CONFIDENCE IN THE PERFORMANCE OF COGNITIVE TASKS IN THE INTERNATIONAL MATHEMATICAL KANGAROO COMPETITION FOR AMERICAN AND RUSSIAN PRIMARY AND MIDDLE SCHOOL GIRLS AGED 8-12

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Abstract

The correlation of self-confidence of 8-to-12-year-old schoolgirls with the results of achievements in the International Mathematical Olympiad in American and Russian samples was studied. The previous research by Lazar Stankov’s team (2014) indicated that when testing students in mathematics using confidence ratings, regardless of cognitive ability, age and gender, confidence in the correctness of the answer was the best predictor of students’ achievements compared to non-cognitive measures such as self-concept, anxiety and self-efficacy. An important impact of students’ perception of the classroom and family environment on confidence and achievement in learning activities was found.

The more traditional dynamics of the classroom and family environment give qualitatively different feedback to boys and girls. More often than not, boys are asked to do things more efficiently, and achievements are assessed in more detail, with a focus on a higher level of personal claims. Studies have shown that girls are often being sidelined by teachers and parents (Popova, 1996). The style of girls’ upbringing in modern society is based on the motivational style of compliance with the rules and requirements of others. M. Steinkamp (1984) believes that girls need to be taught independent behavior in conditions of independence, uncertainty and duality. It is well known that the acquisition of math and science is the basis for succeeding in high-ranking professions in today's technologically advanced society, so the lack of focus on such professions for girls reduces the opportunities for the realization of abilities compared to boys (Popova, 1996).

In our opinion, such educational conditions can be achieved through training and participation in various mathematical contests and specifically in the popular and widespread worldwide Mathematical Kangaroo, which began in the 1980s as the Australian Mathematical National Contest.

Confidence in answering multiple-choice cognitive problems in the Mathematical Kangaroo competition was compared to confidence in knowledge in schoolgirls of the 3rd through 6th grades of the American and Russian samples using a diagnostic technique based on a two-category scale to assess students' confidence in each of the 24 or 30 problems: «I’m sure» vs. «I doubt it». To assess the confidence in knowledge, the following were recorded: the share of correct answers; the shares of all categories of answers (confident/correct; confident/incorrect; doubtful/correct; doubtful/incorrect); the average category of confidence in all given tasks of the contest; and the degree of adequacy of confidence in solving cognitive problems (Golovina, 2002; Golovina, Skotnikova, Elliott, 2009). The results of cross-cultural comparative analysis of all combinations of answers for the American and Russian samples of 8-to-12-year-old schoolgirls are discussed.

Keywords: Self-confidence, 8-to-12-year-old schoolgirls, decision making in cognitive tasks, International Mathematical Kangaroo Competition, cross-cultural study.