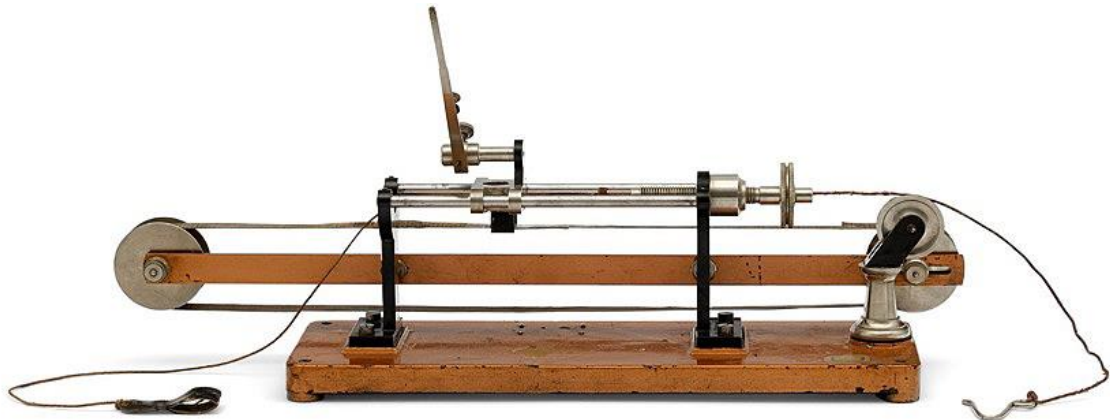


XXX INTERNATIONAL SCIENTIFIC CONFERENCE

EMPIRICAL STUDIES IN PSYCHOLOGY

MARCH 22 – 24, 2024

FACULTY OF PHILOSOPHY, UNIVERSITY OF BELGRADE



INSTITUTE OF PSYCHOLOGY
LABORATORY FOR EXPERIMENTAL PSYCHOLOGY
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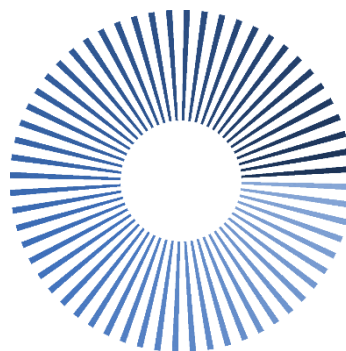
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Ergograph, after Mosso (G. Boulitte, Paris)

Device for testing the rate of fatigue under conditions of monotonous motion and loading. It consists of an arm support, a device for accurately measuring the shifts of a weight, and a set of weights (50 g – 2 kg). The subject's forearm is made immobile by firmly resting on the semicircular arm support. The forefinger and the ring finger are introduced into the tubes, while onto the middle finger a loop of a cord is fastened, carrying a weight. The lifting of the weight moves a slide. The height of a lift is traced with a metal pen and recorded onto the kymographic band. The lifting of the weight is also monitored by means of a sliding tape-measure (one meter-long). The tape rolls over two wheels unidirectionally, due to a blocker installed on the slide. Such a mechanism allows the evaluation both of a single lift and of the total amount of work expressed in millimeters. Some parts of an arm support are missing. The device was construed by Italian physiologist Angelo Mosso (1846-1910).

From the Collection of Old Scientific Instruments of the Laboratory of Experimental Psychology, Faculty of Philosophy, University of Belgrade

TABLE OF CONTENTS:

KEYNOTE LECTURES	5
NENAD HAVELKA LECTURE OF HONOR:.....	9
SYMPOSIUMS.....	11
ROUND TABLE	37
PERCEPTION	39
COGNITIVE PSYCHOLOGY	46
PERSONALITY PSYCHOLOGY	61
DEVELOPMENTAL PSYCHOLOGY.....	77
SOCIAL PSYCHOLOGY	88
EDUCATIONAL PSYCHOLOGY	112
ORGANIZATIONAL PSYCHOLOGY	123
CLINICAL PSYCHOLOGY	126
PSYCHOLOGY OF ART.....	136
KATARINA MARIĆ FOUNDATION	143

VALIDATION OF THE ACHIEVEMENT EMOTIONS QUESTIONNAIRE IN
MATHEMATICS AMONG HIGH SCHOOL STUDENTS

Isidora Micić^{1,2,*}, Jelica Miložičić^{2,3}, Nevena Jovčić², Viktorija Jovanović², Emilija Karalejić², Marko Živković², & Ksenija Krstić^{2,3}

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This study aims to validate the Achievement Emotions Questionnaire in Mathematics (AEQ-M) within a Serbian sample, comprising high school students aged 15 to 19. Grounded in control-value theory, the study posits that these emotions stem from appraisals related to control and value, subsequently influencing students' motivation, learning strategies, and performance. The AEQ-M instrument contains 60 items and assesses seven emotions (enjoyment, pride, anger, anxiety, shame, hopelessness, boredom) across three contexts (in class, during learning, in testing situations). The sample of 457 students (70% female; *M*age = 16.35), from both grammar and vocational schools, completed the questionnaire either in the school or online format. Confirmatory factor analysis was carried out in Mplus 7 to examine the fit of our data to scale's theory-proposed factor structure. A CFA of the 60 scale items showed poor model fit. After excluding 10 items with low factor loadings (< .50) and 14 items that were cross-loaded on two or more factors, the final model consisted of 36 items and resulted in adequate model fit ($\chi^2(573) = 2194.50$, CFI = .88, TLI = .87, RMSEA = .08 and SRMR = 0.07). To test reliability and convergent validity of constructs we conducted CR (> .70), AVE (> .50) and inspected factors loadings. Analysis showed that all emotions had acceptable values indicating good reliability and convergent validity. Comparing configural, metric and scalar invariance models, we tested cross-gender, school and grade measurement invariance. Based on differences in CFI < .01 and in RMSEA < .015, metric and scalar invariance was established. In the next step, we analyzed emotions' correlations with the math grades and motivation for learning math and correlations were in expected order and directions. In order to test discriminant validity we inspected correlations between emotions and compared AVE with the squared correlation between emotions. These analyses revealed very strong correlations (> .70) between Hopelessness and factors encompassing Anxiety, Anger, and Shame, indicative of substantial multicollinearity challenges among these constructs, as obtained in previous studies. These strong intercorrelations highlight the complexity of disentangling the specific influences of these related emotional constructs, necessitating a nuanced approach in the interpretation and refinement of the analytical model.

Keywords: adolescents, academic motivation, emotions, validity, AEQ questionnaire

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