

Stereotypes still affect females' career aspirations in STEM topics

June 22 2017, by Melissa Cochrane

Masculine stereotypes of STEM (Science, Technology, Engineering and Mathematics) subjects corrupt the self-concept of female students and their career aspirations in such areas.

Science, Technology, Engineering and Mathematics, the so-called STEM subjects, are traditionally male dominated and it is well established that female students remain underrepresented in such programmes to this day. This gender discrepancy has been a hot topic among researchers and advocates who seek to understand this phenomenon to ultimately close or at least reduce the gap. For the few female students who successfully end up in STEM programmes, one would assume they overcame the barriers and are less prone to <u>stereotype</u> views. But is this so?

Professor Bernhard Ertl from the Universität der Bundeswehr München, in Germany et.al. took a closer look at this topic in their recent study "The Impact of Gender Stereotypes on the Self-Concept of Female Students in STEM Subjects with an Under-Representation of Females" published in Frontiers for Psychology.

The study involved 296 women from different German universities who are all enrolled in a STEM programme with less than 30 percent female students. It aimed at investigating the impact of stereotypes and the role of family, school and society on the self-concept of female students already studying these scientific subjects. Stereotypes impact a person's self-assessment and lower their sense of competence, ability and selfconfidence, i.e. the self-concept.



"We were astonished that stereotypes about STEM still corrupt the selfconcept of female students who already crossed several barriers and found their way into a STEM subject with a quite low proportion of females." states Professor Ertl.

Even though the students participating in the study presumably had good grades in STEM, stereotypes still corrupted their self-concept. The STEM career path is considered untypical by many of the students' social environments and in some instances, was met with surprise or even scepticism. One of the reasons for this might lie in stereotypes that attribute girls' achievements to diligence instead of talent.

Professor Ertl expands "Stereotypes are grounded in society and therefore it is important for us to know the effect of our stereotypes on individuals' self-concepts, achievements and career decisions." The study points to the fact that family can have a negative impact on female students' self-concept and initiatives that directly seek to support the students may actually backfire and reinforce the stereotypical views instead.

Indirect support has proven to be more effective. This involves for instance giving children the opportunity to have positive experiences in science related subjects or by giving them the chance to meet role models that are enthusiastic about their STEM professions. Such measures may boost the self-concept of female students in STEM programmes, more so than direct encouragement.

To conclude, study co-author Professor Manuela Paechter highlights the key learnings from the study for education "We should realise that supporting students may have ambiguous effects. Consider this paradox: If we perceive a <u>student</u> as not sufficiently gifted by the standards of our implicit stereotypes, we may communicate this opinion subconsciously whilst at the same time giving them support. Even if well intentioned,



such behaviour will foil the hoped-for effects. Instead, teaching subjects like physics while linking them to how they explain daily life phenomena could attract more girls (and also more boys). "

More information: Bernhard Ertl et al. The Impact of Gender Stereotypes on the Self-Concept of Female Students in STEM Subjects with an Under-Representation of Females, *Frontiers in Psychology* (2017). DOI: 10.3389/fpsyg.2017.00703

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