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Guest Editorial

Gendered Motivation and Choice in STEM
Part 2: Socio-cultural, organizational and socialization factors.

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It is well known that there is a persistent underrepresentation of women in the fields of science, technology, engineering and mathematics (STEM) (OECD, 2013a). Gendered educational and occupational choices are highly problematic as they affect outcomes of societal concern, such as level of education and career prestige (Watt, 2016).Gendered choice behaviors start to solidify in adolescence when girls, despite gender equal performance levels in mathematics and science, report less motivation to learn, lower competence belief and higher levels of anxiety in regard to mathematics than boys (OECD, 2013b). Together with occupational values, high competence beliefs and motivation in mathematics and science are, however, important prerequisites for occupational choices in adulthood (Eccles & Wang, 2015).

This special issue of GST, published in two parts, includes papers that are based on a selected number of keynotes and research papers presented at the 2nd Network Gender & STEM Conference. The conference took place from 3-5 July, 2014 at Technische Universität Berlin, Germany. The 3rd Gender & STEM Network conference entitled "Promoting girls' and women's participation in STEM advancement and innovation: Connecting research with global policy and practice" takes place July 21-23, 2016 and is organized by Pooran Wynarczyk, Helen Watt and Noortje Jansen in close collaboration with the Network Gender & STEM (www.genderandSTEM.com).

This second part of the special issue includes innovative empirical research papers and perspective papers authored by researchers from Germany, New Zealand, the Netherlands, and the United States. It aims to deepen existing knowledge about the role that socio-cultural and individual factors, socialization agents and organizational structures play in gendered motivation, career plans and choice behaviors of girls and boys and women and men in STEM. The papers focus on gendered motivation and choice in STEM in different age groups from elementary school to adulthood and discuss how education, policy and workplaces enhance or inhibit girls' and women's choice behaviors in STEM.

Individual factors such as adolescents' gender, immigrant background and their coping strategies in school play an important role for their gendered motivation and achievement in STEM. The effects of adolescents' gender and immigrant background on their achievement and motivation in mathematics and science are examined by Malte Jansen and Petra Stanat in their empirical paper *Achievement and Motivation in Mathematics and Science: The Role of Gender and Immigrant Background*. This paper addresses a highly important issue in current research by comparing patterns of gender differences in mathematics and science (biology, chemistry, and physics) achievement and motivation of adolescent girls and boys with, and without, an immigrant background using data from the German National Assessment Study. Little is known about the coping methods that girls and women prefer to utilize when confronted with gender bias. Using data of girls and women from high schools and a university in the western United States, in her paper *Girls' and Women's Preferred Methods of Coping with Gender Bias in STEM,* Rachael D. Robnett examines the extent to which girls and women endorse various coping strategies in response to gender bias in STEM and investigates the predictors of active versus passive coping. Focusing on adulthood and women's participation in STEM, Erica S. Weisgram and Amanda B. Diekman, in their perspective paper *Family Friendly STEM: Perspectives on Recruiting and Retaining Women in STEM Fields,* emphasize women's family goals as an important factor that affects their career choices and discuss ways in which STEM careers might become more "family friendly" both in perception and in reality.

Angelika Trübswetter and colleagues also examine how workplace-related structural conditions in women's lives shape their participation in STEM careers. Their research paper *Corporate culture matters – what kinds of workplaces appeal to highly skilled engineers?* explores the preferences of highly skilled female and male engineers in Europe and discusses gender-specific differences in regard to job aspects and their importance for women and men.

The question of how women's participation impacts gender dynamics in physics is discussed by Petra Lucht in her case study *De-Gendering STEM - Lessons Learned from an Ethnographic Case Study of a Physics Laboratory*. The results presented are based on ethnographic field notes and qualitative interviews with members of a physics group working under one professor at a German university.

Socialization contexts, such as teachers and families, are important prerequisites for achievement, motivation and choice behaviors of girls and boys and of women and men in STEM-related fields. Male and female teacher expectations, and the influence of teacher-student gender match and mismatch on teacher expectations, of elementary student mathematics achievement are explored by Penelope W. St J. Watson, Christine M. Rubie-Davies and colleagues in their empirical paper *Teacher Gender and Expectation of Student Mathematics Achievement: A Kink at the Base of the New Zealand Pipeline?*. The findings reveal possible implications for men in the

teaching profession, and for girls' future involvement in mathematics and related fields.

The influences of parents' science-related values and child-specific expectations on the learning and future-oriented motivation, and the science achievement, of boys and girls is highlighted by Päivi Taskinen, Julia Dietrich and Bärbel Kracke in their research paper *The Role of Parental Values and Child-specific Expectations in the Science Motivation and Achievement of Adolescent Girls and Boys*. Using data from students and their parents who were included in the German PISA (Program for International Student Assessment) sample, the paper reports associations between the values and expectations of parents and the motivation and achievement of adolescent girls and boys.

Inter-individual differences in the motivation of adolescent girls and boys in mathematics, and the role of student-perceived parents' mathematics values for adolescents' membership in these mathematics profiles, are examined by Rebecca Lazarides, Charlott Rubach and Angela Ittel. Their empirical paper *Motivational Profiles in Mathematics: What Roles Do Gender, Age, and Parents' Valuing of Mathematics Play?* identifies and discusses gender-related differences in profile membership as well as achievement-related differences across motivational profiles.

Noortje Jansen and Linda M. Derksen describe, in their perspective paper *Talent Viewer: Evaluation of a project aimed at breaking down (gender) stereotypes about STEM and STEM-talents in primary schools in the Netherlands*, a large project in primary education in the Netherlands that aims to break down gender stereotypes about Science and Technology among primary school pupils, their parents, and the teachers. The program included the involvement of parents, who were encouraged to discuss the talents with their child and was evaluated by teachers.

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