SELF-CONFIDENCE AND SPORTS PERFORMANCE

A. Bund

Institute for Sport Science, University of Darmstadt, Germany

Female and male athletes often create a relationship between their performance and their actual self-confidence. Poor performances are explained with a lack of self-confidence and good performances with strong self-confidence. The purpose of this presentation is to elaborate the validity of these common sense explanations based on a literature review. First, we describe the postulates of self-efficacy theory (Bandura, 1977, 1986, 1997), which is the most extensively used theory for investigating the relation of self-confidence to sport (or motor) performance. Second, we report some empirical findings and suggest some directions for future research.

Self-efficacy theory, developed within the framework of a social cognitive theory (Bandura, 1986), poseses self-efficacy as a common cognitive mechanism for mediating people's motivation and behav-iour. Bandura originally proposed the theory to account for the different results achieved by the diverse methods used in clinical psychology for treating anxiety. Self-efficacy is defined as "...beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments" (Ban-dura, 1997, 3). Thus, self-efficacy is not concerned with the skills an individual has but with the judge-ments of what an individual can do with the skills he or she possesses and therefore can be considered as a situation-specific form of self-confidence.

In brief, self-efficacy theory states that when the necessary skills and appropriate incentives are given, self-efficacy affects choice of activities, effort expenditure, persistence, and achievement. Com-pared with persons who doubt their capabilities, those with high self-efficacy for accomplishing a task participate more readily, work harder, persist longer when they encounter difficulties, and finally achieve at a higher level. In turn, self-perception of efficacy are based on four principal sources of information: performance accomplishments, vicarious experiences, verbal persuasion, and emotional/physiological arousal. Performance accomplishments provide the most influential source of efficacy information be-cause they are based on personal mastery experiences. The relationship is thought to be reciprocal, i.e. efficacy expectations affect performance and are, in turn, altered by the cumulative effects of perform-ance experiences.

Much of the self-efficacy research in sport and motor performance has focused on examining (a) the effects of various methods used to create athletic competence in self-efficacy and performance and (b) the relationship between self-efficacy and performance. Taken together, the previous research supported the predictions of self-efficacy theory. In a recent meta-analysis (Moritz, Feltz, Fahrbach & Mack, 2000), based on 45 studies, the average correlation between self-efficacy and performance in sport was .38. The authors notice: "This meta-analysis provides clear evidence for a significant relationship between self-efficacy and performance. The studies included used different tasks and measures. Self-efficacy is both a cause and effect of performance" (Moritz, Feltz, Fahrbach & Mack, 2000, 289). However, the correlatio-nal design of the majority of studies has not permitted inferences to be made with regard to causality or direction of the self-efficacy-performance relationship. The few studies that have used path analytic tech-niques typically report direct effects of self-efficacy and previous performance on future performance.

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DOES PERCEIVED EXERTION DEPEND ON PSYCHOLOGICAL STATE, FLICKER-FUSION AND BLOOD-LACTATE?

J. Kleinert, C. Burgmer, A. Gogol

Psychological Institute, German Sport University Cologne, Germany

Since its development in the 1950s the Borgs "rate of perceived exertion" (RPE) became one of the most widely used scale in studies and experiments which necessitate the measurement of an individual's perception during and after exercise. The rate of perceived exertion scale (RPE) was developed with particular consideration of the heart rate, but there are many other physiological and psychological variables determining the RPE. For this reason, the factors, which were thought to be related to the rate of perceived exertion (RPE; see Borg 1998) were investigated by numerous studies. However, so far only few experiments have been carried out to investigate psychological state variables as to motivation and emotion. Furthermore we did not find any study, where the role of psycho-physiological factors or psycho-physiological constellations in the process of exertion-perceiving was examined.

As a result of this theoretical situation, the aim of our study is to find out, whether emotional and motivational states on their own or in relation to a physiological variable (e.g. blood-lactate) determine the rate of perceived exertion at different heart-rates. Thirty six sport-students were randomly divided into two groups with a high (75% max.power) and a low (25% max.power) muscular pre-test exercise (leg extension). The pre-test exercise consisted of 5 series with 8 repetitions of each series. After this exercise, the emotional and motivational states (using a short form of the EZ-scale from Nitsch, 1976), the flicker-fusion (using the Wiener-test-system) and the blood-lactate were measured. Subsequently the subjects performed physical exercise on a bicycle ergometer. The rate of increase was 40 Watt/min. (ramp condition) starting with 100 Watt. At heart rates of 110, 130, 150 and 170bpm, they were asked about their perceived exertion. At the same time, the blood lactate was measured. The pre-test exercise caused a wide value range of the variables in the whole sample. Anyway we couldn't discriminate the groups using the group condition (25% vs. 75%) because of very high standard deviations in both groups. On account of this fact, we decided to correlate the independent motivational, emotional, psycho-physiological and physiological variables with the RPE in the whole group.

Although blood lactate after pre-exercise correlates significantly ($p<.05$) with blood lactate during the ergometric exercise (HR110: r=.92, HR130: r=.78, HR150: r=.40) there is no significant correlation between blood lactate after pre-exercise and the RPE at any heart rate point. The correlations between lactate and RPE at the same time are significant at the 150bpm (r=.45) and 170bpm-point (r=.38). There are several significant or tendentious ($p<0.1$) correlations between emotional and motivational factors on the one hand and the RPE on the other hand. The weightiest of them appear at HR130 (self-confidence r=.43), at HR150 (self-confidence r=.46; calmness r=.41) and at HR170 (positive mood r=.40). Finally the rate of flicker fusion correlates tendentiously at HR110 (r=-.32) and at HR150 (r=-.28) and significantly at HR170 (r=-.33) with the rate of perceived exertion. Stepwise regressions show a relationship between self-confidence, flicker fusion and current blood lactate. For example self-confidence increases the rate of declared variance at HR150 from 18% (blood lactate only) to 28% (blood lactate and self-confidence as predictor variables).

The results underline the role of psychological and psycho-physiological variables in a person's rating of perceived exertion. Although the RPE highly correlates with the heart rate, the gap in declaring the whole variance can be filled out with motivational variables especially (so as self confidence). Anyway, the processes between psychological and physiological aspects in perceived exertion are quite not clear. For this reason experimental studies focussing on the perception process by using different kinds of (possibly new) variables have to be carried out.

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