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Sociocultural Attitudes Regarding Gender Differences in Mathematics Education and Implications for Related Employment

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ABSTRACT

For many years in several countries there has been gender inequality in mathematics achievement, and girls are less likely to study and specialize in precise sciences. A primary explanation for these gender differences is sociocultural. The attitudes and perceptions prevalent in a society's culture regarding gender can affect students' attitudes and performance in maths education and their choice to pursue professional careers in maths related areas. Studies have found that learning in single-sex classrooms can influence girls' achievements and attitudes. The goal of the present study is to examine the attitudes of girls in mixed and single-sex classrooms towards mathematics and towards gender differences in mathematics. The study population included 281 students in the fifth to ninth grades, attending state-religious schools in Israel. The participants completed a multiple-choice questionnaire, which addressed their attitudes toward mathematics and possible differences between boys and girls. Most of the girls, in both types of classrooms, expressed positive attitudes towards learning mathematics and egalitarian views, although differences were found as girls learning in mixed-sex classes expressed views that were slightly more egalitarian. In addition, girls in single-sex classrooms expressed a moderately higher agreement in the "girls are better" category.

KEY WORDS

Single-sex classroom, mixed-sex classroom, mathematics, girls' attitudes, gender differences

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References

- Arad, A. (2018), The Religious Public Education in Israel Status Report, Tendencies and Achievements, Part 4, Be'erot Yitzhak, Israel, Ne'emanei Torah Va'Avodah.
- Arslan, H., Çanli, M., & Sabo, H. M. (2012), A research of the effect of attitude, achievement, and gender on mathematic education, Acta Didactica Napocensia, 5(1): 45-52.
- Becker, G.S., Hubbard, W.H., & Murphy, K.M. (2010), Explaining the Worldwide Boom in Higher Education of Women, Journal of Human Capital, 4: 203-241.
- Berger, E. (2015), The Religious Public Education in Israel: Status Report, Tendencies and Achievements, Part 3, Be'erot Yitzhak, Israel, Ne'emanei Torah Va'Avodah.
- Cherney, I. D., & Campbell, K. L. (2011), A league of their own: Do single-sex schools increase girls' participation in the physical sciences? Sex Roles, 65(9-10): 712-724.
- Cheryan, S. (2012), Understanding the paradox in math-related fields: Why do some gender gaps remain while others do not? Sex Roles, 66(3-4): 184-190
- Choi, N., & Chang, M. (2011), Interplay among school climate, gender, attitude toward mathematics, and mathematics performance of middle school students, Middle Grades Research Journal, 6(1): 15-28.
- Čiuladienė, G., and Walancik, M. (2020), Being Ready to Lecture a Multicultural Class: Asian Preferences for Conflict Management Style, Cultural Management: Science and Education, 4(1): 105-118.
- Eagly, H. A., & Wood, W. (2013), The Nature– Nurture Debates: 25 Years of Challenges in Understanding the Psychology of Gender, Perspectives on Psychological Science, 8(3): 340–357.
- Ellison, G., & Swanson, A. (2010), The gender gap in secondary school mathematics at high achievement levels: Evidence from the American Mathematics Competitions, The Journal of Economic Perspectives, 24: 109-128.
- Finkelstain, A. (2015), Lema'an Taskil: The Study of Mathematics and Natural Sciences in the National Religious Sector, Be'erot Yitzhak, Israel, Ne'emanei Torah Va'Avodah.
- Forgasz, H., & Leder, G. (2019), VCE STEM subject enrolments in co-educational and single-sex

- schools, Mathematics Education Research Journal, 1-16.
- Fryer, R. G., & Levitt, S. D. (2010), An Empirical analysis of the Gender Gap in Mathematics, American Economic Journal: Applied Economics, 2: 210-240.
- Gazit, A. (2012), As male and female created them: attitudes of Mathematics teachers towards gender differences in mathematical thinking, Education and Surrounding, It: Yearbook of Kibbutzim Seminar, 34: 69-81.
- Goldin, C., Katz, L.F., & Kuziemko, I. (2006), The Homecoming of American College Women: The Reversal of the College Gender Gap, Journal of Economic Perspectives, 20: 133-156.
- Gunderson, E. A., Ramirez, G., Levine, S. C., & Beilock, S. L. (2012), The role of parents and teachers in the development of gender-related math attitudes, Sex Roles, 66(3-4): 153-166.
- Hadad-Trabelsi, T. (2019), Favors in math. Yediot Aharonot, available at: https://www.yediot.co.il/articles/0,7340,L-5454937,00.html (accessed 30 July 2019).
- Halpern, D., Eliot, L., Bigler, R., Fabes, R., Hanish, L., Hyde, J., Liben, L., & Martin, C. (2011), The Pseudo Science of Single-Sex Schooling, Science, 333(6050): 1706-1707.
- Heilbronner, N. M. (2013), The STEM pathway for women: What has changed? Gifted Child Quarterly, 57: 39–55.
- Heyder, A., Steinmayr, R., & Kessels, U. (2019), Do Teachers' Beliefs About Math Aptitude and Brilliance Explain Gender Differences in Children's Math Ability Self-Concept? Frontiers in Education, 4: 34.
- Hyde, J. S., Mertz, J. E. (2009), Gender, culture, and mathematics performance, Proceedings of the National Academy of Sciences of the United States of America, 106(22): 8801-8807.
- Kombe, D., Che, S., Carter, T., & Bridges, W. (2016), Student Academic Self-Concept and Perception of Classroom Environment in Single-Sex and Coeducational Middle Grades Mathematics Classes, School Science and Mathematics, 116(5): 265-275.
- Lavy, V., & Sand, E. (2015), On the Origins of Gender Human Capital Gaps: Short and Long Term Consequences of Teachers' Stereotypical Biases, The National Bureau of Economic Research, Working Paper No. 20909.

- Mittelberg, D., & Forgasz, H. G. (2010), Attitudes of Israeli teaching students regarding gender and math, Dvarim, 3: 148-155.
- Mohamed, A., & Razak, F. (2018), Effects of gender and school type on attitudes towards mathematics, Journal of Physics: Conference Series, 1132(1): 1-6.
- Mullis, I. V. S., Martin, M. O., Foy, P., & Hooper, M. (2016), TIMSS 2015 International Results in Mathematics, Chestnut Hill, Boston, TIMSS & PIRLS International Study Center.
- Pahlke, E., Hyde, J. S., & Allison, C. M. (2014), The effects of single-sex compared with coeducational schooling on students' performance and attitudes: a meta-analysis, Psychological Bulletin, 140: 1042–1072.
- Picho, K., & Stephens, J. (2012), Culture, Context and Stereotype Threat: A Comparative Analysis of Young Ugandan Women in Coed and Single-Sex Schools, The Journal of Educational Research, 105(1): 52-63.
- RAMA (2018), The National Authority for Measurement and Evaluation in Education, Meitzav 2018: Measures of efficiency and school growth, Achievement tests, Ramat Gan, Israel, RAMA, available at: http://meyda.education.gov.il/files/Rama/Meitzav_Hesegim_Report_2018.pdf (accessed 11 August 2019).
- Sarouphim, K., & Chartouny, M. (2017), Mathematics Education in Lebanon: Gender Differences in Attitudes and Achievement, Educational Studies in Mathematics, 94(1): 55-68.
- Sherri, L., Brown, S. L., & Ronau R. R. (2012), Students' Perceptions of Single-Gender Science and

- Mathematics Classroom Experiences, School Science and Mathematics, 112(2): 66–87.
- Steinback, M., & Gwizdala, J. (1995), Gender differences in mathematics attitudes of secondary students, School Science and Mathematics, 95(1): 36.
- Strauss, S. (2007), Report of the committee for determining the nurture Index and the allocation model of teaching hours in primary Schools, Ministry of education, available at: https://meyda.education.gov.il/files/Scientist/Shtraus.pdf (accessed 8 November 2020).
- Tichenor, M., Welsh, A., Corcoran, C., Piechura, K., & Heins, E. (2016), Elementary Girls' Attitudes toward Mathematics in Mixed-Gender and Single-Gender Classrooms, Education, 137(1): 93-100.
- Wang, M. T., Chow, A., Degol, J. L., & Eccles, J. S. (2017), Does everyone's motivational beliefs about physical science decline in secondary school? Heterogeneity of adolescents' achievement motivation trajectories in physics and chemistry, Journal of Youth and Adolescence, 46: 1821–1838.
- Wang, M. T., Ye, F., & Degol, J. L. (2017), Who chooses STEM careers? Using a relative cognitive strength and interest model to predict careers in science, technology, engineering, and mathematics, Journal of Youth and Adolescence, 46: 1805–1820.
- Wong, W., Shi, S., & Chen, Z. (2018), Students from single-sex schools are more gender-salient and more anxious in mixed-gender situations: Results from high school and college samples, PloS One, 13(12).