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Gender stereotypes in education: Development, consequences, and interventions

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ABSTRACT

Despite many efforts to increase gender fairness in education in recent years, the issue has not yet become obsolete: Gender discrimination still exists and finds expression in unused chances and limited action repertoires for both sexes. This article gives an overview on existing gender differences across the lifespan before providing explanations for these differences from a developmental perspective. We present psychological theories of development dealing with the adoption of gender typical preferences and behaviors in children, and draw the connection to the role parents' and teachers' gender stereotypes play in this process. The mechanisms contributing to the perpetuation of gender differences are illustrated via empirical studies. Finally, we offer starting points for interventions to prevent the development of these gender differences, and introduce the REFLECT program which enhances gender competence in secondary school teachers and their students, and a training program for kindergarten teachers as concrete examples of such interventions.

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KEYWORDS Gender discrimination; gender stereotypes; education; gender schema theory; reflective coeducation

Introduction

The educational careers of women and men in Europe differ greatly, although gender equality in educational institutions and in the labor market is an important goal of the European Union, which is manifest in various efforts to promote gender fairness (European Commission, 2015). Despite men and women, or boys and girls, formally having the same educational opportunities, gender differences still exist in students' performance and motivation, in vocational aspirations, and also in salaries and participation in different substantive fields.

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The intention of this paper is to present and discuss explanations for these differences from a developmental perspective. In the first section, we report a selection of gender differences that can be seen in educational careers across the lifespan. As explanations for these differences, we then present different psychological theories of development dealing with the adoption of gender typical preferences and behaviors in children, focusing on Bem's gender schema theory (1981). In the third section, we draw the connection from individual gender schemas to culturally shared gender stereotypes. The concept of gender stereotypes is of high importance for individual development but has not received much attention in the field of developmental psychology; for example, in the EJDP, founded in 2004, the term and its synonyms can be found in just four articles. We elaborate how gender stereotypes lead to different expectations of men and women, or boys and girls, concerning skills, personality attributes and self-concepts. Using empirical studies, we demonstrate in the fourth section how agents of socialization transfer these gender-stereotyped expectations to children, resulting in the perpetuation of gender differences. As an intervention against the (often unintentional) perpetuation of gender differences, we recommend the implementation of reflective coeducation in teacher education and present the REFLECT program and a training program for kindergarten teachers as concrete examples of this in the last section. Finally, we draw conclusions concerning the consequences of this research for educational systems in Europe.

Gender differences across the lifespan

In terms of school performance, findings from PISA (OECD, 2014) show that boys perform better than girls in mathematics in most countries (average gender gap: 11 points) while in reading girls outperform boys almost everywhere (average gender gap: 38 points). Gender differences not only occur regarding student performance, but also regarding student motivation (for an overview see Meece, Glienke, & Burg, 2006; Wigfield, Battle, Keller, & Eccles, 2002): For example, boys hold higher competence beliefs than girls for mathematics and sports, even after all relevant skill-level differences have been controlled for. By contrast, girls have higher competence beliefs than boys for reading, English, and social activities, and are more likely to express strong feelings of anxiety towards mathematics (OECD, 2014), see Figure 1. Besides performance and motivation, boys and girls also differ in the levels of educational qualification they reach: Fewer boys than girls successfully complete upper secondary programs (OECD, 2014). Concerning vocational aspirations, more girls are interested in working in health services, while more boys plan careers in engineering or computing (OECD, 2012), see Figures 2 and 3. When boys and girls become men and women and enter the labor market, another gender difference emerges: The gender wage gap is the unadjusted difference between male and female earnings expressed as a percentage of male earnings. It ranges from 5.6% in New Zealand to 36.6% in

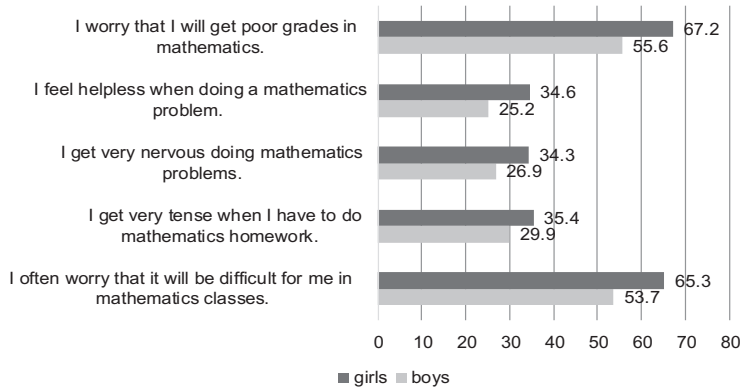

Figure 1. Gender differences in mathematics anxiety. OECD average percentage of students who agreed or strongly agreed with the cited statements.

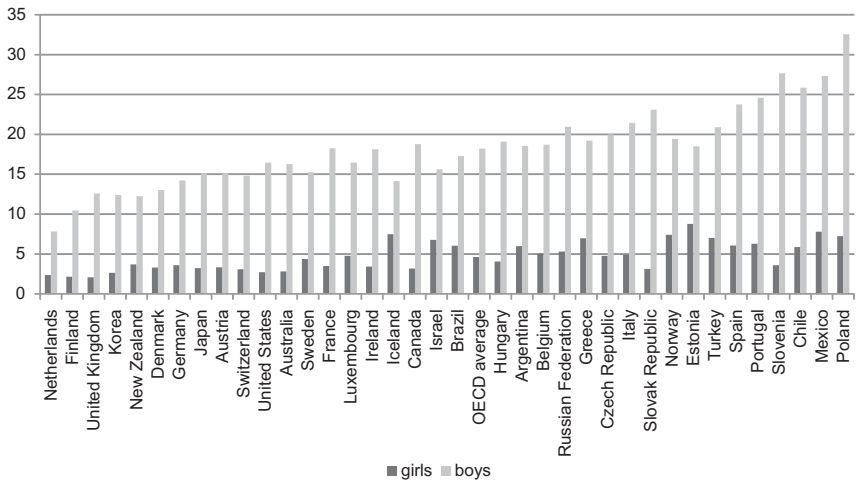

Figure 2. Percentage of 15-year-old boys and girls planning a career in engineering and computing.

Korea, indicating that men earn higher wages than women in all OECD countries; the OECD average gender pay gap in 2013 was 15.5% (OECD, 2015). Not only do women earn less than men, they are also underrepresented in decision-making positions in politics – the proportion of women amongst members of national parliaments in EU countries was only 27% in 2013 – and economy (European Commission, 2013, 2014). Figure 4 shows the representation of women and men on the boards of large listed companies in the European Union in 2013.

The reported findings are just some examples for the dramatic gender differences still occurring in educational careers. It is important to note that there is no evidence that these differences can be explained by gender differences in

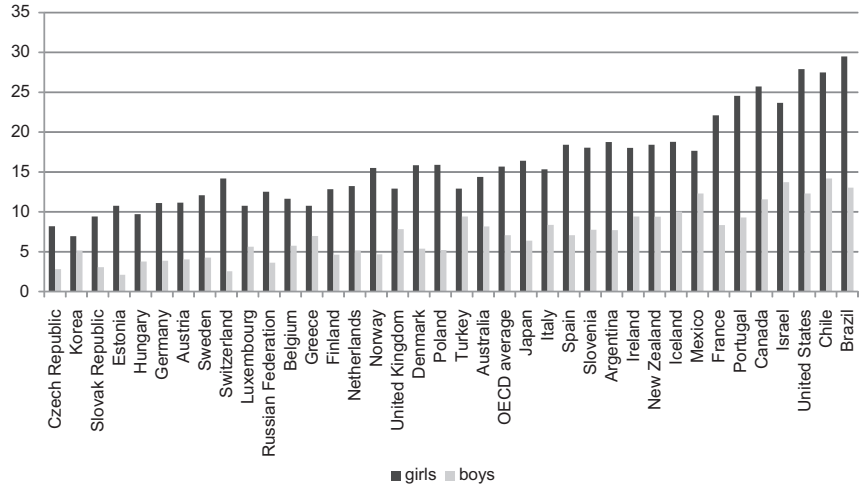

Figure 3. Percentage of 15-year-old boys and girls planning a career in health services.

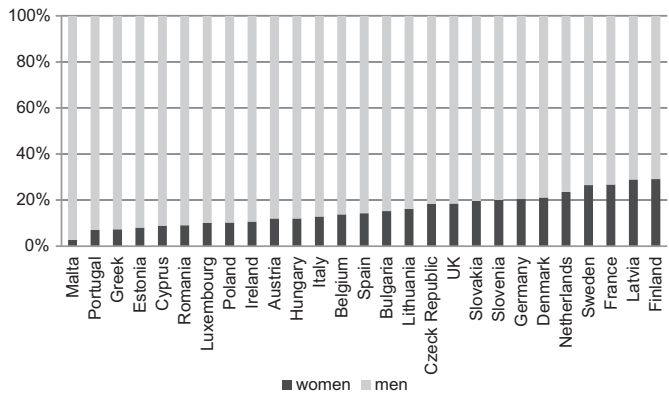

Figure 4. Representation of women and men on the boards of large listed companies, 2013.

basic abilities or in personality traits: According to Hyde (2005), who inspected the effect sizes of 128 meta-analyses conducted on psychological gender differences, 30% of the effect sizes are in the close-to-zero range, and an additional 48% are in the small range. Moreover, while differences in interests or performance in early childhood and the first years of schooling are small, differences become increasingly apparent at adolescence (e.g., Evans, Schweingruber, & Stevenson, 2002; Retelsdorf, Schwartz, & Asbrock, 2015). Thus, the reported gender differences indicate that socialization increases gender differences in education and leads men and women to be restricted from realizing their full potentials. But how does it happen that girls and boys develop so differently over the course of their educational careers? The following section deals with

the question of how children adopt gender typical preferences and behaviors from a developmental perspective.

Development of gender differences

Children begin to show gender typical interests and behavior at an early age. Preschoolers already associate toys, clothes, domestic appliances, occupations, and colors with one gender or another, which is also reflected in their behavior, preferences and personality attributes: Children tend to behave in a way culture defines as appropriate for their gender (for an overview see Berenbaum, Martin, & Ruble, 2008). The acquisition of 'gender-appropriate' preferences, skills, personality attributes, behaviors, and self-concepts is referred to as the process of gender typing (or sex typing) within psychology. Different psychological theories of development offer explanations about how this process is carried out: Social learning theory highlights the explicit reinforcement of gender-appropriate behavior by important others such as parents and teachers, as well as indirect learning via observation and modeling (e.g., Mischel, 1966). In contrast, cognitive-developmental theory emphasizes children's cognitions about their own gender as the basis for gender typical preferences and behavior, and stresses the importance of recognizing that one's gender is stable over time and situations for gender typing: a child knows about his/her gender before showing gender typical behavior (Kohlberg, 1966). Both approaches have their strengths and weaknesses, but neither can exhaustively explain the process of gender typing (for a detailed discussion see Bem, 1983). Gender schema theory (Bem, 1981, 1983) thus contains features of both the social learning and the cognitive-developmental approach to gender typing. Like social learning theory, gender schema theory assumes that gender typing is a learned phenomenon and, hence, is neither inevitable nor unmodifiable. According to Bem, children observe their environment, learning the various associations with masculinity and femininity, including the physical differences between men and women, their societal roles, the characteristics of each gender, and also how society treats each gender. Children then adjust their behavior to align with the gender norms of their culture, with parenting, schools, and the media serving as factors of influence. Like cognitive-developmental theory, gender schema theory proposes that children's cognitive processing is crucial for gender typing: Children learn to recognize and organize incoming information in gender-based categories (= gender schemas). A gender schema comprises networks of ideas and information that filter perceptions before the child is even aware of this process (Bem, 1981, 1983). Gender-schematic processing involves spontaneously sorting objects, attributes and behaviors into masculine and feminine categories, regardless of their differences in dimensions unrelated to gender. Individuals also construct their self-concept within the framework of these gender-based categories. Gender schemas are constantly changing in the course of a child's

development and differ from child to child as they are constructed individually. However, most individuals growing up in the same cultural context have similar gender schemas, which is to a certain degree due to cultural gender stereotypes.

Gender stereotypes

Gender stereotypes (also called sex stereotypes, sex-role stereotypes, or gender-role stereotypes) are structured sets of beliefs about personal attributes, e.g., interests, competences, and roles, of men and women (Ashmore & Del Boca, 1979). These socially shared beliefs have been found to be very stable over time (Prentice & Carranza, 2003). Overall men and women are thought to differ both in terms of achievement-oriented traits, labeled as *agency* or *instrumentality,* and in terms of social- and service-oriented traits, labeled as *communion* or *expressivity* (Kite, Deaux, & Haines, 2008). Men are characterized as aggressive, forceful, independent, and decisive (= agentic attributes), whereas women are characterized as kind, helpful, beautiful, and concerned about others (= communal attributes). Due to the widespread changes in the roles and activities of men and women, people witness violations of these gender stereotypes every day. Nevertheless the content of gender stereotypes hasn't changed over the years (Prentice & Carranza, 2003). Whereas all categorical stereotypes, such as national stereotypes, contain (presumably) descriptive information about category members, gender stereotypes have both descriptive and prescriptive components. The descriptive component consists of beliefs about the characteristics that women and men *do* possess, whereas the prescriptive component consists of beliefs about the characteristics that women and men *should* possess (Burgess & Borgida, 1999). In other words, gender stereotypes include information about attributes that are likely to characterize men and women and attributes that are supposed to characterize them (Prentice & Carranza, 2003). Although the content of the two components overlaps, the processes by which the descriptive and prescriptive components of gender stereotypes lead to disadvantages for men and women, or boys and girls, differ: Whereas the descriptive component of gender stereotypes leads to disadvantages for women or men who are perceived as lacking the necessary attributes to succeed in fields dominated by the opposite gender, the prescriptive component leads to disadvantages for women or men who violate shared beliefs about how women or men should behave (Burgess & Borgida, 1999). Gender stereotypes concerning leadership positions are good examples of these processes: Schein (2001) showed that the typical successful manager is generally described as agentic. Therefore men (also described as agentic) are seen as more suitable for such positions than women. This phenomenon has become known as 'think manager – think male'. Women, who consequently display agentic traits are viewed as violating the prescriptions of feminine niceness, again resulting in hiring discrimination (Rudman & Glick, 2001).

Descriptive and prescriptive components of gender stereotypes lead to different expectations of men and women, or boys and girls, with regard to skills, personality attributes and self-concepts. These expectations are transmitted to children beginning with the day of their birth by parents, teachers, peers, the media, and other agents of socialization and contribute to the development of children's gender schemas and consequently to boys' and girls' self-concepts and available repertoires of behaviors and actions. Gender-stereotyped expectations are often confirmed even though they are false, as expectations often lead to self-fulfilling prophecies and to perceptual biases (see Jussim, Eccles, & Madon, 1996). In the context of education, gender-stereotyped expectations particularly concern interests, abilities and vocational aptitudes attributed to girls and boys. These expectations have a strong impact on girls' and boys' educational careers.

Gender stereotypes in education

Parents are the most important socializing agents for children before they start attending school. They act as models, share their knowledge and expectations and reward desired behavior (Carli & Bukkato, 2000). Parents' influence on their children regarding their gender schemas is particularly large when children are between three and six years old (Gelman, Taylor, & Naguyen, 2004), and there is a positive relationship between parents' and children's gender-stereotyped cognitions (Tenenbaum & Leaper, 2002). We chose three empirical studies to illustrate how parents unintentionally convey traditional gender stereotypes to their children.

Hagan and Kuebli (2007) conducted a study on parents' socialization of preschoolers' physical risk taking, examining 80 parent-child dyads. The 3–4.5 year old children had to overcome an obstacle course involving seven different physical activities, e.g., climbing across a five-foot high catwalk and walking across a three-foot high beam. Parents were instructed to interact with their child the way they would if their child was doing these physical activities on the playground. Results show that fathers of daughters monitored their children more closely than did fathers of sons. This might be due to the stereotype that men and boys are (and should be) more willing to take risks and also stronger and less sensitive than girls. Such differential treatment of preschool-aged girls and boys in risk taking situations is likely be a contributor to gender differences: Girls are monitored more closely and are therefore less prepared to master risky situations, while boys are encouraged to engage in physical risks and thus have more unintentional injuries (see also Galligan & Kuebli, 2011; Granié, 2010; Morrongiello & Hogg, 2004).

The second study illustrating parents' influence on their children's gender schemas (Kollmayer, Schultes, Schober, & Spiel, 2016) deals with an important factor in children's lives: toys. Parents' toy selection as well as parental responses to toy play serve as primary influences in learning gender roles

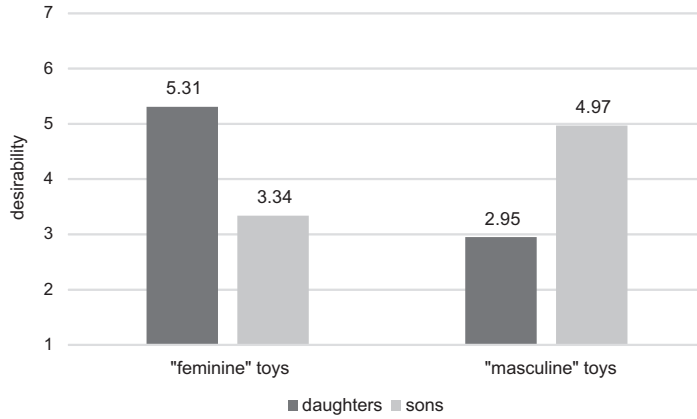

Figure 5. Desirability of gender-stereotyped toys for own child, by gender of child.

(Wood, Desmarais, & Gugula, 2002) as gender-stereotyped toy play leads to the promotion of different skills in boys and girls, with girls practicing domestic roles and boys practicing agentic roles (e.g., Cherney, Kelly-Vance, Gill Glover, Ruane, & Ryalls, 2003; Li & Wong, 2016). We conducted a survey with 324 parents of 3–6 year old children to examine parents' explicit and implicit gender stereotypes. The results showed that when asked explicitly, parents report egalitarian (not gender-stereotyped) attitudes towards gender roles. Nevertheless, when asked implicitly about the desirability of different toys for their own child, parents prefer gender-stereotyped toys for their children, see Figure 5. There seems to be a gap between parents' explicit and implicit attitudes: They explicitly describe themselves as progressive, but implicitly transmit traditional gender roles to their children. Parents of daughters find toys related to qualities of nurturance, attractiveness, and beauty desirable for their children, while parents of sons prefer toys conducive to competition, aggression, and construction (see also Campenni, 1999; Freeman, 2007).

Dresel, Heller, Schober, and Ziegler (2001) conducted the third study we report to illustrate parental influences on gender-stereotyped educational careers with 311 parents of 8th grade grammar school students. They examined how parents rate their 13–14 year old children's qualification for different study subjects. The results showed that in accordance with traditional gender stereotypes, parents see STEM subjects (= Science, Technology, Engineering and Mathematics) as less suitable for girls, while they see languages and teaching as less suitable for boys, see Figure 6. Of course, this doesn't mean that parents explicitly embrace gender stereotypes. It might also be the case that parents prefer jobs for their children, in which the probability is high that the job environment is not hostile to them, or they prefer jobs for their children according to their own job experiences. Nevertheless, also in these cases gender-stereotypes play an important role in parents' expectations for their children because job

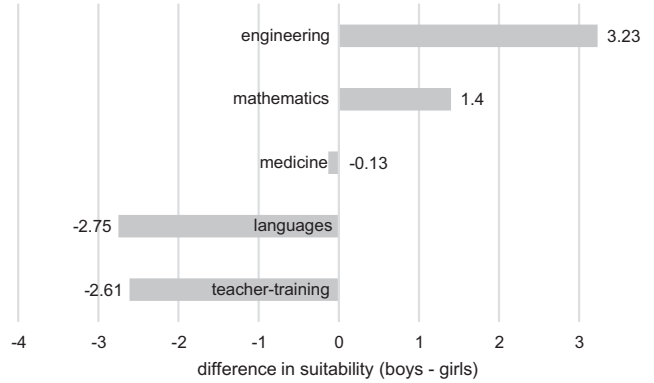

Figure 6. Gender differences in qualifications for different study subjects as assessed by parents.

environments as well as parents' own job experiences are gender-stereotyped, too. Parents might transport their expectations directly and indirectly e.g., when discussing possible fields of study with their children. This might be one reason for the differences in career planning described above and in turn for the continued horizontal segregation of the labor market (see also Tenenbaum & Leaper, 2003; Tomasetto, Mirisola, Galdi, & Cadinu, 2015).

Next, we illustrate schools' role in the perpetuation of gender differences based on three empirical studies examining teachers' and student teachers' beliefs, as well as teaching materials.

Heller, Finsterwald, and Ziegler (2010) examined beliefs about gender-specific aptitudes in mathematics and physics teachers at German gymnasiums (= college preparatory high schools). They found the same gender stereotypes concerning qualifications for different study subjects Dresel et al. (2001) found in parents: Whereas teachers would suggest that girls pursue careers in education, medicine or languages, they would advise boys to study mathematical, engineering or technological subjects. Gender-stereotyped beliefs about students' qualifications have a strong impact on teacher behavior (for an overview of gender differences in teacher-initiated teacher–student interactions see Jones & Dindia, 2004) and in turn on students' self-concepts and motivation (see also Tiedemann, 2000; Wolter, Braun, & Hannover, 2015).

One might argue that these gender-stereotyped judgments result from teachers' experiences, but the results of the following study indicate that teachers' experiences play a minor part in the development of gender-stereotyped beliefs. Schober and Finsterwald (2016) conducted a survey of 244 education students who had not yet taught in schools, asking them about their attributions of girls' and boys' success and failure in mathematics. The results showed that for girls, the education students attributed success in mathematics primarily to effort, and failure in mathematics mainly to a lack of talent. For boys, they

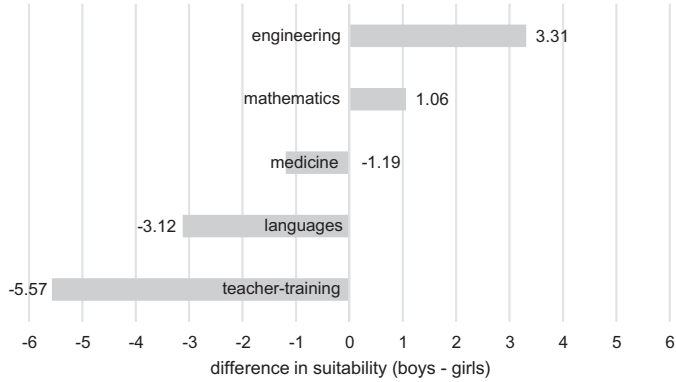

Figure 7. Gender differences in qualifications for different study subjects as assessed by teachers.

showed the opposite attribution pattern, attributing success in mathematics primarily to talent and failure mainly to a lack of effort, see Figure 7. These attributions lead girls and boys to receive different kinds of feedback, which have different motivational consequences (Finsterwald, Schober, Jöstl, & Spiel, 2012). Generally, girls are more often praised for effort, and boys for ability (e.g., Kerr, 2000; Zorman & David, 2000).

Another factor to be considered when talking about schools' role in the perpetuation of gender stereotypes is teaching materials. Finsterwald and Ziegler (2007) conducted an analysis of textbooks, focusing on the implicit communication of gender stereotypes in pictures contained therein. They examined 28 textbooks (Grades 1–4) and included a total of about 300 pictures depicting more than 800 people in their analysis. Results revealed that adult female characters are represented less frequently than adult male characters. Moreover, they found differences in the fields of action male and female characters were depicted in: Men were represented at their job more often than women, whereas women were represented in a family/household context and during leisure time more often than men. With regard to adult characters' personal attributes, men were represented as more individualistic, more competitive and more willing to take a risk than women. In terms of child characters, girls were depicted as more submissive than boys. Thus, teaching materials not only support students' learning, but also convey socially shared cultural knowledge, such as stereotypes (see also Hintermann, Markom, Üllen, & Weinhäupl, 2014; Moser, Hannover, & Becker, 2013), especially when teachers use them without reflecting on gender stereotypes.

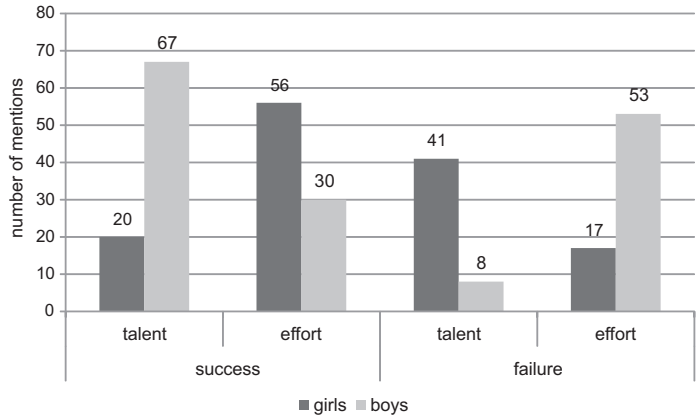

Figure 8. Education students' attributions of success and failure in mathematics for boys and girls.

Interventions: reflective coeducation

As described above, gender-stereotyped expectations play a central role in the perpetuation of gender differences, as they determine the behavior of important others and thus lead to vicious cycles in the development of children's gender-stereotyped motivation and performance. Teachers – in school as well as in kindergarten – are promising starting points for enacting change (e.g., Hattie, 2012); they are much easier to reach than parents, and in turn reach more children themselves. There is robust evidence that in addition to teachers' attitudes, also their instructional practices influence gender differences; for example, gender differences in classes decrease when teachers are able to foster aspects of individualization, autonomy and self-regulation (Lüftenegger et al., 2012). Consequently, to move forward in promoting gender fairness in education across the lifespan, from our point of view, evidence-based training programs for teachers focusing on reflective coeducation are needed. The aim of reflective coeducation is to ensure that girls and boys are taught together in a way that enables them to become aware of their individual competences and develop them without limitations arising from gender stereotypes (Finsterwald, Schober, Jöstl, & Spiel, 2013). This is in contrast to approaches assuming that single-sex education might prevent gender differences in educational careers. Halpern and colleagues (Halpern et al., 2011) convincingly argue that there is no well-designed research showing that single-sex education improves students' academic performance, but there is evidence that sex segregation increases gender stereotyping and legitimizes institutional sexism.

Based on a current action theory in the field of intervention research – the actiotope model of Ziegler, Heller, Schober, and Dresel (2006) – we created the training program REFLECT (Finsterwald et al., 2012; see also Schultes, Jöstl,

Finsterwald, Schober, & Spiel, 2015) to achieve the following goals: (1) expanding secondary school teachers' relevant objective action repertoire, providing them with the knowledge necessary to change their teaching (e.g., knowledge of the causes of gender differences, the effects of stereotypes, opportunities for fostering motivation in all students), (2) expanding secondary school teachers' subjective action space (e.g., enhancing their self-efficacy with regard to motivation enhancement in boys and girls), (3) promoting secondary school teachers' reflection on their own contributions to the formation of gender differences, resulting in changed teaching goals, and finally (4) reducing secondary school students' gender stereotypes.(Figure 8)

In order to reach these goals, the program followed a course of four consecutive phases. In Phase 1, REFLECT was developed and executed by a group of researchers. As participants, we chose a total of 38 teachers from 26 schools distributed all over Austria in cooperation with the pedagogical universities. In Phase 2, the training, blocked into four modules of two days each, was realized over the course of 7 months. Most participants simultaneously taught education students at pedagogical universities and were trained to subsequently take on a multiplication function. In Phase 3, teachers were supported in systematically integrating the contents of the training into their teaching in the context of five-week projects in their classes. The class projects were developed and realized by the teachers themselves, and supervised by the REFLECT trainers. Phase 4 focused on evaluating the efficacy of REFLECT. The summative evaluation was carried out by means of a training-control-group design with a multi-method, multi-informant approach. The results of the evaluation clearly show the effectiveness of the program: In comparison to the control group, participants' objective action repertoire increased (goal 1), as did their subjective action space (goal 2) (Schober et al., 2012). Significant positive effects were also found among the students involved: their knowledge of gender issues increased during the program (Schultes et al., 2015), which is a very important precondition for reducing students' gender stereotypes (goal 4). In the last phase, we also produced a training manual and distributed it to all pedagogical universities to support the implementation of REFLECT in general teacher education.

As children's gender-stereotyped educational careers don't start in schools, we subsequently created a similar training program for the elementary sector (Kollmayer, Schultes, Schmolmüller, Spiel, & Schober, 2015). In four half-day modules, kindergarten teachers learn about (1) developmental theories concerning children's adoption of gender typical preferences and behaviors, (2) gender stereotypes in kindergarten-settings (with a special focus on books and toys), (3) possibilities for reducing gender-stereotypes in kindergartens by providing corresponding materials and by interacting with the children in a gender-sensitive way, and (4) possibilities for gender-sensitive parental work. The four modules contain input elements as well as exercises. Between the modules, the kindergarten teachers work on reflection exercises that support them

in integrating the contents of the training into their day-to-day work and reflect on opportunities and obstacles. Moreover these reflection exercises support teachers in practicing their role as multipliers in their kindergarten. In the last module dealing with parental work, we design a parent-teacher conference on gender stereotypes in kindergartens together with the kindergarten-teachers. In role plays they also practice how to address gender stereotypes in parental work without triggering resistance.

Resume: consequences for the educational system

In order to prevent gender differences in education arising from gender stereotypes, educational systems in Europe are supposed to base their work on the available scientific knowledge. As there is no well-designed research showing that single-sex education reduces gender differences in students' academic performance (Halpern et al., 2011), we argue in favor of reflective coeducation becoming an obligatory topic in basic and further education for school and kindergarten teachers. Teacher education should build knowledge about the causes of gender differences in student performance and student motivation and about teachers' (unintentional) contributions to these gender differences. This includes a deliberate reflection on the fact that gender stereotypes always constitute restrictions on individual possibilities and potentials. As parents are very important socializing agents but quite hard to reach, teachers' parental work is crucial for initiating reflection on gender stereotypes and their effects in parents, too. Teachers should be empowered to educate and teach in a way that focuses on the individual and his/her competence development. They should know how to foster learning motivation and self-regulation in all students regardless of their gender. Therefore, role models for boys and girls should be provided in teaching materials, and teachers should learn about opportunities to consider students' previous knowledge and interests in their instructional designs. A positive view on heterogeneity should become a pivotal educational goal for teachers, leading them to actively promote students' social competence and ability to deal with diversity. Especially in the current European situation with respect to incoming refugees, not only the consequences of gender stereotypes for educational processes should be scrutinized, but also the consequences of ethnical, national or religious stereotypes. The principles of reflexive coeducation offer promising opportunities for these challenges and allow all children to exploit their potential without being restricted by stereotypes.

Disclosure statement

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