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GENDERED PATHS IN SECONDARY STUDENTS' EXPECTANCIES ABOUT STEM STUDIES

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1. BACKGROUND

The dearth of women is particularly low in engineering and physical science. However, they make up half of the enrollments in other science and biology-related fields, such as medicine, chemistry or pharmacy.

The theory of expectancy-value of achievement related choices explains young people's gendered academic choices and performance (Eccles-Parsons et al, 1983; Wigfield and Eccles, 2000). Young girls are therefore more likely to enroll in courses and studies that they think they can master and that have a high task value for them.

2. OBJECTIVES

❑ The present longitudinal study aims at analyzing secondary students' interest in STEM studies, from a gender perspective.

3. METHODS

Sample

529 students enrolled in the second (14 years; time 1) and third courses (15 years; time 2) of compulsory secondary school. 51% were girls. 53% come from intermediate households. 77% are Spanish.

Instruments:

❑ Self-concept of domain ability in all the subject areas (Eccles & Harold, 1984)

-Mathematics: α =.84

-Spanish: α =.83

-Natural Science: α =.93

-Technology: α =.92

❑ Utility value of some subject areas (Eccles & Harold, 1984)

-Mathematics : α =.81

-Spanish: α =.84

-Natural Science: α =.92

-Technology: α =.88

❑ STEM studies (MEC, 2013)

-Architecture and technology

-Experimental/health sciences

Procedure

A survey was administered at the two consecutive times, with questions about sociodemographics, as well as performance in some subject areas, students' self-concept of ability and perception of utility in some subject areas, along with future study choices related to STEM studies.

4. RESULTS

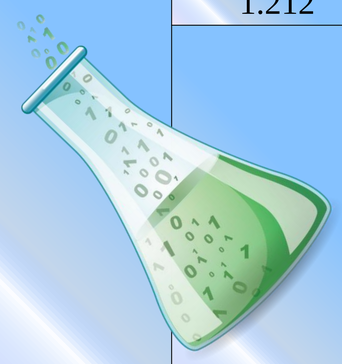
TABLE 1. Stepwise logistic regression to predict the choice of TECHNOLOGICAL STUDIES at time 2

VARIABLES	MODEL 1	MODEL2	MODEL 3	MODEL 4
GENDER (Girls)	7.532***	.8.000***	6.907***	6.599 ***
PLACE OF ORIGIN (African-LatinAmerican)	.995	.861	.891	.768
SES (Low)	.887	.951	.907	1.092
GRA DES MATHEMATICS		1.009	1.033	1.045
GRADES SPANISH		1.061	1.105	.993
GRADES NATURAL SCIENCE		1.243	1.592**	1.704**
GRADES TECHNOLOGY		.887	.709*	.749
SELF CONCEPT OF ABILITY MATHEMATICS			.976	.891
SELF CONCEPT OF ABILITY SPANISH			.985	1.150
SELF CONCEPT OF ABILITY NATURAL SCIENCE			.674**	.870
SELCONCEPT OF ABILITY TECHNOLOGY			1.597***	.902
UTILITY VALUE MATHEMATICS				1.056
UTILITY VALUE SPANISH				.959
UTILITY VALUE NATURAL SCIENCE				.720**
UTILITY VALUE TECHNOLOGY				1.784***
Δ R^2	.14	.15	.18	.24

***p<.001 **p<.01 *p<.05 Boys=0 Girls=1 Dependent Variable: No choice=0 Choice=1

TABLE 2. Stepwise logistic regression to predict the choice of EXPERIMENTAL AND HEALTH STUDIES at time 2

VARIABLES	MODEL 1	MODEL2	MODEL 3	MODEL 4
GENDER (Girls)	.614*	.613*	.603*	.565*
PLACE OF ORIGIN (African-LatinAmerican)	.986	.700	.822	.970
SES (Low)	1.274	1.054	1.006	1.048
GRA DES MATHEMATICS		1.067	.799	.825
GRADES SPANISH		1.136	1412*	1.379*
GRADES NATURAL SCIENCES		1.180	.835	.805
GRADES TECHNOLOGY		1.212	1.295	1.094
SELF CONCEPT OF ABILITY MATHEMATICS			1.503**	1.476**
SELF CONCEPT OF ABILITY SPANISH			.772	.999
SELF CONCEPT OF ABILITY NATURAL SCIENCE			1.757***	1.078
SELCONCEPT OF ABILITY TECHNOLOGY			.819	1.190
UTILITY VALUE MATHEMATICS				1.048
UTILITY VALUE SPANISH				.724***
UTILITY VALUE NATURAL SCIENCE				1.657***
UTILITY VALUE TECHNOLOGY				.690***
Δ R^2	.02	.06	.12	.20



***p<.001 **p<.01 *p<.05 Boys=0 Girls=1 Dependent Variable: No choice=0 Choice=1

5. CONCLUSION

✓Logistic regressions revealed that young males and students with high self-concept of ability in technology and low performance in natural sciences at time 1 were more likely to pursue technological studies at time 2. In addition, students with high utility value of technology and natural science at time 1 were more likely to pursue experimental and health studies at time 2.

✓Similarly, young females and students reporting high self-concept of ability in math and natural science and high performance in Spanish at time 1 were more likely to pursue experimental and health studies at time 2.

✓ These findings have important educational implications and suggest that the structure of the educational system in Spain as well as the role played by the different subject areas in the curriculum of secondary education shape students' gendered aspirations in STEM.

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