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A teacher like me: the role of teacher gender representation and gender stereotypes in education

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CHAPTER **SIX**

Conclusion

6.1 THE ROLE OF GENDER AND GENDER STEREOTYPES IN EDUCATION

Even though the relation between students' and teachers' gender and students' performance have often been studied in different scientific disciplines (e.g., Dee, 2005; Riccucci & Van Ryzin, 2017), still little is known about the mechanisms explaining these relations (Volman, Ten Dam, & Van Eck, 1995). Gender stereotypes have often been assumed to play a role in these explanatory mechanisms, but empirical tests are rare and solely situated in the 'females in math' context (Xu & Meier, 2021; Zhang, 2019). This dissertation aimed to provide more insight into the relation between student and teacher gender and student performance through theorizing and examining the role of gender stereotypes. By complementing insights from studies on representative bureaucracy in public administration with social psychological literature on gender stereotypes and social identity the relation between student-teacher gender congruence and student performance was scrutinized. In four empirical studies I specifically examined the contexts in which relations between student-teacher gender congruence and student performance occur as well as the mechanisms underlying these relations, from both the student and the teacher perspective.

This concluding chapter is structured as follows. Section 6.2 summarizes the findings of each empirical study. Then, Section 6.3 discusses the lessons learned from this research. Thereafter, Section 6.4 describes the theoretical and methodological implications, followed by Section 6.5 in which this research's limitations are discussed. Finally, section 6.6 concludes this dissertation and formulates the implications for education practice.

6.2 SUMMARY OF FINDINGS

6.2.1 WHEN AND WHERE: THE ROLE OF CONTEXT

Chapter 2 focused on the role of context in the relation between student-teacher gender congruence and students' performance. Based on literature on gender salience and gender stereotypes (e.g., Hilliard & Liben, 2010; Keiser et al., 2002), I suggested that the relation between student-teacher gender congruence and student performance would occur for female students in math and physics, and for male students in Dutch language and French language, because these are the subjects in which performance of these groups of students is negatively gender stereotyped. Negative gender stereotypes (i.e., men/women are bad at languages/STEM) are generally easier to internalize and more resistant to change than positive gender stereotypes (Baumeister et al., 2001). I therefore expected gender to be a salient characteristic for women in STEM and men in languages, enabling the relation between gender congruence and performance to occur in these settings. Indeed, analyses of administrative secondary school data showed that student-teacher gender congruence was positively related to female students' performance in math and physics but not in Dutch

language and French language, and to male students' performance in Dutch language and French language but not in math and physics.

Further, I argued that apart from the type of subject, the extent to which the gender stereotypes connected to STEM and languages play a role, may vary in different educational settings. I expected the relation between student-teacher gender congruence and student performance to be stronger in lower educational levels, in religious schools, and in schools located in less populated areas, because these are the educational contexts in which gender stereotypes may be relatively strong (De Vries et al., 2022; Istenič, 2007; Turner et al., 2019). However, the results showed distinct relations for the different educational contexts for male and female students across the subjects which did not correspond with the suggested role of gender stereotypes in these contexts.

6.2.2 HOW: THE STUDENT PERSPECTIVE

While no or contradictory effects of context were found, Chapter 2 also showed that, regardless of context, a relation between student-teacher gender congruence and student performance exists in subjects with gender stereotypes connected to it. More specifically, associations between student-teacher gender congruence and student performance were observed for groups of students in subjects in which the gender of a teacher can serve as a rejection of a negative gender stereotype connected to the subject. In Chapter 3 and 4, I proposed a mechanism that may underly these associations from the perspective of the student based on insights from social cognitive theory (Bussey & Bandura, 1999). The mechanism explains effects of the presence of a male or female teacher on students' performance through students' gender stereotypes and self-efficacy beliefs. In Chapter 3, we tested this association between student-teacher gender congruence, gender stereotypes, and self-efficacy beliefs. A vignette experiment among Dutch high school students showed significant gender differences in stereotypical beliefs and academic self-concepts of male and female students and a significant effect of female math teachers on both female and male students' self-beliefs in math. However, the experiment did not provide evidence for the hypothesized mechanism as students' gender stereotypes were not affected by teachers' gender.

In Chapter 4, I built on this study by including the association with student performance. We tested the full proposed mechanism in both math and Dutch language based on multisource data from a longitudinal research project. The results showed that student-teacher gender congruence was not related to female students' gender stereotypes, self-beliefs or performance in math or Dutch language. For male students, student-teacher gender congruence was not related to gender stereotypes, self-beliefs or performance in math. However, in Dutch language, student-teacher gender congruence was unexpectedly negatively associated with male students' performance. Although male students' gender stereotypes and self-beliefs were related to their Dutch language performance, teachers' gender was not associated with male students' gender stereotypes or self-beliefs.

6.2.3 HOW: THE TEACHER PERSPECTIVE

Finally, in Chapter 5, I studied the perspective of the teacher. I suggested that teachers' grading is gender biased because of teachers' gender-typed associations and expectations influencing students' administered performance (grades). Based on insights from gender schema theory (Bem, 1981), I argued that male teachers in Dutch language and female teachers in math may display less gender grading bias, because of weaker gender-typed associations and expectations. By means of a field experiment among teachers in training we tested the hypothesized mechanism. The experiment showed that teachers' grading, on average, was not gender biased. However, individual variation in gender grading bias was associated with teachers' implicit expectations of male and female students. Further, the experiment showed that female math teachers and male Dutch language teachers had weaker implicit gender stereotypes than their counterparts. In math, these weaker implicit gender stereotypes translated into less gender bias in expectations of students, which resulted in less gender grading bias.

6.3 LESSONS LEARNED

This dissertation provided three important lessons with regard to the role of gender and gender stereotypes in education. First, this dissertation showed that student and teacher gender are related to student performance. Each study within this dissertation provided evidence for an association between students' and teachers' gender and students' performance. Second, this dissertation showed that gender stereotypes are an important part of the puzzle that explains the role of gender in education. Each study within this dissertation showed that gender stereotypes in students and teachers still exist and that these gender stereotypes are associated with students' performance through students' beliefs of self and teachers' beliefs of others. The gender stereotypes of teachers were found to explain effects of teachers' gender on student performance through teachers' gendered associations, expectations, and gender grading bias.

However, and this is the third lesson with regard to the role of gender and gender stereotypes in education, context matters. Student and teacher gender do not always relate to student performance and when they do the magnitude and direction of the associations can vary in different contexts. This dissertation showed positive (Chapter 2 and 3), as well as negative (Chapter 4), and no associations (Chapter 4) between student-teacher gender congruence and students' performance. Further, gender stereotypes were found to explain effects of teacher gender on student performance, but only from the perspective of the teacher and only in the subject math. These findings stress the importance of contextual factors.

Although this dissertation examined the role of contextual factors (Chapter 2), a conclusive answer with regard to what contextual conditions strengthen or weaken the relation between student-teacher gender congruence and student performance could

not be given. On the macro level, we found that student-teacher gender congruence was related to better performance of male and female students in subjects in which students' performance is negatively gender stereotyped. We tested the existence of these relations in three educational contexts that were assumed to differ in the extent to which gender stereotypes play a role (i.e., students' educational level, schools' religiousness, and schools' location). I expected the associations between student-teacher gender congruence and student performance to be the strongest in lower educational levels, in religious schools, and in less-populated areas because these are the contexts in which gender stereotypes are assumed to be relatively strong. However, the data showed distinct relations between student-teacher gender congruence and performance in different educational contexts that did not correspond with the suggested role of gender stereotypes. For instance, on the macro level, student-teacher gender congruence was positively related to female students' performance and was not related to male students' performance in physics. Zooming in on the three different educational levels, student-teacher gender congruence was both positively and negatively related to female and male students' physics performance. Student-teacher gender congruence was positively related to female students' physics performance in the lower vocational track and the scientific track (lowest and highest educational level) and negatively related in the higher vocational track (moderate educational level). For male students, student-teacher gender congruence had a positive association with performance in the higher vocational track (moderate level) and a negative association with performance in the lower vocational track and scientific track (lowest and highest level). These distinct findings, that do not correspond with the hypothesized role of gender stereotypes, leave important questions and avenues for future research on the topic of gender and gender stereotypes in education which I will discuss in the next section.

6.4 THEORETICAL AND METHODOLOGICAL IMPLICATIONS

The role of gender and gender stereotypes in student performance has been the topic of study in different scientific disciplines. The theoretical framework in this dissertation was built based on studies on representative bureaucracy in public administration complemented with insights from social psychological theories. Therefore, in the following sections, the theoretical implications for the study of representative bureaucracy are discussed first, followed by the theoretical implications for the study of gender and gender stereotypes in education. In the last section I elaborate on the methodological implications of this research.

6.4.1 REPRESENTATIVE BUREAUCRACY

The study of representative bureaucracy within public administration has intensified in the past decade and focuses on the outcomes of representation within public organizations.

Representation within public organizations is assumed to benefit democratic values such as inclusiveness and equity (e.g., Sowa & Selden, 2003). Despite the increase of studies focusing on individual level effects of representation (e.g., Nicholson-Crotty et al., 2016; Song; 2018; Zhang, 2019), still little is known is about the mechanisms underlying representation effects. When expanding on the mechanisms underlying representation it can be helpful to make use of theories from other disciplines. This dissertation made use of social psychological theories to propose and empirically test psychological mechanisms in students and teachers that may explain effects of gender representation.

The explanatory psychological mechanisms were centered around the role of gender stereotypes. The explanatory role of gender stereotypes in processes of gender representation have been suggested by public administration scholars (e.g., Keiser et al., 2002; Riccucci & Van Ryzin, 2017). However, theorization and empirical tests of such mechanisms are limited (Xu & Meier, 2021; Zhang, 2019). This dissertation hypothesized that the presence of representative teachers can influence students' gender stereotypes, self-efficacy beliefs, and performance explaining effects of representation from the student perspective. Further, this dissertation hypothesized that the presence of representative teachers can influence teachers' own gender stereotypes, expectations of male and female students, and evaluations of student performance explaining effects of representation from the perspective of the teacher. Although the studies within this dissertation did not provide evidence for these mechanisms to explain effects of gender representation (i.e., student-teacher gender congruence), these mechanisms can still be a starting point for representative bureaucracy scholars to further examine the role of gender stereotypes. In addition, this dissertation showed that gender stereotypes play out for a large part on an implicit level indicating that gender representation may unconsciously and unintentionally result in performance effects. Although representative bureaucracy scholars recognized these unconscious and unintentional processes in the perspective of the citizen/client, their role in the perspective of the bureaucrat are rarely acknowledged (Akram, 2018). Representative bureaucracy scholars should further explore the role of unconscious and unintentional gendered processes that may underly symbolic as well as active gender representation effects.

Further, the findings of the studies within this dissertation stress the importance of context in gender representation effects. Representative bureaucracy scholars have been suggesting that context is an important condition for processes of (gender) representation to occur (e.g., Keiser et al., 2002; Groeneveld et al., 2015; Meier, 2019). Hence, research on this topic has increased in the past decade and contributed to insights on contextual factors that facilitate or impede gender representation on the national (e.g., An et al., 2021) and organizational level (e.g., Song, 2018). This dissertation showed that contextual factors in the vicinity of an organization (e.g., educational level, religiousness, and location) are related to the occurrence and the direction (positive or negative) of representation effects. However, the suggested role of gender stereotypes (i.e., differences in the relative strength

of gender stereotypes in the different contexts) was unable to explain the distinct findings of student-teacher gender congruence. As a consequence, it remains unclear why effects of student-teacher gender congruence occur and result in positive or negative effects in particular educational contexts. Future research should try to unravel why student-teacher gender congruence has distinct effects in different contexts. Further, future research should further explore contextual factors in the vicinity of public organizations that may facilitate or impede positive as well as negative effects of gender representation to receive a better understanding of where, when, and why positive and negative effects of gender representation occur.

Lastly, similar to much research within the field of representative bureaucracy, this research was situated in the education sector (e.g., Keiser et al., 2002). Consequently, the proposed mechanisms and contextual factors explored within this dissertation apply to the student-teacher relationship. Although the suggested mechanisms and contextual factors may apply to other citizen-bureaucrat relationships, the relation between teachers and students (that is generally characterized by frequent and enduring interactions) is different from the relation between, for instance, police officers and citizens (that is generally characterized by infrequent and short interactions). Public administration scholars should further theorize and examine whether the explanatory mechanisms and contextual factors as proposed in this dissertation apply to other settings within the public sector.

6.4.2 THE STUDY OF GENDER AND GENDER STEREOTYPES IN EDUCATION

Apart from public administration, the role of student and teacher gender in student performance is studied in the fields of economics and education (e.g., Dee, 2005; Muntoni & Retelsdorf, 2018). Although several theories in the field of education studies elaborate on the role of gender in education (e.g., Thompson, 2003), little attention has been paid to the combination of student and teacher gender and its potential unique influence on student performance. Therefore, hypotheses on the effects of student-teacher gender congruence are often based on results of previous empirical studies rather than on gender or educational theories explaining why student and teacher gender can be related to student performance (e.g., Cho, 2012; Holmlund & Sund, 2008). Consequently, recent research on the topic of student and teacher gender and student performance focused on the existence of student-teacher gender congruence effects rather than on the explanation of these effects. To receive an understanding of the role of student-teacher gender congruence in student performance, and to be able to do something about them, knowledge on why and when effects of student-teacher gender congruence occur is necessary. This dissertation brought together theoretical insights from studies on gender representation (e.g., Keiser et al., 2002), social cognitive theory (Bussey & Bandura, 1999), and gender schema theory (Bem, 1981) to develop hypotheses on the relations between student and teacher gender, gender stereotypes, and student performance. In doing so, this dissertation showed the applicability and significance of different streams in the literature to build a theoretical framework for

understanding why and when effects of student-teacher gender congruence in education might occur. Future research might want to follow this example to further theorize the role of student-teacher gender congruence in education, and possibly try to generate and specify middle range theories on gender congruence in education, to move the study and understanding of student-teacher gender congruence on student performance beyond empirical observations.

The studies within this dissertation are among the first to empirically test mechanisms explaining effects of teacher gender on student performance. Teacher gender was proposed to influence student performance through the role of gender stereotypes and gender-typed expectations of self and others, from both the student and teacher perspective. The empirical tests of the hypothesized mechanisms only provided evidence for the explanatory role of teachers' gender stereotypes in the relation between teachers' gender and students' performance (through teachers' gender bias in expectations and grading). Although previous research demonstrated that teacher gender can affect students' gender stereotypes (e.g., Beilock et al., 2012), the studies within this dissertation provided no evidence for this relation. Based on this dissertation it seems more likely that teachers' gender stereotypes explain effects of teacher gender on student performance than students' gender stereotypes. At the same time, teachers' gender stereotypes and gender bias in expectations and grading were unable to explain effects of student-teacher gender congruence as teachers' grading was, on average, not gender biased. Future research should further explore the role of teachers' gender stereotypes as an explanation for effects of teacher gender on student performance. It might be interesting to explore interactions between teachers' gender stereotypes and other teacher characteristics such as effortful control, awareness of own gender bias, or gender ideology to receive a better understanding when teachers' gender stereotypes translate into student performance.

6.4.3 METHODOLOGICAL IMPLICATIONS

This dissertation showed the value and suitability of a variety in research angles, methods, and populations to study the role of gender and gender stereotypes in education. Most research on gender in education used international or national databases on student performance (e.g., TIMMS) to study effects of student and teacher gender (e.g., Cho, 2012). These databases rely on assessments and questionnaires to measure student performance and other relevant student, teacher, and school characteristics. Measurements through assessments and questionnaires are prone to bias, social desirability, and lack of motivation or fatigue which might result in invalid statements about the role of gender and gender stereotypes in education (Wulff & Villadsen, 2019). This dissertation showed the possibility and value of using register data to study real-life effects of student-teacher gender congruence on students' performance. Schools often use student administration systems to register information on students' demographic characteristics, school attendance, school performance, subject choice, teacher characteristics, and much more. These rich, large, and

longitudinal datasets are only rarely used for research purposes while the data is available and is not prone to response bias. When studying (causal) relations between gender and student performance, future research should make use of (longitudinal) register data more often.

In addition to longitudinal (register) data, experimental designs can provide insights into the causal effects of gender. Previous research often compared average grades of groups of students for the student-teacher gender dyad to study effects of student and teacher gender on student performance (e.g., Protivínský & Munich, 2018; Zhang, 2019). As a result, still little is known about causality in the relation between gender and student performance. This dissertation used a vignette experiment (Chapter 3) and a field experiment (Chapter 5) to study the causal effects of student and teacher gender on student performance. Future research should make use of experimental designs (or longitudinal designs) more often to explore the causality in relations between student and teacher gender and student performance.

Lastly, this dissertation demonstrated the role of *implicit* gender stereotypes in education indicating that gender and gender stereotypes play an unconscious and unintentional role in student performance. Especially in countries in which gender equality is considered important, such as the Netherlands where this research was conducted, implicit measures may provide a better understanding of the working of gender and gender stereotypes in education. Future research should consider the unconscious and unintentional role of gender and gender stereotypes and should use research designs that allow for measuring implicit biases to unravel effects of gender in education such as qualitative content analyses or classroom observations.

6.5 LIMITATIONS

This research also has some limitations that need to be discussed. First, the variation in research angles, methods, and populations in each of the studies within this dissertation is a strength that comes with a disadvantage. While the variety in studies offers a rich picture of the roles that gender and gender stereotypes play within secondary education, the use of different angles, methods, and populations limits the extent to which the findings can be synthesized. For instance, it would have been valuable if the students from the individual schools included in the macro-level study also participated in the micro-level studies, so that these studies could have been linked in the empirical analyses. Hence, more studies with data at multiple levels are needed to be able to connect the dots.

Further, this research solely focused on gender. Although the focus on gender alone is relevant, the contextualization and understanding of effects of gender in education might have benefitted from the inclusion of other student and teacher characteristics. For instance, characteristics such as migration background and socioeconomic status in combination

with students' and teachers' gender (i.e., intersectionality) may play an important role in processes of representation (Meier, 2019) and discrimination (Riegle-Crumb & Humphries, 2012). Intersectionality refers to characteristics such as gender, migration background, and socioeconomic status jointly shaping individuals' experiences and reinforcing or neutralizing one another (Collins et al., 2021; Shields, 2008). Future research should consider the role of intersectionality to further contextualize and understand effects of gender in education.

Lastly, this research only used quantitative research methods and thereby did not make use of the benefits of qualitative research methods. Qualitative research methods can provide other types of insights that may have contributed to the understanding of the role of gender and gender stereotypes in education. Following the implications of this dissertation, it may be valuable to use qualitative research methods from other scientific disciplines that enable the study of the effects of gender and gender stereotypes due to implicit psychological and social processes. Hence, future research should consider ethnographic research methods, such as participant observation. Participants observation may provide new insights on how gender and gender stereotypes unconsciously and unintentionally shape the interaction between students and their teachers and how these processes can translate into student performance.

6.6 CONCLUSION

In all, this dissertation brought together literature from different scientific disciplines and used a variety of methods and research angles to theorize about and empirically test the role of gender and gender stereotypes in student performance. This dissertation showed that both gender and gender stereotypes have an impact on student performance but stresses the importance of context. On the macro level, students' and teachers' gender were found to be related to students' performance in subjects in which students' performance is negatively gender stereotyped (i.e., women in STEM and men in languages). However, when zooming in on educational contexts, the relations between student and teacher gender and student performance differed for men and women across subjects in the different contexts. Further, teachers' gender stereotypes, and not students' gender stereotypes, were found to play an explanatory role in effects of teachers' gender on student performance through gender bias in expectations and grading, but only in the subject math. Hence, follow-up questions about the contexts in which gender and gender stereotypes affect student performance were raised resulting in avenues for future research on the theorization and examination of the role of student and teacher gender and gender stereotypes in education.

The research within this dissertation has implications for education practice. First, this dissertation showed that student and teacher gender are relevant for student performance. The findings within this dissertation indicate that improving gender representation in STEM and language subjects in Dutch secondary education may be desirable as gender

representation benefits the performance of the groups of students that are confronted with negative gender stereotypes in STEM and language subjects. For this reason, schools should try to attract and maintain female STEM teachers and male language teachers.

Second, this dissertation showed that gender stereotypes still exist in students and teachers and that implicit gender stereotypes can translate into student performance through students' beliefs of self and teachers' beliefs of others. So, improving students' and teachers' awareness of implicit gender stereotypes may contribute to reducing negative effects of gender stereotypes on beliefs of self and others and student performance.

However, this dissertation also showed that the role of gender and gender stereotypes can differ for male and female students across subjects and in different educational contexts. Thus, improving gender representation and awareness of implicit gender stereotypes does not necessarily benefit student performance in every educational context (i.e., every group of students in every school). Hence, schools should explore if gender and gender stereotypes may impact beliefs of self, beliefs of others, grading, and student performance in their school, and for which groups of students and teachers gender and gender stereotypes are relevant. This requires schools to gain knowledge on the possible role of gender in education. The studies within this dissertation can help to recognize when, where, and how gender and gender stereotypes affect the education process. Further, this dissertation laid the foundation for the development of an education tool intended to create awareness about teachers' own gender bias in expectations and grading. The development of this tool is one of the projects that I will be working on after this research. In doing so, I aim to contribute to shedding a light on the hidden effects of gender and gender stereotypes in education so that gendered beliefs or lack of representation no longer hinder students to see their capabilities or, in other words, *butterflies to see themselves.*