vol 10: Sport for Children and Youth. Champaign (Ill), Human Kinetics, 45-50.
- Malina, R. (1988) Competitive youth sport and biological maturation. E.V.Brown and C.F.Branta (eds.), Competitive Sport for Children and Youth: an overview for research and issues. Champaign (Ill), Human Kinetics, 227-245.
- Martens, R. (1977) Sport Competition Anxiety Test. Champaign (Ill), Human Kinetics.
- Martens, R. (1988) Competitive anxiety in children's sports. In R.Malina (ed.) Young Athletes: biological, psychological and educational perspectives. Champaign (Ill), Human Kinetics.
- Martens, R. et alli (1990) Competitive Anxiety in Sport. Champaign (Ill), Human Kinetics.
- Monteiro, A.A. (1994) Ansiedade-traço competitiva e atletismo: comparação de diferentes faixas etárias em função do sexo. I Congresso de Iniciação Científica da EEFUSP, S.Paulo, Anais, p.23.
- Passer, M.W. (1988) Determinants and consequences of children's competitive stress. In F.L.Smoll, R.A.Magill and M.J.Ash (eds.), Children in Sport. Champaign (Ill), Human Kinetics, 203-227.
- Roberts, G.C. (1980) Children in competition: a theoretical perspective and recomendations to practice. Motor Skills: Theory into Practice, 4, 1, 37-50.

Ryan, A.J. (1988) Perspectives on children's sport with suggestions for future decisions. In E.V.Brown and C.F. Branta (eds.), *Competitive Sport for Children and Youth: an overview for research and issues*. Champaign (Ill), Human Kinetics, 309-313.

Scanlan T.K. (1986 b) Competitive stress and the child athlete. In J.M. Silva and R.S. Weinberg (eds.) *Psychological Foundations of Sports*. Champaign (Ill), Human Kinetics, 118-129.

Scanlan, T.K. (1986 a) Competitive stress in children. In M.P.Weiss and D.Gould (eds), *The 1984 Olympic Scientific Congress Proceedings*, vol 10: Sport for Children and Youth. Champaign (Ill), Human Kinetics, 113-119.

Simon,J.A. and Martens, R. (1979) Children's anxiety in sport and non sport evaluative activities. Journal of Sport Psychology, 1, 160-179.

Smith, T. (1983) Competition trait anxiety in youth sport: differences according to age, sex, race and playing status. Perceptual and Motor Skills, 57, 1235-1238.

DISSOCIATIVE STATES AS AN EXPLANATION FOR A SUDDEN COLLAPSE OF FIGURE SKATING PERFORMANCE

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Introduction

In this paper¹ a perspective on performance deterioration in figure skating will be introduced whereby a dissociative state is seen as the cause of a sudden collapse during competition. It should be pointed out that this view is based on observation by the author.² The underlying theoretical mechanisms have not yet been tested empirically, and as a consequence are more hypothetical in nature than based on pure scientific evidence.

Figure Skating and the Performing Arts

Figure skating can be defined as a hybrid between sport and art, and resembles other esthetic sports in not having a more objective measuring device for assessing performance than the human eye and brain. The two separate marks awarded by a panel of judges for a figure skating routine (one for the technical merit and the other for the artistic impression) are in fact an illustration of this notion. "How shall I interpret the character of the music?" has to be a relevant question both in figure skating and in many of the performing arts. In the performing arts acting is of crucial importance. Therefore attention should be paid to such topics as the expression of emotions and the actor's inner state. It can be argued that during acting the actor has an altered state of consciousness, which could be called a mild hypnoid trance (see Moormann, 1994, 1995). Magda Olivero, a well-known Italian opera singer, said in an interview some interesting things about what happened to her on stage (Vetter, 1993):

"As soon as I was on stage my own self did not exist anymore. Magda stayed out. I was like a medium, seeing things that happened behind my back, and feeling the warmth streaming out of my fingers. This came from what I used to call 'the little flame in me'. For me music was a magic aureole, which I entered at the beginning of the opera and which I left at the end of the performance.

I wanted to live in the character I had to personify, up to the last sigh. It was something stronger than myself. Adriana dies from poison in an awfully slow and terrible way. Then I got the feeling as if I was really dying as well. Something broke in me. I found the applause the most difficult part of the role. That I had then to stand up to thank the audience, to force myself to come back in myself" (T16).

This quotation gives the impression that the actor becomes as it were another person. However, the actor still has control over his/her inner life and keeps a 'distance' between the

¹ key words: figure skating performance, dissociative states, sudden collapse, acting

² national coach for figure skating and ice dancing of the Royal Dutch Skating Federation

character he/she is portraying and his/her own personality, otherwise Magda could not have stopped the trance by forcing herself to come back in herself, back in reality. In the history of acting it has been to happen that the actor lost control over his own inner life, the 'distance' disappeared, and the actor became the character instead of playing it (see Moormann, 1995). In psychology this is called a depersonalization, which is a serious disturbance of consciousness. In trauma theories a highly painful emotion related to an early trauma, is seen as the cause of this depersonalization (see Albach, 1993). Acting techniques, such as Stanislavski's (1936) which rely on 'affective memories', and which are aimed at the realistic portrayal of emotions, can be dangerous for actors with unstable personalities, and for those who have been traumatized at an early age. By relying on affective memories, traumatic, highly painful events are likely to be triggered. In the present viewpoint the same mechanism as in traumatized persons are thought to be responsible for a sudden performance collapse in figure skating.

Anxiety and Sport Performance

Emperical evidence on stress responses and ice dancing performance demonstrates that precompetitive anxiety has a debilitating effect on skating performance (Moormann & Van der Knoop, 1989). This finding is in accordance with the results from a meta-analysis of fifty empirical studies (Kleine, 1990), indicating a weak negative relation between anxiety and sport performance. However, many contradictory results have been obtained on the relation between anxiety and performance (see Bakker, Vanden Auwele, & Moormann, 1992). Sometimes anxiety has a facilitating effect on performance, in other cases a debilitating effect. These contradictory findings are assumed to be related to the kind of sport involved and to individual characteristics of the athlete. Golf and chess should require lower levels of optimal arousal than weight lifting or boxing. Differences in attentional styles (Nideffer, 1976a, 1976b) or Eysenck's (1956) ideas about introversion and extraversion are examples of characteristics of the athlete which have an effect on the relation between anxiety and performance. The typical introvert has a relatively high level of internal arousal, and is therefore soon overwhelmed by stimuli. The typical extravert has a relatively low level of internal arousal, and therefore has a constant 'hunger' for stimuli.

Arousal-Performance Models

Several models have been proposed for describing the relationship between arousal and performance such as the drive theory of Hull-Spence (Spence & Spence, 1966), assuming a more or less linear relation between arousal and performance, and the 'inverted-U hypothesis',

assuming a curvilinear relation between arousal and anxiety. Hanin (1980, 1989) applied the ideas of the inverted-U hypothesis on a strictly individual level by introducing the hypothesis of the 'zone of optimal functioning' (ZOF). Kerr (1992) elaborated Apter's (1982) reversal theory to the context of sport. Anxiety, as outlined in reversal theory (Apter, 1989), is one of a matrix of pleasant and unpleasant somatic and transactional emotions associated with different metamotivational states. Sport performers will usually experience arousal at important contests. According to Kerr, the experience of this arousal depends on how the person interprets his own emotional state. If, for example, a person is oriented towards some essential goal, he will experience arousal as unpleasant and it will rise to feelings of anxiety. However, if the person is oriented towards aspects of his ongoing behavior, the same high arousal is experienced as excitement. An essential assumption in reversal theory is the occurrence of changes from a particular 'metamotivational state' to another ('reversals'). The foregoing implies possible changes from feelings of anxiety to feelings of excitement or vice versa, depending upon whether or not a reversal takes place. In other words (Bakker, Vanden Auwele & Moormann, 1992):

"Anxiety, experienced at a particular moment, might quickly dissipate due to a reversal. If this happened it would be extremely difficult to answer the question of whether anxiety was facilitating or inhibiting performance" (p. 6).

A more fundamental problem with the arousal-performance models is the lack of knowledge about the exact nature of the relation between arousal and anxiety. The measurement of arousal is the first obstacle. Different opinions exist about what is the best measure of arousal: skin conductance, heart rate, or pupil dilation? (see for instance Kahneman, 1973). Results of one-dimensional recordings have sometimes been interpreted as paradoxical reactions (Born, Lazarus-Mainka, & Stölting, 1980), but they could also be interpreted as part of a broader pattern of arousal (Hentschel & Ternes, 1984). In the literature on sport psychology this problem is greatly overlooked or neglected. Examples of confusing anxiety or related emotions with arousal can be found in those graphic representations of arousal-performance relations, where the word arousal on the x-axis is simply replaced by anxiety, emotion, motivation or activation (see for example Rushall, 1979).

Another problem with arousal-performance models such as the inverted-U hypothesis concerns the symmetry of the performance curve. This implies that the level of performance would slowly decrease after having surpassed the optimal arousal level. This may happen in a real life situation. However, the opposite a sudden collapse, a complete breakdown instead of a gradual deterioration of performance, can be observed as well. For the description of the latter case a Catastrophe Model of anxiety and performance in sport was introduced (see Hardy, 1992). This model describes the interactive effects of cognitive anxiety and physiological arousal upon performance in terms of a threedimensional behavior surface

rather than the more traditional linear and curvilinear relationships. The "catastrophe curve" indicates (Jones & Hardy, 1989):

"... that under low levels of stress and physiological arousal performance should improve as stress increases up to a certain critical threshold. At this point the performer begins to perceive an imbalance between the demands of the situation and his capability to match them. Anxiety occurs and performance suddenly and dramatically falls, causing a discontinuity in the graph" (p. 46).

The Sudden Collapse during Competition, a Nightmare for Skaters and Coaches

The Catastrophe Model offers an attractive explanation for a rather common phenomenon in figure skating, that is to say there can be a sudden, dramatic decline in the performance level. This usually happens quite unexpectedly, both for the skater(s) and for the spectators. A sudden fall, caused by an irregularity on the ice surface may bring the skater out of balance, and can cause a kind of panic reaction which disrupts the whole performance. In most cases such a panic reaction does not happen after a fall in a difficult triple jump, because the skater knows in advance that he/she could fall. He/she is prepared for this, and can anticipate. Of course such a fall that is more or less anticipated, can build up increased levels of anxiety as well, because the skater realizes that he/she failed, loses faith in the outcome, and starts to worry. This concentration of task-irrelevant thoughts leads to other small mistakes, the cumulative effect thereof causes a further gradual decline in performance. In fact this description of a gradual performance decline is exactly what would be expected from the inverted-U hypothesis. It is the representation of the right hand part of the inverted-U curve. But what then happens in the case of a catastrophe, a complete breakdown? Given that the skater did not expect or calculate the mistake, he/she did not have an opportunity to anticipate or plan ahead, he/she therefore becomes totally confused, and may even experience a severe mental shock. The facial expression of the skater, especially in young children, often displays total helplessness and bewilderment. Crying, anger outbursts or other signs of affect storms can be observed as well. The skater can become extremely frightened or can experience another intense emotion. The already high arousal level produced by the need for an optimal performance is dramatically increased and the skater loses control, becomes dissociated, derealized or depersonalized. Janet (1911) and Freud & Breuer (1893/1924) already stated that intense emotions affect voluntary control and often lead to a splitting or dissociation of consciousness. It can be argued that the skater enters a traumatic state (see Krystal, 1988), in which:

"there is a psychological paralysis that starts with a virtually complete blocking of the ability to feel emotions and pain, as well as other physical sensations, and progresses to inhibition of other mental functions" (p. 151).

According to Krystal the subjects themselves are able to observe and describe the blocking of affective responses - a circumstance that has led to such terms as psychic numbing,

sudden collapse

'psychological closing off' (Lifton, 1967), and 'affective anesthesia' (Minkowski, 1946). However, how can the paradox between on the one hand intense affect and at the other hand affective blocking be explained? Krystal (1988) gives the following answer:

"The paradox in the traumatic state is that the numbing and closing off are experienced as relief from previously painful affects such as anxiety" (p. 151).

The observation that derealizations and depersonalizations can play an crucial role in a sudden collapse of performance not only heightens our understanding of the mechanisms underlying performance deterioration, but offers new perspectives for the treatment of athletes who suffer from chronic performance deterioration under stress as well. Therefore trauma theories, and particularly dissociative phenomena and their treatment should be included in mental training programs. None of the current theories, as far as I know, explicitly pays attention to depersonalizations or derealizations as possible explanations for sudden performance deteriorations during serious competition. Nearly all models concentrate on precompetitive, postcompetitive, or other retrospective measures of anxiety and arousal for the explanation of performance deterioration instead of focusing on what happens during performance, i.e., looking at modified states of consciousness and its mechanisms. Furthermore the models assume gradual increases of arousal up to a certain level as being crucial for performance deterioration (for example the left part of the inverted-U in the Catastrophe Model). However, here it is suggested that in real-life situations sudden, dramatic increases of arousal, instigated by an unexpected threatening event, and accompanied by an intense, and painful affect, are more likely to initiate a total collapse of performance than gradual increases up to the critical level. Derealizations, depersonalizations, and other states of modified consciousness are 'special protective devices' to alleviate the pain, and they frequently happen in reaction to a psychic trauma (see Krystal, 1988, and Albach, 1993). Constriction and progressive blocking of mental functions is the other side of the coin. This will be illustrated in observation 1:

At one of our national championships I coached two ice dance couples in the same category. For mental and physical preparation they received a standard treatment, aimed at concentrating on task relevant (warm-up - practising the programs without skates - and imagery training of the theme running through the program, based on Stanislavski's method of acting) and ignoring/avoiding task irrelevant activities (negativistic thinking - keeping the skaters away from their parents, club members, officials, judges, and other competitors - the skaters are not allowed to watch the programs of the preceding skaters). It is important to be consistent as a coach in giving standard procedures, because then the pupils become accustomed to follow a routine which will build up their confidence. The Stanislavski Method of acting in fact is a mental training program. Audio cassettes with the progressive relaxation technique can be used to obtain the state of muzzle relaxation which is required to enter the phase of vivid imagination of the theme running through the program. As this technique relies on affective memory it has the advantage that a desirable emotional state, i.e., the emotional line of the skating program, instead of an undesirable emotional state such as anxiety, can be obtained (in Apter's terminology this would be a reversal). It should be noted that these techniques involve a kind of self-hypnosis, which is supposed to bring the skater in a mild trance-like state, where control over the voluntary system remains by means of a mechanisms called the 'hidden observer' (see Hilgard, 1977).

It is always difficult for a coach to have two competing couples in the same category at a competition. During the warm-up on the ice you try to give an equal amount of attention to both couples. However you are tempted to

give some extra attention to a couple showing signs of tension or demonstrating technical problems. That's what I did. I looked more at the couple in second place. The couple that was leading looked fine, so I did not interrupt them in the warm-up. The day before they had skated the compulsory dances and the Original Dance very well, and they knew that their Free Dance was their strongest point. The first mistake I made as a coach was not paying enough attention to the leading couple, because I supposed that they did not need it. I had too much confidence. The evening before during the practice session they skated the free dance without obvious mistakes and full of enthusiasm. So, why should I worry? However, one difference with usual practice sessions on this ice rink was that they had to change the pattern of the Free Dance otherwise they would skate the entire dance with their backs towards the judges instead of showing their faces. This minor change did not bother them, they were used to reverse the pattern when they were skating on other rinks. During the warm-up at the competition I did not check the opening steps of the leading couple. That was my second mistake. After the warm-up the leading couple had to skate first. Everything looked fine. They skated to the middle of the ice rink, stopped, took the beginning pose, waited for the music, and started the program when the first tones sounded through the speakers. The beginning lift went well, there was nothing to worry about, but then the disaster happened. The boy had forgotten that the pattern was reversed, and skated in opposite direction of the girl after the landing of the lift. As they had much speed they became separated from each other for quite a distance. The girl took the initiative and skated to the boy in an attempt to continue the dance at that point, while the music went on and a part of the program was already skipped. But the boy was so embarrassed by this unexpected event that he had forgotten the program. He did not know the steps anymore. He looked as if frozen, had a kind of helpless smile on his face, and had lost every initiative. The girl tried to help him by saying the steps aloud, but it did not work. He did not respond properly. When her attempts failed, her mood changed. After a brief moment of desperation her mood swung into anger. She stamped one foot on the ice and ran-off from the ice floor, straight into the dressing room. There I calmed her down and persuaded her to go back to the rink, go to her partner who was still on the ice, and go with him to the referee. Although she was very sad now, she went with her partner to the referee and they were allowed to skate the whole program again. The referee could have disqualified them directly because they had violated the rules. However, he seemed to have spurred that a rational decision could have resulted in broken couple, and this might have been the reason that he took a more human decision allowing the couple a reskate. In the reskate they performed the whole program, although it was lacking real spirit. It looked flat. The second couple took its chance and skated very well. The leading couple had to be disqualified because of offending the rules, and the second couple automatically became champion.

This observation gives little or no evidence to support the belief that anxiety gradually increases up to a critical level, and then performance collapses. Before and during the compulsory dances and the Original Dance the skaters must have experienced similar patterns of tension as before and also during the very short beginning of the catastrophic Free Dance. They obviously were able to cope with this level of anxiety, arousal, or tension, otherwise they could not have skated the preceding parts of the competition so well. The collapse happened directly after an unexpected and unprepared event, i.e., the unanticipated separation between the partners after the first lift. The realization that something went awfully wrong and that nothing could be done about it anymore led to an emotional shock, accompanied by a sudden dramatic arousal increase. Afterwards the boy told me that he had not been nervous at all, in fact he did not feel anything. This is Krystal's paradox of the traumatic state: psychic numbing as a relief from a previous painful emotion. The boy reported that his perception was altered, his sense of reality was changed, and he felt detached from his own mental processes. This modified state of consciousness is likely to have caused the temporary loss of memory for the free skating program.

In this context it is interesting to note that:

sudden collapse

1. The boy's memory for the free skating program clearly returned within a few minutes, after the affect storm had calmed down (i.e., after the Psychological Refractory Period). Otherwise he could not have done the reskate.
2. The boy and girl reacted in different ways to an unexpected threatening event. These reactions are found in animal studies, as well as in war neurosis (see Kretschmer, 1961). On the one hand animals are found to show a 'death feint' (Totstellreflex), also called an immobilization reflex or freezing response, and on the other hand an 'instinctive flurry' (Bewegungssturm) or startle response when exposed to an intensely stressful event. The boy demonstrated signs of a freezing response in the form of a twilight state. According to Kretschmer (1961):

"... we frequently find the twilight state, a hypnoid sleeplike or dreamlike state of consciousness which illustrates, without simultaneous motor paralysis, the death feint, especially its sensory side; it affords protection against external physical and psychic forces and can culminate in true reactive somnolent states, or narcolepsy" (p. 12).

The girl demonstrated signs of a startle response. She literally ran-off from the site of the disaster. According to Kretschmer the flurry or 'Bewegungssturm' is an instinctive defensive reaction to frustrating external stimuli. It should be noted that the girl did not experience neither psychic numbing nor loss of memory. Her cognitive and affective functions were less affected. She was furious and reacted that way.

Perhaps readers might think that this example of a sudden performance collapse is a relatively rare phenomenon. This is a misunderstanding. Especially in inexperienced young skaters a total breakdown of performance can be seen quite often at competitions.

Another reported manifestation of a modified state of consciousness which is less obvious for or even goes unnoticed by the audience concerns the feeling of skating like an automaton. This phenomenon is described in observation 2:

A girl who experienced this form of a depersonalization said that it was a very unpleasant experience. From a technical point of view she did not perform poorly, but she disliked the feeling that her body became detached from her mind, as if someone else was skating the program. Here too the skater did not feel anything, and could not express herself. It could have been that the standard of skating asked for by the skating federation was so high that the skater started worrying whether she could meet the expectation. "At the next competition you have to perform a double axel and three different triples. If not, you won't be sent to the international competition in so and so". Often the parents spend a lot of money on the skating of their child. The child does not want to disappoint them. This too lays an extra burden on the child's shoulders. The pressure is too high for the child and it becomes terrified by the idea that it will fail. It has been said before that being extremely frightened can result in a modified state of consciousness where closing off acts as a protective mechanism against painful emotional states. However, in this instance the mental operations needed for the technical completion of the program stayed intact.

The examples given suggest that there is a lot of variation in the modified states of consciousness and their effects on skating performance. For instance, the intensity of the emotion, the individual differences in the strength of the nervous system (Pavlov's ideas on

the different types of nervous systems where either excitation or inhibition predominates, see Pavlov, 1941), and earlier traumatic experiences which are triggered by the acute affect storm, may be explanations for the variety of symptoms.

REFERENCES

- Albach, F. (1993). Freud's Verleidingstheorie: Incest, trauma en hysterie [Freud's seduction theory: incest, trauma and hysteria]. Academisch Proefschrift. Middelburg, Uitgave Stichting Petra.
- Apter, M.J. (1982). The experience of motivation: The theory of psychological reversals, London, Academic Press.
- Apter, M.J. (1989). Reversal theory: Motivation, emotion, and personality, London, Routledge.
- Bakker, F.C., Vanden Auweele, Y., & Moormann, P.P. (1992, July). Anxiety in sport and the laws of emotion (pp. 1-24). Paper presented at the STAR conference, Leuven.
- Born, C., Lazarus-Mainka, G., & Stölting, E. (1980). Die paradoxe Reaktion nichtängstlicher Personen [The paradoxical reaction of non anxious persons]. *Zeitschrift für Experimentelle und Angewandte Psychologie*, 27, 369-383.
- Eysenck, H.J. (1956) The inheritance of extraversion-introversion. *Acta Psychologica*, 12, 95-110.
- Freud, S. & Breuer, J. (1893). On the physical mechanism of hysterical phenomena. In Freud, S., *Collected papers*, Vol. 1, London, International Psychoanalytic Press (1924)
- Hanin, Y.L. (1980). A study of anxiety in sports. In W.F. Straub (Ed.), *Sport Psychology: An analysis of athlete behavior* (2nd ed.), Ithaca, NY, Movement Publications.
- Hanin, Y.L. (1989). Intrapersonal and intragroup anxiety in sports. In D. Hackfort & C.D. Spielberger (Eds.), *Anxiety in sports* (pp. 19-28), New York, Hemisphere.
- Hardy, L. (1992). Empirical support for a catastrophe model of anxiety and performance in sport. Paper presented at the 13th International of the Stress and Anxiety Research Society, Leuven.
- Hentschel, U., & Ternes, G. (1984). Moderating effects of trait anxiety on electrodermal reactions in different learning conditions. *Psychological Reports*, 54, 803-809.
- Hilgard, E.R. (1977). *Divided consciousness: Multiple controls in human thought and action*, New York, Wiley.
- Janet, P. (1911). *L'état mental des hystériques* (The mental state of hystericals), Paris, Félix Alcan.
- Jones, J.G., & Hardy, L. (1989). Stress and cognitive functioning in sport. *Journal of Sport Sciences*, 7, 41-63.
- Kahneman, D. (1973). *Attention and effort*, New Jersey, Englewood Cliffs.
- Kerr, J.H. (1992, July). Anxiety and other emotions in sport. Paper presented at the 13th International of the Stress and Anxiety Research Society, Leuven.
- Kleine, D. (1989). Anxiety and sports performance: A meta-analysis. *Anxiety Research*, 2, 113-131.
- Kretschmer, E. (1961). *Hysteria, reflex, and instinct*, London, Peter Owen.
- Krystal, H. (1988). *Integration and self-healing: Affect, trauma, and alexithymia*. Hillsdale, New York, Analytic Press.
- Lifton, R.J. (1967). *Death in life: survivors of Hiroshima*, New York, Random House.
- Minkowski, E. (1946). L'anesthésie affective [Affective anesthesia]. *Ann. Medicopsychol.*, 104, 8-13.
- Moormann, P.P., & Knoop, A. van der (1989). Stress responses and ice dancing performance. In R. Schwarzer, H.M. van der Plöeg, & C.D. Spielberger (Eds.), *Advances in Test Anxiety Research* (Vol. 6), 121-135. Amsterdam / Lisse, Swets & Zeitlinger.
- Moormann, P.P. (1994). *Figure skating performance*. Dissertation. Leiden University, The Netherlands.
- Moormann, P.P. (1995). Acteren: Fictie of realiteit? [Acting: Fiction or reality?]. *De Psycholoog*, 30, 2, 53-60.
- Nideffer, R.M. (1976a). Test of attentional and interpersonal style. *Journal of Personality and Social Psychology*, 34, 394-404.
- Nideffer, R.M. (1976b). *An interpreter's manual for the test of attentional and interpersonal style*, New York, Behavioral Research Application Group, Rochester.
- Pavlov, I.P. (1941). *Lectures on conditioned reflexes: Conditioned reflexes and psychiatry* (Vol. 2), London, Lawrence & Wishart.
- Spence, J.T., & Spence, K.W. (1966). The motivational components of manifest anxiety: Drive and drive stimuli. In C.D. Spielberger (Ed.), *Anxiety and Behavior*, London & New York, Academic Press.
- Stanislavski, C. (1936). *An actor prepares* (E.R. Hapgood, trans.). New York, Theatre Arts Books.
- Vetter, E. (1993, augustus). Diva Magda Olivero maakt come-back op haar 83ste! (Diva Magda Olivero makes a come-back at 83 years of age!). *Telegraaf*, T16.

EMOTION AND PERFORMANCE RELATIONSHIP
IN SQUASH AND BADMINTON PLAYERS

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emotions, affect, performance, squash, badminton, IZOF model, idiographic

INTRODUCTION

Idiographic approach proposed in the Individual Zones of Optimal Functioning (IZOF) model was initially applied to the study of anxiety-performance relationships (2, 3, 4, 9, 11, 13). Recently, the basic assumptions of the IZOF model were extended to positive and negative affect (PNA) in top athletes (5, 6, 7, 8, 14). Specifically, it was proposed to describe athletes' emotional experiences by four global PNA content categories: a) positive, pleasant, facilitating (P+), b) negative, unpleasant, facilitating (N+), c) positive, pleasant, debilitating, (P-), and d) negative, unpleasant, debilitating (N-). Besides, athlete's functionally optimal (P+N+) and non-optimal (P-N-) PNA patterns related to effective (S) and ineffective (F) game performance were combined into individual's PNA-SF profile. In our previous studies, first only individual patterns of optimal and non-optimal PNA (emotion content and intensity zones) were examined in ice-hockey and soccer (7, 8). However, recently a more systematic study of PNA-performance relationships in soccer players was initiated (14).

The goal of the present study was to replicate and extend the previous findings to squash and badminton with more emphasis on performance emotions in practices. The following hypotheses based on the "in-out of the zone" principle of the IZOF model (5, 7, 8) were tested: a) individually successful performance would be expected, if athlete's PNA was within (close to) the

Emotion in squash and badminton

P+N+ pattern and outside the P-N- pattern; b) individually less successful performance would be expected, if athlete's PNA was outside his P+N+ pattern and within (close to) the his P-N- pattern.

METHOD AND PROCEDURE

Subjects: Seventeen Finnish squash (age 14-30, M=19.6, SD=4.3) and thirteen badminton (16-27, M=20.6, SD=3.6) players of both national and international levels participated in the study. Sporting experience of players ranged from 4 to 14 years (M=7.1, SD=2.4) in squash and from 4 to 10 years (M=6.2, SD=3.6) in badminton.

Instrumentation: Recall and current idiographic scaling following the methodology of the IZOF model (5, 6, 7, 8) was used to identify the PNA patterns (content and intensities) of players' repeated emotional experiences in successful and unsuccessful performances in practices. The intensity (level and zones) for each PNA item was estimated on the Borg's Category Ratio (CR-10) scale (1) using the following verbal anchors: 0= nothing at all, 0.5= very, very little, 1=very little, 2= little, 3= somewhat, 4=moderately, 5=much, 7= very much, 10= very, very much, # = maximal possible. The same scale with modified anchors ranging from 0.5 - very, very poor to 10 - excellent was used in self-ratings of players' performance.

Procedure:

1. In the initial session the individualized PNA-SF scale for practices was developed for each player by asking him to select from the PNA stimulus list the items which best described his emotions in successful (P+, N+) and unsuccessful (P-, N-) practices. Optimal and non-optimal zones were also identified to get a PNA-SF profile.
2. The individualized PNA-SF₁ scale was then used in five practices to assess each player's: a) current PNA 5-10 min before practice; b) current PNA 5-10 min after the practice

Emotion in squash and badminton

and "during the practice" recalled PNA and performance level.

Data analysis: Each player's current and recalled PNA measures were contrasted with his individual PNA-SF profile (in 5 practices separately). Then PNA deviations of each item from its individually optimal and non-optimal zones were calculated and the following parameters were used in the analysis:

- a) averaged deviation subscores for each of the four PNA categories $d(P+)$, $d(N+)$, $d(P-)$, and $d(N-)$;
- b) averaged subtotal deviations for effective $D+=(P+N+)$ and ineffective $D-=(P+N-)$ PNA items; and
- c) total $\Sigma D = [d(P-)+ d(N-)] - [d(P+)+ d(N+)]$.

Then these PNA deviations were examined across all players and two groups were selected for further analysis: athletes with successful (7-10 range) and poor (0-3) performances.

RESULTS

The average PNA deviations in successful(+) and poor(-) performance groups before, during and after practices are reported in Table 1. The Mann-Whitney test was used to examine the significance of differences between these two extreme groups of observations.

It is seen, that in squash during practices all differences in PNA deviations were significant and in the predicted direction, with the exception for $dN+$ and $dP-$. As expected, PNA deviations in + group were closer to optimal and outside of non-optimal patterns. Before practices significant differences were founded only for $dP+$ and $dN-$, whereas after practices the significant differences were observed for $d(P+)$, $d(N-)$, $D-$ and ΣD .

In badminton, compared to squash, significant differences in PNA deviations in the predicted direction were observed in a fewer number of cases: before ($dP+$), during ($dP+$, $D+$ and ΣD) and after ($dP+$ and $D+$) practices .

Emotion in squash and badminton

Table 1. Performance level and PNA deviations before, during and after practices

		In squash			In badminton		
		-	+	M-W	-	+	M-W
Performance		1.9	8.2	***	1.9	8.1	***
B	d(P+)	2.0	0.5	**	3.4	1.8	*
E	d(N+)	0.6	0.7	ns	2.1	2.2	ns
F	D+(dP+dN+)	1.5	0.6	ns	2.9	1.9	ns
O	d(P-)	2.2	2.2	ns	2.9	2.5	ns
R	d(N-)	2.4	4.5	*	4.7	5.5	ns
E	D-(dP-dN-)	2.3	3.5	ns	4.1	4.3	ns
	$\Sigma D(D- - D+)$	2.0	5.5	ns	2.0	3.6	ns

D	d(P+)	3.3	0.1	***	3.9	0.9	***
U	d(N+)	0.2	0.7	ns	1.4	1.3	ns
R	D+(dP+dN+)	2.3	0.3	***	3.0	1.0	**
I	d(P-)	2.6	2.1	ns	3.1	2.7	ns
N	d(N-)	1.1	4.6	***	4.4	5.4	ns
G	D-(dP-dN-)	1.6	3.6	*	3.9	4.3	ns
	$\Sigma D(D- - D+)$	0.2	5.9	***	1.9	5.6	*

A	d(P+)	3.0	1.2	**	4.4	1.5	***
F	d(N+)	0.9	1.9	ns	1.4	2.3	ns
T	D+(dP+dN+)	2.3	1.6	ns	3.3	1.8	**
E	d(P-)	2.5	2.4	ns	3.3	2.2	ns
R	d(N-)	1.6	4.4	***	4.3	5.4	ns
	D-(dP-dN-)	1.9	3.5	*	3.9	4.1	ns
	$\Sigma D(D- - D+)$	0.2	3.6	*	1.3	3.5	ns

Observations		15	32		14	22	

* > .05; ** > .01; *** > .001

Emotion in squash and badminton

Similar findings were also obtained by computing Spearman correlations between all PNA deviations and individual performance. In squash predicted relationships were observed in 52,4% of all 21 cases, with more significant correlations for (D-, D+, dP+, and ΣD) as compared with partial deviations subscores (dP+, dN+, and dP-). Significant relationships were found for dP+ and dN- before the performance. Non-significant correlation were observed for dN+ and dP- (during and after), and D+ (after performance). In badminton players significant correlations between performance level and PNA deviations after performance were found only for dP+ and D+ ($r = -.62$ $p = .000$; $r = -.34$ $p = .010$, respectively), but not before practices. During performance these relationships were significant for dP+ ($r = -.47$ $p = .000$), D+ ($r = -.42$ $p = .001$) and total ΣD ($r = .28$ $p = .032$). The results of regression analysis indicated that joint impact of effective (dP+) and ineffective (dN-) emotions during the performance accounted for 51.2 % ($F = 38.9$ $p = .000$) of variance and dP+ alone accounted for 40.4 % of variance ($F = 50.8$ $p = .000$) in squash players. In badminton players 27.2 % of variance in performance was explained by joint impact of effective (dP+) and ineffective (dP-) emotions ($F = 10.1$ $p = .000$), whereas dP+ alone explained 21.1 % of variance ($F = 14.7$ $p = .000$).

The Friedman test indicated that PNA intensity (P+, N+, P-, N-, P+N+, P-N-, and P+N+P-N-) before, during and after performance changed over time in both squash and badminton, however, the + and - performance groups were quite similar: in squash (+ 40.6% and - 60.0%) and in badminton (+ 54.5% and - 60.0%). It was also found that the direction of PNA-performance relationship changed over time: first PNA influenced players' performance and then was influenced by performance.

DISCUSSION AND CONCLUSIONS

In previous studies (5, 7, 8) individual patterns of optimal and non-optimal PNA (content and zones) were examined in ice-hockey and soccer. The present investigation extends the

Emotion in squash and badminton

Hanin's IZOF model to PNA content (P+, N+, P-, and N-), intensity (level and zones), time (before, during and after) and, context (games versus practices) in squash and badminton players. In this study, as well as our previous study (14), not only PNA patterns were identified, but also PNA-performance relationships were examined. The hypotheses based on the "in-out of the zone" principle were tested considering both optimal and non-optimal PNA patterns. The findings indicate that PNA deviations during the activity from optimal and non-optimal patterns were in the predicted direction in both successful and unsuccessful performance groups. Players seemed to be better aware of the impact of (P+) and (N-) emotions on their performance but not of (N+) and (P-). Besides, anecdotal data indicate that these emotions (N+ and P-) are experienced by some players in very special situations and usually produce facilitating effect only, if channelled properly to the task at hand.

In our previous study of performance emotions in junior soccer players (14) more significant relationships were founded in games than in practices: 81% and 28.6% of all 21 cases, respectively. In the present study significant relationships between PNA deviations and performance level in practices were founded higher in squash (52.4%) and nearly the same for badminton players (23.8% of 21 cases). One possible explanation for these findings is that practices are perceived by players as repeated experiences which are less important than games. In squash, however, task demands in practices were more similar to those in the games and players were "forced" to do better. Players in the present study also started practices without any serious preparation and did not try to excel or use all their potential. It seems that in practices even top level players are less motivated, and final results in each training session is not critical for the individual. That is why the significant relationships between PNA deviations and performance level before practices were observed only in 14.4 % of all cases. Other possible factor explaining the findings is related to players' low awareness of the PNA impact on their performance

Emotion in squash and badminton

in practices compared to the games. Besides, PNA-SF scales and PNA-SF profiles in this study were developed for players only once. Better awareness of emotions impact on performance in practices might result in more significant relationships.

Conclusions:

1. The findings supported the main hypotheses of the study based on the IZOF model extended to PNA in practices;
2. The best predictors of performance before and during practices were positive, facilitating (dP+) and negative, debilitating (dN-) emotions;
3. During practices PNA-performance relationships were more significant and in the predicted direction than either before or after performance.

REFERENCES

1. Borg, G. (1982). A category scale with ratio properties for intermodal and interindividual comparisons, in: H-G. Geiss, & P. Petzold (Eds.): Psychophysical judgement and the Process of Perception. Berlin: VEB Deutscher Verlag der Wissenschaften, 25-34.
2. Gould, D., Tuffey, S., Hardy, L., & Lochbaum, M. (1993). Multidimensional State anxiety and Middle distance Running Performance: An Explanatory Examination of Hanin's (1980) Zones of Optimal functioning Hypothesis. Journal of Applied Sport Psychology, 5, 85-95.
3. Hanin, Y. (1986). The state-trait anxiety research on sports in the USSR. In: C.D. Spielberger, & R. Diaz-Guerrero (Eds.) Cross-Cultural Anxiety. Hemisphere, Washington DC, 3, 45-64.
4. Hanin, Y. (1989). Interpersonal and intragroup anxiety in sports. In: D. Hackfort, & C.D. Spielberger (Eds.), Anxiety in sports. Hemisphere, Washington, DC, 19-28.
5. Hanin, Y. (1993). Optimal Performance Emotions in Top Athletes. In: S. Serpa, J. Alves, V. Ferreira, & A. Paula-

Emotion in squash and badminton

- Brito (eds.) Sport Psychology: An integrated Approach
 Proceedings of the VIII World Congress of Sport Psychology.
 Lisbon, 22-27, June, 229-232.
6. Hanin, Y. (1994 in press). Individual Zones of Optimal Functioning (IZOF) model: An Idiographic Approach to Performance Anxiety. In: K. Henschen (ed.) Sport Psychology: An Analysis of Athlete's Behaviour, Vol. 3. Ithaca, Movement Publications.
 7. Hanin, Y., & Syrjä, P. (1994 in press). Performance Affect in Junior Ice-Hockey Players: A test of the IZOF Model. The Sport Psychologist.
 8. Hanin, Y., & Syrjä, P. (1994 in press). Performance Affect in Soccer Players: A test of the IZOF Model. International Journal of Sports Medicine.
 9. Krane, V. (1993). A Practical Application of the Anxiety-Athletic Performance Relationships: The Zone of Optimal Functioning Hypothesis. The Sport Psychologist, 7, 113-126.
 10. Morgan, W.P., & Ellickson, K.A. (1989). Health, Anxiety, and Physical Exercise. In: Hackfort D., & Spielberger C.D. (eds.): Anxiety in sports: An International Perspective. Washington: Hemisphere, 165-182.
 11. Prapavessis, H., & Grove J.R. (1991). Precompetitive Emotions and Shooting Performance: The Mental Health and Zone of Optimal Function Models. The Sport Psychologist, 5, 223-234.
 12. Raglin, J.S. (1992). Anxiety and Sport Performance, in: Exercise and Sports Sciences Reviews, Baltimore: Williams & Wilkins, 20, 243-274.
 13. Raglin, J.S., & Turner, P.E. (1993). Anxiety and Performance in Track and Field Athletes: A Comparison of the Inverted-U Hypothesis with Zone of Optimal Function Theory. Personal Individual Differences, 14 (1), 163-171.
 14. Syrjä, P., Hanin, Y., & Pesonen, T., (1995). Emotion and performance relationship in soccer players. Paper presented at the IX FEPSAC Congress, July 4-9, 1995, Brussels.

EMOTION AND PERFORMANCE RELATIONSHIP IN SOCCER PLAYERS

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INTRODUCTION

Most of the research into emotion-performance relationship in sport until quite recently was limited to nomothetic, based on group effects studies of negative affect, such as anxiety (3, 6, 10, 12). An alternative idiographic approach was proposed by Hanin in his Individual Zones of Optimal Functioning (IZOF) model first applied to anxiety (2, 3, 4, 9, 11, 13) and then to positive and negative affect (PNA) in top athletes (5, 6, 7, 8). The IZOF model posits that athletes' emotional experiences can be described by four global PNA contents categories: (a) positive, pleasant, facilitating (P+), (b) negative, unpleasant, facilitating (N+), (c) positive, pleasant, debilitating, (P-), and (d) negative, unpleasant, debilitating (N-). Athlete's functionally optimal (P+N+) and non-optimal (P-N-) PNA patterns related to effective (S) and ineffective (F) performance are combined into individual's PNA-SF profile. In our earlier studies individual PNA patterns (emotion content and intensity zones) were identified in ice-hockey players and Olympic level soccer players (5, 7, 8).

The goal of the present study was to test the following hypotheses based on the IZOF model: (a) individually successful performance would be expected, if athlete's PNA was within (close to) the P+N+ pattern and outside the P-N- pattern; (b) individually less successful performance would be expected, if athlete's PNA was outside the P+N+ pattern and within (close to) the P-N- pattern.

Emotion-performance relationship in soccer

METHOD AND PROCEDURE

Subjects: Twenty seven Finnish First Division male junior soccer players aged 15 - 17 years ($M = 15.5$, $SD = 0.57$) participated in the study.

Instrumentation: Recall and current idiographic scaling following the methodology of the IZOF model (6, 7, 8) was used to identify the PNA patterns (content and intensities) of players' repeated emotional experiences in successful and unsuccessful performances in practices and games. The intensity (level and zones) for each PNA item was estimated on the Borg's Category Ratio (CR-10) scale (1) using the following verbal anchors: 0= nothing at all, 0.5= very, very little, 1= very little, 2= little, 3= somewhat, 4= moderately, 5= much, 7= very much, 10= very, very much, # = maximal possible. The same scale with modified anchors ranging from 0.5= very, very poor to 10= excellent was used in self-ratings of players' performance.

Procedure:

1. In the initial session the individualized PNA-SF₁ scale for practices was developed for each player by asking him to select from the PNA stimulus list the items which best describe his emotions in effective (P+, N+) and ineffective (P-, N-) performance in practices. Optimal and non-optimal zones were also identified to get a PNA-SF₁ profile.
2. The individualized PNA-SF₁ scale was then used in three practices to asses each player's: (a) current PNA 5 min before practice, (b) current PNA 5 min after and recalled PNA and performance during practice.
3. The second PNA-SF₂ scale and PNA-SF₂ profile for practices following the above procedures were developed after 47 days from the initial assessments. The new PNA-SF₂ scale was then used in two practices with the same instructions(n.2).
4. The PNA-SF₃ scales and PNA-SF₃ profiles for games following the above procedures were developed after 57 days from the initial assessments. Then the PNA-SF₃ scale was used in three games to asses each player's: (a) current PNA 30 min before game, (b) current PNA 5 min after and recalled PNA and performance during game. Coach's ratings of each

Emotion-performance relationship in soccer

player's performance correlated with players' self-ratings in games ($r=.39$, $p=.001$) and in practices ($r=.29$, $p=.004$).

Data analysis: Each player's current and recalled PNA measures were contrasted with his PNA-SF profile (in 5 practices and 3 games separately). Then PNA deviations of each item from its individually optimal and non-optimal zones were calculated and the following parameters were used in the analysis:

- (a) averaged deviation subscores for each of the PNA categories $d(P+)$, $d(N+)$, $d(P-)$, and $d(N-)$;
- (b) averaged subtotal deviations for effective $D+(P+N+)$ and ineffective $D-(P-N-)$ PNA items; and
- (c) total $\Sigma D = [d(P-)+ d(N-)] - [d(P+)+ d(N+)]$.

Then these PNA deviations were examined across all players with successful (7-10 range), average (4-6), and poor (0-3) performances both in games and practices.

RESULTS

The average PNA deviations in successful (+), average (o), and poor (-) performance groups before, during and after games and practices are reported in Table 1. The Kruskal-Wallis test was used to examine the significance of differences across all three independent groups of observations.

It is seen, that in games the differences in PNA deviations before and during performance were significant and in the predicted direction. In (+), as compared to (o) and (-) performance groups, these were closer to optimal and outside of non-optimal patterns. After the games all differences, except for $dN+$ and $dP-$, were significant.

In practices significant differences in the predicted direction (except, for $dP-$ and $D-$) were observed only during but not before the performance. On the other hand, after practices the differences only for $dP+$, $dN+$ and $dP-$ were statistically ($p<.05$) significant.

Emotion-performance relationship in soccer

Table 1. Performance level and PNA deviations before, during and after games and practices

		In games				In practices			
		-	o	+	K-W	-	o	+	K-W
Performance		2.3	4.6	7.8	***	2.4	4.8	7.8	***
B	d(P+)	1.1	1.5	0.5	**	2.1	1.4	0.8	ns
E	d(N+)	1.4	1.8	0.0	**	2.1	2.4	1.8	ns
F	D+(dP+dN+)	1.2	1.6	0.2	***	2.1	1.9	1.3	ns
O	d(P-)	2.0	2.0	4.2	***	2.0	1.6	2.6	ns
R	d(N-)	1.8	3.1	5.3	***	3.1	3.5	3.5	ns
E	D-(dP-dN-)	1.9	2.6	4.8	***	2.5	2.6	3.1	ns
	$\Sigma D(D- - D+)$	1.3	1.9	9.1	***	0.8	1.4	3.5	ns

D	d(P+)	2.0	1.6	0.5	**	3.1	1.5	0.3	***
U	d(N+)	0.7	1.3	0.2	*	1.6	1.9	0.8	*
R	D+(P+N+)	1.4	1.4	0.3	**	2.3	1.7	0.5	***
I	d(P-)	2.2	2.7	4.1	*	3.2	2.2	2.8	ns
N	d(N-)	1.0	3.0	5.5	***	2.1	3.5	4.1	**
G	D-(P-N-)	1.6	2.8	4.8	***	2.7	2.8	3.5	ns
	$\Sigma D(D- - D+)$	0.4	2.8	9.0	***	0.7	2.3	5.8	***

A	d(P+)	3.5	2.5	1.1	**	3.6	2.6	1.7	*
F	d(N+)	1.0	1.8	0.7	ns	1.5	2.8	1.8	*
T	D+(dP+dN+)	2.3	2.1	0.9	**	2.5	2.7	1.8	ns
E	d(P-)	2.6	2.6	3.5	ns	2.7	1.7	2.5	*
R	d(N-)	0.9	2.9	4.9	***	2.3	3.3	3.2	ns
	D-(dP-dN-)	1.7	2.8	4.2	***	2.5	2.5	2.9	ns
	$\Sigma D(D- - D+)$	-1.0	1.3	6.6	***	-0.1	-0.4	2.2	ns

Observations		17	34	16		17	50	24	

* > .05; ** > .01; *** > .001

Emotion-performance relationship in soccer

Similar findings were obtained by computing Spearman correlations between all PNA deviations and individual performance. In games predicted relationships were observed in 81,0 % of all 21 cases, with more significant correlations for D-, D+, dN-, and ΣD , as compared with partial deviations subscores (dP+, dN+, and dP-). Non-significant relationships were found only for dP+ (before), dN+ (during and after), and dP- (after performance). Significant correlations between performance level and PNA deviations before and after practices were found only for dP+ ($r=-.27$, $p=.009$; $r=-.35$, $p=.000$, respectively). During performance significant correlations were found for dP+ ($r=-.57$, $p=.000$), dN- ($r=.28$, $p=.007$), D+ ($r=-.38$, $p=.000$), and ΣD ($r=.47$, $p=.000$). The results of regression analysis indicated that joint impact of ineffective (dN-) and effective (dP+) emotions accounted for 41.8 % ($F=23.0$, $p=.000$) of variance and dN- alone accounted for 34.0 % of variance ($F=33.5$, $p=.000$) in game performance. In practices 31.6 % of variance in performance was explained by joint impact of effective (dP+) and ineffective (dN-) emotions ($F=20.3$, $p=.000$), whereas dP+ alone explained 26.7 % of variance ($F=32.5$, $p=.000$).

The results of the Friedman test indicated that PNA intensity (P+, N+, P-, N-, P+N+, P-N-, and P+N+P-N-) before, during and after performance change over time, however, differently in + and - performance groups. For instance, in (-) group players were outside their optimal zones already before the game. And, even if they managed to enter their optimal PNA-SF profiles spontaneously during performance, they still failed to maintain it. After the game their PNA dropped dramatically. Thus in (-) group the PNA change over time was observed quite often (88,2 % of all cases). On the other hand, successful players were closer to their optimal PNA patterns and outside non-optimal already before the game. However, they managed to maintain their optimal PNA until the task was completed. As a result, the PNA change over time in (+) group was also observed but less often than in (-) group (37,5 %). However, in (+) group players sometimes stayed in the optimal PNA state even after

Emotion-performance relationship in soccer

the the game which might create a problem for their adequate recovery. And, finally, it was also found that PNA not only influenced players' performance but was influenced by the subsequent performance. In other words, the direction of PNA-performance relationship also changed over time.

DISCUSSION AND CONCLUSIONS

In previous studies (5, 7, 8) individual patterns of optimal and non-optimal PNA (content and zones) were examined in ice-hockey and soccer. The present investigation extends the Hanin's IZOF model to PNA content (P+, N+, P-, and N-), intensity (level and zones), time (before, during and after) and, context (games versus practices) in junior soccer players. In this study not only PNA patterns were identified, but also PNA-performance relationships were examined. The hypotheses based on the "in-out of the zone" principle were tested considering both optimal and non-optimal PNA patterns. The findings indicate that PNA deviations from optimal and non-optimal patterns were in the predicted direction in different performance level (+, o, -) groups. However, player's PNA deviations before games were a better predictor of individual performance than the PNA deviations before practices. Junior players seemed to be better aware of the impact of (N-) and (P+) emotions on their performance but not of (N+) and (P-). Besides, anecdotal data indicate that these emotions (especially N+) are experienced by some players in very special situations and usually produce facilitating effect only, if channelled properly to the task at hand.

In the IZOF model the main focus initially was on demanding and exceptionally difficult tasks requiring the individual to do his/her best (3, 4). Thus one possible explanation of differences in PNA-performance relationship is the importance of the games as compared with practices. In the games players are typically more motivated, the results are important both individually and for the team. And since the games are usually more demanding than practices, players use special routines to

Emotion-performance relationship in soccer

prepare themselves physically and mentally. In contrast, practices with different psychological demands are sometimes perceived by young players as regular, repeated and even boring experiences. Players usually do not try to excel or use their all potential and start practices without a special preparation. The other possible factor identified in the study is the players's increased awareness of the PNA impact on their performance. The PNA-SF₃ scales and PNA-SF₃ profiles for games were developed after 57 days following the development of the individual PNA-profiles and repeated assessments in practices and games using the individualized PNA-SF scales. Thus players became gradually more and more accurate in their evaluations (Hanin, Syrjä, in preparation). Thus, it can be concluded that:

1. the basic assumptions of the IZOF model are extended to PNA content, time and context and intensity dimensions;
2. the in-out of the zone principle is valid for prediction of performance level based on PNA deviations from individually optimal and non-optimal patterns;
3. prediction of individual performance is more accurate for games (more important activity) than for practices
4. total PNA deviations are better predictors of performance level than separate emotion categories.

REFERENCES

1. Borg, G. (1982). A category scale with ratio properties for intermodal and interindividual comparisons. In: H-G. Geiss, & P. Petzold (Eds.), Psychophysical judgement and the Process of Perception. Berlin: VEB Deutscher Verlag der Wissenschaften, 25-34.
2. Gould, D., Tuffey, S., Hardy, L., & Lochbaum, M. (1993). Multidimensional State anxiety and Middle distance Running Performance: An Explanatory Examination of Hanin's (1980) Zones of Optimal functioning Hypothesis. Journal of Applied Sport Psychology, 5, 85-95.
3. Hanin, Y. (1986). The state-trait anxiety research on sports in the USSR. In: C.D. Spielberger, & R. Diaz-

Emotion-performance relationship in soccer

- Guerrero (Eds.) Cross-Cultural Anxiety. Hemisphere: Washington, V.3, 45-64.
4. Hanin, Y. (1989). Interpersonal and intragroup anxiety in sports. In: D. Hackfort, & C.D. Spielberger (Eds.), Anxiety in Sports. Hemisphere, Washington, DC, 19-28.
 5. Hanin, Y. (1993). Optimal Performance Emotions in Top Athletes. In: S. Serpa, J. Alves, V. Ferreira, & A. Paula-Brito (eds.), Sport Psychology: An integrated Approach. The 8th World Congress of Sport Psychology. Lisbon, 229-232.
 6. Hanin, Y. (1994 in press). Individual Zones of Optimal Functioning (IZOF) model: An Idiographic Approach to Performance Anxiety. In: K. Henschen (ed.), Sport Psychology: An Analysis of Athlete's Behaviour, Vol. 3. Ithaca, Movement Publications.
 7. Hanin, Y., & Syrjä, P. (1995 in press). Performance Affect in Junior Ice-Hockey Players: An application of the IZOF Model. The Sport Psychologist.
 8. Hanin, Y., & Syrjä, P. (1995 in press). Performance Affect in Soccer Players: An application of the IZOF Model. International Journal of Sports Medicine.
 9. Krane, V. (1993). A Practical Application of the Anxiety-Athletic Performance Relationships: The Zone of Optimal Functioning Hypothesis. The Sport Psychologist, 7, 113-126.
 10. Morgan, W.P., & Ellickson, K.A. (1989). Health, Anxiety, and Physical Exercise. In: Hackfort D., & Spielberger C.D. (eds.), Anxiety in sports: An International Perspective. Washington: Hemisphere, 165-182.
 11. Prapavassis, H., & Grove J.R. (1991). Precompetitive Emotions and Shooting Performance: The Mental Health and Zone of Optimal Function Models. The Sport Psychologist, 5, 223-234.
 12. Raglin, J.S. (1992). Anxiety and Sport Performance, in: Exercise and Sports Sciences Reviews, Baltimore: Williams & Wilkins, 20, 243-274.
 13. Raglin, J.S., & Turner, P.E. (1993). Anxiety and Performance in Track and Field Athletes: A Comparison of the Inverted-U Hypothesis with Zone of Optimal Function Theory. Personal Individual Differences, 14 (1), 163-171.

SPECIFIC ASPECTS OF PSYCHOLOGICAL STRESS OF SOCCER REFEREES

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1. INTRODUCTION

In general, specific aspects of the behavior of officials in various kinds of sport have been analysed quite seldom. Apart from the overviews of Goldberger (1980) and Weinberg & Richardson (1990), there are few comprehensive publications.

In contrast to the actions of soccer players and soccer coaches, the tasks, actions and functions of soccer referees have apparently been rarely investigated.

Specific physiological aspects of the soccer referees were analysed by Asami, Togari & Ohashi (1988) in respect of movements of referees on the field during games and by Besecke (1987) in respect of heart rates of referees before, during and after games in the Bundesliga.

Special psychological investigations on soccer referees were conducted by Albrecht & Musahl (1979) in relation to personality traits, by Aresu, Bucarelli & Marongiu (1979) in respect of the authoritarian tendencies in soccer referees and by Van Meerbeek, Van Gool & Bollens (1988) concerning the refereeing decisions during the world soccer championship in 1986 in Mexico. Specific instructions for referees' behavior before, during and after games were pointed out by Ebersperger et al. (1989).

In the present study the prevalent investigations on various aspects of psychological stress in soccer referees are analysed and emphasized.

2. RESULTS OF STUDIES ON PSYCHOLOGICAL STRESS OF REFEREES

Specific aspects of the psychological stress of soccer referees were investigated by Heisterkamp (1978), Isberg (1982), Taylor & Daniel (1988) and Taylor (1993).

Isberg (1982) considered the referee's duties and demands as well as the referee's training in soccer. The study was conducted with referees, players, club directors and teaching staff from the division I and II in Sweden and also journalists. Special interviews and questionnaires were applied with the participants, and comprehensive observations were conducted concerning the behavior of the referees.

Isberg (1982) pointed out that the most important requirements which were made on the referee's job were to cope with actions and demands in the specific referee's situation in terms of personality traits such as courage and consistency, to make appropriate and correct decisions together with the linesmen and to punish law violations adequately by means of warning and sending off.

Controversial or wrong decisions during the game were regarded as quite stressful. Such decisions were, for example, when the observers considered that the referee made a wrong decision, when he did not blow his whistle although he should have done so and when he did not see or react to a violation of the soccer laws. The perception of the controversial decisions apparently increased with the distance from the critical incident.

The questionnaire data revealed that the positive side of the referee's job was the companionship, whereas the negative aspects were related to irresponsible criticism of the mass media and club management. The most prevalent motive to become a referee was the interest in soccer. Furthermore the need for achievement played also an important role in motivation process for the referees.

As a consequence, Isberg (1982) made several proposals concerning external qualifications, rules and regulations and individual qualifications. For the improvement of external qualifications the outsiders should be enabled to gain more thorough informations about the soccer rules. To counteract irresponsible criticism from sport journalists, management and spectators the football associations should arrange information courses for the journalists, put a rule column in the major newspapers and make loudspeaker explanations to mediate decisions to the journalists

and the spectators during the game. The proposals concerning rules and regulations were centered on the division of labour between referee and linesmen and the rule changes in terms of replacement of the indirect free kick by direct free kick. The suggestions concerning individual qualifications were related to physical training (an endurance test of at least 25 minutes), behavior training in terms of improvement of courage and consistency by means of mental training and improvement of the interaction between instructors and referees in terms of a thorough analysis of the individual and social needs of the instructors and the referees observed. Isberg (1982) was quite sure that the situation of the referee could be improved by these task-oriented and socio-emotion-oriented devices.

Taylor and Daniel (1988) constructed the 'Soccer Officials' Stress Survey' (SOSS) for the analysis of selected stressful conditions and situations. The questionnaire consisted of 53 items related to the activity of referees and included potential acute as well as chronic types of stressors. The referees were asked to answer these items in reference to the degree of stress they had experienced during the last season on a 4-point-scale from '0=did not' to '3=strongly'. Besides the referees had to evaluate the frequency of the stress during the last season on a 4-point-scale from '0=never' to '3=often'.

This questionnaire was answered by 215 soccer referees in the area of Ontario, Canada. The referees were between 20 and 50 years old and had acquired licenses from low to high soccer class levels. They had already been active as referees for 5 to 15 years and had spent 2 to 12 hours per week for their soccer activity during the previous season.

The referees assessed the situation as most stressful, when they had a bad game. The conditions of working with poor officials and making a bad call were also evaluated highly stressful. The next rather stressful conditions were interactions with players or coaches who did not understand the laws, the dismissal of players and conflicts with over-excited or hostile coaches as well as conflicts with abusive players. The situations of very important games to one or both teams, little recognition for officials, critical decisions during the game and an aggressive game were

regarded as medium stressful. Besides the conditions of spectators being close to the field, violence/fighting in a game and conflicts between officiating and daily family demands were evaluated as rather low stressful.

87% of the referees pointed out that they had experienced several times that the players or coaches had not known the soccer laws. 76.6% of the referees had already felt high degrees of stress in very important games for one or both teams. 75% of the referees confirmed that they had experienced the condition of spectators being close to the field.

The questionnaire was analysed by means of a main component factor analysis with varimax rotation. According to the criteria of loadings of marking items of more than .40 on each factor and the existence of 3 marking items per factor, all in all, 6 factors including 28 items could be extracted. These 6 factors were 'interpersonal conflict', 'fear of physical harm', 'time pressures', 'peer conflicts', 'role-culture conflict' and 'fear of failure'.

Taylor & Daniel (1988) looked upon their questionnaire as an adequate instrument for the analysis of specific stress factors and as a means for the identification of essential problems of the activity of soccer referees.

In a follow-up study Taylor (1993) analysed specific components of satisfaction among soccer officials. He described the findings of the questionnaire study using the 'Soccer Officials Stress Survey' in 529 referees in low to high league levels in Canada.

The average official was a male persons, 38.7 years old and was employed in a white collar profession. He spent 7.4 hours per week officiating and had experience for 7.2 years on an average. Generally, most referees were rather satisfied with their role. But the further analysis showed that the referees were satisfied with most aspects of their role, apart from pay and support received. The satisfaction of the referees increased significantly with age ($r=.12$) and among those with more advanced levels of certification ($r=-.09$). The six sources of stress revealed significant negative correlations with satisfaction,

except the component of peer conflicts. Satisfaction showed positive correlations with number of games officiating ($r=.21$) and hours involved in officiating ($r=.24$), but a negative correlation with turnover intentions ($r=-.42$). A path analysis was applied in order to identify relationships between satisfaction and the intent to quit.

The officials at higher levels tended to be more satisfied. But the older officials reported more frequent turnover intentions. The strongest predictor of turnover intention was found to be satisfaction, whereas the three other predictive components like officiating level, fitness concerns and role-culture conflicts proved to be of lower predicting relevance.

Taylor (1993) resumed that there existed a specific relation between certification, age and satisfaction. The lack of recognition and appreciation as well as concerns about personal fitness were related to low referee satisfaction. Referees mostly had only few opportunities of communication with players and coaches. Furthermore the referees were given only little credit for their efforts of officiating. The less satisfied referees tended to quit, whereas the referees who gained satisfaction from officiating tended to continue their job.

Taylor (1993) concluded that because of the lack of officials psychological skills such as stress and conflict management should be taught to inexperienced and also experienced officials. Apparently younger referees needed better instructions on interpersonal skills, whereas older referees needed better physical fitness. In general, the referees desired a higher amount of social support and recognition.

For the analysis of various aspects of the psychological stress of referees the attitudes and opinions of referees and instructors can also be taken into account. A referee pointed out the essential tasks and the psychological stress in following way:

"Referees have to conduct a difficult job. This attitude is well-known among all participants in soccer. Some participants try to make the task of the referee as easy as possible. Other participants try to make the task of

the referee a difficult one. The job of the referee is in general not liked very much... In soccer everyone can criticise the decisions of the referee vehemently and can discredit the 'person' referee in a negative way, without being punished by a certain institution."

"There were more journalists than usual, but again only these journalists who could be labeled soccer journalists. They wrote adequate, though critical comments. The negative journalists could not be influenced or criticised... More composedness is needed. If you read negative remarks about yourself, you are surely astonished and angry. But this type of journalism requires different headlines the next day. Besides, there are a lot of people who do not read this type of articles and who do not worry about it. In my opinion we cannot ignore, when responsible managers and/or coaches evaluate the referees and their associations in a negative way."

The psychological stress of referees in international games was regarded as very high by a soccer functioneer and instructor. Therefore he considered the tendency of educating professional referees in the future as necessary. This attitude can be seen in the following remark:

"The psychological stress which a referee is confronted with in a world championship or in a continental championship is very high. The better the physical shape of the referee, the easier he can be cope with the mental stress. A referee who is physically as well as psychologically well prepared can sustain the stress of refereeing better than a referee who has problems to sustain physically a game of 90 or even 120 minutes. A professional attitude alone is not sufficient for a high level referee. The training, the preparation for the matches, the regeneration and the pauses should also be organised in a professional way."

"The task of the referee is to become a respected person on the field. The referee is a single athlete among 22 players, thousands of spectators in the stadium and millions of spectators on television. There exist only few comparable jobs which are associated with such a stress. Nowadays two teams of a transfer value of 10 or even 100 million DM play against each other in important international games. These teams were prepared for their task in a professional environment over several years. This preparation also includes procedures to cheat and deceive the referee."

"The referee of the future should not be suspected to conduct his task with a qualitatively worse preparation than the players. The best leagues in the world in the leading soccer nations need better high level referees with an improved status. In the future the leading referees must be recruited from these leagues for international games, not as amateurs, but as semi-professionals or full-professionals."

Thus, the behavior of soccer coaches on amateur and especially on professional level apparently incorporates various sources of stress and requires the application of adequate coping strategies on the side of the referees.

In terms of valuable coping strategies the referees regarded the procedures as adequate to show a clear, strict and just way of refereeing, to make a good preparation of the game and to have a good cooperation with the linesmen. Furthermore they considered necessary to develop good relationships with the players and coaches.

It seems that the various facets of behavior and professional requirements of soccer referees have been analysed not yet in a sufficiently detailed way.

3. SUMMARY

In the present study the emphasis is laid on the findings of investigations about various aspects of stress of the referees.

Studies concerning physiological stress centered on the actions and movements as well as heart rates of referees during games. Investigations on various aspects of psychological stress of referees focussed on the referee's reaction to criticism from soccer game participants, on the division of labour between referees and linesmen and on the improvement of physical training and individual characteristics. Another study showed the main stress factors of referees: interpersonal conflict, fear of physical harm, time pressures, peer conflicts, role-culture conflict and fear of failure. The evaluation of satisfaction depended on the age, experience and level of refereeing. Specific interview statements revealed the tremendous amount of stress especially in professional referees in international games.

The findings of the study are discussed in respect of the requirements of the various role expectations of referees. Specific hints are mentioned for the improvement of the stress evaluations and specific coping strategies of soccer referees.

4. LITERATURE

- Albrecht, D. & Musahl, H.P. (1979). Das Schiedsrichterphänomen - ein Syndrom? In Albrecht, D. (Ed.) Fussballsport. Ergebnisse sportwissenschaftlicher Forschung (33-64). Berlin: Bartels & Wernitz.
- Anshel, M.H. (1990). Toward validation of a model for coping with acute stress in sport. *International Journal of Sport Psychology*, 21, 58-83.
- Aresu, M. Bucarelli, A. & Marongiu, P. (1979). A preliminary investigation of the authoritarian tendencies in a group of sport referees. *International Journal of Sport Psychology*, 10, 1, 42-51.
- Asami, T., Togari, H. & Ohashi, J. (1988). Analysis of movement patterns of referees during soccer matches. In Reilly, T., Lees, A., Davids, K. & Murphy, W.J. (Eds.). *Science and football* (314-345). London: Spon.
- Besecke, S. (1987). Über das Verhalten der Herzschlagfrequenz bei Schiedsrichtern während eines Bundesliga-Fussballspiels. Köln: Universität (Diss.).
- Ebersperger, H., Malka, J. & Pohler, R. (1989). *Schiedsrichter im Fussball*. Bad Homburg: Limpert.
- Goldberger, A.S. (1986). *Sports officiating. A legal guide*. New York: Leisure Press.
- Heisterkamp, G. (1978). Psychologische Aspekte der Belastung von Schiedsrichtern. *Leistungssport*, 2, 162-172.
- Isberg, L. (1982). Referee problems in football. In Partington, J.T., Orlick, T. & Salmela, J.H. (eds.): *Sport in perspective* (78-79). Ottawa: Sport in Perspective Inc.
- Taylor, A. (1993). Satisfaction among soccer officials. In Nitsch, J.R. & Seiler, R. (Eds.): *Bewegung und Sport: Psychologische Grundlagen und Wirkungen. Band 1: Motivation, Emotion, Stress* (197-202). Sankt Augustin: Academia.
- Taylor, A.H. & Daniel, J.V. (1988). Sources of stress in soccer officiating: an empirical study. In Reilly, T., Lees, A., Davids, K. & Murphy, W.J. (eds.): *Science and football* (538-544). London: Spon.
- Teipel, D. (1992). *Beanspruchung von Spielern und Trainern im Fussball*. Köln: Sport und Buch Strauss.
- Van Meerbeek, R., Van Gool, D. & Bollens, J. (1988). Analysis of the refereeing decisions during the world soccer championship in 1986 in Mexico. In Reilly, T., Lees, A., Davids, K. & Murphy, W.J. (Eds.): *Science and football* (377-382). London: Spon.
- Weinberg, R.S. & Richardson, P.A. (1990). *Psychology of officiating*. Champaign: Human Kinetics.

SPECIFICITY DIMENSIONS OF ANXIETY IN SPORT- THEORETICAL POSTULATES

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Key words: anxiety, theory

The statement of the eminent French philosopher J.P. Sartre that a man who is not afraid, is not normal, superbly explains the substantial interest of researchers in the problem of anxiety. Thus not only the clinicists involve themselves into research and studies on this kind of emotions. The reason for it is that man, observed in different existential situations and dimensions of his description, from his social to his biological characteristics, happens to be afraid.

The presented article is, in its content, a continuation of considerations having a long and significant tradition. The authors refer in their presentation to works of different provenance, of both theoretical and casuistic character. One has to say, that studies of the literature written till now are not easy, since under the same terminology different meanings were understood. The aim of the present work is an attempt to renew the discussion, that the authors would like to initiate in order to more fully understand the specificity of sport anxiety.

Thus, the authors, intend to get involved in the discussion, that in the present literature proceeds only marginally, nearly unnoticeably, although concepts used in it became sufficiently familiar, as if in result of their obviousness. The issue is about the concept of general anxiety and specific anxiety. Psychology distinguishes at least several specific kinds of anxiety. Among them one can enumerate e.g. test anxiety (Savason 1975a, 1975b), audience anxiety (Paivio, Lambert 1959), social evaluative anxiety (Watson, Friend 1968), communication apprehension (McCroskey 1970, 1984) and others.

Quite a prominent place among specific anxieties occupies competitive anxiety in sport (Martens 1970; Martens, Vealey, Burton 1990). R. Martens based his approach on a theoretical model of the competitive process in sport, which is composed of : objective competitive situation, response, consequences and qualities of the person (Martens 1975). The approaches originating from the assumptions of interactive paradigm differentiate - according to Spielberg (1972) - between the anxiety-state and the anxiety-trait. The approach developed by Martens and his group became a basis for research on anxiety in sport, the more so that on the theoretical basis several research tools were developed: Sport Competition Anxiety Test (SCAT) (Martens 1977) and Competitive State Anxiety Inventory-2 (SCAI-2). (Martens, Vealey, Burton, Bump, Smith 1990), generally acknowledged and applied in a number of research projects (cf. Martens, Vealey, Burton 1990; Smith, Smoll 1990)

Parallely with conceptual issues a prominent place in a number of research projects occupies the problem of relation between anxiety and sport performance (a review of issues is given in Klein 1990; Krane 1992; Raglin 1992). Among more relevant

hypotheses which were tested one can enumerate: the Drive Theory (Spence, Spence 1966, Taylor, Spence 1971), the Inverted-U Hypothesis (cf. Martens 1974), Multidimensional Anxiety Theory (Martens, Vealey, Burton 1990), the Catastrophe Theory (Fazey, Hardy 1988, Hardy 1990; Hardy, Parfitt 1991), the Zone of Optimal Function Theory (Hanin 1978, 1986, 1994) and the Reversal Theory (Kerr 1990). The problem of appropriate level of activation is related to the question concerning the method of attaining that optimum level. That issue has also been studied in literature a number of times (cf. Murphy, Jowdy 1992; Boutcher 1992; Burton 1992; Greenspan, Feltz 1989, Jones, Hardy 1992; Hanin 1994).

The next problem studied in literature is the question of measurement of anxiety in sport. Some of the research is based on scales measuring general anxiety, such as MAS by Taylor, STAI by Spielbergen and others (cf. Kleine 1990). Other researchers of sport use research tools specially conceived for sport purposes, like the already mentioned SCAT, SCAI-2 or the Sport Anxiety Scale (SAS) (Smith, Smoll, Schutz 1990). Ostrow (1990) enumerates and describes 17 different tests of anxiety in sport collected from literature published in English. One should add to that other sources, published in other languages, like the German SAD (Hechfort 1983), Polish "Self-Assessment" scale (Karolczak-Biernacka, Skrzypek-Siwińska 1969), or various kinds of psycho-physiological measures (cf. Hechfort, Schwenkmezger 1989). At present the researchers continuously try to upgrade the existing tools and develop new ones.

The presented problem groups of research devoted to the studies of anxiety in sport do not exhaust all possibilities. Authors wanted to only focus attention on the emerging tendencies. They would then like to present their own postulates concerning considerations over specificity of anxiety in sport.

Firstly, according to the authors' opinion, there is a gap in research devoted to the content of anxieties, their reciprocal dependence in a sport situation. Only scanty works document that issue (cf. Scanlon, Stein, Ravizza 1991; Gould, Jackson, Finch 1993). On the basis of earlier works, i.a. of such authors like Basovitz, Persky, Korchin, Gninker (1955), Becker (1980), Hechfort & Nitsch (1988), Kępiński (1986), one can classify all the content of anxieties into biological anxieties and social anxieties. Adoption of such a classification of anxiety components in order to extend the concept of specificity of anxiety in sport seems to be justified. The concept of biological anxiety may contain i.a. anxiety resulting from unfavourable condition of the organism, fear of pain, contusion, health, loss of life etc.; and of social anxiety - anxiety resulting from concern for the outcome, judgment of the coach, colleagues, family, peers, spectators, mass media, progress of the sport career, practical consequences (like loss of stipend, premium) etc. (cf. Krawczyński 1991).

Secondly, the issue which seems to be well analysed is the mechanism of anxiety with relations - cognitive anxiety and somatic anxiety (Liembart, Morris 1967; Wine 1971; Borkovec 1976; Davidson, Schwartz 1976; Morris, Davis, Hutchings 1981; Steptoe, Kearsley 1990, in sport Martens, Vealey, Burton, Bump, Smith 1990). Referring to the adage that when man is anxious, everything rustles around him, allows to justify the phenomenon of variety of ways of experiencing fear, taking into consideration the mechanisms of its manifestation and cognitive strategies realised in complementarity with them. Man is afraid in a variety of ways, with differently expressed physiological component, with cognitive strategies located in a number of different ways (like cognitive preorientation, interpretation of one's own somatic symptoms, defensive reinterpretation, cognitive tolerance, reductive controllability etc.) Variety of

experiencing is not exhausted in the complexity of its mechanisms, this variety is also justified and reinforced with the degree of intensity. One should also note that the existing similarities of two-dimensionality (social anxiety vs. cognitive anxiety and biological anxiety vs. somatic anxiety) related to content and process have often been a cause of conceptual confusion, leading to reciprocal complementation of both areas.

Thirdly, it seems that an extremely seducing perspective in studies of specificity of sport anxiety is to undertake an attempt to determine its motivational characteristics. The question would be to determine all those mechanisms, which precede the appearance of anxiety, but are not related to its content (Tłokiński 1995). Needs of an individual, their valuation and frustration as determinants of anxiety are the issues that have not been studied very thoroughly so far and are closely related with the motivation to anxiety.

The fourth problem area should be focused on modification of intensity of fear and is closely related with the formerly described problems of anxiety and sport performance.

Summing up, it should be stressed that authors postulate that the consideration of specificity of sport anxiety were included in a four-dimensional descriptive framework:

1. Anxiety content dimension (what am I afraid of): in this dimension the following three kinds of relations exist - biological anxiety, social anxiety and mixed (socio-biological) anxiety (Kępiński 1986)
2. Anxiety mechanism dimension (how am I afraid): with relations - cognitive anxiety and somatic anxiety (Liembert, Morris 1967; Wine 1971; Borkovec 1976; Davidson, Schwartz 1976; Morris, Davis, Hutchings 1981; Steptoe, Kearsley 1990; in sport Martens et al. 1990);
3. Anxiety motivation dimension (why am I afraid): needs (their frustration) and valuation as determinants of anxiety (Tłokiński 1995);
4. Anxiety intensiveness modification dimension (anxiety reduction and enhancement): methods of exertion of effective psychoregulatory influence, which in the perspective of the three above mentioned dimensions lead to improvement of effectiveness of the sport accomplishment (Murphy, Jowdy 1992; Boutcher 1992; Burton 1992; Jones, Hardy 1992; Hanin 1994).

According to the authors the four dimensional description of relations proposed by them provide a suitable framework of attribution of anxiety specificity in sport.

REFERENCES

- Basowitz, H., Persky, H., Korchin, S.I. & Grinker R.R. (1955). *Anxiety and stress*. New York, McGraw-Hill.
- Becker P. (180). *Studien zur Psychologie der Angst*. Weinheim, Beltz.
- Borkovec, T.D. (1976). Psychological and cognitive processes in the regulation of anxiety. In G. Schwartz and D. Shapiro (EDS.), *Consciousness and self-regulation: Advances in research, Vol. 1*. New York, Phelm Press. pp. 261-312.
- Burton, D. (1992). The Jekyll/Hyde nature of goals: Reconceptualizing goal setting in sport. In T.S. Horn (Ed.), *Advances in sport psychology*. Champaign, IL, Human Kinetics. pp. 267-298.
- Boutcher, S.H. (1992). Attention and athletic performance: An integrated approach. In T.S. Horn (Ed.), *Advances in sport psychology*. Champaign, IL, Human Kinetics. pp. 251-266.

- Davison, R.J. & Schwartz, G.E. (1976). The psychobiology of relaxation and related states: a multi - process theory. In D. Mostofsky (Ed.), *Behavioral control and modification of psychological activity*. Englewood Cliffs, NY, Prentive Hall. pp. 399-442.
- Fazey, J.A. & Hardy, L. (1988). The inverted-U hypotesis: Catastrophe for sport psychology. In *British Association of Sport Sciences Monograph No. 1*. Leeds, The National Coaching Foundation.
- Gould, D. & Krane, V. (1992). The arousal - athletic performance relationship: Current Status and Future directions. In T.S. Horn (Ed.), *Advances in sport psychology*. Champaign, IL, Human Kinetics. pp. 119-142.
- Gould D., Jackson, S. & Finch, L. (1993). Sources of stress in national champion figure skaters. *Journal of Sport and Exercise Psychology*, 15, 134-159.
- Greenspan, M.J. & Feltz, D.L. (1989). Psychological interventions with athletes in competitive situations: A review. *Psychologist The Sport*, 3, 219-236.
- Hackfort, D. (1983). *Teorie und Diagnostik sportbezogener Angstlichkeit. Ein situationsanalytischer Ansatz*. Köln, Das Psychologische Institut der Deutschen Sporthochschule.
- Hackfort, D. & Nitsch J.R. (1988). *Das Sportaengst - Deutungsverfahren SAD. Grundlagen und Handanweisung*. Schorndorf, Hofmann.
- Hackfort, D. & Schwenkmezger, P. (1989). Measuring anxiety in sports: Perspectives and problems. In D. Hackfort & C.D. Spielberger (Eds.), *Anxiety in sport: An international perspective*. New York, Hemisphere. pp. 55-76.
- Hanin, Y. (1978). A study of anxiety in sports. In W.F. Straub (Ed.), *Sport psychology: An analysis of athlete behavior*. Ithaca, NY, Movement Publications. pp. 236-249.
- Hanin, Y. (1986). The state - trait anxiety research on sport in the USSR. In C.D. Spielberger & R. Diaz - Guerrero (Eds.), *Cross - cultural anxiety, Vol. 3*. Washington, DC, Hemisphere. pp. 45-64.
- Hanin, Y. (1994). Performance emotions in top sports: An idiographic approach. 23rd International Congress of Applied Psychology, July 17-22, Madrid, Spain.
- Hardy, L. (1990). A catastrophe model of preformance in sport. In J.G. Jones and L. Hardy (Eds.), *Stress and performance in sport*. Chichester, New York, Brisbane, Toronto, Singapore, John Wiley and Sons. pp. 81-106.
- Hardy, L. & Parfitt, G. (1991). A catastrophe model of anxiety and performance. *British Journal of Psychology*, 82, 163-178.
- Jones, J.G. & Hardy, L. (1990). The academic study of stress in sport. In J.G. Jones and L. Hardy (Eds.), *Stress and performance in sport*. Chichester, New York, Brisbane, Singapore, John Wiley and Sons. pp. 3-16.
- Karolczak - Biernacka, B. & Skrzypek - Siwińska E. (1969). Pomiar lęku specyficznego u zawodników kwalifikowanych. *Wychowanie Fizyczne i Sport*, 4, 97-101.
- Kerr, J.H. (1990). Stress and sport: Reversal theory. In J.G. Jones and L. Hardy (Eds.), *Stress and performance in sport*. Chichester, New York, Brisbane, Toronto, Singapore, John Wiley and Sons. pp. 107-131.
- Kępiński, A. (1986). *Psychopatologia nerwic*. Warszawa, PZWL.
- Kleine, D. (1990). Anxiety and sport performance: A meta-analysis. *Anxiety Research*, vol. 2, 113-131.
- Krane, V. (1992). Conceptual and methodological considerations in sport anxiety research: From the inverted-U hypotesis to catastrophe theory. *Quest*, 44, 72-87.
- Krawczyński, M. (1991). Wokół specyfiki lęku sportowego. In W. Tłokiński (Ed.), *Lęk. W poszukiwaniu specyficzności*, Warszawa, Arx Regia. pp. 45-53.
- Liembert, R.M. & Morris, L.W. (1967). Cognitive and emotional components of test anxiety: A distinction and some initial data. *Psychological Reports*, 20, 975-978.

- Martens, R. (1974). Arousal and motor performance. In J. Wilmore (Ed.), *Exercise and sport science review*, vol. 2, New York, Academic Press. pp. 155-188.
- Martens, R. (1975). *Social psychology and physical activity*, New York, Harper and Row.
- Martens, R. (1977). *Sport Competition Anxiety Test*. Champaign, IL, Human Kinetics.
- Martens, R., Vealey, R.S. & Burton, D. (1990). *Competitive anxiety in sport*. Champaign, IL, Human Kinetics.
- Martens, R., Burton, D., Vealey, R.S., Bump, L.A. & Smith, D.E. (1990). The development of the Competitive State Anxiety Inventory-2 (SCAI-2). In R. Martens, R.S. Vealey, D. Burton, *Competitive anxiety in sport*. Champaign, IL, Human Kinetics. pp. 117-190.
- McCroskey, J.C. (1970). Measures of communication-bound anxiety. *Speech Monographs*, 37, 269-277.
- McCroskey, J.C. (1984). Oral communication apprehension: Reconceptualization and a new look at measurement. *Avoiding Communication: Shyness, Reticence and Communication Apprehension*. Sage.
- Morris, L., Davis, D. & Hutchings, C. (1981). Cognitive and emotional components of anxiety: Literature review and revised worry-emotionality scale. *Journal of Educational Psychology*, 73, 541-555.
- Murphy, S.M. & Jowoly, D.P. (1992). Imagery and mental practice. In T.S. Horn (Ed.), *Advances in sport psychology*. Champaign, IL, Human Kinetics.
- Ostrow, A.C. (Ed.) (1990). *Directory of psychological test in the sport and exercise sciences*. Morgantown, West Virginia, Fitness Information Technology, Inc.
- Paivio, A. & Lambert, W.E. (1959). Measures and correlates of audience anxiety. *Journal of Personality*, 27, 1-17.
- Raglin, J.L. (1992). Anxiety and sport performance. In J.O. Holloszy (Ed.) *Exercise and sport sciences reviews*, vol. 20, Baltimore, Williams and Wilkins. pp. 243-274.
- Sarason, I.G. (1975a). Test anxiety and self-disclosing coping model. *Journal of Consulting and Clinical Psychology*, 43, 148-153.
- Sarason, I.G. (1975b). Test anxiety, attention and the general problem of anxiety. In C.D. Spielberger and I.G. Sarason (Eds.), *Stress and anxiety*, vol. 1, Washington, DC, Hemisphere. pp. 165-187.
- Scanlan, T.K., Stein, G.L. & Ravizza K. (1991). An in-depth study of former elite figure skaters: III. Sources of stress, *Journal of Sport and Exercise Psychology*, 13, 103-120.
- Smith, R.E. & Smoll, F.L. (1990). Sport performance anxiety. In H. Leitenberg (Ed.), *Handbook of social and evaluation anxiety*. New York, London, Plenum Press. pp. 417-454.
- Smith, R.E., Smoll, F.L. & Schultz, R.W. (1990). Measurement and correlates of sport-specific cognitive and somatic trait anxiety: The Sport Anxiety Scale. *Anxiety Research*, 2, 263-280.
- Spence, J.T. & Spence, K.A. (1966). The motivational components of manifest anxiety: Drive and drive stimuli. In C.D. Spielberger (Ed.), *Anxiety and behavior*. New York, Academic. pp. 291-326.
- Spielberger, C.D. (1972). Anxiety as emotional state. In C.D. Spielberger (Ed.), *Anxiety: current trends in theory and research*, Vol. 1. New York, Academic. pp. 24-54.
- Stephens, A. & Kearsley, N. (1990). Cognitive and somatic anxiety. *Behavior Research and Therapy*, 28, 75-81.
- Taylor Spence, J. (1971). What can you say about a twenty-year old theory that won't die? *Journal of Motor Behavior*, 3, 193-203.
- Tłokiński, W. (Ed.) (1995). *Lęk. Zjawisko umotywowane*. Warszawa, Arx Regia.

- Watson, D. & Friend, R. (1969). Measurement of social - evaluative anxiety. *Journal of Consulting and Clinical Psychology*, 33, 448-457.
- Wine, J.D. (1971). Test anxiety and direction of attention. *Psychological Bulletin*, 76, 92-104.

EMOTIONS IN CONTEXT OF HEALTH-ORIENTATED GYMNASTICS

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KEY WORDS: Emotion, health-related exercise

INTRODUCTION

Sedentary living of many people is associated with health problems, among other things back pains. In order to decrease back problems and to prevent serious damage some people enter exercise programs. But the expected health benefits can only be attained if programs are attended regular for a long period of time. The high dropout rates of 30 % to 50 % (Pahmeier, 1994) demonstrate that rational reasons like health outcomes alone aren't enough for a regular exercise. Emotional experience especially enjoyment is important in the same way (Wankel, 1985).

Emotional experience is characterized by the fact of being involved, concerned and affected. So emotions express our relationship to the world, to subjects, other persons and events. They show if an event is concerning us and if it makes something to 'swing' in our person (Ulich, 1989; Ulich & Mayring, 1992). From that point of view emotions have a communication function about the relationship of a person to certain facts and events.

The purpose of this study is to describe the emotional experiences of participants of health-related exercise programs and so to get information about the relationship of participants to such activities. It is also aimed to investigate the relationship between emotions and personal as well as situational factors.

METHOD AND PROCEDURE

The subjects in this study were participants in exercise programs of sport at Humboldt-

Emotions in Context of Health-oriented Gymnastics

University. All participants at the programs "physical fitness", "back school" and "yoga" in winter semester 1994 were asked to answer a questionnaire about their emotional experiences before, during and after exercises. The return was about 35 percent. So data are available for 103 persons. These were 39 students and 64 employees at university aged between 18 and 63 years with an average age of 32.2 years. There were 26 males and 76 females.

The method we used was a questionnaire. Following Wallbott and Scherer (1985) one approach in emotional research is to question persons about their memories of situations in which they have experienced specific emotions. In this context especially open questions are suitable for revealing individual experiences. So the subjects of our investigation were asked to name the three emotions that they usually experience during their exercises. They could answer free in form of adjectives or nouns. Subjects should also mentioned personal and situational factors connecting with their feeling. In addition they should describe their emotional state before and after activities.

For evaluation all mentioned terms of emotions were listed and counted. In order to obtain a general idea about the diversity of terms similar emotions were integrated into categories. By that we were following results of cluster analyses and linguistic analyses of Mees (1992) and Schmidt-Atzert and Ströhm (1983).

SELECTED RESULTS

The emotional experiences during the exercises are marked by a great variety. So about 50 terms of emotions were said. Among that are terms as 'concentration' and 'motivation' that don't represent emotions in the narrower sense. They describe rather perceptions of the functional state of mind. But because person asked considered such terms as their feelings we took it into evaluation too. The results of integrating all terms into categories are shown in Table 1. Feelings of relaxation are named most frequently. Joy and happiness as well as peace of mind are mentioned quite often. About a quarter of participants feel that they have

Emotions in Context of Health-orientated Gymnastics

moving and breathing, lying on one's back and breaks between exercises. Some subjects reported that they enjoy the transition away from daily stress. Joy and happiness were attributed to common interest and sense of community, taking part actively, doing something nice for one's own person and overcoming difficulties. Effort was explained by inadequate fitness, strain on certain muscles and the difficulties to bring oneself to go to practicing hour.

The emotional state before exercises is characterized by having mixed feelings (Table 3). About half the subjects named stress. Nearly 40 % of them said that they feel tiredly. But a considerable share of participants reported that they feel joyful anticipation and expectance in view of forthcoming practicing hour. Significant differences between males and females are not realized. In tendency females mentioned tiredness more frequently.

Nearly all participants (92.2 %) believed that exercises have influence on their mood after practicing hours. In detail they reported about relaxation (24.3 %), well-being (18.5 %), satisfaction (11.7 %), peace of mind (11.7 %), good humour (9.7 %) and various other terms describing good feeling. Only 5 % of them emphasized an adverse effect, specially exhaustion. In opinion of 49 % of subjects positive or negative effects continue in the course of the same day depending how things go. 15 % of them said that they could perceive pleasant effects even about two or more days. On the other hand 15 % of subjects experienced that effects last one or two hours.

DISCUSSION

In difference to performance-related sport (Hackfort & Schlattmann, 1991; Rethorst, 1992) in context of health-related exercises the emotional experiences of participants are mainly characterized by relaxation and peace of mind. Although programs as "physical fitness", "back school" and "yoga" make clear and try to reduce weak points of body participants enjoy exercises. Without competition and performance-orientation they also experience positive emotions in form of joy and happiness, satisfaction, pride and self-esteem, whereas

Emotions in Context of Health-oriented Gymnastics

to make an effort during exercises. Hardly any 'negative' emotions were pointed out. There are not significant differences in verbalization about emotional experiences between males and females (chi-square test).

Table 2 shows emotional experiences during exercises in dependence on kind of programs. There are some significant differences. Participants in "yoga" reported more frequently about relaxation than participants in "physical fitness" ($\chi^2_{1,0.001} = 10.981$) and in "back school" ($\chi^2_{1,0.05} = 4.691$). Peace of mind was also mentioned more frequently by participants in "yoga" compared to participants in "physical fitness" ($\chi^2_{1,0.001} = 13.531$) as well as by participants in "back school" compared by participants in "physical fitness" ($\chi^2_{1,0.05} = 3.958$). If the emotions satisfaction, pride and self-esteem are considered together participants in "physical fitness" placed more emphasis an such emotions of self-evaluation than participants in "yoga" ($\chi^2_{1,0.05} = 5.830$).

There are hardly differences in dependence on age. But subjects that are equal or older than 30 years reported more frequently about feeling relaxation in comparison with younger participants ($\chi^2_{1,0.01} = 8.869$).

It was also evaluated emotional experiences depending on duration of participation at exercises. Subjects that regular practise longer than one year mentioned more frequently feeling effort ($\chi^2_{1,0.05} = 4.058$) and ambition ($\chi^2_{1,0.01} = 7.708$) as well as the emotions of self-evaluation ($\chi^2_{1,0.05} = 6.578$). The one who practise less than one year told more often about peace of mind ($\chi^2_{1,0.05} = 4.318$).

In opinion of subjects certain factors during practice hours affect emotional state. As far as relaxation and peace of mind is concerned they made responsible mainly the atmosphere and the specific way of practising. In regarding to atmosphere they emphasized the language accompaniment of exercise leader, especially the pleasant and calm voice, the subdued action of light and the relaxing music. The specific way of practising was characterized by such facts as the slow motions, the connection of motions and breathing, the self-observation of

Emotions in Health-orientated Gymnastics

negative emotions don't often characterize feeling. The atmosphere and the specific way of practising support them in finding such a positive relationship to exercises.

The differences in dependence of duration of involvement indicate that emotional experiences change in the course of time. Whereas in the first time participants especially enjoy the transition from daily stress and feel relaxation advanced exercisers go over to focus on the fact of developing abilities. Obvious self-evaluation of one's own activities creeps into the thinking and feeling of advanced exercisers much more.

By viewing the results of this study is raising the objection that subjects practise regular physical activities for a longer time, some of it about one year and more. It seems they were successful to find out pleasant sides of exercise. In future it would be interesting to compare emotional experiences of participants and dropouts and to reveal reasons for differences in feeling.

REFERENCES

- Hackfort, D. & Schlattmann, A. (1991). Funktionen der Emotionspräsentation beim sportlichen Handeln. In D. Hackfort (Eds.), Funktionen von Emotionen im Sport (pp. 141-188), Schorndorf, Verlag Karl Hofmann
- Mees, U. (1992). Die Struktur der Emotionen. In U. Mees (Eds.), Psychologie des Ärgers (pp. 1-29), Göttingen, Toronto, Zürich, Verlag für Psychologie
- Pahmeier, I. (1994). Drop-out und Bindung im Breiten- und Gesundheitssport. Sportwissenschaft, 24, 117-150
- Rethorst, S. (1992). Kognition und Emotion in sportlichen Leistungssituationen. Köln, bps
- Schmidt-Atzert, L. & Ströhm, S. (1983). Ein Beitrag zur Taxonomie von Emotionswörtern. Psychologische Beiträge, 25, 126-141
- Wallbott, H. G. & Scherer, K. R. (1985). Differentielle Situations- und Reaktionscharakteristika in Emotionserinnerungen: Ein neuer Forschungsansatz. Psychologische Rundschau, 34, 83-101
- Wankel, L. M. (1985). Personal and Situational Factors Affecting Exercise Involvement. Research Quarterly for Sport and Exercise, 56, 275-282
- Ulich, D. (1989). Das Gefühl. München, Psychologie Verlags Union
- Ulich, D. & Mayring, P. (1992). Psychologie der Emotionen. Stuttgart, Berlin, Köln, Kohlhammer

Table 1. Emotional Experiences during Exercises

	Total (N = 103) ¹		Males (N = 26)		Females (N = 76)	
	Count	Percent	Count	Percent	Count	Percent
Joy and Happiness	44	42.7	14	53.8	29	38.2
Satisfaction	11	10.7	2	7.7	9	11.8
Pride	4	3.9	1	3.8	3	3.9
Self-esteem	12	11.7	3	11.5	9	11.8
Relaxation	62	60.2	14	53.8	48	63.2
Well-being	15	14.6	2	7.7	13	17.1
Easiness	8	7.8	0	0	8	10.5
Peace of Mind	39	37.9	13	50.0	26	34.2
Activation	16	15.5	1	3.8	15	19.7
Effort	29	28.2	5	19.2	23	30.3
Ambition	8	7.8	5	19.2	3	3.9
Motivation	8	7.8	2	7.7	6	7.9
Surprise	5	4.9	2	7.7	3	3.9
Concentration	19	18.4	5	19.2	14	18.4
Openness	1	1.0	1	3.8	0	0
Softness	1	1.0	0	0	1	1.3
Tiredness	2	1.9	2	7.7	0	0
Frustration	3	2.9	1	3.8	2	2.6
Sadness	1	1.0	0	0	1	1.1
Unsteadiness	1	1.0	1	3.8	0	0
Restlessness	1	1.0	1	3.8	0	0
Indiposition	1	1.0	1	3.8	0	0
Listlessness	2	1.9	1	3.8	1	1.3

¹One person didn't mark his gender.

Table 2. Emotional Experiences during Exercises in Different Programs

	Physical Fitness (N = 30)		Back School (N = 28)		Yoga (N = 45)	
	Count	Percent	Count	Percent	Count	Percent
Joy and Happiness	17	56.7	11	39.3	16	35.6
Satisfaction	5	16.7	4	14.3	2	4.4
Pride	4	13.3	0	0	0	0
Self-esteem	4	13.3	2	7.1	6	13.3
Relaxation	12	40.0	15	57.7	35	77.8
Well-being	5	16.7	4	14.3	6	13.3
Easiness	1	3.3	2	7.1	5	11.1
Peace of Mind	4	13.3	10	35.7	25	55.6
Activation	3	10.0	6	21.4	7	15.6
Effort	15	50.0	11	39.3	3	6.7
Ambition	5	16.7	2	7.1	1	2.2
Motivation	3	10.0	4	14.4	1	2.2
Surprise	3	10.0	0	0	2	4.4
Concentration	4	13.0	3	10.7	12	26.7
Openness	0	0	0	0	1	2.2
Softness	0	0	0	0	1	2.2
Tiredness	1	3.3	0	0	1	2.2
Frustration	1	3.3	1	3.6	1	2.2
Sadness	0	0	1	3.6	0	0
Unsteadiness	0	0	1	3.6	0	0
Restlessness	0	0	0	0	1	2.2
Indisposition	0	0	1	3.6	0	0
Listlessness	1	3.3	1	3.6	0	0

Table 3. Emotional Experiences before Exercise

	Total (N = 103) ¹		Males (N = 26)		Females (N = 76)	
	Count	Percent	Count	Percent	Count	Percent
Stress	55	53.4	16	61.5	38	50.0
Restlessness	16	15.5	6	23.1	10	13.2
Aggressiveness	3	2.9	2	7.7	1	1.3
Anxiety	5	4.9	1	3.8	4	5.3
Tiredness	40	38.8	7	26.9	32	42.1
Dissatisfaction	3	2.9	1	3.8	2	2.6
Effort	15	14.6	4	15.4	11	14.5
Listlessness	21	20.4	4	15.4	17	22.4
Joyful Anticipation	31	30.1	9	34.6	6	7.9
Motivation	8	7.8	2	7.7	6	7.9
Activation	2	1.9	0	0	2	2.6
Relaxation	5	4.9	2	7.7	3	3.9
Peace of Mind	1	1.0	0	0	1	1.3
Expectance	20	19.4	4	15.4	16	21.1
Openness	1	1.0	0	0	1	1.3
Concentration	3	2.9	3	11.5	0	0

¹One person didn't mark his gender.

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AGGRESSION IN JUDO

ABBREVIATIONS and SYMBOLS:

OG – Olympic Games

WC – World Championships

EC – European Championships

PC – Poland Championships

BD-100 – Test Buss, Durkee, containing 100 questions on aggression

IPSA-83 – Inventory of Psychological Syndrom of Aggression – test containing 83 questions

INTRODUCTION

Recent years brought the growing number of better and better results achieved in different sport disciplines. We must realize that when striving for improvement of the efficiency of a training process just science is the decisive factor and higher quality means practically the rationalization of all the training activities. The transition from the scientific knowledge to its practical application in training is very complicated and proves successful only when such theoretical knowledge forms guidelines for practical activities. It is essential to keep to systematic proceedings according to scientific rules and to introduce at the same time the research methods. After some time we surely are able to have our activities oriented on the most effective results. This paper deals with aggression at judo sportsmen. The main objective here is to change the universal opinion according to which competitors in this sport discipline are aggressive persons having difficulties with constraining their violent behaviours and very eager to appear in conflicting situations. The research on aggression in sport was conducted, among others, by J. Supiński (4, 5). The results proved that judo as a combat sport discipline is perceived as very aggressive. While listening to sport commentaries from judo contests, one can learn about „aggressively fighting competitors” or overhear a coach prompting his team member „fight more aggressively”.

People having affiliations with judo who were asked in a questionnaire to give the ranking of the 50 most aggressive disciplines, classified judo at very high positions. Club team

competitors placed judo on the 6th place, representatives of the national team on the 5th, trainers on the 8th and referees on the 7th.

Usually aggression is associated with positive as well as negative meanings. From the research done by J. Supiński (4, 5) using a questionnaire, it turns out that judo competitors associate aggression:

- in the positive meaning with:
 - activeness, persiverance
 - ambition, courage
 - impulsiveness
 - determined attack while fighting
 - stubbornness
 - combat willingness
 - desire to defeat the opponent and achieve victory
- in the negative meaning with:
 - breaking rules
 - fauling
 - doing harm, malice
 - assault, anger
 - hatred
 - „battering” to the mat after the throw
 - vicious kicks and strikes
 - overdragging arm-locks
 - bites
 - finger twisting
 - purposeful causing pain to the opponent
 - attacks at prohibited or sore areas
- in the double meaning
 - valor but also brutality
 - immediate contact with the opponent but also foul
 - endurance in attaining goals but also not fair behaviour
 - increased activity but also arrogance

R. Kalina (3) suggests separating the positively perceived aggression from the negative one by naming it as „combat attitude”, the certain level of which is indispensable for achieving best results in sport.

The hypothesis put in this paper assumes dependance between the level of aggression and sport results in judo.

RESEARCH MATERIAL

In the research altogether 126 competitors took place from different Polish sport clubs. The authors of the paper divided them in 3 groups:

1. Medal winners of Olympic Games, World Championships and European Championships.
2. Medal winners of Poland Championships.
3. The rest of competitors without meaningful results.

TABLE 1. Division of Competitors According to Sport Achievements.

No	COMPETITORS GROUPS	NUMBER OF COMPETITORS	PERCENTAGE
1.	OG,WC,EC Medal Winners	14	11.1
2.	PC Medal Winners	63	50.0
3.	The Rest of Competitors	49	38.9

The research results referred to in this paper were collected by the Psychology Department of The Academy of Physical Training in Wrocław in the years 1981-1990.

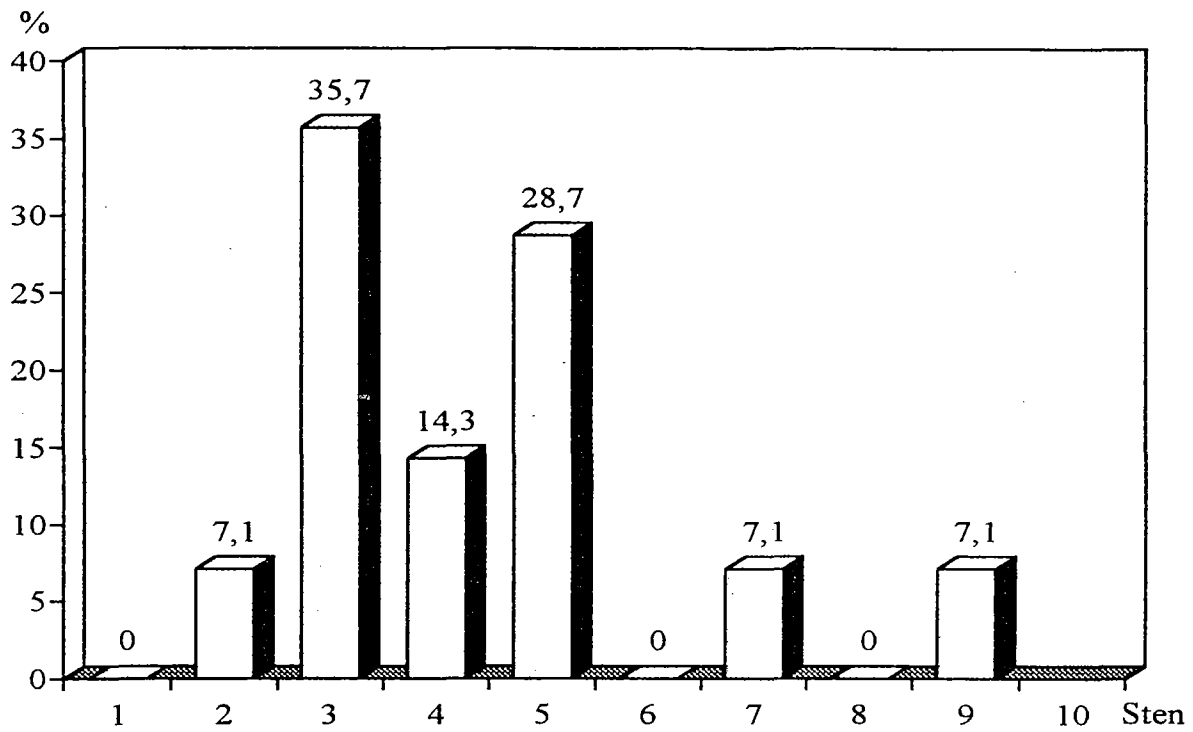
Aggression was measured by means of two highly correlated tests: BD-100 (1) and IPSA-83 (2). Both tests yield results in a 10-grade scale which allows, on one hand, to make use of them exchangeably and, on the other, to increase the number of the examined competitors as some of them underwent tests with BD-100 and some with IPSA-83. Sten scale and related raw results of both tests were applied after E. Wlaziło (7).

RESEARCH RESULTS

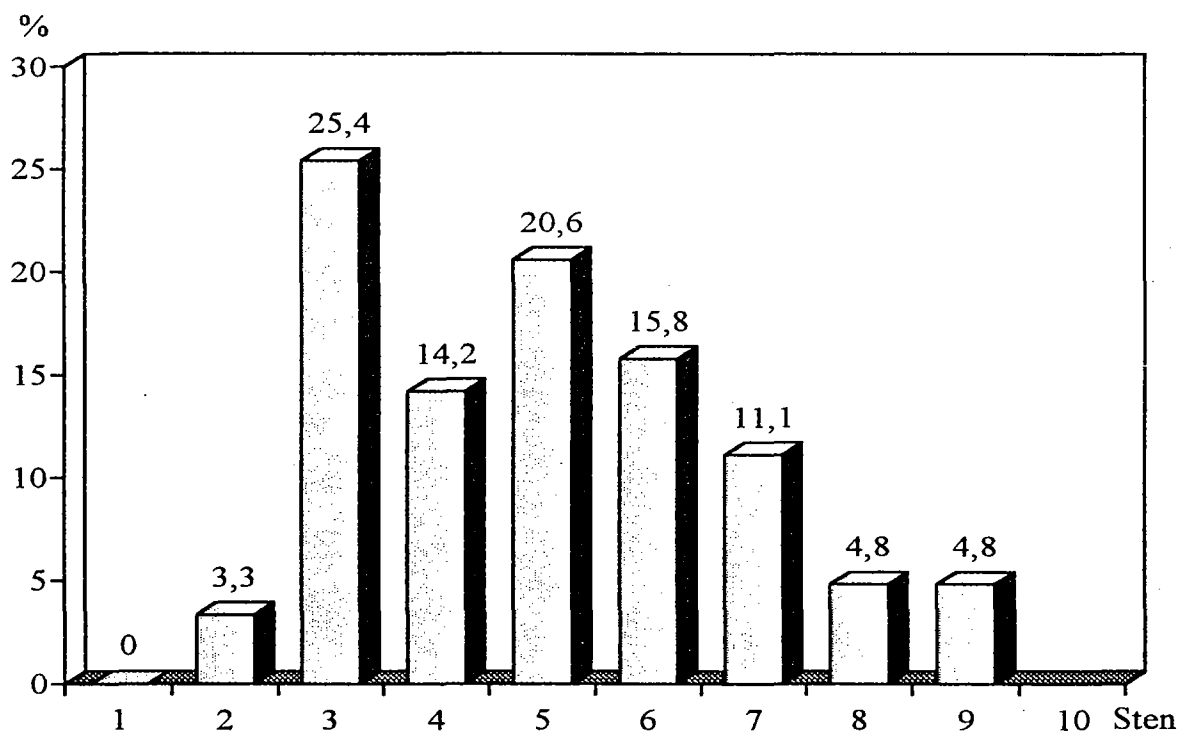
The results of the research were classified and systemized in the form of a table. For better presentation they were also depicted in histograms 1-4.

TABLE 2. Results in Percentage According to the Level of Aggression

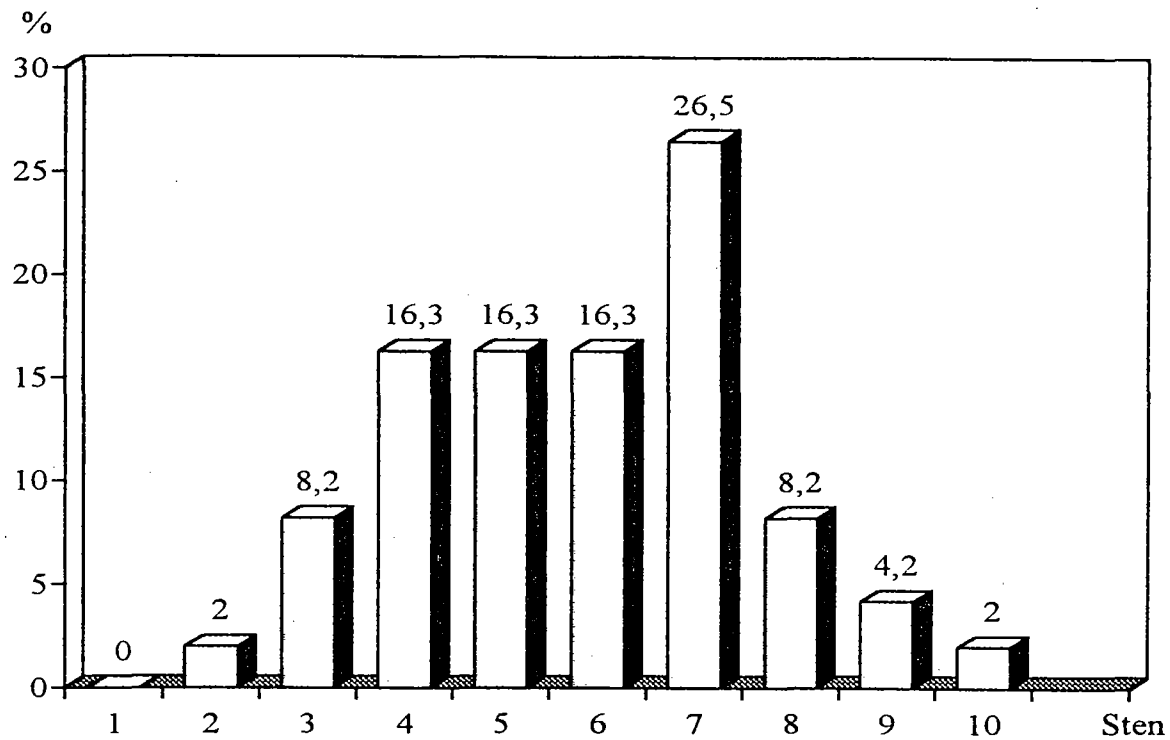
Results in stens	Whole group	OG,WC,EC Medal winners	PC Medal winners	The rest of competitors
very low 1-2	3.2	7.1	3.3	2.0
low 3-4	34.9	50.0	39.6	24.5
average 5-6	34.0	28.7	36.4	32.6
high 7-8	22.3	7.1	15.9	34.7
very high 9-10	5.6	7.1	4.8	6.2



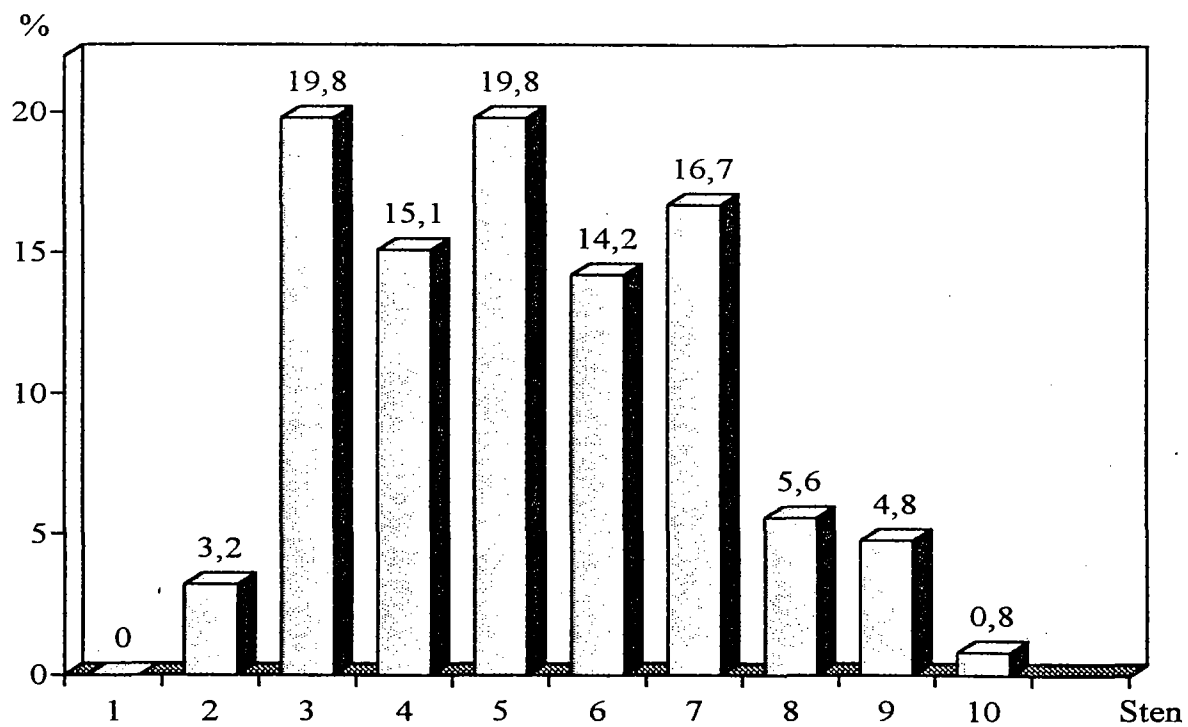
Hist. 1. OG,WC,EC Medal Winners



Hist. 2. PC Medal Winners



Hist. 3. The Rest of the Competitors



Hist. 4. The Whole Group

DISCUSSION

A preliminary research conducted by K. Witkowski and E. Jaskólski on a 50-person group of competitors from one of Wrocław sport clubs preceded publication of this paper. A tendency observed in that preliminary research was fully confirmed and vastly justified in the present country-wide study.

The authors' intention in this paper was to check whether success in sport influences the level of aggression of judo competitors. The results definitely confirm the hypothesis assumed at the beginning – the more significant sport achievements, the lower level of aggression at a given sportsman. What is the reason of such a phenomenon? According to the authors it is the result of years-long shaping of sportsmen behaviours and attitudes by the training process and sport regulations of judo competition.

It must be stressed that judo is not only a sport – in great measure it is influenced by ZEN philosophy. All the elements directly threatening sportsman's life or health have been eliminated and the idea of the very fight excludes causing harm to the opponent when struggling for victory. A bow of salutation preceding and following each fight is the sign of courtesy and regard towards the rival. A fight may be won only when regulations are strictly obeyed. A competitor not complying to rules is going to be punished and in case he keeps on disregarding regulations he may be disqualified. Such an improper behaviour and its consequences considerably limit chances for success.

A definite level of aggression at judo sportsmen seems also to be influenced by the selection taking place in course of training period and leaving only those with character features suitable for judo. What influences these features in greater measure, a training process or selection, is difficult to establish. It would require creating another control group, a subject to periodical analysis. However, it is a hard task to compose such a group as there is no way to foresee which competitors will continue practicing judo until senior age and even more so which of them will prove meaningfully successful. Those boasting internationally acknowledged results are scarce due to enormous competitiveness and limited number of medal positions. The above is reflected in the results in the histogram 1 where a very little number of competitors caused the lack of anyone with the aggression level reaching 6 or 8 stens.

CONCLUSIONS

The greater sport achievement, the lower level of aggression at judo sportsmen.

REFERENCES

1. Buss, A.H., Durkee, A., (1972), Skrócony podręcznik do testu: „Nastroje i Humory” opracowany na podstawie podręcznika M. Choynowskiego, Warszawa, Ministerstwo Oświaty i Wychowania.
2. Gaś, Z., (1980), Inwentarz Psychologiczny Syndromu Agresji, Przegląd Psychologiczny, 1, 143-157.
3. Kalina, R.M., (1991), Przeciwdziałanie Agresji, Warszawa, Polskie Towarzystwo Higieny Psychiczej.
4. Supiński, J., (1991), „Agresja w sporcie, jej determinanty i następstwa społeczno-wychowawcze”, Rozprawa Doktorska, Wrocław, Akademia Wychowania Fizycznego.
5. Supiński, J., (1993), Agresywność studentek wychowania fizycznego – zawodniczek, Trening, 4, 128-136.
6. Witkowski, K., Jaskólski, E., (1986), Ocena wybranych parametrów sprawnościowych i kryteriów osobowościowych zawodników judo, Rozprawy Naukowe Akademii Wychowania Fizycznego we Wrocławiu XX, 197-206.
7. Wlazło, E., (1991), Osobowościowe i sytuacyjne determinanty celowego zachowania się człowieka w świetle badań naukowych. Studia i Monografie, Wrocław, Akademia Wychowania Fizycznego.

PECULIARITIES OF PSYCHOLOGICAL AND PHYSIOLOGICAL REACTIVITY IN CYCLIST IN THE STATE OF EMOTIONAL STRAIN

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Key words: competitive activity, mental stress, emotional strain, ratio of emotional reactivity, functional fitness.

Mental stress is a regulatory process of athlete functional capacities aimed at efficient and reliable performance of training and competitive activity. In the given aspect, mental stress may be considered through inner mechanisms of activity self-regulation providing its efficiency and reliability, in particular by means of such integral mechanisms of mental self-regulation as emotions, will, intellect and intuition (Fig.1).

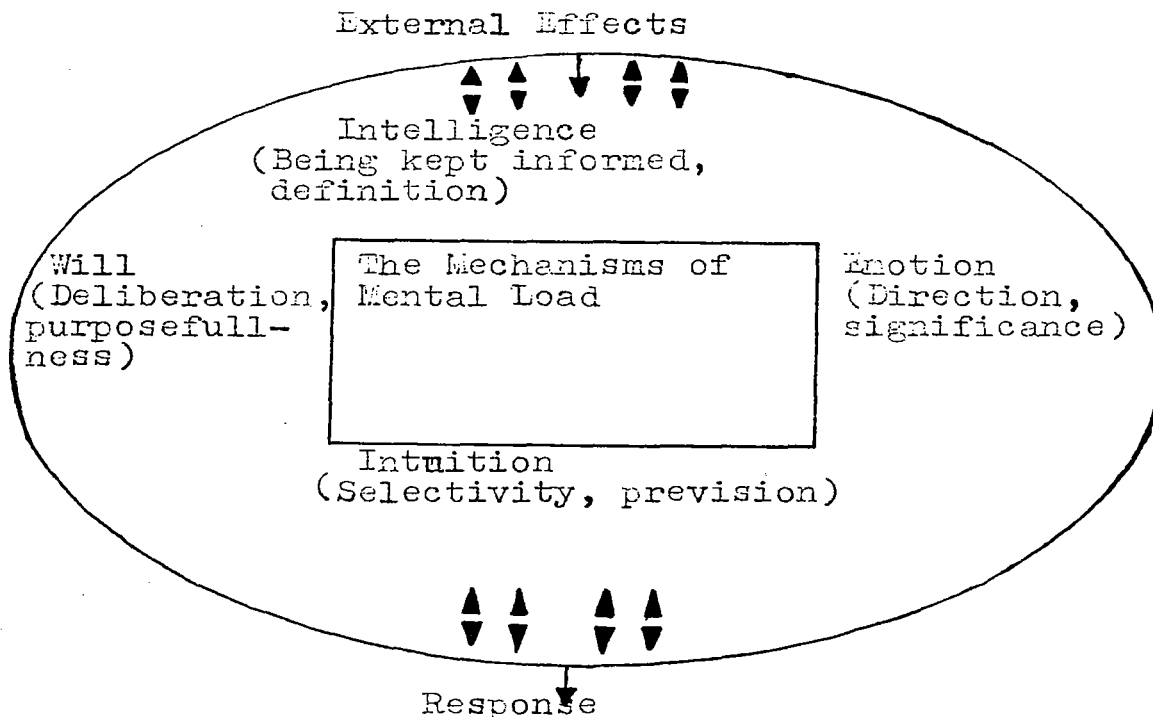


Fig.1. Major Inner Mechanisms Constituting the Features of Mental Stress.

Concrete functioning of these mechanisms and their combinations determines, to a great extent, athlete's tolerance

and fitness for mental stress under extremal conditions of athletic activity.

One of the most prevailing mechanisms within specific conditions of forthcoming competitive stress are emotional mechanisms of mental stress which are manifested in athletes as a pre-start state of emotional strain.

Expressed level of pre-start emotional strain is provoked, mainly, by subjective attitude of athlete to competitions rather, then objective factors, such as, physical loads and may occur long before the beginning of competitive activity (1, 4, 7, 8, 9, 10). The most expressed emotional regulation of mental stress in different manifestations: motor, vegetative, intellectual, volitional, is observed just before the competitive activity. Emotional mechanisms provide "tuning" of the body, its mobilization for action of the load, its fitness for efficient competitive activity. On the whole, the effect of action of mental stress emotional mechanisms under pre-competitive conditions may be quite different in its impact on efficiency and reliability of competitive activity.

The problem of study of emotional regulation mechanisms is actual for modern preparation methods in cyclic sports events and cycling (road), in particular. It is due to the fact, that elaboration of methods of objective evaluation of the impact of pre-start emotional strain on functional systems restricting high level of work capacity of athletes is of great importance for cycling (2, 4, 5).

Methods. Our studies were aimed at investigation of pre-start emotional strain (according to indices of operative control) in cyclists with different level of preparedness for competitive activity.

Operative control in the given case provides necessary information about the level of functional fitness, thus allowing to determine weak aspects in the structure of competitive activity, in the aspect of directed development of aerobic and anaerobic capacities of cyclists, on the one hand, and formation of individual style of activity (ISA), on the other

hand.

Heart rate (during rest, before start and in the process of competitive activity: at start, at the first and at the second halves of distance and at finish) was recorded by means of "Sporttester" microcomputer device (7).

Elite athletes of two teams (average age - 21 years) were tested.

The major attention was paid during analysis of heart rate dynamics at the action of emotional mechanisms of mental stress (emotional reactivity, in particular) in athletes characterized by successful and less successful competitive activities at starting part of distance.

We suggested that the greatest efficiency of competitive activity is achieved by cyclists with low indices of reactivity during emotion stress before start.

Ratio of reactivity a minute before start and at the 6th minute of starting segment of activity was calculated according to formula: $R_r = \frac{HR \text{ back} - HR \text{ before}}{HR \text{ back}}$; $R_r = \frac{HR \text{ back} - HR 1}{HR \text{ back}}$,

where, R_r - ratio of emotional reactivity;

HR back - absolute values of index during morning measurements;

HR before - absolute values of index a minute before competitive load.

HR 1 - mean values of index in the process of competitive activity (at 6th minute) relative to the first and the second positions of athletes.

Besides objective index of HR for estimation of athletes' emotional state before competitions, methods of situational anxiety of Spilberger-Khanin and colour test of Lucher (8 colour) were used (8).

Efficiency of competitive activity (in the process - of control segment and two trials) of cyclists was evaluated in the following parameters: mean time of cyclists at the first position; starting velocity; number of transitions; degree of work capacity recovery according to differences in HR in-

tensity (beats/min) at the 1st and the 2nd positions (Table 1).

Results and discussions.

TABLE 1. Efficiency Indices of Competitive Activity of
the Most (A) and the Less (B) Successful Team
in the Given Competitions

Competition:	Result at 100 km:		Starting velocity km/h, (10 km)		Av. time at 1 position, s (10 km)		Number of tra-nsitions (10 km)		Difference in intensity of recovery at 1-2 positions	
level :	A	B	A	B	A	B	A	B	A	B
Control start (15 km)	-	-	51.84	50.68	31	30.1	5.6	5.9	18.3	16.9
Trials I	1.57,53	1.58,36	59,63	51,2	30,0	29,3	5,7	6,0	16,8	16,1
Trials II	1.54,28	1.55,42	55,19	53,39	30,2	28,1	5,4	6,0	16,4	15,6

Efficiency level of the competitive activity of cyclists of two teams (A and B) was determined and analyzed according to relative indices, i.e. ratio of pre-start value to start values of HR in the process of competitive activity and not by means of level of absolute value of HR before load.

The given ratio characterizes individual and model peculiarities of emotional regulation of vegetative function to energy expenditures of functional system restricting high level of athletes' special work capacity.

Due to the above, interrelation between ratios of emotional reactivity (R_r) of HR and indices of efficiency of activity was established on the basis of interpretation of correlational analysis findings.

It has been discovered that ratio of emotional reactivity of HR before competition has a negative correlation with indices of efficiency of cyclists' competitive activity ($p < 0,05$; $r = - 0,79$). Ratio of emotional reactivity registe-

red at the distance of start segment has positive correlations with the indices of competitive activity efficiency at the same significance level (at $r = - 0,81$).

Negative correlation between emotional reactivity and activity efficiency indicates that in athletes with more successful achievements of competitive results the shift difference between back HR values relative to prestart ones has a lesser difference than that in athletes with less successful activity indices (Fig.2).

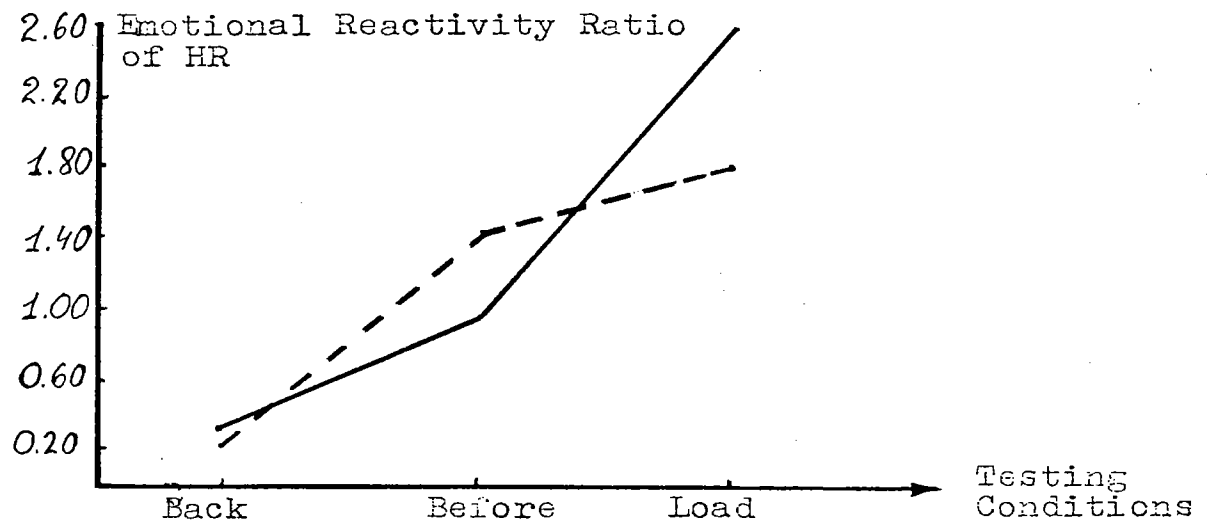


Fig.2. Diagram of Values for Emotional Reactivity Ratio Changes in Athletes with Successful (A) and Less Successful (B) Competitive Activities.

Conventional signs: Back - back evaluation of vegetative index; Before - evaluation during minute preparedness for competitive load; Load - evaluation in the process of physical load at the start segment of distance.

Linear diagrams presented in Fig.2 reflect the model features of HR emotional reactivity pre- and during competitive loads in cyclists with different successes of activity. Analysis indicates that the higher the ratio of emotional reactivity before start and the lower the ratio at the start segment of distance the less successful is performance. And vice versa, the higher is the ratio of emotional reactivity at the start segment and the lower is the ratio before start the more suc-

cessful is competition.

Probably, in athletes with the most efficient competitive activity, functional mechanisms are strengthened at the account of optimal realization of energy expenditures under mental load directly in pre-start conditions and during competitive activity. In athletes with less successful activity, dynamics of vegetative shifts in the process of competitive load supply is predominantly determined at the account of excessive expenditures under pre-start conditions due to higher pre-load ratio of emotional reactivity. The athletes rather "burn out" during pre-competitive setting for competition by forecasting their success or failure in it.

Availability of unadequate emotional response to mental load in the athletes of survey sample is confirmed by positive correlation between pre-load HR value and subjective indices of situational anxiety according to Spielberger-Khanin methods ($r = 0,48 - 0,54$), as well as quantitative indices of total deviation (TD) of colour selection from "AT - standard" where $\bar{X} = 18$ points according to the test, whereas for the group of athletes with successful activity TD - according to $\bar{X} = 10$ points.

Thus, issuing from the ratio of emotional reactivity, dynamics of energy expenditures under emotional stress mediated by the features of mental load effect has significant valid difference for athletes with different successes of competitive activity which confirms our hypothesis. It should be mentioned that analysis of relations within functional system limiting the level of special work capacity which allows to interpret the changes in energy expenditures with respect to pre-start level and not selective analysis according to pre-load absolute indices and those ones in the process of competitive activity is the objective evaluation for mental load emotional mechanisms which influence efficient competitive activity of cyclists.

1. Аболин Л.М./1987/. Психологические механизмы эмоциональной устойчивости человека. Казань. Казанский университет.
2. Бахвалов В.А. & Романин А.Н./1983/. Психологическая подготовка велогонщика. Москва. Физкультура и спорт.
3. Гошек В./1983/. Неудача как психическая нагрузка. Стресс и тревога в спорте. Москва. Физкультура и спорт. С.64-72.
4. Ердаков С.В. & Капитонов В.А. Михайлов В.В./1990/. Тренировка велосипедистов-шоссейников. Москва. Физкультура и спорт.
5. Полищук Д.А./1986/. Велосипедный спорт. Киев. Выща школа.
6. Родионов А.В./1983/. Влияние психологических факторов на спортивный результат. Москва. Физкультура и спорт.
7. Soulek V. & Vondruska V. /1988/. Vynziti sport testeru ve sportovni praxi. Trener. 5, 15-16.
8. Управление психическим стрессом в спортивных соревнованиях. /1981/. Москва. Физкультура и спорт.
9. Филатов А.Т./1975/. Эмоционально-волевая подготовка велосипедистов. Киев. Здоров'я.
10. Филимоненко Ю.И. Юрьев А.И. Нестеров В.М./1982/. Экспресс-методика для оценки эффективности аутотренинга и прогноза успешности деятельности человека. Экспериментальная и прикладная психология. Вып. I4. Ленинград. Ленинградский университет. С.52-57.

SYMPOSIUM SESSION 1

- S.1.1.** Positive emotion in sport
- S.1.2.** New trends in research method

S.1.1. POSITIVE EMOTION IN SPORT

Chairperson : R. VANFRAECHEM-RAWAY

EFFECTS OF PHYSICAL EXERCISE ON SELF-CONCEPT AND SUBJECTIVE WELL-BEING: RESULTS OF FIELD EXPERIMENTS

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Oliver Stoll, University of Giessen, Germany

Key words: Exercise; self-concept; well-being

INTRODUCTION

The consequences of sport and exercise on health have been a major issue in sport sciences for years. In the beginnings the discussion and empirical studies were focused on physical health and on the effects of exercise on longevity. In the meantime we can see a shift in emphasis such that more and more the effects of exercise on the *quality* of life are emphasized. This also means that health cannot only be regarded as a physical matter but also as a psychological and social matter. Health, as defined by the World Health Organisation, means physical, psychological and social well-being. If sport and exercise could affect health then it would seem obvious that it could also affect mental health.

Folkins & Sime's summary review in 1981 is one the first concerned with the relationship of physical exercise and mental health. Though the authors were rather critical as to the methodological rigor and the experimental design of many studies done so far they nevertheless left no doubt that physical fitness training *could* be beneficial to mental health. Since then a growing body of research tries to demonstrate that sport and exercise may improve various aspects of mental health. The meta-analytic review by McDonald & Hodgdon (1991), published ten years after that of Folkins & Sime (1981), or the monograph of Biddle & Mutrie (1991), published in the same year, all come to the conclusion that there is growing evidence about health promoting effects of physical exercise. Exercise may help to improve mild forms of depressive states, may have anxiolytic and tension releasing effects. Exercise has an influence on mood states, it reduces anger and improves good mood. And it may also be able to heighten stress resitence and to strengthen self concept and even self-esteem. Though these conclusions sound rather optimistic, nevertheless a number of authors (e.g. Folkins & Sime 1981; Kirkcaldy & Shepard 1990; McDonald & Hodgdon 1991) complain of several shortcomings and deficiencies in the research literature.

One of the main problems of research done so far certainly concerns the experimental design and as a consequence the conclusion of causality or - technically spoken - the internal validity. Most studies were correlational or so-called survey studies comparing exercisers and non-exercisers at a certain point of time, the so-called dependent variables

being aspects of mental health, like mood states, self-concept and subjective well-being. Thus exercise was no experimental treatment and subjects were not divided up by chance to both groups but by way of self-selection. This means that differences between both groups might not only be attributed to physical exercise but to a variety of other variables as well. Thus the causal conclusion that exercise is the cause and mental health is the effect is not warranted. Instead the reverse could also be true: Good (mental) health is the cause of activity and exercise.

This problem of internal validity can be solved by an experimental design that compares the behavior of at least one treatment group, like physical exercise, with one control group and where subjects have been divided up by chance. Thus changes after the treatment and/or differences between treatment and control group could be attributed to the treatment and not to other variables. The first study as presented here is a field experiment studying long-term effects of exercise on mental health, with an experimental group and a no treatment control group.

THEORETICAL FOUNDATION

When scanning the literature it soon became obvious that the underlying causes of the effects of physical exercise on mental health not only are manifold but also must be differentiated with regard to the dependent variable, i.e. the psychological symptoms under investigation. It also became obvious that physical exercise is a rather vague and dubious kind of treatment. So we tried to specify not only the treatment (i.e. the independent variable) but also the dependent variables according to theoretical considerations. Which theoretical models did we rely on ?

(1) Robert Sonstroem (1984; 1988; Sonstroem & Morgan 1989) developed a model that postulates long-term effects of physical exercise on self-concept and self-esteem (cf. figure 2 in Sonstroem & Morgan 1989, p. 333). Grounded on a hierarchical model of self-concept, as demonstrated in Fox & Corbin (1989), Sonstroem starts from the fundamental idea that physical activity first of all influences the physical self-concept such that sport and movement improve the self-perception of physical competence, leading to a higher physical self-worth which means that the own body and the own physical competence is more positively evaluated. Having a more positive physical self-concept this should then lead to a heightened feeling of self-esteem, because an increase in one subarea of self-concept should lead to an increase in general self-concept, i.e. in self-esteem. Sonstroem's model is best to be tested longitudinally: Physical exercise should first influence physical self-concept and afterwards other subareas of self-concept and self-esteem as well. We tested this model in our study as will be explained later on.

(2) Besides self-concept which seems to be positively influenced by physical exercise (cf. McDonald & Hodgdon 1991) our study was also addressed toward effects of exercise on subjective well-being. Self-concept and well-being are both central aspects of mental health. Subjective well-being should both be defined via positive vs. negative affective states as well as via psychosomatic and somatic complaints (Diener 1984). Thus a person with positive subjective well-being should be in a good mood, feel happy and have a low incidence rate of psychosomatic complaints. Why should we expect physical exercise to improve subjective well-being? The theoretical foundations are not as clear and self-evident as those of the effects on self-concept. Of course we could also think of an increase in positive well-being because of a heightened self-concept and self-esteem, but this sounds all too simple. Mainly two additional theoretical assumptions should be mentioned here. First of all the assumption of 'unspecific circumstances': The effects of exercise on well-being are not so much dependent on exercise itself but more on its circumstances, like social support, experiencing social competence, and success. The second assumption rests on the Pygmalion effect, also called the expectancy effect. As participants of an exercise program have or build expectancies about the possible effects of exercise, why should they not think of effects on their mood and their well-being? In other words, if subjects expect their well-being, their health to be improved by means of physical exercise then they should be more apt to perceive these effects in themselves or/and to make their crosses on the right side of the scales.

A FIELD EXPERIMENT

Method and Design¹

So what did we do to test the assumption that physical exercise would improve self-concept and subjective well-being? In early Spring 1992 we published announcements in local newspapers and in faculties of our university saying that we were looking for non-exercisers (we called them beginners), willing to participate in a sport and exercise program for beginners at our institute for at least half a year. As more volunteers applied for the program than we were able to accept we could divide the beginners at random into an exercise group, consisting of 39 persons at the beginning, and a waiting group. After half a year the waiting group subjects also moved into an exercise program. All in all, there were three points of measurement. A first one at the beginning of the program in April '92, a second one six months later, when the experimental group had participated in our program for six months whereas the waiting group still had to wait, and a third one another 6 months later (in April '93), when the experimental group now had participated for 12 months and the waiting group for 6 months in an exercise program. We got complete data at all three points of measurement from 24 subjects of the experimental

group and from 13 subjects of the waiting group. All subjects were healthy adults, most of them in the age of 30 to 45. The 'treatment', i.e. the sport and exercise program consisted of 1 hour per week under our guidance, and subjects were encouraged to do more exercise on their own. The contents of the exercise program were manifold and primarily intended to train aerobic and anaerobic fitness. We were especially concerned about a positive and noncompetitive atmosphere in the groups and about maintaining adherence. The dependent variables consisted of three aspects of self-concept and of three aspects of subjective well-being. The self-concept was operationalized by standardized scales, measuring physical self-concept in four dimensions, which we expected to change at an earlier point of time than the two other aspects of self-concept. These two aspects were gender identity, which has been shown to correlate with engagement in sports, and self-esteem. Self-esteem consisted of two scales measuring general, achievement oriented, self esteem and social self-esteem. Thus both scales cover the two most important dimensions of self-esteem.

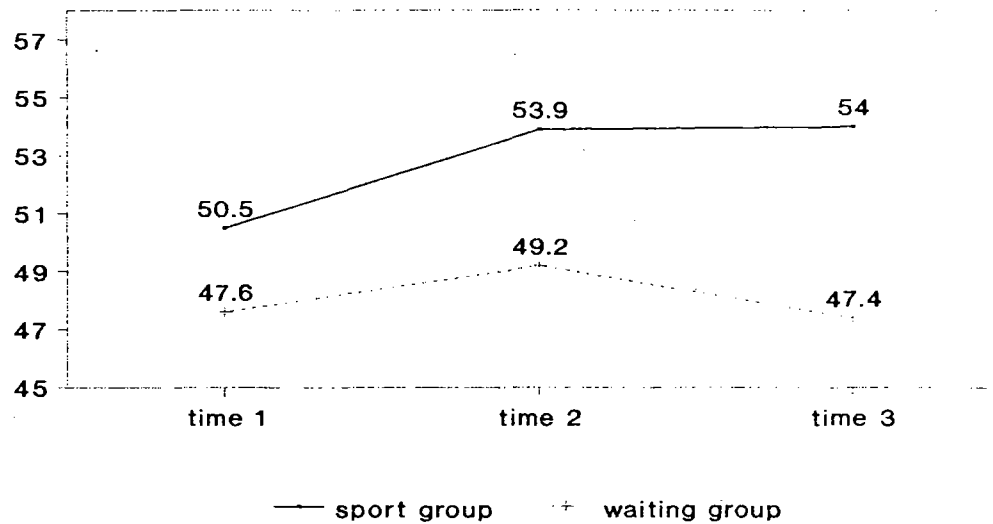
Subjective well-being was assessed in three aspects. First, by means of eight rating-scales, measuring habitual well-being, like 'In general I am in a good mood'. Second, we administered the trait anxiety scale by Spielberger, and third, a standardized scale measuring psychosomatic complaints. All subjects got the scales three times.

Results

The data were run separately for the three aspects of self-concept, for habitual well-being and for anxiety/psychosomatic complaints. We conducted multivariate analyses of variance with group and time as two factors. First the results will be presented for the first two data points, which represent a complete experimental 2x2-design. Afterwards we shall continue the presentation for the third data point, when the waiting group had participated in our exercise program for half a year, and the experimental group for 1 year.

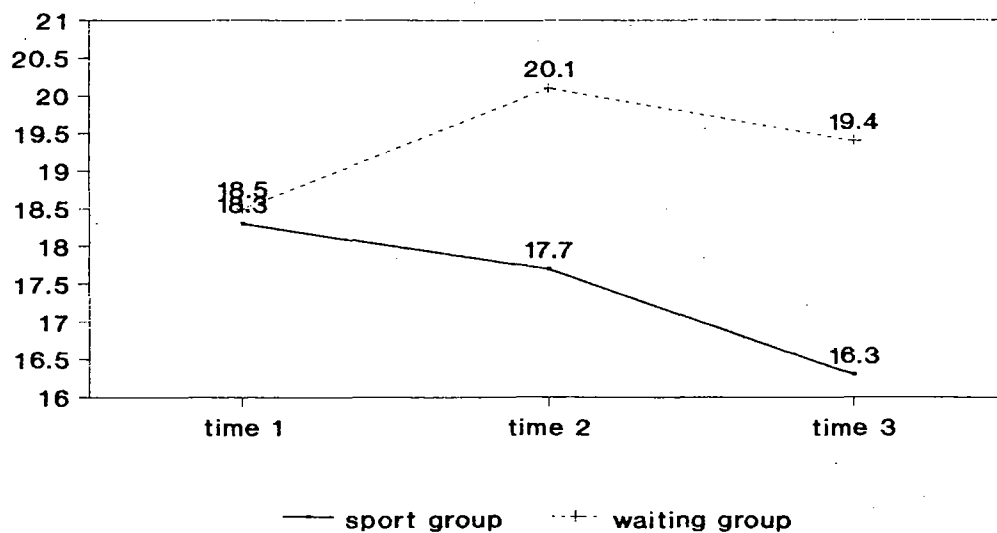
At the first data point the two groups did not differ. The multivariate analyses of variance for the first two data points revealed two interaction effects that were expected: for the physical self-concept and for psychosomatic complaints. As can be shown in figures 1 to 5 all effects result from the fact that the sport group improves in the five variables and the waiting group remains even or deteriorates. So these results of the first two data points clearly support Sonstroem's model that physical exercise first of all improves physical self-concept. As the variable of psychosomatic complaints also includes physical sensations and disorders and thus is not so far away from physical self-concept, this result may also be seen as supporting Sonstroem's model. But what happens when continuing for another 6 months?

Figure 1 Changes in
Positive Body Self-Concept



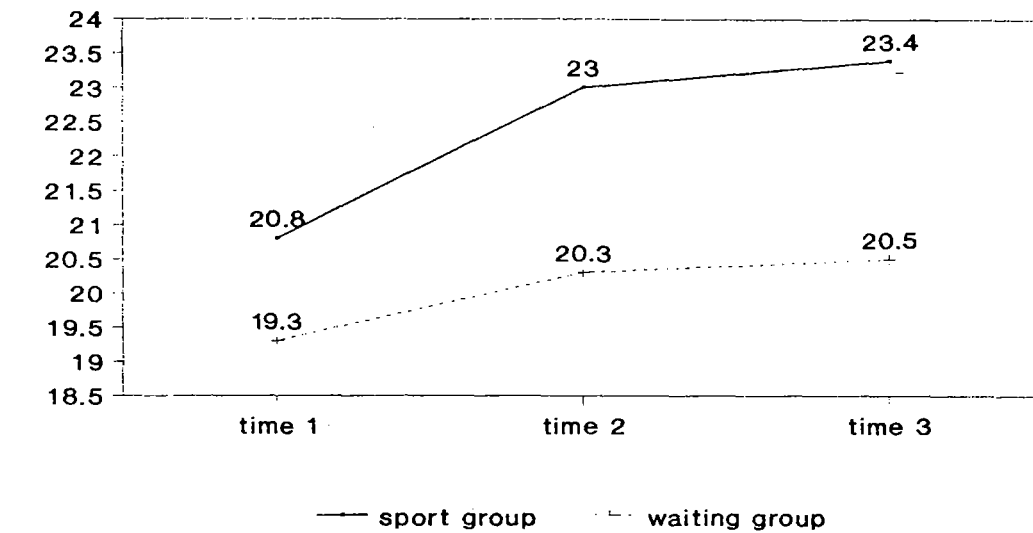
Scale ranges from 12 to 72
higher values indicate
a more positive self-concept

Figure 2 Changes in
Negative Body Self-Concept



scale ranges from 7 to 42
higher values indicate
a more negative body self-concept

Figure 3 Changes in Athletic Body Self-Concept



Scale ranges from 6 to 36
higher values indicate a higher
athletic body self-concept

Figure 4 Changes in Body Self-Concept (discontent with the figure)

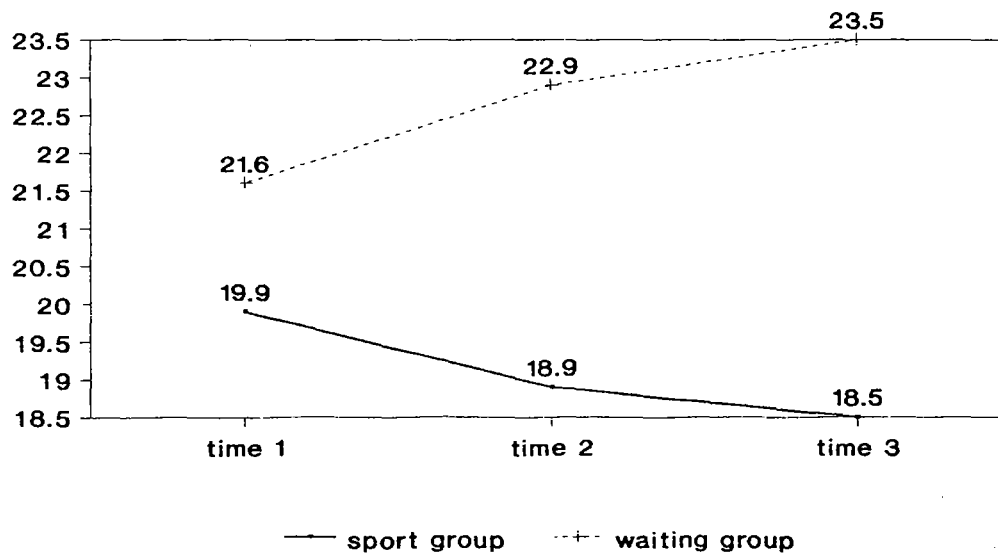
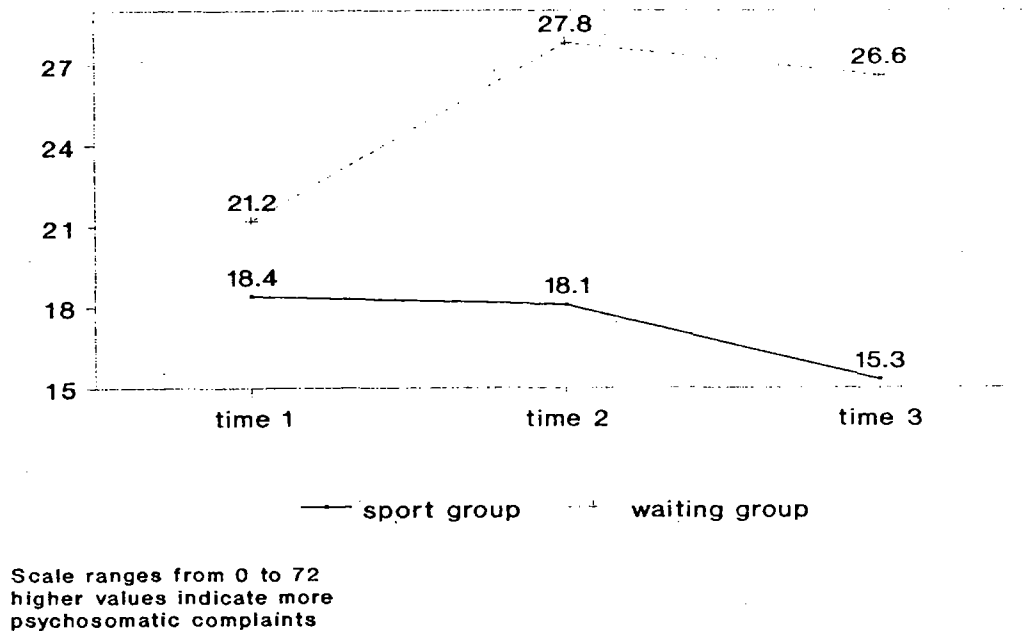


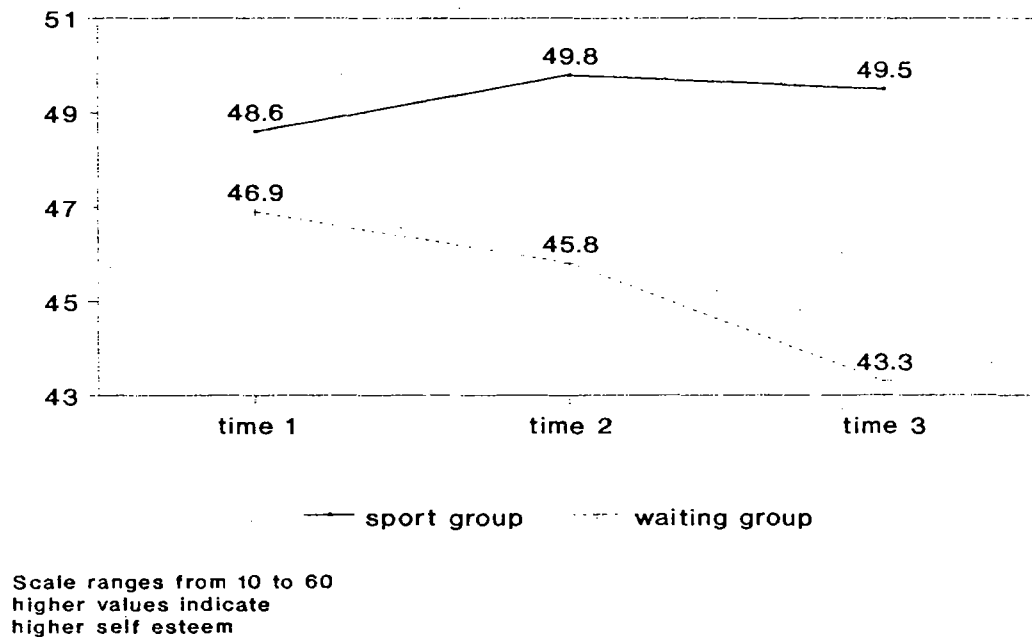
Figure 5 Changes in
Psychosomatic Complaints



The MANOVAS for the three data points showed interaction effects of time by group for three constructs: physical self-concept, self-esteem, and psychosomatic complaints. When you see figures 1 to 5, it becomes clear that the differences between the experimental group and the waiting group have remained. Physical self-concept and psychosomatic complaints have only slightly improved in the waiting group subjects after half a year of exercise. In the experimental group all variables remained even or have improved, like psychosomatic complaints.

A very important result refers to self-esteem. As can be seen in figure 6 the experimental group subjects increased in self-esteem significantly as compared to data point two and as compared to the waiting group at the same time. This means that in fact after a certain amount of time not only physical self-concept is affected by exercise but that also other aspects of self-concept show variations due to exercise. This corresponds perfectly to the model of Sonstroem & Morgan (1989).

Figure 6 Changes in
General Self Esteem



CONCLUSIONS

In sum we can say that exercise in fact is able to influence physical self-concept and in the long run also self-esteem. In addition subjective well-being was rising in the way that our experimental subjects complained less about psychosomatic hassles and illnesses. So this fits perfectly to our hypotheses. But why did the waiting group subjects not improve in the same way after beginning an exercise program? Our answer is that due to waiting such a long time subjects were less motivated at the beginning and it took a longer time for them to adhere to the program and to the group. So what I think afterwards is that one should not leave the waiting group alone for half a year but give them an alternative program, like meditation. May be that this is also effective, though probably not so much in the self-concept dimensions. What we can see from our data and from our own observations is the fact that not only exercise alone is an important factor but also the group atmosphere and the motivation of the subjects, the so-called 'unspecific circumstances'. These cannot be kept constant, especially not in a field experiment. All in all our data suggest that these circumstances in interaction with an exercise program combine to the effects we could observe here.

Exercise and mental health

In the meantime we have started with another field experiment. Again subjects are healthy adults between 30 and 50 years of age. They are randomly assigned to two treatment groups (jogging or aerobics) and to two control conditions (relaxation or callisthenics). This second experiment is designed as an extension of the first one. All subjects take part in the program for at least six months, so that long term effects on self-concept and well-being can be assessed. In addition stress-resistance is another dependent variable. The experiment is designed to test the effects of different activities (not only exercise) on mental health. Results of this experiment are to be expected in the near future.

References

- Biddle, S. & Mutrie, N. (1991). *Psychology of physical activity and exercise*. New York: Springer.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95, 542-575.
- Folkens, C.H. & Sime, W.E. (1981). Physical fitness training and mental health. *American Psychologist*, 36, 373-389.
- Fox, K.R. & Corbin, C.B. (1989). The physical self-perception profile: Development and preliminary validation. *Journal of Sport and Exercise Psychology*, 11, 408-430.
- Kirkcaldy, B.D. Shepard, R.J. (1990). Therapeutic implications of exercise. *International Journal of Sport Psychology*, 21, 165-184.
- McDonald, D.G. & Hodgdon, J.A. (1991). *Psychological effects of aerobic fitness training. Research and theory*. New York: Springer.
- Sonstroem, R.J. (1984). Exercise and self-esteem. *Exercise and Sport Science Reviews*, 12, 123-155.
- Sonstroem, R.J. (1988). Psychological models. In R.K. Dishman (Ed.), *Exercise adherence. Its impact on public health* (pp. 125-153). Champaign, Ill.: Human Kinetics.
- Sonstroem, R.J. & Morgan, W.P. (1989). Exercise and self-esteem: Rationale and model. *Medicine and Science in Sports and Exercise*, 21, 329-337.

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"BENEFITS OF EXERCISE FOR PEOPLE WITH PSYCHOLOGICAL DISORDERS"

J. BOUSSARD AND PROF. R. VANFRAECHEM-RAWAY

INTRODUCTION:

The development of psychosomatic medicine attests to our modern day belief in Homer's Philosophy:

"Mens Sana in Corpore Sano", and there is currently substantial interest in psychosomatic medicine in using exercise for the treatment of depression.

or psychological disorders (Cann and Holmes, 1984).

It's well known that physical exercise has positive implications in psychological well-being.

In the mechanisms mediating the beneficial effects on mental status are unknown, but various hypotheses have been postulated to explain them.

For MartinsEn (1990), the same psychological gains were found to accompany non-aerobic as well as aerobic exercise and are indirect arguments against the biological hypotheses.

This opens up the field for psychological mechanisms such as:

- Stress reduction (Berger B.G 1987).
- Enhancement of self esteem (Jorgenson, 1979) and self-efficacy (Bandura 1977).
- Reduction of the symptoms of depression (Simons, 1985).

OBJECTIVES:

From our present study, we would like firstly, to specify the mechanisms mediating the beneficial psychological effect of exercise and, secondly, to confirm that physical activities are an excellent therapy to add to psychiatric treatment

METHOD AND PROCEDURE:

(I) SUBJECTS

The subjects in the study are 50 adults and teenagers with psychological disorders (Neurosis - Borderline - Psychosis - Depression - Drug Addiction) from a day hospital of the University in Belgium.

The group is composed of 29 females and 21 males. The mean age is 35 years (+ 8 years old),
 The hospitalisation period averages 50 working days.
 During this period, all the patients received different treatments such as:

- Psychotherapy (in group and individuals).
- Ergotherapy
- Medication
- Physical exercise (3 times weekly).

The population with psychological problems are usually unfit and sedentary.

(II) EXERCISE PROGRAMME

The sport programme contains:

- Swimming, once a week for 45' and includes breathing exercises and relaxation.
- Psychomotor function, twice a week for 60' each session combining aerobics stretching, motor skills, co-ordination, improvement of body image, musculature, space and time organization.

All the activities are in groups with occasional private counselling.

For psychological improvement, the important factor seems to be the participation in the exercise itself rather than the fitness or any technique.

The experienced and qualified instructor gives to the patients specially adapted exercises, not too high a level. He motivates them to "move with pleasure".

(III) TESTING

We asked the patients to make 2 graphic representations of the human being, one at the beginning (pre-test) and one at the end (Post-test) of the hospitalisation period.

We then analysed the material according to Royer (1975) and Abraham (1962).

Abraham (1962) affirms that the representations of the human beings is able to measure the changes of self consciousness.

That test, according to Osterrieth (1976) favours the personal expressions.

It implies the reference of Drawer's body - image and of his social life.

This test leads to all sorts of projections and, therefore, constitutes in particularly abundant source of informations about the drawer himself and about the way his behaviour.

RESULTS AND DISCUSSION

To obtain a statistical analysis, we used the sign test (related sample).

We had compared various characteristics from the pre-test graphic and from the post-test graphic for each patient.

Table (1): Evolution between pre-test and post-test

<u>Characteristics</u>	<u>+</u>	<u>-</u>	<u>P</u>	<u>P < 0.05</u>
- Esthetic preoccupations	11	5	0.105	NS
- Aggressiveness - Anger	12	5	0.072	±S
- Anxiety	13	3	0.011	S
- Internal tension	17	6	0.017	S
- Feeling of inferiority	13	3	0.011	S
- Dissatisfactions of basic instincts	12	3	0.018	S
- Self confidence	12	2	0.006	S
- Guilt complex	13	4	0.025	S
- Dependance	8	4	0.194	NS
- Sensoriality	8	4	0.194	NS
- Inhibition	8	7	0.5	NS
- Difficulties in the social contacts	11	5	0.105	NS
- Desire of self value	10	6	0.227	NS
- Depressive state	13	3	0.011	S
- Emotional development	14	3	0.006	S

The comparison between the 2 graphic representations showed us part of the mechanism of enhancement of psychological well-being:

- Lessening of aggressiveness and anger.
- Improvement in anxiety and internal tension.
- Reduction in feelings of inferiority.
- Compensation of basic instincts.
- Improvement in self-confidence.
- Regression of guilt complex.
- Improvement of the depressive state.
- Improvement of emotional development.

In part, the physical activities are responsible for the enhancement of well-being.

Some characteristics of the exercise are essential:

- (1) Must be given by a qualified personnel.
- (2) Minimum time per session of 20' to 25'
- (3) To be of an average of 60 to 70% of maximum.
- (4) To be practised at least 3 times weekly.
- (5) In a pleasant non-competitive environment.

The most important feature of the exercise however, (for the patients requiring psychological care) is to be associated with the psychotherapy itself.

When exercise and psychotherapy are combined, this combination increases the psychological well-being more than exercise or psychotherapy alone.

Exercise, therefore seems to be a promising new approach in psychological treatment.

Martinsen (1990) limits the positive effects to the depression.

In our study, however we did not find any difference in response between the various pathologies.

We found a difference in the general evolution of the patient (during the hospitalisation period).

If the subject did or did not follow the exercise programme.

50 patients were included in our study.

14 of them did not participate in the physical activities and testing (but participated in psychotherapy only. Inability for physical or psychiatric reasons, refusal, or absence).

At the end of the hospitalisation period, the para-medical and medical team gave an "evolution mark" to the patient to evaluate his improvement.

Table (2): Comparisons between sportman and sedentary:

	"EVOLUTION MARK"		
	+	=	-
--- Sportman N=36	n=26 <u>72.2%</u>	n=9 25%	n=1 2.8%
Sedentary N=14	n=5 35.7%	n=1 7.1%	n=8 <u>57.1%</u>
Total N=50	n=31	n=10	n=9

The majority of patients (72.2%) who obtained a positive mark (indicating positive general evolution) had practised exercise (plus psychotherapy).

The majority of patients (57.1%) who obtained a negative mark meaning regression) had not practised exercise only psychotherapy).

The results of exercise plus psychotherapy suggest that an Additive effect of both treatments may exist.

The exercise seems to confirm through the body what the psychotherapy does for the mental functions. Exercise may potentiate the outcome of the psychotherapy. Like Sivadon (1969) discovered the body is the relay of the mental functions.

CONCLUSIONS:

We have tried to explain some of the mechanisms mediating the beneficial effects of exercise. We noticed 2 mechanisms:

The first is the improvement of the well-being feelings such as self-confidence and the emotional development.

The second is the reduction in ill feelings such as:

- Aggressiveness
- Anxiety
- Feelings of inferiority
- Guilt complex
- Depressive state
- Compensation of basic instincts

Our findings confirm the effectiveness of exercise as a dual treatment with psychotherapy in treating psychiatric disorders. However further research is needed to determine the relative significance of both.

It seems clear, nevertheless that exercise deserves an important place as part of the various therapies and should be recognised by health companies, the Ministry of Health and, in particular, by the Ministry of Education.

REFERENCES:

- MCCANNIL, HOLMES DS: Influence of aerobic exercise on depression.
Stress Med. 3:Q3
J PERS SOC. PSYCHOL 46:1143 - 1147, 1984

- MARTINSEN EGIL W: Benefits of exercise for the treatment of depression, sports medicine Q(6): 380 - 389, 1990.
- JORGENSEN CH, JORGENSEN DE: Effect of Running on perception of self and others. J percept mot skills 48:242, 1979.
- BANDURA A: self - efficacy: Toward a unifying theory of behavioural change. Psychol Rev 2:191-215, 1977.
- SIMONS AD, EPSTEIN HE, MC GOWAN CR, KUPPER DJ, ROBERTSON RJ, Exercise as a treatment for depression: An update. Clin. Rev, 5: 553 - 568, 1985.
- ROYER, N: Le Dessin du personnage Humain, Bruxelles, Editest, 1975.
- ABRAHAM, A: LE DESSIN d'une personne, issy les Moulineaux, Edit. EAP., 1962
- OSTERRIETH. P.A. "LA Psychologie de l'enfant et de l'adolescent, ED. G. THOWE - LIEGE, 1965.
- SIDNEY SIEGEL; Non parametric statistics for the behavioural sciences, Tokyo International Student Edition, 1956 (p 68).
- BERGER B.G.,: Exercice physique et reduction du stress, science et motricite, No.3. 1987.
- "ACTIVITES CORPORELLES EW SANTEMENTALE" IVTH International congress on sport psychology, Nov. 1987.
- SIVADON P. "La Re-education Corporelle des fonctions mentales" Paris. ESF, 1969

PERFORMANCE AFFECT IN TOP SPORTS

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KEY WORDS: performance, affect, sports, IZOF model, idiographic

INTRODUCTION

During the last thirty years subjective experiences, mental states, and emotions related to athletic performance were among important areas of applied research and counseling, especially in top sports. However, systematic research into emotions did not start until 1970-80-s when standardized self-report scales were introduced. As of to-day, the study of emotions or positive-negative affect (PNA) in sports is still limited to the examination of inter-individual differences in pre-competition anxiety and establishing the shape of anxiety-performance relationship(2,3,11,12,14,16).

This paper will focus on conceptual and methodological issues related to performance PNA within the framework of the Individual Zones of Optimal Functioning (IZOF) Model(3,4) and its recent developments (5,6,7,8,9). The issues of multidimensionality, the zone concept and PNA content will be first examined. Then idiographic assessments with individualized PNA scales, affect-performance relationships and implications for research and consulting in top sports will be briefly discussed.

MULTIDIMENSIONALITY OF PERFORMANCE AFFECT

Traditionally, somatic, cognitive, and behavioral manifestations of mental functioning are distinguished as three measurable parameters of emotions (1, 2, 10, 11, 16). In contrast, the IZOF

Performance Affect in Sport

model is based on multi-dimensional conception of emotion as an integral component of mental state and performance process. The PNA is described using the PENTA-basis, a five-concept foundation, initially proposed for the study of personality, but also used to examine communication patterns in sport teams and performance affect (5, 7, 8).

Emotion in the IZOF model is conceptualized as an affective part of individual's subjective experience accompanied by cognitive, motivational, bodily-somatic, motor-behavioral, operational and communicative components of mental state (form dimension). Other key dimensions of emotion not formulated explicitly in most of the current conceptions include time, intensity, context, and content (5, 6, 7, 8). This paper is dealing mainly with the intensity (zone concept) and the content of optimal and non-optimal PNA patterns.

THE "ZONE" CONCEPT

Research findings on within-individual dynamics of optimal intensity of anxiety in relatively short-duration tasks (3, 4) indicated that athletes with high, moderate, and low optimal levels of pre-competition anxiety were successful, if athlete's current anxiety was within (or close to) his/her individual optimums. Thus, the concept of "zones of optimal functioning" (ZOF) was proposed as individual reference points to evaluate the magnitude of deviations of current, anticipatory, or recalled levels of anxiety from the individual's optimal zones. In several cross-cultural studies it has been demonstrated that irrespective of the instruments used to identify the ZOF (the State-Trait-Anxiety Inventory, the Body Awareness Scale, the Competitive State Anxiety Inventory-2, and the Profile of Moods), the "zone" concept was useful for the idiographic analysis of anxiety-performance relationships (2, 7, 10, 12, 13, 14).

Performance Affect in Sport

In recent studies the zone concept was further developed and extended to optimal and non-optimal PNA patterns. It was found, for instance, that the content and intensity zones of optimal versus non-optimal emotions experienced by athletes were individual and quite different for various parts of the long duration events, such as orienteering, cross-country skiing, biathlon, triathlon, rowing, swimming, ice-hockey, and soccer (5, 6, 7, 8, 9). Besides, different emotions produced total optimal or non-optimal impact on performance by interacting so that a lower intensity of some emotions was compensated by a higher intensity of the others. Therefore, the principle seemed to account for measurement error and for the "functional reversal" of emotions when their intensity was outside of the individually established optimal zones. Thus, the initially proposed concept was reformulated into the IZOF to emphasize its idiographic nature.

THE CONTENT OF PERFORMANCE AFFECT

Although research in sport psychology has concentrated on anxiety-performance relationships, the PNA content as a dimension was either taken for granted or totally ignored. In general and clinical psychology there is still a lack of consensus concerning the dimensional structure of affect. Multifactorial orientation posits that 5 to 11 single-emotion factors are necessary for an adequate description of the mood space. In contrast, a two-dimensional framework emphasizes the importance of assessing global positivity and negativity as two bipolar dimensions of affect (15).

Since the two-dimensional structure characterizes affect quite well at the most general level, the global affect could be a relevant point of departure in the study of the structure of emotional experiences in sports. However, in sports PNA content should be functionally closely related to performance. Besides,

Performance Affect in Sport

in the IZOF model both positive(P) and negative(N) emotions as well as success(+) - failure(-) performance categories are each conceptualized as two discontinuous patterns(5, 6, 7, 8, 9). Consequently, four global PNA content categories have been identified: P+ positive, pleasant, facilitating; N+ negative, unpleasant, facilitating; P- positive, pleasant, debilitating; N- negative, unpleasant, debilitating. Athlete's optimal (P+N+) and non-optimal(P-N-) patterns related to effective (S) and ineffective (F) performance can then be combined into this individual's PNA-SF profile. To make the specific PNA content within each of the four categories more relevant for performance and the individual it was proposed to use athlete-generated PNA items (5, 6, 7, 8, 9).

INDIVIDUALIZED ASSESSMENTS OF PERFORMANCE AFFECT

The nomothetic assessments with standardized scales aim to describe inter-individual or group differences rather than apply the findings to enhance the performance of concrete individuals. In contrast, the idiographic assessments provide within-individual dynamics of PNA in successful and unsuccessful situations which can be used directly in prediction/monitoring of individual's level of performance.

Thus, the assessment goals in top performance setting, following the IZOF model, are, first, to identify the individually optimal and non-optimal patterns of emotions (PNA-SF profile). This individualized profile is then used to evaluate either original (current) or reflected (recalled/anticipated) PNA experiences of the athlete.

For individualized assessments in applied setting, either existing nomothetic standardized scales are used with modified instructions (2, 3, 4, 10, 12, 13, 14) or individual PNA scales with athlete-generated (task and person relevant) items are

Performance Affect in Sport

developed for each athlete (5, 6, 7, 8, 9). At the group level, combining PNA items across several athletes provides a list of emotions typically experienced by performers in successful and unsuccessful situations. These patterns are sports-specific since they include performance-induced emotions reflecting the demands of particular sport.

At this point, a step-wise idiographic analysis of PNA includes recall, anticipatory and current assessments before, during and after performance using individualized scales. Initial recall scaling of performance history is important to generate individual's PNA-SF profile. Then, repeated assessments of situational PNA are contrasted with individual's P+N+ and P-N- patterns. This typically results in athlete's increased awareness of the PNA impact on his performance and the initially established PNA-SF profiles are validated and refined. After that individually oriented strategies and skills can be provided or developed for effective entering (re-entering) the PNA-SF profile before, during and after task execution. All this provides well structured and individual-oriented procedures enhancing self-awareness and ability to accurately predict and self-monitor the PNA patterns on content, intensity, time, and context dimensions with the emphasis on the constructive use of PNA to enhance individual and team performance.

AFFECT - PERFORMANCE RELATIONSHIPS

Based on the IZOF model assumptions, two lines of research are being currently conducted with different samples of top athletes. The first deals with the accurate description of individual patterns of PNA content and intensities before, during and after athletic performance. These patterns are then compiled across athletes from similar/different sports. Also athlete's awareness

Performance Affect in Sport

of these emotional experiences in repeated predictions and post-performance recalls is evaluated.

The second line of testing the validity of the IZOF model is focused on examining individual affect - performance relationships. Specifically, high probability of successful performance is expected, if athlete's PNA is within (close to) the P+N+ pattern and outside the P-N- pattern. High probability of unsuccessful performance is expected, if athlete's PNA is outside his P+N+ patterns and inside (or close to) his P-N- pattern.

These predictions of individual affect-performance relationships before, during and after task execution have been examined and supported experimentally in several studies involving top athletes in ice-hockey(8), soccer (9, Syrjä, Hanin, Pesonen, 1995 in press), squash and badminton (Syrjä, Hanin, Tarvonen, 1995 in press), skiing (Hanin, Syrjä, 1995 in prep.), and in swimming (Syrjä, Hanin, Saarnio, 1995 in prep.).

IMPLICATION FOR FUTURE RESEARCH AND CONSULTING

The above concepts and research findings might have several implications for future research and consulting in top level sports. Specifically, more focus is warranted on:

- a) using idiographic analysis of PNA;
- b) content analysis of the existing PNA scales;
- c) application vs description of optimal & non-optimal PNA;
- d) developing of individual strategies to enter the IZOF;
- e) applying the IZOF model to other components of mental state and identify their interrelationships with affect.

Performance Affect in Sport

REFERENCES

1. Eysenck, HJ. (1975) The measurement of emotion: psychological parameters and methods. In: Levi, L ed, Emotions - their parameters and measurement. N.Y: Raven Press, 439-467.
2. Gould, D., Tuffey, S., Hardy, L., Lochbaum, M. (1993) Multidimensional State anxiety and Middle distance Running Performance: An Explanatory Examination of Hanin's (1980) Zones of Optimal functioning Hypothesis. J. of Applied Sport Psychology, 5, 85-95.
3. Hanin, Y. (1986). The state-trait anxiety research on sports in the USSR. Spielberger, CD., Diaz-Guerrero, R. (eds.) Cross-Cultural Anxiety. Washington, Hemisphere, 3, 45-64.
4. Hanin, Y. (1989) Interpersonal and intragroup anxiety in sports. Hackfort, D. Spielberger CD. (Eds.) Anxiety in sports, Washington, Hemisphere, 19-28.
5. Hanin, Y (1993) Optimal Performance Emotions in Top Athletes. In: Serpa, S Alves, Ferreira, J.V. Paula-Brito A. (eds) Sport Psychology: An integrated Approach Proceedings of the 8 World Congress of Sport Psychology. Lisbon, 229-232.
6. Hanin, J. (1994) Idiographic Assessment of Performance Emotions: A computerized program using the IZOF methodology. Top Performance. The 1st Congress of Elite Finnish coaches. April 8-10, 1994, Jyväskylä, Finland. Proceedings, 123-128.
7. Hanin, Y (1994 in press) Individual Zones of Optimal Functioning (IZOF) model: An Idiographic Approach to Performance Anxiety. K. Henschen (ed.) Sport Psychology: An

Performance Affect in Sport

Analysis of Athlete's Behavior. Vol.3 Ithaca: Movement Publications.

8. Hanin, YL., Syrjä, P. (1994, in press) Performance Affect in Junior Ice-Hockey Players: A test of the IZOF Model. The Sport Psychologist.
9. Hanin, Y.L., Syrjä, P. (1994 in press) Performance Affect in Soccer Players: An Application of the IZOF Model. International Journal of Sports Medicine
10. Krane, V. (1993) A Practical Application of the Anxiety-Athletic Performance Relationships: The Zone of Optimal Functioning Hypothesis. The Sport Psychologist, 7, 113 - 126.
11. Martens, R., Vealey, R.S. & Burton, D. (1990) Competitive anxiety in sport. Champaign, Illinois: Human Kinetics.
12. Morgan, W.P. & Ellickson, K.A. (1989) Health, anxiety, and physical exercise. Hackfort D., Spielberger, C.D., eds. Anxiety in Sports: An International Perspective New York: Hemisphere Publishing, 165-182.
13. Prapavessis, H., Grove JR. (1991) Precompetitive Emotions and Shooting Performance: The Mental Health and Zone of Optimal Function Models. The Sport Psychologist, 5, 223-234.
14. Raglin, J.S. (1992) Anxiety and Sport Performance. Exercise and Sports Sciences Reviews, ACSM Series, Williams & Wilkins, Baltimore, Vol. 20, 243-274.
15. Watson D., & Tellegen A. (1985). Towards a consensual Structure of Mood. Psychological Bulletin, 98, 219-235.
16. Weinberg, R.S. (1990) Anxiety and Motor Performance: Where to From Here? Anxiety Research, 2, 227-242.

OPTIMAL EMOTIONAL BALANCE:
A VIDEO STIMULATION PROGRAM

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KEYWORDS: optimal emotions, balance, intervention, IZOF model

INTRODUCTION

There is still a strong focus in current applied practice upon anxiety reduction strategies as the primary tool for stress management in top level performers (2, 14, 15, 16). Thus it comes as no surprise that most of the existing intervention programs using auditory and/or visual tapes typically aim to produce a uniform relaxed response in all subjects. All these programs (usually directive and verbal) are based on the implicit assumption that moderate anxiety, for instance, would be optimal for all subjects. However, consultancy and applied research (2, 4, 5, 6, 9, 14, 20) suggests that, many performers do not regard such strategies as optimal for their psychological preparation. It is clear that individual-oriented intervention strategies are needed to match individual's optimal and non-optimal patterns of emotions (7, 8, 9, 10, 11) and to incorporate stronger non-directive and stimulating element which would produce either increase or decrease of the individual's level of affect and activation.

The goal of this demonstration is to present a new multi-modal, non-verbal, non-directive, and short-duration (18 min) video program aimed to help individuals to regain their individually

Optimal Emotional Balance

optimal emotional balance (OEB). The program is based on the Individual Zones of Optimal Functioning (IZOF) model (5, 6, 9) as applied to the study global positive-negative affect (PNA) in top sports (7, 8, 10, 11). The selection of specific colours for the proposed OEB program was guided by the basic assumptions and experiences from psychology of colour (3, 13, 18). Besides, research findings and applications from light therapy for seasonal affective disorders (1, 17, 19) were also used.

TARGET POPULATION or WHO MIGHT BENEFIT

The program has been developed for people experiencing mood shifts due to the specific conditions of their life and work. These include normal populations:

- (a) working under strong pressures of high achievement setting (acute and chronic pressures of big failures and successes),
- (b) coping with routine and daily stresses (fatigue, anxiety, frustration, boredom, loss of motivation, low productivity), and
- (c) suffering from (or sensitive to) bad weather, darkness in autumn/winter - seasonal affective disorders (SAD).

TARGETED PROBLEM BEHAVIORS

The OEB program as a mini-dose video stimulation is aimed to change individual's current emotional state by shifting either the balance-disbalance of positive-negative affect and/or increasing or decreasing activation level. In the development of the programme it was assumed that any human activity requires sustained efforts and energy provided by individual OEB, both positive or negative. The OEB-related energy is used during the performance which results in a gradual or sudden shift (or reversal) in emotions depending on performance outcomes. Accumulated disbalance due to failure to return to the individual OEB might result in performance decrements and relatively stable

Optimal Emotional Balance

and sometimes irreversible emotional disturbances, such as staleness and/or burn-out.

In both cases of positive and negative disbalance detrimental to individual's performance and/or well-being requires focused "neutralizing" the situation. Thus balancing pre- and post-performance affects and restoring individual's OEB becomes an important self-regulation task in several professional groups. In all interventions individually optimal and non-optimal PNA patterns following the methodology of the IZOF model (7, 8, 10, 11) are used as individualized criteria to evaluate the effectiveness of the OEB program.

SPECIFIC INTERVENTION PROTOKOL

Procedure. The OEB is regained by simply having the subject(s) sit back comfortably and watch the movement of colours and shapes on the TV screen and listen to the music. Selected warm and quiet colours and moving shapes matched with the functional music are used in the program as a multi-modal stimulus for triggering individual's self-regulation processes.

The program consists of six separate but interrelated units (each of 3-min duration) aimed to produce a recurring "relaxation-activation" response. The mini-dose nature of video-stimulation helps subject to focus his attention and to follow easily what is happening on the screen.

Thus without special efforts individual's current PNA is repeatedly "swinging" up and down from a pleasant relaxation to a slightly "psyched up" mental state. As a result, most appropriate conditions for self-regulation are provided for the individual who just lets it happen. The unstructured and abstract content of colour images and shapes makes it possible to use the video repeatedly.

Optimal Emotional Balance

Instructions. For more focused intervention the subject(s) can be provided with non-directive instructions briefly outlining what s/he should do and what is typically happening during the OEB program. This also helps to reduce orienteering reactions.

Here is a sample of standard instructions: "Now, please, sit down comfortably and watch a special video program helping you to regain your optimal emotional state... Your attention will easily follow the movement of colours and shapes on the TV screen and the sound of music... Without any special efforts, just letting it happen, you will be slowly "swinging" from a pleasant relaxation to a slightly "psyched up" mental state... If you are distracted during the program, just get back to the screen slowly by re-focusing... let your thoughts and association flow freely... If you start thinking about your task or something... it is also fine...just let it happen... By the end of the program you will feel emotionally more balanced and your body and mind will tell, you if you need to more rest or you can go on with your tasks and activities..."

In several pilot studies the "no instruction" set was also used to generate idiosyncratic reactions to examine individualized impact of the program. These "minimal impact" brief instructions included the following: "Now, please, sit down comfortably and just watch the TV screen...just let your thoughts and associations flow. By the end of the program, we will share our experiences, and then I will explain how and why this program was developed."

THE IMPACT OF THE PROGRAM

Subjects. About 500 subjects participated in several pilot studies aimed to examine individualized and group effect of the OEB program. These included 32 Olympic level athletes (skiing and

Optimal Emotional Balance

soccer), 210 coaches (soccer and track-and-field), 165 managers and 78 sales persons, 25 language students.

Instruments. Open ended interviews, PNA individualized scales (8, 10, 11), and HR monitoring were used to assess the dynamics of subjects' emotional experiences before, during and after the program. The content analysis of typical and idiosyncratic reactions to different elements of the program and its whole impact as well as other data are being processed at the moment, however, preliminary illustrative findings highlighting the general features of the program are reported in the section that follows.

Preliminary findings.

An orienteering reaction (curiosity, expectations of something to happen, HR acceleration) was typically observed at the beginning of the program followed by a relaxation response and then an increase in activation.

During the program current PNA was repeatedly "swinging" up and down from a relaxed to a slightly "psyched up" mental state. For most subjects the program helped to re-focus attention and shift from current concerns to emotionally more balanced experiences.

Typically after the program subjects felt relaxed, refreshed and active ("feel very peaceful", "forgetting all current concerns and worries", "clear head ", "no special thoughts", "ready to resume my work"). However, the total impact of the program was usually related to the previous mental state of the subjects.

This point is illustrated by the data obtained a pilot study involving 34 healthy subjects. The OEB program was used immediately after a regular work (or training session) and the subjects were requested to describe their spontaneous reaction(s) or any association produced by the tape.

Optimal Emotional Balance

The following were the most frequently reported reactions:

- "feel relaxed and at peace" (55,9 % of the subjects),
- "nice colours " (47,1%),
- "nice music" (32,4%),
- "my head is empty" (26,5 %),
- "task-related associations" (26,4 %),
- "would like to do something" (20,1 %),
- "feel sleepy" or "would like more rest" (8,8 %).

In several cases modality preference was observed when the total impact was triggered either by colour, or moving shapes, or music, and sometimes by both colour and music. Typical "summer" associations (sea, waves, warm day, sand, etc.) as well as performance-related dissociations (thinking about or planning the subsequent task or activity) were also reported. However, in general, a "reversed" and individual effect was observed in both initially psyched up subjects and in those who felt quite tired. The former became more relaxed and balanced after watching the program, while the latter felt more rested, re-charged and psyched-up.

In several cases situational and personality projections as well as different cognitive styles reactions to the program were observed. These pilot data suggest the need for future research to examine the psycho-diagnostic potential of the OEB program. And, finally, in repeated applications of the OEB program with the same subjects initially positive individual effect was typically more pronounced. Besides, subjects' orienteering reactions usually disappeared, however, they could not remember neither the exact shape patterns nor their presentation sequence in the program. In other words, the OEB program, in contrast to the existing interventions, can be used repeatedly. However, additional evidence and more idiographic research is warranted, before the specific individualized regimens can be recommended for different individuals.

Optimal Emotional Balance

REFERENCES

1. Bauer, M.S. (1992) Defining seasonal affective disorder(s). Biological Psychiatry, 31, 12, 1185-1189.
2. Burton, D. (1990). Multi-modal stress management in sport: Current status and future directions. In G. Jones & L. Hardy (Eds.), Stress and Performance in Sport. Chichester: Wiley.
3. French C.A., Alexander, A.B. (1972) The Lüscher Colour Test: an investigation of validity and underlying assumptions. J. of Personality Assessment, 36, 361-365.
4. Gould, D., Ecklund, R.C., Jackson, S.A. (1993) Coping strategies used by U.S. Olympic wrestlers. Research Quarterly for Exercise and Sport, 64, 83-93.
5. Hanin, Y. (1986). The state-trait anxiety research on sports in the USSR. Spielberger, C.D., Diaz-Guerrero, R. (eds.) Cross-Cultural Anxiety. Washington: Hemisphere, 3, 45-64.
6. Hanin, Y. (1989) Interpersonal and intragroup anxiety in sports. Hackfort, D. Spielberger C.D. (Eds.) Anxiety in sports, Washington: Hemisphere, 19-28.
7. Hanin, Y. (1993) Optimal Performance Emotions in Top Athletes. In: Serpa, S. Alves, Ferreira, J.V. Paula-Brito A. (eds) Sport Psychology: An integrated Approach Proceedings of the 8 World Congress of Sport Psychology. Lisbon, 229-232.
8. Hanin, J. (1994) Idiographic Assessment of Performance Emotions: A computerized program using the IZOF methodology. Top Performance. The 1st Congress of Elite Finnish coaches. April 8-10, 1994, Jyväskylä, Finland. Proceedings, 123-128.
9. Hanin, Y. (1994 in press) Individual Zones of Optimal Functioning (IZOF) model: An Idiographic Approach to Performance Anxiety. K. Henschen (ed.) Sport Psychology: An Analysis of Athlete's Behavior. Vol. 3 Ithaca: Movement Publications.

Optimal Emotional Balance

10. Hanin, Y.L., Syrjä, P. (1994, in press) Performance Affect in Junior Ice-Hockey Players: An application of the IZOF Model. The Sport Psychologist.
11. Hanin, Y.L., Syrjä, P. (1994 in press) Performance Affect in Soccer Players: An Application of the IZOF Model. International Journal of Sports Medicine
12. Hardy, L. Jones, G. (1994) Current issues and future directions for performance related research in sport psychology. Journal of Sports Sciences, 12, 61-92.
13. Lüscher, M. (1985) Psychology der Farben. Basel.
14. Morgan, W.P. (1993) Hypnosis and Sport Psychology. In: Rhue, J.W, Lynn, S.J. & Kirsch, I (Eds.), Handbook of Clinical Hypnosis, Washington, : APA, 649-670.
15. Morgan, W.P. & Ellickson, K.A. (1989) Health, anxiety, and physical exercise. Hackfort D., Spielberger, C.D., eds. Anxiety in Sports: An International Perspective New York: Hemisphere, 165-182.
16. Raglin, J.S. (1992) Anxiety and Sport Performance. Exercise and Sports Sciences Reviews, ACSM Series, Williams & Wilkins, Baltimore, Vol. 20, 243-274.
17. Rosen, L.N., Rosenthal, N.E. (1991) Seasonal variations in mood and behavior in the general population: A factor-analytic approach. Psychiatry-Research, 38 (3), 271-283.
18. Serov, N.V. (1993) Lechenie tsvetom . (Treatment with colour). St-Petersburg.
19. Shimanko I. I. Svetolechenie (Light therapy). Moscow, 1950.
20. Vealey, R.S. (1994) Current status and prominent issues in sport psychology interventions. Medicine And Science in Sport and Exercise. 26, no. 4, 495-502.

RELATIONSHIP BETWEEN PERSONALITY TRAITS AND SELF-PERCEPTION OF DANCERS IN PERFORMANCE

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Key words:

Self-perception, personality traits, modern dance, artistic performance.

INTRODUCTION

In starting this study we were motivated by the importance that dancing before an audience seems to have for most dancers. Our own experience, as well as the references found in literature (Stinson, Blumenfeldt-Jones and Van Dyke, 1990, Lesage, 1992, Lyle, 1977), led us to believe that it is precisely the experience of choreographic performance in front of an audience that represents the main attraction in the choice of dance as a career or as leisure activity. This, and other previous studies (Macara-Oliveira, 1988), indicated the need for a study directed to an analysis of the dancer's self-perception of the experience of dancing on stage. Furthermore, we were interested in understanding how the way dancers self-perceive their stage experience, is related to their personality traits. In particular, previous studies (Vanfraechem, 1986, Vanfraechem and Hallet, 1991, Jette, 1981) pointed to the importance of self-concept and body image in this study.

Under a phenomenological approach (Fraleigh, 1991), we were interested in finding out how the performer understands the significance of performing before an audience and the attitudes typical of dancers on stage, according to their personality profiles.

METHODS

The research was carried among Portuguese modern dancers, with ballet background. We have tested a sample of two groups: amateurs and semi-professionals. The amateurs ($n = 22$) were dance students at the "Universidade Técnica de Lisboa". The semi-professionals ($n = 14$) belonged to two dance companies from the same area. They had approximately the same age average (21.8 ± 4.52 - amateurs; 22.07 ± 2.75) and came from comparable socio-cultural backgrounds. They all had performing experience in modern dance.

Based on experimental methodologies of research in psycho-social sciences (Mucchielli, 1979, Javeau, 1992) we have designed a questionnaire (QEDS) for our experimental work. The purpose of the questionnaire was to facilitate the dancers' expression on a large number of items referring to their personal experience as performers on stage. The questionnaire was created based on literature, previous systematic interviews with dancers and personal experience as dancer and choreographer. The first part of this questionnaire, specifically concerning this study, was directed to the discrimination of the feelings and the attitudes perceived by the dancer while performing on stage. One hundred semi-open questions were formulated, to be answered in a 5 categories scale. A distribution of the different items of the QEDS in factors was prepared and tested through the study of the correlations of the items within each of the factors. Seven factors were thus established concerning the situation of dancing on stage: perception of the body (PC), feelings of anxiety (SA), feelings of well-being (BE), technical aspects (AT), expressive aspects (AE), relation to the audience (P) and feelings of alteration (AR). Based on Lickert's cumulative scale (Marconi and Lakatos, 1982, Javeau, 1992) the answers to each item were coded, so as to obtain for each individual, a total score in each of the factors.

For the study of personality traits we applied two tests: an adaptation of Thill's Q.P.S. test (Thill, 1983) and Alfermann's test (Alfermann, 1992) to the groups of amateurs and semi-professionals. This allowed us to correlate specific traits of personality with results of the previous questionnaire.

The scores obtained were treated by applying Bravais-Pearson's Correlation Test between each of the factors of the QEDS and each personality test item. The outcome of this correlated study has brought out some relations between personality characteristics, and the attitudes and self-perception of dancers.

RESULTS

After applying Bravais-Person test between the factors of the QEDS related to the presence on stage and each item of our adaptation of Thill's QPS test, we came out with the results presented on Table 1.

As we can see by the observation of the table, there is no significant correlation between the items *perception of the body* (PC), *feelings of well-being* (BE), *technical aspects* (AT) or *expressive aspects* (AE), and any of the personality traits under study.

TESTE DE CORRELAÇÃO DE BRAVAIS - PEARSON														
QEDC	PC		SA		BE		AT		AE		P		AR	
Alferr	r	p	r	p	r	p	r	p	r	p	r	p	r	p
SC+	0,414	NS	-0,547	0,051	0,081	NS	0,212	NS	0,124	NS	0,131	NS	0,098	NS
SC-	-0,480	NS	0,404	NS	-0,208	NS	-0,172	NS	-0,244	NS	-0,335	NS	-0,183	NS
Sp/M	0,118	NS	-0,181	NS	0,144	NS	-0,225	NS	0,188	NS	-0,396	NS	-0,137	NS
Disc	-0,255	NS	0,476	NS	0,043	NS	-0,272	NS	-0,456	NS	-0,033	NS	-0,094	NS
F+	-0,003	NS	-0,022	NS	0,437	NS	-0,161	NS	0,313	NS	-0,140	NS	-0,230	NS
F-	-0,294	NS	0,334	NS	-0,263	NS	0,628	0,021	-0,042	NS	-0,046	NS	0,191	NS
M+	0,504	NS	-0,474	NS	0,207	NS	-0,536	NS	0,050	NS	0,025	NS	0,196	NS

TABLE 1 - QEDS factors and items of Thill's QPS Test
Correlations in the amateur group

As to the *feelings of anxiety* (SA) we could find negative correlations with the items CP, CE, RP and ES. This means that the dancer shows the lesser feelings of anxiety on stage, the more he is competitive, emotionally stable, psychologically resistant and has a good self-esteem. We have also verified the existence of a correlation, in this group, between emotional stability and psychological resistance.

The factor *relation to the audience* (P) showed a positive relation to the item PR. The more audacious the dancer, the better the relation to the audience. Subjects with more difficulty in risktaking situations seem to be less aware of the audience and also less aware of *feelings of alteration* (AR), as there is also a positive correlation with this factor. The item CA is also correlated to this factor, indicating that not only audacity, but also the tendance to be impulsive is favourable to a better relation with the audience and a better awareness of the alteration present in the situation of dancing on stage. Subjects that tend to be always in self-control, with a preference for safe situations seem to be more centred on the routine aspects of the experience of dancing on stage, probably trying to repeat the familiarity of a rehearsal.

In what concerns the semi-professionals, we present on Table 2 the results of the correlation tests applied referring to Thill's QPS. We can see that, contrarily to what happens in the amateur group, the *feelings of anxiety* on stage are negatively correlated only to the items DR and DO. This indicates that semi-professional dancers show more feelings of anxiety when they have a low motivation, on one hand, and when they tend to be submissive on the other. Or we can understand that

a good motivation and dominance characteristics can contribute to a low level of anxiety on stage. This seems very meaningful, considering that in the amateurs the same feelings of anxiety are correlated with a tendency to competition and emotional stability, as well as self-esteem. With the experience, the feelings of anxiety no longer depend on those personality traits, and this seems natural, since the situation of dancing on stage became more familiar to the dancer: It no longer represents a threat disturbing the less stable or psychologically less resistant, or even the dancer with a low self-esteem. On the contrary, among the semi-professionals, it is mostly the lack of motivation or the lack of dominance characteristics that seem to be associated with a high level of anxiety.

TESTE DE CORRELAÇÃO DE BRAVAIS-PEARSON														
QEDC	PC		SA		BE		AT		AE		P		AR	
QPS	r	p	r	p	r	p	r	p	r	p	r	p	r	p
DR 1	0,555	NS	-0,552	NS	0,425	NS	-0,542	NS	0,467	NS	0,444	NS	0,375	NS
DR 2	0,033	NS	-0,201	NS	0,133	NS	-0,224	NS	0,498	NS	0,528	NS	0,061	NS
DR	0,614	NS	-0,717	0,045	0,516	NS	-0,729	0,039	0,894	0,003	0,900	0,002	0,416	NS
CP	0,054	NS	-0,338	NS	0,429	NS	-0,171	NS	0,013	NS	0,010	NS	-0,024	NS
CA	0,032	NS	-0,186	NS	0,217	NS	0,000	NS	-0,369	NS	-0,306	NS	-0,297	NS
PR	-0,301	NS	-0,169	NS	0,154	NS	-0,249	NS	-0,336	NS	-0,263	NS	-0,216	NS
CE	0,040	NS	-0,291	NS	0,243	NS	-0,418	NS	0,392	NS	0,280	NS	0,407	NS
RP	0,614	NS	-0,463	NS	0,532	NS	-0,441	NS	0,536	NS	0,447	NS	0,708	0,049
EI	-0,033	NS	-0,402	NS	0,445	NS	-0,451	NS	-0,335	NS	-0,296	NS	0,028	NS
DO	0,398	NS	-0,777	0,023	0,798	0,018	-0,563	NS	0,176	NS	0,310	NS	-0,062	NS
SO	0,021	NS	-0,362	NS	0,488	NS	-0,322	NS	-0,118	NS	-0,171	NS	0,211	NS
ES	0,156	NS	-0,516	NS	0,571	NS	-0,438	NS	0,148	NS	0,134	NS	0,178	NS

TABLE 2 - QEDS factors and items of Thill's QPS Test
Correlations in the semi-professional group

Motivation is also correlated with the factors *expressive aspects* and *relation to the audience* and negatively, to *technical aspects*. Dancers that are more motivated are more concerned with the expressive aspects of performance and have a better relation with the audience, at the same time being less concerned with technical problems of the performance.

The dominance trait is also correlated to the factor *well-being*. This seems coherent, since the dancer who has a tendency to command and dominate, not only feels less anxious, he also shows more feelings of well being.

Finally we found a positive correlation between *feelings of alteration* and psychological resistance. This leads us to believe that a low psychological resistance to the stress is associated with a lack of attention to and perception of non-routine

aspects of dancing on stage. This is probably because these alteration feelings may seem menacing and more stressing, since they are less familiar to the dancer.

We also applied the same Bravais-Person test between the factors of the QEDS related to the presence on stage and each item of Alfermann's test. The results are presented on Table 3:

TESTE DE CORRELAÇÃO DE BRAVAIS - PEARSON														
QEDC	PC		SA		BE		AT		AE		P		AR	
QPS	r	p	r	p	r	p	r	p	r	p	r	p	r	p
DR 1	0,118	NS	0,179	NS	0,155	NS	0,043	NS	0,035	NS	0,393	NS	0,342	NS
DR 2	-0,151	NS	-0,137	NS	0,075	NS	-0,323	NS	0,354	NS	0,138	NS	-0,321	NS
DR	0,010	NS	0,086	NS	0,100	NS	-0,149	NS	0,162	NS	0,340	NS	0,077	NS
CP	0,277	NS	-0,434	0,054	0,031	NS	-0,331	NS	0,220	NS	-0,213	NS	-0,258	NS
CA	-0,091	NS	0,325	NS	-0,063	NS	0,094	NS	-0,185	NS	0,146	NS	0,462	0,039
PR	0,408	NS	0,020	NS	0,228	NS	0,135	NS	-0,191	NS	0,454	0,042	0,585	0,007
CE	0,341	NS	-0,643	0,002	0,066	NS	-0,339	NS	0,070	NS	-0,028	NS	-0,132	NS
RP	0,304	NS	-0,582	0,007	0,129	NS	-0,413	NS	0,124	NS	-0,109	NS	-0,183	NS
EI	0,119	NS	-0,328	NS	-0,090	NS	-0,274	NS	-0,004	NS	-0,031	NS	-0,055	NS
DO	0,304	NS	-0,266	NS	0,207	NS	-0,283	NS	-0,003	NS	-0,266	NS	-0,086	NS
SO	-0,154	NS	0,030	NS	-0,171	NS	-0,201	NS	-0,084	NS	-0,219	NS	0,140	NS
ES	0,306	NS	-0,511	0,021	0,061	NS	-0,405	NS	0,086	NS	0,227	NS	-0,211	NS

TABLE 3 - QEDS factors and items of Alfermann's Test
Correlations in the amateur group

We could find only two significant correlations. One, negative, between *feelings of alteration* and SC+, positive self-concept. It seems normal that the less positive is the subject's self-concept the more anxious he/she is on stage. A positive correlation is found between the factor related to the preoccupation with technical aspects and F-, negative expressivity. Amateurs that tend to manifest negative expressivity seem to be more worried about the overcoming of their technical problems in the performance.

In the correlated study of the factors of the QEDS and the items of Alfermann's test applied to the semi-professionals, we could find no significant correlation, as shown on Table 4.

Among these semi-professionals, the aspects of self-concept and image of the body, as well as expressivity such as it is measured by Alfermann's test does not show no correlations with the way the dancer perceives the situation of dancing on stage, or his/her typical attitudes as assessed by the QEDS. It may be, though, that such relations are of too much complexity to be evaluated in a study of this kind.

TESTE DE CORRELAÇÃO DE BRAVAIS-PEARSON														
QEDC	P C		S A		B E		A T		A E		P		A R	
Alferr	r	p	r	p	r	p	r	p	r	p	r	p	r	p
SC+	0,703	NS	-0,264	NS	0,421	NS	0,002	NS	0,480	NS	0,285	NS	0,408	NS
SC-	-0,437	NS	0,011	NS	-0,399	NS	-0,277	NS	0,002	NS	0,151	NS	-0,041	NS
Sp/M	-0,020	NS	0,176	NS	0,338	NS	0,433	NS	-0,529	NS	-0,605	NS	-0,236	NS
Disc	-0,570	NS	0,269	NS	-0,564	NS	-0,149	NS	-0,226	NS	-0,041	NS	-0,161	NS
F+	0,088	NS	0,265	NS	0,094	NS	0,461	NS	-0,522	NS	-0,608	NS	-0,279	NS
F-	0,071	NS	0,402	NS	-0,462	NS	0,097	NS	0,500	NS	0,329	NS	0,539	NS
M+	0,445	NS	-0,435	NS	0,666	NS	0,035	NS	0,092	NS	-0,023	NS	0,052	NS

TABLE 4 - QEDS Factors and items of Alferrmann's Test
Correlations in the semi-professional group

DISCUSSION OF THE RESULTS

From the results obtained in the different parts of the study it was possible to bring out several conclusions on how the experience of the dancer on stage is related to some personality traits, and how it varies with the degree of involvement with the activity.

It is interesting to note that while amateurs with a negative expressivity seem to be more worried about the overcoming of their technical problems in the performance, this does not happen any more to the semi-professional. The importance of this personality trait becomes less important when the dancer has more experience.

In amateurs the anxiety on stage is inversely related to personality traits connected with being competitive, emotionally controlled and with a high self-esteem; on the contrary, the motivation and dominance traits of semi-professionals, are the characteristics related to a lower level of anxiety. This points out to the importance of learning and experience in this factor. Being competitive or impulsive does not affect the anxiety of the dancer with more experience any more. But motivation, the will to excel as well the tendency to command, that does not seem relevant in the case of amateurs becomes important in the semi-professional group. Dancing on stage is naturally not so much related with the dancer's impulsivity when he gains the experience.

Also, amateurs with higher risk-taking tendencies, as well as the semi-professionals with a higher motivation show a more positive appreciation of their relationship with the audience, suggesting that for the amateurs the situation of dancing on stage

represents in itself a menace. That may be why in this group there is a certain tendency to ignore not only the relation with the audience, but also the aspects of routine alteration inherent to experiencing a performance on stage.

It becomes apparent that amateurs and semi-professionals deal with the stress provoked by the public performance in different ways. The situation certainly appears as menacing for that group, since audacity is a personality trait that affects the way the dancer feels the public and is able to better perceive feelings of alteration.

To conclude, we would like to note that in all, we could find less correlations between personality traits and the self-perception among semi-professionals than among amateurs. This naturally indicates that the performance of the amateur is more directly dependent on his personality traits. In the semi-professional the acquired experience and technical control become more important.

References

- ALFERMANN, D. (1992). Exercise, self-concept and psychological well-being. Unpublished communication, presented in Congress Mondial de Psychologie. Brussels.
- JAVEAU, C. (1992). L'enquête par questionnaire: Manuel à l'usage du praticien. Brussels: Université de Bruxelles.
- JETTE, N. (1981). The effect of modern dance and music on body image in college women. American Corrective Therapy Journal, 35, 104-106.
- LESAGE, B. (1992). L'étrange appel: Le danseur et/est son double. In M. Arguel (Ed.), Danse: Le corps en jeu, (pp. 243-266). Paris: Presses Universitaires de France.
- LYLE, C. (1977). Dancers on dancing. New York: Sterling.
- MACARA-OLIVEIRA, A. (1988). Center of the body and centering: Study of different approaches to the subject, and its significance for the dancer. Unpublished Master Thesis. University of North Carolina at Greensboro.
- MARCONI, M. A. e LAKATOS, E. M. (1982). Técnicas de pesquisa. São Paulo: Atlas.
- MILLIER, C. (1987). Le trac du danseur. La Recherche en Danse, 4, pp. 93-109.
- MUCCHIELLI, R. (1979). Le questionnaire dans l'enquête psycho-sociale: Connaissance du problème. Paris: ESF.
- STINSON, S. W., BLUMENFIELD-JONES D. e VAN DYKE, J. (1990). Voices of young women dance students: An interpretive study of meaning in dance. Dance Research Journal, 22, (2), 13-22.
- THILL, E. (1983). Manuel du questionnaire de personnalité pour sportives. Paris: Centre de Psychologie Appliquée.
- VANFRAECHEM-RAWAY, R. (1986). L'expression de la personnalité et l'image du corps chez la danseuse. Actas do Colóquio L'enjeu de la danse. Courier de la danse, 1, (2), 5-9.
- VANFRAECHEM, R. e HALLET, M. (1989). Recherches concernant l'image du corps et la personnalité de danseuses. Sport, 3, (127), 145-150.
- WILSON, V. E. e MANLEY, M. E. (1976). Personality, self-actualization, and creativity of dance students. In D. Woodruff (Ed.), Essays in Dance Research. Dance Research Annual IX (pp. 185-197). New York: CORD.

S.1.2. NEW TRENDS IN RESEARCH METHOD

Chairperson : Y. VANDEN AUWEELE

CONTEXTUALIZED SPORT PSYCHOLOGY AND THE IMPLEMENTATION OF QUALITATIVE RESEARCH DESIGN

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Keywords

Action theory, experience, intentionality, perception, phenomenology, qualitative methods, research design, social context, social discourse, theory of knowledge.

Introduction

The presentation is motivated by the following observation: A number of (sport) psychological researchers do not have direct contact with the subjects to be studied and with the (sport) environments these subjects participate in. They sit in their offices and conduct their research without any (physical) involvement in the field. The contact with the field is often in the hands of assistants or student helpers. Although these studies may be well designed and the results may present a valid analysis of phenomena the researcher has set focus on, the research often has very little influence on the subjects involved in the study or on the sport system in general, for instance coaches, instructors, teachers, consultants or decision makers in sport organisations.

The theory of knowledge is the basis

The presentation is guided by the following assumption: The theory of knowledge "used" by the researcher has consequences for the choice of research methods and vica versa. Further: Every researcher is part of society, and the knowledge generated by the research has in a broad sense influence on the development of society. *Research is not value free*. Researchers who do not think about the implementation of their knowledge in relation to further social and individual development are in my opinion naive, sometimes even politically dangerous.

(Sport) psychology as a scientific discipline has its roots in two different traditions: The natural science tradition and the humanities/social science tradition. Some of the problems we find in (sport) psychology are caused by this state of affairs. Researchers who are more affiliated with the traditions of the natural sciences than with the social sciences in their research design and choice of methods seem to be less conscious about their theory of

knowledge. In their research they seem to have a focus which psychologists who work in the humanities/social science tradition find difficult to accept. It is a positive development in the last decades' discussion - initiated by Kuhn (1962) - that discussion about the theory of knowledge and shifting paradigms has become important.

The theory of knowledge in contextualized sport psychology

Contextualized sport psychology always focuses on the *interplay or dialogue* between the individual and the individual's environment. The individual perceives, experiences, thinks, has emotions, moves and acts *as an expression* of this dialogue. Different phenomena which form the field of interest of the researcher must always be studied in their specific *context*.

Contextualized sport psychological research should have an orientation:

1. *On the life world of sport persons, coaches, and other people involved in the setting.*
Every research project has to be based on intensive knowledge of the participating individuals and their milieu. Their life world is socially and individually constructed, it is mediated by social symbols like the chosen setting, clothes, body language, intonation, and it is conditioned by communication - verbal and nonverbal. The individual's life world is designed by the single person through action in relation to the social environment.

For many research designs it is, and it should be, central to get an imagination of the life world and the social context of the subjects involved in the study. The individual's action in the environment has to be seen through the eyes of the individual. The personal "*meaning as an 'intent' or 'purpose' of a deliberate action*" - as Arnold (1979, 61) says - is the focus for interpretation which puts the person's action into a framework. *Participant observation* is the primary method to guarantee intensive knowledge of the subjects participating in the research project.

2. *On the experiential and perceptual dimension in relation to movement activities.*
Body experience and body perception are a unique entrance to the life world of sport participants. Sport psychological studies are more contextualized if they focus on the experiential dimension in relation to sport, movement and games. An investigation of this experiential dimension (Stelter 1995) shows great differences in the way people experience and perceive similar situations. The French phenomenologist Merleau-Ponty (1962) has an explanation for this state of affairs: Every person has his/her existential view of the world, which is the basis for perceptions of the world and action in relation to the world. There is

no neutral and external perspective of the world where people can be pure observers in their own environment. It is the single subject that perceives the environment in his/her own unique way. The body is the mediator to the world. Every perception, every movement and every action of a human being is an expression of the subject's relation to his/her life world. In Merleau-Ponty's theory of perception the lived body is seen in its *relation within the world*, a world we are all connected to and enclosed in - prior to any reflection.

3. *On perception, movement, and action as a united system.*

Bodily perception, movement, human action, and other psychological modes (like remembering, thinking, speaking etc.) can meet in the concept of *intentionality* which is fundamental for Merleau-Ponty and other phenomenologists and action theorists. Merleau-Ponty (1962, 234) states that all human body functions are "linked together in the general action of being in the world." He refers here to Buytendijk's and Plessner's (1925) term of "Umweltintentionalität": By intentionality a specific attitude to a real life situation is expressed. The Dutch sport scientist and movement therapist Tamboer (1991, 68) uses the term "Bedeutungsrelation". By that he wants to express the following: People relate themselves to the social and material setting, and at the same time they express their personal meaning (in German: *Bedeutung*) in relation to the situation. By intentionality our relational modality to the setting or context is shown and manifested. This form for intentionality is a *pre-reflexive* state of consciousness in the individual's relation to the environment (see: Giorgi 1985, 43).

A similar model was developed by V. von Weizsäcker (1933/1986).

4. *On the social and situational context as a determining factor for action in sport.*

Action can be defined as intentional and goal-directed behaviour (Frese/Sabini 1985). In this case intentionality is defined as a more or less conscious orientation of the individual in relation to the social and situational context. Giorgi (1985, 43) talks about "*operative intentionality*", meaning: the individual plans and makes decisions in relation to the situation, and to specific situational tasks chosen by the individual. On the other hand the social context influences the person and the person's plans, decisions and actions (see: Ginsburg 1985, Snyder 1981).

In sport psychological research the social and situational context can be integrated and evaluated on two levels: a) on a more "objective" level, and b) on the level of the single person.

a) An objective level can be outlined by criteria which can characterize the social setting. The German sport scientists Dietrich/Landau (1990, 90-113) introduce the term "Inszenie-

rungsformen des Sport", translated into English: "forms of *staging in sport*". There is a great difference in how people stage themselves playing soccer in a sport for all setting in a non-profit sports club or practising aerobic in a commercial fitness centre. The differences of the settings have an influence on the construction of psychological categories. The individual's choice of a specific setting or context is expressive of goal-directed behaviour in sport.

b) The social situation is defined and evaluated differently by different persons. Nitsch (1986, 233ff.) developed a concept which he calls "Subjektive Situationsdefinition", the *subjective evaluation of the situation*. The three components of the situation - person, environment and task - are evaluated on the basis of action competence and on the basis of action valence (involvement).

5. *On the social discourse as the basis of cognition, knowledge and emotion.*

Personal experience and perception in relation to movement and sport is the first fundamental dimension in a contextualized sport psychology. As mentioned under point four, the social and situational interpretation is the second fundamental dimension in a contextualized research approach. The social situation is also manifested in the social discourse between the people involved in the setting. Psychological categories like cognition, knowledge or emotion are generated in the social context, they are *relational*. The American social psychologist Gergen (1984, 100) focuses on the system of human relations in order to explain psychological processes:

"The constitution of the self is not thus carried out by individuals in isolation, but requires complicity, negotiation, and collusion – terms that all refer to relationships and not to single individuals."

In their study of the self presentation of sports people, Mummendey & Mielke (1989) arranged different "frames" in relation to their interviews. They asked sports people as "private persons", "in relation to the sport context", and in relation to the sports people's "ideal picture as a sports person". As a result Mummendey & Mielke found that sports people have different self descriptions depending on the "frame" of the interview. In other words: The social discourse between the interviewed sport person and the interviewer had a different outcome depending on the introductory information the sports people got from the interviewer.

The implementation of the qualitative research design

These dimensions of the theory of knowledge have consequences for the choice of research methods. My intention is to show that the qualitative research design fits the theory of

knowledge presented in the previous section of the article. On the other hand I would like to point out: Other research methods including statistics can be incorporated as a part of the total research design, if the above-mentioned contextualized orientation is guaranteed.

The interrelationship between contextualized sport psychology and qualitative research design will be illustrated by a research project focusing on the development of self concept and identity in different sport settings (Stelter 1995). The major approaches in this study were:

1. the qualitative research interview as the major data source,
2. participant field observations in the different sport settings, and
3. visits to the homes of the sport participants in connection with the interview.

The qualitative research interview

The qualitative research interview is the major data source in most of the qualitative research designs. There the life world of the person interviewed is the central matter. The interview has to be conducted in such a way that questions and answers are always connected to the situational context (Kvale 1983). Perception, movement and action are always situated, and they only give sense and *personal meaning* if they are connected to and analyzed in relation to the social context.

The major problem in qualitative sport psychological research interviews is the following: How can perceptual and experiential knowledge - so called *tacit knowledge* (Polanyi 1966) - be transformed into words and language?

In the above-mentioned research project I developed a visualisation and imagination technique based on the work of Gendlin (1981), an Austrian-American psychotherapist and phenomenologically orientated psychologist. He developed a method called *focusing*. The basis of the interview is the "*felt sense*" in relation to the concrete sport situation with all the facets important to the person interviewed. Gendlin (1981, 31) gives the following definition:

"A felt sense is not a mental experience but a physical one. *Physical*. A bodily awareness of a situation or person or event. ... Think of it as a taste, if you like, or a great musical chord that makes you feel a powerful impact, a big round unclear feeling. A felt sense doesn't come to you in the form of thoughts or words or other separate units, but as a single (...) bodily feeling."

The interrelation between the "*felt sense*" and its transformation into language can be illustrated by the following table (see: Stelter 1995):

the felt sense	inner pictures, metaphors, perceptions, emotions, thoughts	symbols/syntax
"the implicit" – tacit knowledge	"the explicit"	Morphemes – discursive knowledge
pre-reflexive	analog	digital

In this research process *pre-reflexive bodily experiences and perceptions* will be transformed *via inner pictures, metaphors etc.* into an analog mode of information and finally into a digital mode of information, meaning *language* presented by means of an interview transcription which is the basis of the analytical and interpretative work.

For example the practical implementation of the relation between body experience and language had great importance in the research project on self concept and identity (ibid.). It could be documented that bodily experiences and perception are the fundamental source for the development of our self concept.

This form of interview conduct implements several dimensions of the presented theory of knowledge: The focus on the experiential and perceptual dimension, the focus on perception, experience and action as a united system, including the focus on the life world and the social and situational context.

Participant observation

The data collected by participant observation is the primary source that enables the researcher to get an imagination of the life world and the social context of the participants involved in the research project (Lamnek 1989, Denzin/Lincoln 1994). There are different forms of participant observation: Researchers who have the physical ability can participate on the same level as all the other sport people in the setting. Another way is partial participation, where the researcher is an observer from the "side line" of the field. In all cases it is important to think about the ethical dimension of this field research.

The idea of participant observation is to shift between "going native" (Girtler 1974, 115), where the researcher studies the world through the eyes of the participant, and an "objective", research orientated distance. The observations written down in a field report (Spradley 1979, 69ff.) should function as an *ecological validation* (Lamnek 1988, 151f.) in relation to other sources. That means: The data material gained through other research methods (as for instance the qualitative research interview) can be compared and related to the real life setting of the participants.

Analyzing qualitative data

The analysis procedure of qualitative sport psychological research has to be orientated towards the theory of knowledge presented in this article. Qualitative research is often criticized because natural science or positivistic orientated researchers are sceptical about the validity of qualitative studies. It is important to mention that *there is a difference*, but nevertheless, qualitative researchers are working hard on developing research criteria that fit their approach¹.

A very useful example of how to analyze qualitative data is inspired by the *phenomenological method* of Giorgi (1985). Four steps can be distinguished:

1. *Description*: The basis of all qualitative work is the collection of experiential descriptions given by the people in the field and/or collected by the researcher. The raw taped material has to be transcribed, coded under different terms and structured through different variables (like age, sex, layer, sport setting etc.).
2. *Reduction*: The different text passages are reduced by transforming them into a more psychologically orientated language. The goal is to extract the *meaning structure* of the individual in relation to the situation. The focus of analysis is still on the single individual.
3. *Search for the essence*: Giorgi (1985, 50) speaks about uncovering "the invariants of the phenomenon." The comments and formulations of the first reduction are generalized and no longer connected to the single person. This second reduction sets focus on psychological concepts like "perceived self efficacy".
4. *Notion of intentionality*: The intentional relation between the individual and his/her (social) environment is central for the interpretation and analysis.

Conclusion

My idea was to show that a qualitative research design is often able to come close to the life world and social context of the subjects participating in the study. The greatest challenge for a qualitative researcher is to generalize his/her results, but despite criticism, the results are commonly applicable and not just confined to the group chosen for research.

¹ For more information see i.e.: Marshall/Rossmann 1989, 144ff.; Kvale et al. 1989.

References

- Arnold, P.J. (1979). *Meaning in movement, sport and physical education*. London: Heinemann.
- Buytendiyk, F.J.J./H. Plessner (1925). Die Bedeutung des mimischen Ausdrucks. In *Philosophischer Anzeiger* 1, 72-126.
- Denzin, N.K/Y.S. Lincoln (Eds.) (1994). *Handbook of Qualitative Research*. Newbury Park: Sage.
- Dietrich, K./Landau, G. (1990). *Sportpädagogik*. Reinbek: Rowohlt.
- Frese, M/J. Sabini (Eds.) (1985). *Goal directed behavior: The concept of Action in Psychology*. Hillsdale, N.J./London: Lawrence Erlbaum.
- Gendlin, E.T. (1981). *Focusing*. New York: Bantam.
- Giorgi, A. (1985). The phenomenological psychology of learning and the verbal learning tradition. In A. Giorgi (ed.), *Phenomenology and psychological research* (pp. 42-85). Pittsburg: Duquesne University Press.
- Gergen, K.J. (1984). Theory of the self: impasse and evolution. In Berkowitz, L. (ed.). *Advances in Experimental Social Psychology*, Vol. 17 (pp. 49-115), New York: Academic Press.
- Ginsburg, G.P. (1985). Situated Action. An emerging paradigm. In P. Shaver (ed.), *Self, situations, and social behavior (Review of Personality and Social Psychology 6)* (pp. 295-325), Beverly Hills: Sage.
- Girtler, R. (1984). *Methoden der qualitativen Sozialforschung. Anleitung zur Feldarbeit*. Wien/Köln/Graz.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago: Chicago University Press.
- Kvale, S. (1983). The qualitative research interview: A phenomenological and a hermeneutical mode of understanding. In *Journal of Phenomenological Psychology*, 14 (2), 171-196.
- Kvale, S. et al. (1989). *Issues of Validity in Qualitative research*. Lund: Studentlitteratur.
- Lamnek, S. (1989). *Qualitative Sozialforschung, Bd.2: Methoden und Techniken*. München/-Weinheim: Psychologie Verlags Union.
- Marshall, C./G.B. Rossman (1989). *Designing qualitative research*. Newbury Park etc.: Sage.
- Merleau-Ponty, M. (1962). *Phenomenology of perception*. London: Routledge & Kegan Paul.
- Mummendey, H.-D./R. Miehke, R. (1989). *Die Selbstdarstellung des Sportlers*, Schorndorf: Hofmann 1989
- Nitsch, J.R. (1986). Zur handlungstheoretischen Grundlegung der Sportpsychologie. In Gabler, H./Nitsch/Singer. *Einführung in die Sportpsychologie* (pp. 188-270). Schorndorf: Hofmann.
- Polanyi, M. (1966). *The tacit dimension*. London: Routledge & Kegan Paul.
- Snyder, M. (1981). On the influence of individuals on situations. In N. Cantor/J.F. Kihlstrom (eds.), *Personality, cognition, and social interaction* (pp. 309-325), Hillsdale, N.J.: Erlbaum.
- Spradley, J.P. (1979). *The ethnographic interview*. New York: Holt, Rinehart and Winston.
- Stelter, R. (1995). *Du bist wie Dein Sport. Studien zu Selbstkonzept- und Identitätsentwicklung*. Schorndorf: Hofmann.
- Tamboer, J.W.I. (1991). Relationsmodalitäten statt Leib-Seele-Verhältnisse. Ein relationales Menschenbild als Grundlage der Bewegungstherapie. In *Integrative Therapie* 1/2, 58-84.
- Weizsäcker, V. von (1986). *Der Gestaltkreis. Theorie der Einheit von Wahrnehmen und Bewegen*. Stuttgart/New York (5th ed.)

INTRA-INDIVIDUAL RESEARCH METHODS IN SPORT PSYCHOLOGY

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Key words: intra-individual research, methodology, personality, sport psychology

Studying individuals instead of groups has been mainly discussed in the methodological debate about idiographic and nomothetic research. Based on the general principles for structuring the scientific field we propose to make in this matter a distinction between clinical, correlational and experimental designs. In our opinion it is more accurate to denote only clinical individual-directed research with the term 'idiographic'. The controversies in the nomothetic-idiographic debate indeed mainly concerned the clinical use. To avoid confusion and in order not to carry the historical weight of the term 'idiographic', we prefer the neutral term 'intra-individual research', including the three types of designs. Case studies, mostly carried out qualitatively, usually offer good examples of clinical intra-individual research, while intervention studies (e.g. Bryan, 1987) represent the experimental branch of the intra-individual approaches. This contribution will focus on intra-individual correlational research, which seems to be the least known part. The arguments for an intra-individual methodology however can be applied to all three types of designs.

ARGUMENTS FOR AN INTRA-INDIVIDUAL METHODOLOGY

Until the 1980s calls for attention to intra-individual research mainly belonged under the heading of 'future directions'. Recently a growing interest has been discovered coming from different research perspectives. Theoretical and epistemological arguments in favour of intra-individual work have been advanced by several sport psychologists. An important restriction of group research is its inability to provide information on individual structures and processes (Vealey, 1989). Martens (1987) built up an epistemological rationale including a plea for idiographic research as a full-fledged source of knowledge. We can also see a relationship between the growing line of interest for the individual and the

Intra-individual Research Methods

increasing recognition of practice-oriented work in sport psychology, reflected in the recent start up of two journals stressing applied research ('The Sport Psychologist' in 1987 and 'Journal of Applied Sport Psychology' in 1989).

Besides these theoretical arguments, practical advantages, including statistical elements, have been discussed. The reasoning in favour of an intra-individual methodology often refers to perceived shortcomings of inter-individual or group research. Additionally specific problems in the use of questionnaires form a source of dissatisfaction.

First, when working with elite athletes one is confronted with a small number of subjects. It is extremely difficult to find enough of them with the same background, and possibly the same performance deficiencies, to compose a homogeneous group for creating norms, making comparisons or simply coming to conclusions for this population (Bryan, 1987; Vanden Auweele, De Cuyper, Van Mele & Rzewnicki, 1993; Zaichkowsky, 1980).

Secondly, the statistical handling of group data can obscure relevant changes. In much of the group research emphasis is placed on significance level, sample size, etc. Unfortunately, there is often little relationship between what is statistically and practically significant (Zaichkowsky, 1980). Small but consistent changes, which in a group design would not emerge significantly, can be of major importance for a specific elite athlete in his attempts to improve (Wollman, 1986). In intra-individual research, on the contrary, clinical significance or relevance is stressed (Vanden Auweele et al., 1993).

Third, and related to the former argument, the degree of group variance has an important influence on the significance level of results. When within-group variability is low, small differences may emerge rather easily as significant results. The larger the variance, like in field studies where control is more difficult to achieve, the larger the difference between two groups needs to be, to arrive at significance (Bryan, 1987). The problems in composing large, homogeneous groups of elite athletes (see first point) contributes to this difficulty in reaching significance.

As a final, but not the least important concern the credibility and validity of sport psychology has to be considered. Future developments in sport psychology practice will depend, among others, upon the degree to which procedures followed can be accounted for (Bryan, 1987). A detailed and objective study of the individual can be accounted for more easily to the athlete-client and to the public than anonymous data gathering from large groups, and can contribute to the knowledge base in applied sport psychology (Smith, 1989).