

SOFIE LIETAERT

A GENDER GAP IN THE CLASSROOM?

A GENDER GAP IN THE CLASSROOM?

DIFFERENT PERCEPTIONS OF
STUDENT ENGAGEMENT
AND TEACHER SUPPORT

Sofie Lietaert



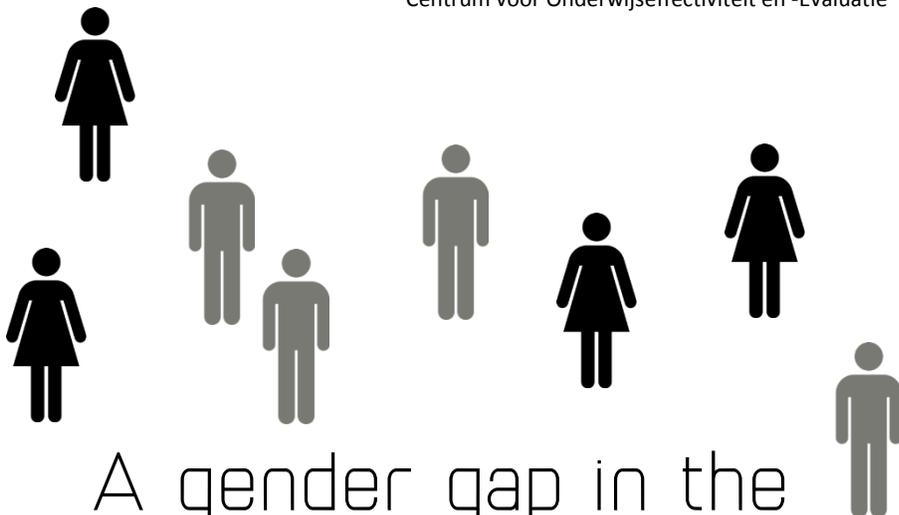
Dissertation offered
to obtain the degree of
Doctor of Educational Sciences (PhD)
Supervisor: Prof. Dr. Bieke De Fraine
Co-supervisor: Prof. Dr. Karine Verschueren
Co-supervisor: Prof. Dr. Ferre Laevers

2016

Faculty of Psychology and Educational Sciences
Centre for Experiential Education
Centre for Educational Effectiveness and Evaluation

KU LEUVEN

Centrum voor Ervaringsgericht Onderwijs &
Centrum voor Onderwijseffectiviteit en -Evaluatie



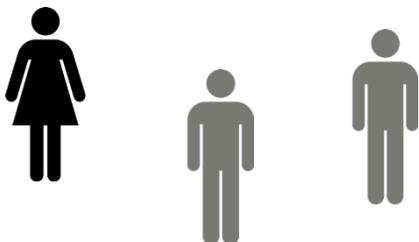
A gender gap in the classroom?

DIFFERENT PERCEPTIONS OF
STUDENT ENGAGEMENT AND TEACHER SUPPORT



Sofie Lietaert

Proefschrift aangeboden tot het verkrijgen van de graad van Doctor in de
Pedagogische Wetenschappen



Promotor: prof. dr. Bieke De Fraine

Copromotor: prof. dr. Karine Verschueren

Copromotor: prof. dr. Ferre Laevers

A gender gap in the classroom?
Different perceptions of student engagement and teacher support

Supervisor: Prof. Dr. Bieke De Fraine

Co-supervisors: Prof. Dr. Karine Verschueren, Prof. Dr. Ferre Laevers

Boys are generally less successful at school than girls, especially in secondary education. More specifically, they tend to show lower achievement, higher dropout rates, and lower student engagement. Teacher support has been found to positively influence students' engagement and achievement. However, boys and girls might perceive the support of their teachers differently. Moreover, teacher support could relate to boys' and girls' outcomes differently. This dissertation aims to clarify secondary school students' perceptions of teacher support and examines the relationship between teacher support and engagement. In addition, our goal is to investigate male and female teachers' perceptions of teacher support. Educational research and practice discussed possible differences between men and women as teachers for boys and girls. This discussion has not often considered actual supportive behavior of teachers and the concept of gender as a broader sociocultural construct. The data used in this dissertation were collected in Grades 7 and 8 in (a selection of) 59 secondary schools in Flanders in the light of the Procrustes project, searching for gender-related factors that predict low achievement, retention, and dropout of secondary school students.

A *first chapter* reviewed literature on differences between boys' and girls' behavioral, emotional, and cognitive engagement in secondary education. Girls generally showed higher engagement than boys, especially for behavioral engagement, more specifically at the school level. For particular subjects and activities in class, the advantage of girls was less consistent. These findings call for more research on boys' and girls' engagement regarding individual subjects and activities.

In the *second chapter*, we investigated, for Dutch language classes, sex differences in the relationship between students' perceptions of three dimensions of teacher support (i.e., autonomy support, structure, and involvement) and student engagement. A total of 385 Grade 7 students (58% boys) of six secondary schools in Flanders and their Dutch language teachers participated. A model was constructed with each of the teacher support dimensions as an independent variable and behavioral engagement as a latent dependent variable with three indicators (i.e., teacher, student, and observer report). The results suggested that boys showed lower engagement than girls and that they considered their teachers to be less supportive for all dimensions. Moreover, autonomy support appeared to be more important for boys' engagement, whereas structure and involvement were equally relevant for both boys' and girls' engagement.

The *third chapter* investigated differences in boys' and girls' perceptions of their actual teachers and of hypothetical situations (vignettes) depicting teachers who differ in autonomy support and structure. Participants were 377 Grade 8 students from the academic track in eight secondary schools in Flanders. The results showed that boys rated their actual teachers lower in autonomy support and structure. The scores for the vignettes indicated that boys were less negative than girls about a hypothetical teacher that provided low structure, whereas they were less positive than girls about a teacher that provided high autonomy support. We suggested that boys' and girls' perceptions of the vignettes might differ according to what teacher behavior they consider important. Moreover, the hypothesis that teachers in fact act differently towards boys versus girls could not be dismissed.

The *fourth chapter* examined male and female teachers' perceptions of their provided teacher support and the role of two sociocultural aspects of gender. These were (1) restricted emotionality or the inability to express emotions and (2) pressure for gender conformity or the extent to which a man or a woman feels pressure to be a typical man or woman (i.e., conformity to gender stereotypes). A sample of 1,244 teachers (28.5% male) in 59 secondary schools in Flanders filled out questionnaires. The results revealed that male and female teachers each scored higher for different dimensions of teacher support (e.g., male teachers scored higher for autonomy support and female teachers for structure). Additional analyses demonstrated that most of the sex differences in teacher support were mediated by restricted emotionality and pressure for gender conformity. Moreover, both sociocultural gender variables were negatively related to teacher support.

Altogether the four studies demonstrate that boys and girls indeed perceive their teachers differently, even in an experimentally controlled situation, and that this perception is related to their engagement, which appears to be lower for boys. These results stress the need for careful reflection and optimization of teacher support, especially concerning autonomy support, when we aim to close the gender gap in students' engagement and perceptions of teacher support.

Een genderkloof in de klas?

Verscheidene percepties van leerkrachtstijl en leerlingbetrokkenheid

Promotor: prof. dr. Bieke De Fraine

Copromotoren: prof. dr. Karine Verschueren, prof. dr. Ferre Laevers

Jongens doen het over het algemeen minder goed op school dan meisjes, in het bijzonder in het secundair onderwijs. Ze presteren minder goed, verlaten vaker vroegtijdig de schoolbanken en hebben een lagere betrokkenheid dan meisjes. Nu blijkt leerkrachtstijl een positief effect te hebben op de betrokkenheid en prestaties van leerlingen. Er kunnen echter verschillen zijn in hoe jongens en meisjes de ondersteuning van hun leerkrachten zien. Daarnaast kan leerkrachtstijl anders gerelateerd zijn aan bijvoorbeeld de betrokkenheid of de prestaties van jongens versus meisjes. Een eerste doel van dit proefschrift is dan ook om percepties van leerlingen in het secundair onderwijs over leerkrachtstijl op te helderen en om de relatie tussen leerkrachtstijl en betrokkenheid te onderzoeken. Een tweede doel is om percepties van mannelijke en vrouwelijke leerkrachten met betrekking tot hun eigen leerkrachtstijl te verkennen en om hierbij gender als een breder socio-cultureel concept te bekijken. Zo kan de discussie in onderzoek en de onderwijspraktijk over verschillen tussen mannelijke en vrouwelijke leerkrachten genuanceerd worden. De dataverzameling voor dit proefschrift gebeurde in het kader van het Procrustesproject, dat tot doel heeft gender-gerelateerde factoren te onderzoeken die lage prestaties, zittenblijven en drop-out in het secundair onderwijs voorspellen. Leerlingen en leerkrachten uit het eerste en tweede jaar van (een selectie van) 59 secundaire scholen in Vlaanderen werden bevestigd en geobserveerd.

In een *eerste hoofdstuk* werden, via een reviewstudie, verschillen onderzocht tussen jongens en meisjes in het secundair onderwijs wat betreft hun gedragsmatige, emotionele en cognitieve betrokkenheid. Daaruit bleek dat meisjes over het algemeen hoger betrokken waren dan jongens, in het bijzonder voor gedragsmatige betrokkenheid en vooral op schoolniveau. Voor de specifieke vakken en activiteiten in de klas was het voordeel van meisjes minder consistent. Deze bevindingen geven aan dat er meer onderzoek nodig is dat de betrokkenheid van jongens en meisjes voor de verschillende vakken en activiteiten op school nagaat.

In het *tweede hoofdstuk* onderzochten we, voor het vak Nederlands, geslachtsverschillen in de relatie tussen leerlingpercepties van drie dimensies van leerkrachtstijl (autonomieondersteuning, structuur bieden en verbondenheid) en leerlingbetrokkenheid (met leerkracht-, leerling- en observatorrapportage als indicatoren). Daartoe participeerden 385 leerlingen (58% jongens) van het eerste jaar en hun leerkrachten Nederlands van zes secundaire scholen in Vlaanderen. Jongens bleken minder betrokken dan meisjes voor het vak Nederlands en jongens percipieerden hun leerkrachten ook als minder ondersteunend voor elk van de drie dimensies. Bovendien bleek autonomieondersteuning belangrijker te zijn voor de betrokkenheid van jongens terwijl structuur bieden en verbondenheid even belangrijk bleken voor de betrokkenheid van jongens als van meisjes.

Een *derde hoofdstuk* onderzocht verschillen in de percepties van jongens en meisjes van hun echte leerkrachten en van hypothetische scenario's (vignettes) met telkens beschrijvingen van een hoge of lage mate van autonomieondersteuning en structuur bieden. In totaal participeerden 377 leerlingen die deel uitmaakten van de A-stroom in het tweede jaar van acht secundaire scholen in Vlaanderen. Jongens schatten hun echte leerkrachten lager in wat betreft autonomieondersteuning en structuur bieden. Jongens stonden ook minder negatief dan meisjes tegenover een scenario waarin de leerkracht weinig structuur bood. Jongens waren dan weer minder positief dan meisjes over een scenario waar de leerkracht hoge autonomieondersteuning bood. Bevindingen uit eerder onderzoek die aangeven dat meisjes en jongens elk andere elementen van leerkrachtstijl belangrijk zouden vinden, kunnen hier een verklaring bieden.

Het *vierde hoofdstuk* onderzocht de percepties van mannelijke en vrouwelijke leerkrachten over hun eigen leerkrachtstijl in relatie tot twee socio-culturele aspecten van gender. Deze waren (1) het onvermogen om emoties te uiten en te begrijpen en (2) genderconformeringsdruk of de mate waarin een man of vrouw druk ervaart om te conformeren naar het mannelijke of vrouwelijke stereotype. In totaal vulden 1244 leerkrachten (28,5% mannen) uit 59 Vlaamse scholen vragenlijsten in. De resultaten gaven onder andere aan dat mannelijke leerkrachten hoger scoorden voor autonomieondersteuning en vrouwelijke leerkrachten voor structuur bieden. Verder bleek dat de meeste geslachtsverschillen in leerkrachtstijl gemedieerd werden door het onvermogen om emoties te uiten en te begrijpen en door genderconformeringsdruk. Voor zowel mannelijke als vrouwelijke leerkrachten bleken deze socio-culturele gendervariabelen negatief samen te hangen met leerkrachtstijl.

Deze vier studies tonen aan dat jongens en meisjes inderdaad hun leerkrachten anders percipiëren, zelfs in een experimenteel gecontroleerde situatie, en dat deze perceptie gerelateerd is aan hun betrokkenheid, die lager blijkt te zijn voor jongens. Deze resultaten beklemtonen dat, als we de genderkloof in leerlingbetrokkenheid en percepties van leerkrachtstijl willen dichten, er nood is aan zorgvuldige reflectie over en optimalisatie van het concept leerkrachtstijl, in het bijzonder met betrekking tot autonomieondersteuning.

Dankwoord

Jongleren was het een beetje. Balletjes in de lucht houden. In mijn proefschrift zelf werden verscheidene perspectieven op betrokkenheid en leerkrachtstijl in kaart gebracht. Ik mocht doorheen de doctoraatstocht ook allerlei perspectieven op onderzoek leren kennen. Daarbij leerde ik me inleven in verschillende rollen die balanceerden tussen de eisen van onderzoek en onderwijspraktijk. Om ervoor te zorgen dat al die jongleerballetjes in de lucht bleven, dat ze opgeraapt konden worden, dat dit werk er kwam te liggen, stonden heel wat mensen dichtbij me en anderen wat verder weg om me aan te moedigen.

Bieke, dank je om het promotorschap op je te willen nemen en me van dichtbij te begeleiden bij de ups en downs. Ook dank voor je gestructureerde kijk op mijn grootse en complexe plannen en verwoordingen.

Karine, jouw uiterst grondige feedback zette me aan het denken en zorgde ervoor dat de inhoud en de vorm van de teksten heel wat beter werden. Ook je positieve aanmoediging stelde ik enorm op prijs.

Ferre, dank je om me deel te laten uitmaken van het Procrustesproject, om me te begeleiden bij het observeren van klassituaties en om me met twee voeten op de 'klaspraktijkgrond' te houden.

Evelien, Debora, Dimitri en Machteld, merci om mijn coauteurs te willen zijn en om samen met mij aan de analyses en teksten te werken.

Scholen, leerkrachten, leerlingen van het Procrustesproject, jullie verdienen toch ook een speciaal woord van dank. Wat een inzet hebben jullie getoond voor ons project! We mochten vragenlijsten afnemen. We mochten wekenlang met camera en microfoon tijdens jullie lessen vooraan in het lokaal postvatten. Jullie waren bereid heel open te praten tijdens interviews. Jullie namen deel aan coachingsessies en kwamen vaak nog enthousiast met een team naar onze studiedagen. Heel erg bedankt. Zonder jullie was dit boekje een pak dunner geweest.

Collega's en ex-collega's van het CEGO, het was me een genoegen om bijna zes jaar deel te mogen uitmaken van zo'n tof, uitgelaten en gedreven team. Charlotte, net als ik wilde jij ook niet meteen voor de klas staan en verwelkomde je me met open armen in 'den bureau' op het

CEGO, waar we echte maatjes werden. Evelien, gelijkgestemde ziel, dank je wel voor de fijne gesprekken, voor alle hulp bij mijn masterproef, bij mijn doctoraat en bij al de rest. Wat ben je geweldig!

COE'tjes en ex-COE'tjes, zolang er after work drinks bestaan, blijven we elkaar zien. En maar goed ook. Moeilijk om hier te beschrijven hoe heerlijk ik het vond om samen te werken, om discussies te voeren over kwantitatief versus kwalitatief onderzoek, om ons af te vragen of het al tijd is voor ijsuitstapjes, om stiekem naar Groep T af te zakken voor een versnaperingetje, om lief en leed te delen, om samen naar conferenties te gaan, Bonding for life was het! Ik had ook nog het geluk om collega te mogen worden van drie lieve studiegenootjes. Charlotte, merci om mee 'verstekeling' te willen spelen, voor het heerlijke Indonesiëavontuur, voor de verhuishulp en voor je spontane zelf. Kim, wat fijn dat ik meteen bij jou in het lokaal terecht kwam! En nog fijner dat we onze zwangerschapsvreugdes (jaja, enkel vreugdes...) en de 'firsts' van onze dochters konden delen. Machteld, mijn go-to person voor alle praktische doctoraatsvraagjes en veel meer. Of jij het evenveel zal missen als ik dat ik geen drie keer per dag meer aan je deur sta, laat ik in het midden.

Procrustesteam, Procrusteas, OT, PT, dat onderzoek dat je niet kan uitspreken, ... , we hadden veel namen en evenveel vergaderingen. En wat waren die geanimeerd! Van hevige discussies over welke schalen in de vragenlijst moesten en hard werken aan valorisatieproducten... over complete eensgezindheid wat betreft gelijke onderwijskansen en feminisme... tot SinteDimi, roze hemden, handcrème, koekjes bij de koffie, Samson en Spice Girls en broodjes met mosterd. Dimitri, merci om met je daadkracht en onderzoekservaring ons kakelende OT zo goed te begeleiden en het Procrustesboek tot zo'n mooi einde te brengen. Nathalie, wat heb jij dat alles schitterend gedaan: onze teksten voor het boek nalezen, vormingen in elkaar steken, studiedagen organiseren, onderzoekers, promotoren en praktijkkeisen op elkaar afstemmen. Wauw! Lies en Thaline, merci om mijn observeerpartners te zijn en om mee met mij eindeloos te willen testen en zoeken. Marian, ik mocht starten samen met jou. Ik kon me daar in de Schapenstraat geen beter en meer complementair bureaugenootje wensen.

Merci aan de badmintonladies en -gentlemen voor alle afreageermomenten. De leuke gesprekken, de ietwat competitieve matches en de Freddy-avonturen zal ik nooit vergeten.

Lies, maat, dank je wel om er altijd te zijn.

Joris, mental coaching goes both ways. Een dikke merci.

Karolien, enorm bedankt voor de foto-organisatie en ook dat je prachtige benen op de foto wilden staan.

Dank je wel ook aan de hobbyhoppers, de burgiebende en de Frankrijk-meisjes voor alle fijne afleidingsmomenten.

Eva, merci om mijn schakelprogrammamaatje te zijn met je eindeloze positieve blik en vrolijke zelf.

Annelise, Anouk, Lynn, wat een prachtdames, elk op jullie manier een voorbeeld voor mij! Dank je voor de fijne lunchkes, uitstapjes, berichtjes, telefoontjes, weekendjes weg. Jullie zijn ook de beste mommies in crime die er bestaan.

Dank ook aan mijn lieve familie en schoonfamilie voor de enthousiaste interesse en lieve steun.

Pieter, merci voor je relativiseringsvermogen, voor je talrijke fijne bezoeken en berichtjes en je schitterende oppaskwaliteiten. Je hebt zelf het voorbije jaar ook een aantal grote stappen gezet. Ik duim verder voor je, Bro!

Mama en papa, jullie hebben me zoveel kansen gegeven en jullie zijn altijd blijven geloven in mij. Dank jullie wel! Nog steeds zorgen jullie daar aan de andere kant van Kessel-Lo voor een fijn thuiskomen. Ik apprecieer jullie warme, lieve bezorgdheid enorm. Dank jullie wel voor de duizenden luisterende oren en de eindeloze aanmoedigingen. Mama, ook je kritisch naleesgeduld heeft me veel geholpen.

Wouter, lieverd. Ik ben blij met jou. Met het team dat we al meer dan 12 jaar zijn. En blij met alle begrip, met het uren luisteren naar mijn werkverhalen, met het kritische doctoraatsvragenuurtje dat je soms plots inlaste. Ook blij met het leven dat ik samen met jou heb opgebouwd, waarin je telkens weer zo'n lieve man bent voor mij en een prachtige trotse papa voor onze kleine meid.

Jente, Jentemie, mijn charelke, lieve kapoen. Jij hebt me veranderd. Met jouw zorgeloze lach, je gekke bekken en je expressieve getater laat je me inzien wat echt belangrijk is.

Sofie Lietaert
Leuven, 30 mei 2016

Table of contents

GENERAL INTRODUCTION	1
BOYS AND GIRLS IN SECONDARY EDUCATION -----	3
STUDENT ENGAGEMENT: A CONCEPTUAL LABYRINTH -----	5
TEACHER SUPPORT: THE SELF-DETERMINATION THEORY PERSPECTIVE -----	8
SEX DIFFERENCES IN ENGAGEMENT AND IN TEACHER SUPPORT -----	9
Boys' and girls' engagement	9
Boys' and girls' perceptions of teacher support, related to engagement	10
Male and female teachers' perceptions of their teacher support	11
GENDER -----	12
PERCEPTIONS OF TEACHERS, STUDENTS, AND OBSERVERS -----	13
THE PROCRUSTES PROJECT -----	14
THE CONTENT OF THIS DISSERTATION -----	15
Chapter 1. Student engagement in secondary education: Reviewing the gender gap	15
Chapter 2. The gender gap in student engagement: The role of teachers' autonomy support, structure, and involvement	16
Chapter 3. Interpreting boys' and girls' perceptions of teacher support: Comparing perceptions of actual and hypothetical teachers	17
Chapter 4. Teacher support: The role of teachers' sex and sociocultural gender differences	18
CHAPTER 1 STUDENT ENGAGEMENT IN SECONDARY EDUCATION: REVIEWING THE GENDER GAP	23
INTRODUCTION -----	26
Student engagement: Finding the specifics in the all-embracing construct	26
Measurement levels of student engagement	28
Gender differences in engagement	28
Research aims	29
METHOD -----	30
Inclusion and exclusion criteria	30
Search strategy	31
Identification of relevant studies	31
Analysis of the retrieved studies	32
RESULTS AND DISCUSSION -----	32
Description of the publications investigating gender differences in engagement	32

Interpretation of the engagement scales	35
Gender differences in student engagement dimensions and subdimensions	36
Gender identity	42
Gaps and perspectives in research on gender differences in engagement	43
Limitations	45
CONCLUSION -----	46

**CHAPTER 2 THE GENDER GAP IN STUDENT ENGAGEMENT: THE ROLE OF TEACHERS’
AUTONOMY SUPPORT, STRUCTURE, AND INVOLVEMENT 49**

INTRODUCTION -----	52
Behavioral engagement	53
Teacher support as an explaining factor for sex differences in engagement	53
Differential effects of teacher support for boys’ versus girls’ engagement	55
The role of teacher support for boys’ and girls’ engagement: Mediation versus differential effects	56
Measuring student engagement: Student, teacher, and observer report	57
Aims and research questions	59
METHOD-----	59
Participants	59
Measures	60
Data analyses	61
RESULTS-----	62
Sex differences in engagement and teacher support	62
Explaining the gender gap in student engagement through teacher support: A structural mediation model	62
The role of teacher support to promote girls’ versus boys’ engagement	65
DISCUSSION-----	68
Implications for educational practice	71
Limitations and suggestions for future research	72
Conclusions	73

**CHAPTER 3 INTERPRETING BOYS’ AND GIRLS’ PERCEPTIONS OF TEACHER SUPPORT:
COMPARING PERCEPTIONS OF ACTUAL AND HYPOTHETICAL TEACHERS 75**

INTRODUCTION -----	78
Teacher support: Autonomy support and structure	79
Boys’ and girls’ perceptions of teacher support	80
Teachers’ actual supportive behavior towards boys and girls	83

Controlling the classroom situation when measuring students' perceptions of teacher support: the use of vignettes	83
Hypotheses	84
METHOD -----	85
Participants	85
Measures	86
Data analyses	87
RESULTS-----	90
DISCUSSION -----	94
Students' perceptions of their actual teachers	95
Students' perceptions of the vignettes	95
Implications for educational practice	99
Limitations and future research	99
Conclusion	101

CHAPTER 4 TEACHER SUPPORT: THE ROLE OF TEACHERS' SEX AND SOCIOCULTURAL GENDER DIFFERENCES

103

INTRODUCTION -----	106
Teacher support: Differences between male and female teachers	107
Teacher's gender: A broad conceptualization	110
Aims and research questions	112
METHOD -----	113
Participants	113
Measures	114
Data analyses	115
RESULTS-----	117
Sex differences in teachers' perceptions of support, restricted emotionality, and pressure for gender conformity	117
The explaining role of restricted emotionality and pressure for gender conformity for sex differences in teacher support	119
The role of restricted emotionality and pressure for gender conformity for male and female teachers' teacher support	123
DISCUSSION -----	126
Sex differences	126
The mediating role of sociocultural gender aspects for sex differences in teacher support	127
The role of restricted emotionality and pressure for gender conformity for teacher support	127

Limitations and future research	130
CONCLUSION -----	131
GENERAL DISCUSSION	133
OVERVIEW -----	136
DISCUSSION -----	138
Boys' and girls' engagement	138
Boys' and girls' perceptions of teacher support	139
A match between male teachers and boys and between female teachers and girls?	141
SUGGESTIONS FOR EDUCATIONAL PRACTICE -----	142
Are we closer to bridging the gender gap?	142
What about the teachers' actual behavior towards boys and girls?	144
Do we need more men in our schools?	145
How to handle boys and girls?	145
SUGGESTIONS FOR FUTURE EDUCATIONAL RESEARCH -----	147
Combining the teacher support dimensions	147
Empathy as the base for teacher support	148
Equal benefits of teacher support for all students?	148
LIMITATIONS AND FUTURE RESEARCH -----	149
REFERENCES	153
APPENDICES	171

GENERAL INTRODUCTION

The gender of teacher and student has been extensively investigated in educational research for many years. Today, the interest for ‘gender at school’ stems from the currently more vulnerable position of boys, especially in secondary education. Boys’ higher dropout rates, lower performance, and lower engagement and well-being suggest there is a gender gap in school success in favor of girls. A related discussion concerns the differences between male and female teachers. Often, partly because of boys’ more vulnerable position, researchers and practitioners have stressed the benefits of recruiting more male teachers for boys’ success at school. However, the actual supportive behavior of these teachers towards students has not been profoundly investigated so far.

In this dissertation, we aim to examine the gender gap specifically for student engagement, a variable that has been known to predict students’ performance and dropout. We choose to focus on engagement (students’, teachers’, and observers’ perceptions) because it is a malleable construct, which means it can be influenced by several factors. One of the most important of these factors has been found to be the supportive behavior of teachers in relation to their students (i.e., teacher support). Therefore, in this dissertation, we also focus on gender differences in various subdimensions (i.e., autonomy support, structure, involvement) and perceptions (i.e., student, teacher) of teacher support.

This introductory section first describes the concepts of student engagement and teacher support and sex differences in students’ perceptions herein. Second, teachers’ perceptions of their supportive behavior are discussed, followed by a conceptualization of the ‘gender’ construct. Additionally, a short paragraph describes the benefits of using multiple perceptions (i.e., student, teacher, observer) to shed light on gender differences in student engagement and teacher support. A final part summarizes the four studies that were conducted within the scope of this dissertation.

BOYS AND GIRLS IN SECONDARY EDUCATION

Boys have higher dropout and grade retention rates than girls (Flemish Department of Education and Training, 2013; Van Landeghem, Goos, & Van Damme, 2010) and they are underrepresented in the academic track (Van Landeghem & Van Damme, 2007).

Concerning students' achievement, the PISA performance results of 2012 (OECD, 2013) indicated that girls outperformed boys in reading and that boys outperformed girls in mathematics. Even though these findings have been consistent since 2003, the discrepancy between boys' and girls' scores is smaller for mathematics than for reading. For science, no sex differences were observed. Van de gaer, Pustjens, Van Damme, and De Munter (2008) found that boys showed higher mathematics scores in Grade 7. In Grade 8, the girls had caught up with the boys and in Grades 10 and 12, again, boys scored higher. On the other hand, Van de gaer, Pustjens, Van Damme, & De Munter (2006a) discovered girls to outperform boys in languages. The OECD (2015) suggested that these performance gaps tend to result from differences in boys' and girls' behaviors and attitudes, rather than from differences in ability and that teachers can play an important role in influencing these behaviors and attitudes. The research of Van de gaer et al. (2006a) indeed showed that in classes where students had very positive school related attitudes, no sex differences could be registered in students' performance. Important aspects of these school related attitudes were interest in and motivation for learning tasks, and attention in the classroom. These elements are generally categorized under the term 'student engagement' (Fredricks, Blumenfeld, & Paris, 2004). In various countries, engagement has indeed been found to relate to students' performances (Lam et al., 2012) and additionally to dropout (Archambault, Janosz, Fallu, & Pagani, 2009; Lamote, Speybroeck, Van Den Noortgate, & Van Damme, 2013).

Several studies recorded boys' engagement to be lower than girls'. For example, Lam et al. (2012) investigated the engagement of 3,400 students in 12 countries (United States, European, and Asian countries) and demonstrated that in Grades 7-9, girls generally reported higher engagement than boys. Cooper (2014) found the same results for 1,132 Grade 9-12 students in the United States.

Throughout secondary education, student engagement appears to decline for both boys and girls (Van de gaer et al., 2009; Wang & Eccles, 2012), with some studies indicating a greater decline for boys than for girls and thus a widening gender gap (Chouinard & Roy, 2008; Dotterer, McHale, & Crouter, 2009; Lamote et al., 2013; Watt, 2000).

The above findings stress the importance of further investigating gender differences in student engagement in secondary school.

STUDENT ENGAGEMENT: A CONCEPTUAL LABYRINTH

Student engagement has been described as an all-embracing construct, rooted in different theoretical frameworks and operationalized in multiple ways. This dissertation aims to bring together several theoretical frameworks in order to provide an overview of the most commonly used descriptions of student engagement and its antecedents.

Reviewing the literature, we developed a model (presented in Figure 1) that integrates the theory on self-system processes developed by Connell (1990) and Skinner and Pitzer (2012) with the three-dimensional conceptualization of student engagement (i.e., behavioral, emotional, cognitive engagement) proposed by Fredricks et al. (2004) and with the dimensions of teacher support (i.e., autonomy support, structure, involvement), developed within self-determination theory (Deci & Ryan, 2008; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Vansteenkiste et al., 2012).

The theory on **self-system processes** (Connell, 1990; Skinner & Pitzer, 2012) provides a differentiation between **indicators and facilitators** of student engagement. Indicators are descriptive parts present in the concept itself (i.e., the outer, observable components of engagement through behavioral, emotional, and cognitive dimensions). Elements that explain and enhance the indicators are facilitators. They precede the actual engagement manifested through the indicators.

Concerning the **indicators** of student engagement, most often, a three-part typology that distinguishes between **behavioral, emotional, and cognitive engagement** is proposed. This conceptualization covers all concepts that are considered to be part of engagement (Fredricks et al., 2004). First, *behavioral engagement* implies participation in school activities, conduct (school compliance and attendance), and participation and initiative in class (i.e., effort, persistence, concentration, attention, asking questions, discussing) (Fredricks et al., 2004; Wang, Willet, & Eccles, 2011). Second, *emotional engagement* is defined as students' affective reactions towards teachers, peers, and school, involving three subdimensions (Wang et al., 2011). A first subdimension is valuing of school and education (Chouinard & Roy, 2008). Interest and enjoyment (or the lack thereof) is a second subdimension and captures feelings of happiness, interest, boredom, frustration, and anger (Cleary & Chen, 2009; Dotterer et al., 2009). A third subdimension comprises orientation towards school and identification with school, often referred to as school

belonging or school connectedness (Fredricks et al., 2004; Wang et al., 2011). Finally, *cognitive engagement* entails the psychological investment in learning and contains two subdimensions. A first subdimension of cognitive engagement concerns students' achievement goals, which refer either to students' desire to develop their competence and understanding (mastery goal orientation) or to students' aims to show their competence (performance goal orientation) or to avoid displaying their incompetence (performance avoidance orientation) (Connell & Wellborn, 1991; Midgley et al., 2000). These achievement goals each entail a different kind of psychological investment. A second subdimension of cognitive engagement is self-regulated learning and strategy use (i.e., students' management of their efforts and completion of their work; applying strategies for learning the material, for setting goals and for solving problems) (Fredricks et al., 2004; Wang et al., 2011).

Concerning the **facilitators** of student engagement, according to Connell (1990) and the interpretation of Skinner and Pitzer (2012), a distinction can be made between personal facilitators and social facilitators. *Personal facilitators* are students' self-system processes like (1) perceived competence (i.e., judgement about the demands of a task and about one's own skills, i.e. self-efficacy, ability/competence beliefs) and (2) autonomy or self-determination (i.e., self-regulatory processes measuring extrinsic, introjected, identified, integrated, or intrinsic motivation as reasons for why someone wants to learn or do well in a learning situation) (Connell, 1990; Skinner, Kindermann, & Furrer, 2009). Another personal facilitator is relatedness (i.e., the connection to others). These personal facilitators are enhanced by the social facilitators, for example the interactions with teachers where teachers fulfill students' needs for competence, autonomy, and relatedness (Connell, 1990; Skinner & Pitzer, 2012). This connection of personal and social facilitators allows us to introduce the framework of self-determination theory (SDT). According to SDT, the fulfillment of students' needs for autonomy, competence, and relatedness through teacher support should promote students' motivation and engagement (Deci & Ryan, 2008; Stroet, Opdenakker, & Minnaert, 2013; Vansteenkiste et al., 2012).

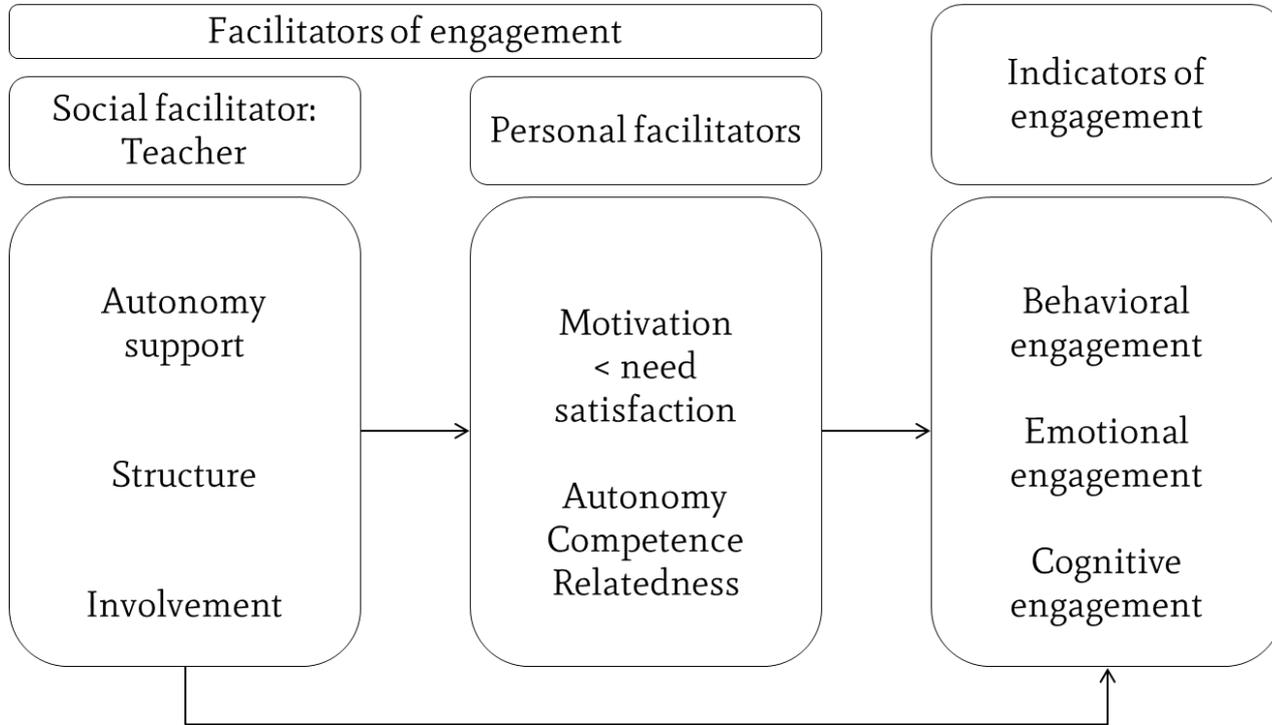


Figure 1. Adapted model of self-system processes with the three-dimensional conceptualization of student engagement and the three dimensions of teacher support (based on Connell, 1990; Deci & Ryan, 2008; Fredricks et al., 2004; Skinner & Pitzer, 2012)

TEACHER SUPPORT: THE SELF-DETERMINATION THEORY PERSPECTIVE

In the self-system processes model (Figure 1), there is a direct and an indirect relation between teacher support dimensions and student engagement (e.g., Hafen et al., 2012; Skinner & Belmont, 1993). Teacher support has also been proved to be one of the most important school related predictors of students' engagement (Fredricks et al., 2004; Hafen et al., 2012; Lam et al., 2012; Roorda, Koomen, Spilt, & Oort, 2011) In their meta-analysis, Roorda et al. (2011) calculated, based on 23 studies, an effect size of .40 for the relationship between teacher support and engagement. Lam et al. (2012) found that teacher support was indirectly related to students' academic performance through student engagement in 12 countries (United States, European, and Asian countries).

As Figure 1 indicates, teacher support, according to SDT, consists of three dimensions, i.e., autonomy support, structure, and involvement.

Autonomy support entails that teachers provide choices for students (or give a rationale when choices are not possible) and illustrate the relevance of the learning material. Additionally, autonomy supportive teachers avoid using controlling language (e.g., "you should") and respect students by taking their perspectives and by being responsive to their feelings (e.g., listening to their opinions). Respectively, the core elements of choice, relevance, control, and respect can be recognized here (Belmont, Skinner, Wellborn, & Connell, 1988; Connell, 1990; Sierens et al., 2009; Vansteenkiste et al., 2012).

Providing **structure** means that teachers display clear expectations of students' behavior in class and set limits, in which they are consistent and predictable towards students. Structuring teachers provide students with challenging yet attainable tasks. They give competence-relevant feedback, encourage students, and express their confidence in students' competences to attain self-appointed learning goals. The elements of expectations, contingency (consistency and predictability of the teachers' responses), adjustment/monitoring, and help/support are distinguished here (Belmont et al., 1988; Connell, 1990; Sierens et al., 2009; Vansteenkiste et al., 2012).

Involvement entails teachers' knowledge about their students and them acting empathically according to that knowledge (attunement), teachers' active engagement with students (dedication of resources), their positive affect towards their students

(affection), and their openness towards students in order for students to depend upon these teachers (dependability). Involved teachers express interest in their students and actively care for them (Connell, 1990).

SEX DIFFERENCES IN ENGAGEMENT AND IN TEACHER SUPPORT

Boys' and girls' engagement

The conceptualization of student engagement appears to be very complex. In addition to three dimensions or indicators of engagement, the construct can also be measured at the general school level, at the subject level, or at the activity level. Different results stem from these different measures. Therefore, it is difficult to provide an accurate answer about whether boys or girls show higher engagement. Girls generally have been found to score higher on most of the student engagement dimensions, especially on behavioral engagement. For emotional and cognitive engagement, the sex differences are less obvious, yet still generally in favor of girls (Blondal & Adalbjarnardottir, 2012; Martin, 2007; Skinner, Furrer, Marchand, & Kindermann; 2008). Girls exert more effort, participate more actively in class, and show higher attention and persistence than boys. Meece, Glienke, and Burg (2006) found, based on their review study, that girls showed more engagement for language, whereas boys showed more engagement for mathematics and science.

Because of possible variations in gender differences within these student engagement dimensions and measurement levels, Chapter 1 of this dissertation provides an overview of studies investigating gender differences in the several dimensions and levels of student engagement. Performing this literature review, we aim to discover patterns in boys' and girls' behavioral, emotional, and cognitive engagement at the general school level, the subject level, and the activity level. We also aim to unravel some gaps in current research on gender differences in student engagement and formulate opportunities for future research concerning this topic.

Moreover, because, among others, Meece et al. (2006) found that especially in language classes, boys showed lower engagement, Chapter 2 of this dissertation focuses on students' engagement specifically for Dutch language classes.

Boys' and girls' perceptions of teacher support, related to engagement

In addition to their lower levels of engagement, boys also have lower perceptions of teacher support (Oelsner, Lippold, & Greenberg, 2011; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012; Vansteenkiste et al., 2012; Van de gaer, Pustjens, Van Damme, & De Munter, 2006b). Because teacher support and engagement are highly related, we might thus expect that boys' lower perceptions of teacher support are related to their lower engagement.

On the one hand, some literature confirmed that boys might need more autonomy support (i.e., choice, relevance, respect) in order to be engaged in class (Martin, 2003). Moreover, Geist and King (2008) and Williams, Burden, and Lanvers (2002) suggested that boys are more distracted when the material is not interesting, whereas girls seem to accept this more than boys do and try to make the task interesting themselves. This might indicate the need of boys for more choice and understanding the relevance of the learning material. Other studies, on the other hand, did not find sex differences in students' perceptions of autonomy support (Hafen et al., 2012; Tucker et al., 2002). For structure, Tucker et al. (2002) did not find sex differences either, yet other studies seemed to indicate boys' higher need for feedback, help, and positive expectations of teachers (Marks, 2000; Suldo et al., 2009). Concerning involvement, a meta-analysis of Roorda et al. (2011) indicated that boys might benefit more from higher quality affective teacher-student relationships, whereas Thijs and Verkuyten (2009) showed that high teacher involvement was more related to girls' engagement than to boys'. Suldo et al. (2009) reported similar findings in their interviews, where girls indicated, twice as often as boys, that they needed teachers to be emotionally involved with students. Other studies found no sex differences (Hafen et al., 2012; Lam et al., 2012; Wang & Eccles, 2012).

These conflicting results about sex differences in students' perceptions of teacher support seem to call for more research on this topic. The review study of Stroet et al. (2013), investigating the link between teacher support and motivation in secondary education, indeed mentioned that only few articles investigated sex differences in students' perceptions of teacher support and in the relationship between teacher support and engagement. Likewise, in their review study on gender and motivation, Meece et al. (2006) pointed to the lack of research on the impact of instructional strategies on sex differences in engagement.

Because of the need for more research on how teachers' supportive behavior might be perceived differently by boys versus girls, one major focus throughout this dissertation is students' perceptions of teacher support. In Chapters 2 and 3, we focus on several teacher support dimensions by examining students' perceptions of their actual teachers' supportive behavior and of the supportive behavior of teachers in a hypothetical scenario.

Male and female teachers' perceptions of their teacher support

Stroet et al. (2013) found no studies that investigated differences between male and female teachers in their supportive behavior. Despite the lack of empirical research thus far, it is important to shed more light on possible differences in male and female teachers' supportive behavior. To date, education in Flanders (and in Europe) counts more female than male teachers. In Flanders, for example, at the secondary school level, in the school year of 2013-2014, 63.6 % of the teachers were women (Flemish Department of Education and Training, 2015). Additionally, several studies argued that the teaching profession still requires more 'feminine' characteristics (Brozo, 2002; Martino, 2008) and that the school environment is often perceived as feminine because students need to act in accordance to the female gender role (i.e., dependent, cooperative behaviour; Heyder & Kessels, 2013). These two elements, i.e., the presence of more female teachers and the school environment that is generally perceived as feminine, contributed to what literature calls the 'feminization of education' (Carrington et al., 2007; Martino, 2008). Scholars and practitioners developed concern about this feminization when it was found that boys showed lower performance than girls and dropped out of school more frequently (Lamote et al., 2013; Wang & Eccles, 2012). School administrators believed female teachers not to be suitable as adequate role models for boys. Consequently, male teachers were recruited because they would balance the teaching staff and because they would function as adequate masculine role models for boys (Ammermüller & Dolton, 2006; Cushman, 2007; Helbig, 2010; Marsh, Martin, & Cheng, 2008; Martino, 2008; Mills, Martino, & Lingard, 2004). In spite of these developments, literature could not confirm these benefits of male teachers for boys' motivation and performance. This lack of scientific support led some scholars to the conclusion that male and female teachers may be equally capable of motivating boys (and girls) and enhancing their performance (e.g., Carrington et al., 2007; de Zeeuw et al., 2014; Lahelma, 2000; Marsh et al., 2008). Studies investigating benefits of male versus

female teachers for boys or girls mostly investigated only the presence of male versus female teachers for boys versus girls in schools, but did not assess the supportive behavior of these male and female teachers in class. Therefore, additional research is needed to unravel the possible differences between male and female teachers' supportive behavior towards students.

In this dissertation, Chapter 4 investigates differences between male versus female teachers' perceptions of their own supportive behavior (i.e., autonomy support, structure, student-centered versus content-centered teaching, mastery and performance approach) in order to broaden insights into sex differences in teachers' supportive behavior.

GENDER

Chapter 4 also aims to investigate the broader concept of 'gender', including more than only 'sex'. In educational psychology, the word 'gender' has been introduced (and started to replace the use of the word 'sex') to indicate that the distinction between men and women was not only biological but largely cultural (Archer & Lloyd, 2002). Later on, it has been argued that both 'sex' and 'gender' should be applied: "... *sex refers to the binary categories 'male' and 'female', and gender to the attributes associated to a greater or lesser extent with the two sexes, i.e. 'masculine' and 'feminine' features rather than 'male' and 'female'*" (Archer & Lloyd, 2002, p. 17).

'Gender' thus refers to the sociocultural connotations with each sex where masculine and feminine roles and expectations are important to consider (Vantieghem, Vandermeersch, & Van Houtte, 2014). During the last few decades, masculinity and femininity have been highlighted more often, as both males and females can identify with masculine as well as with feminine traits. Examples of feminine traits are 'cooperative', 'gentle', 'sensitive', and 'obedient', whereas examples of masculine traits are 'active', 'rebellious', 'inattentive', 'aggressive', 'independent', and 'competitive' (Schneider & Coutts, 1979).

Whether these traits are associated with femininity or masculinity depends on sociocultural values in a particular society.¹

When gender differences are seen more broadly than merely the distinction between men and women, interesting differences within each sex come to the surface and sex differences might be more fully understood by including these sociocultural gender differences. Chapter 4 of this dissertation, investigating teachers' perceptions of their own supportive teaching behavior, focuses on two sociocultural aspects of gender, namely the expression of emotions (Blazina, Pisecco, & O'Neil, 2005) and the pressure to conform to gender stereotypes (Egan & Perry, 2001), and aims to nuance the debate about the recruitment of male versus female teachers.

PERCEPTIONS OF TEACHERS, STUDENTS, AND OBSERVERS

The importance of using multiple perspectives (e.g., student self-report, teacher report, interviews, observations) for the same variables has been repeatedly highlighted in educational research. The use of different informants and methods can indeed counter the problem of shared method variance and can give more insight into the complexity of certain behaviors and contexts (Cohen, Manion, & Morrison, 2013; Doumen, Koomen, Buyse, Wouters, & Verschueren, 2012).

For measuring student engagement, Chapter 2 of this dissertation combines student, teacher, and observer reports. **Observations** of engagement in secondary education where each student is observed individually, are scarce (see for exceptions: Jang, Reeve, & Deci, 2010). The advantage of observations is that they result in the most objective view of students' engagement. Unfortunately, because it is time-consuming, studies using observational data generally have smaller samples to draw conclusions from (Doumen et al., 2012; Fredricks & McColskey, 2012). Research in secondary education most often uses **student self-report** measures because students are capable of evaluating their own engagement and because these students' subjective opinions are

¹ In this dissertation, the word 'sex' is used to discuss the difference between men and women or between boys and girls. The word 'gender' is used when referring to the sociocultural connotations or to both the distinction between the male and female sex and the sociocultural connotations. The expression 'gender gap' is used also when referring to differences between boys and girls or male and female teachers.

highly valuable (Fredricks & McColskey, 2012; Skinner et al., 2009). After all, students' perceptions of engagement have been proved to relate to various outcome variables such as achievement and dropout (Allen et al., 2013; Fredricks et al., 2004). The advantage of **teacher report** of student engagement has been highlighted by Skinner et al. (2009), who argued that teachers, who are in contact with their students each day, should have a valid perception of their students' behavior. Nevertheless, teachers may not notice all students' behavior. Particularly, they may be biased in their perceptions of and behavior towards different groups of students, such as boys versus girls (Consuegra, Engels, & Lombaerts, 2015; Younger, Warrington, & Williams, 1999). Teacher report of teacher support is also valuable because teachers' perceptions of their own classroom practices have been found to predict their actual behavior towards students and even student outcomes (Rubie-Davies, Flint, & McDonald, 2012).

The advantages and disadvantages listed here are discussed in Chapters 2, 3, and 4. Chapter 2 aims to play out the advantages and counter the disadvantages of these various perspectives by investigating student engagement based on student, teacher, and observer report.

In both Chapter 2 and Chapter 3, teacher support is measured through student report. Also, in Chapter 3, we use vignettes, i.e., fixed classroom situations for which students needed to evaluate a hypothetical teacher. In Chapter 4, we investigate teacher report of teachers' own supportive behavior. These studies should provide us with a more comprehensive picture of students' sex differences and teachers' gender differences concerning teacher support in order to make suggestions about what elements in teachers' supportive behavior are important for countering the gender gap.

THE PROCRUSTES PROJECT

This dissertation was embedded in a project called 'Teaching in the bed of Procrustes: Effectiveness of gender-sensitive strategies with regard to academic achievement, school retardation, dropout, the motivation to learn, and the aspirations of boys and girls in secondary education', which was conducted by the KU Leuven, Universiteit Gent, and Vrije Universiteit Brussel.

The main research questions at the start of the project were the following:

1. What are the gender-related factors that predict low achievement, retention, and dropout of youngsters in secondary education?
2. What are the active ingredients of interventions in view of prevention of low achievement, retention, and school dropout in boys and girls?

The research for this dissertation focuses on answering the first research question by investigating student engagement and teacher support from various perspectives.

The project started in January 2012 and ended in December 2015. Three data collection waves were conducted (September-November 2012; April-May 2013; April-May 2014), for which over 6,000 students and their parents, 1,244 teachers, and the principals of 59 schools in Flanders filled out questionnaires. To obtain a representative sample of the school population in Flanders, a disproportionally stratified sampling method was applied, which demanded equal distribution of the schools according to several criteria. In this case, three criteria were used: (1) geographical distribution in the Flemish community, (2) urban versus rural location, and (3) publicly run versus privately run education. For Chapters 2 and 3 of this dissertation, additional specific data were collected (questionnaires for students and teachers and observations) in a subsample of 6 schools in 2012 (for Chapter 2) and of 8 schools (the previous 6 schools and 2 additional schools) in 2014 (for Chapter 3). Table 1 presents the additional information for the data used in each chapter of this dissertation.

THE CONTENT OF THIS DISSERTATION

All four chapters of this dissertation discuss parts of the model in Figure 1. Figure 2 indicates which study investigates which component of the model. Table 1 presents the aims, participants, perspectives, and instruments of all four studies.

Chapter 1. Student engagement in secondary education: Reviewing the gender gap

Throughout literature, boys have been found to show lower engagement and achievement than girls. Student engagement is considered to be an important student variable because it positively predicts achievement. Fortunately, engagement in class and at school is a malleable construct, which means it can be influenced by, for example, interactions with peers and teachers.

The benefits of enhancing students' engagement are clear, yet student engagement appears to be a very comprehensive concept. It consists of various dimensions (e.g., behavioral, emotional and cognitive engagement) and measurement levels (e.g., school level, subject level, activity level), based on different theoretical foundations. This makes it difficult to profoundly investigate gender differences in students' engagement.

As a way to deal with this conceptual labyrinth, this chapter aims to define student engagement, based on what is most commonly accepted in engagement literature. Following this definition, a literature search was conducted for studies investigating gender differences in student engagement. The search for articles from 2000-2014 resulted in 2,715 publications, of which 21 met the criteria. Analyzing these publications, we aim to draw conclusions about differences between boys' and girls' engagement for the various dimensions and measurement levels and we aspire to discuss some gaps concerning sex differences in student engagement.

Chapter 2. The gender gap in student engagement: The role of teachers' autonomy support, structure, and involvement

Previous literature indicated that especially for behavioral engagement, boys score lower than girls. Therefore, in Chapter 2, we aim to investigate sex differences, specifically for behavioral engagement. We also examine the relationship between teacher support (a social facilitator mentioned in Figure 2) and student engagement. Studies reporting on sex differences in this relation are scarce and the three teacher support dimensions of autonomy support, structure, and involvement have not often been investigated together. Therefore, this study contributes to the literature on teacher support and engagement while paying attention to differences between boys' and girls' engagement and their perceptions of teacher support. Additionally, we choose to specifically investigate Dutch language classes, because previous literature has learned us that, especially during language classes, girls are more engaged than boys .

Three research questions are investigated in this chapter:

1. How do boys and girls differ regarding their behavioral engagement and regarding the perceived support (autonomy support, structure, and involvement) from their Dutch language teacher?

2. Which teacher support dimensions (autonomy support, structure, and involvement) can explain the relationship between sex and students' behavioral engagement (mediation effects)?
3. Does teacher support matter more for boys' as opposed to girls' behavioral engagement and for which specific teacher support dimensions (autonomy support, structure, involvement) is this the case (differential effects)?

Student engagement was measured by including three perspectives. First, students rated their own engagement during Dutch language classes. To this goal, of the 59 schools in the Procrustes project, six schools were selected of which 385 students (58% boys) filled out the questionnaire between September and November 2012. Second, the Dutch language teachers rated the students' engagement with the same instrument. Finally, observers rated individual students' engagement during several Dutch language classes. This was the case in three of these six schools, for 10 randomly selected students per class (N = 156; 62% boys). Teacher support was measured through student report of all three dimensions.

Chapter 3. Interpreting boys' and girls' perceptions of teacher support: Comparing perceptions of actual and hypothetical teachers

One of the subjects for debate in Chapter 2 was that we only measured students' perceptions of teacher support, which might not reflect teachers' actual supportive behavior. On the one hand, it might be a good representation because observation research has shown, for example, teachers to give more negative feedback to boys than to girls. On the other hand, perceptions of teacher support may also be affected by more general perception differences between boys and girls, irrespective of their teachers' actual behavior. This chapter aims to first investigate students' perceptions of their actual teachers' supportive behavior in order to replicate previous findings that boys generally perceive their teachers to be less supportive than girls do. Additionally, students were asked to evaluate teacher behavior in four scenarios (vignettes) describing a classroom situation (i.e., a high and a low autonomy supportive situation and a high and a low structuring situation). The four scenarios were randomly distributed among the students in each class. Half of the students assessed the high autonomy supportive and low structuring vignette and the other half assessed the low autonomy supportive and high structuring vignette. By examining sex differences in the

evaluation of these scenarios, we aim to detect possible differences in boys' and girls' perceptions of the exact same situation, ruling out the effect of possible differences in teachers' actual behavior .

The participants for this investigation were students from eight of the 59 schools participating in the Procrustes project, among them the six schools of Chapter 2. In these eight schools, during the period of April to May 2014, 377 Grade 8 students in 32 classes of the academic track filled out a questionnaire about their actual teachers and about the teachers in the vignettes.

Chapter 4. Teacher support: The role of teachers' sex and sociocultural gender differences

Chapter 4 examined differences between male and female teachers. As discussed above, the debate about boys benefiting more from male teachers has been going on for several years in research and educational practice. Yet, research most often has not been able to confirm this idea. Additionally, the benefits of male and female teachers' supportive behavior have been rarely investigated. Therefore, this chapter aims to examine teachers' perceptions of their own supportive behavior. To this end, sex differences in various teacher support dimensions, drawing from three research traditions (i.e., self-determination theory, achievement goal theory, and social-constructivist theory) are explored. In order to understand these sex differences, two sociocultural gender characteristics are included. These are (1) restricted emotionality or the inability to express emotions and (2) pressure for gender conformity or the extent to which a man or a woman feels pressured to conform to respectively the male or female stereotype.

Chapter 4 addresses four research questions:

1. Do male and female teachers differ in perceptions of their support (i.e., autonomy support, structure, mastery approach, performance approach, student-centered teaching, content-centered teaching)?
2. Do male and female teacher differ in their perceptions of restricted emotionality and pressure for gender conformity?
3. Do restricted emotionality and pressure for gender conformity explain possible sex differences in teacher support?
4. Do restricted emotionality and pressure for gender conformity relate differently to teacher support for male versus female teachers?

A total of 1,244 teachers (28.5% men) of all 59 schools of the Procrustes project, teaching Grades 7 and 8 filled out questionnaires during the period of September to November 2012.

	Aim	Participants	Perspective	Instruments
Chapter 1	Systematic review study of sex differences in student engagement	<ul style="list-style-type: none"> ▪ Grade 7-12 students 	Engagement: Student	
Chapter 2	Sex differences in students' engagement and their perceptions of teacher support and the connection between the two.	<ul style="list-style-type: none"> ▪ 385 students (156 students for observations) ▪ 58% boys, 42% girls ▪ Grade 7 ▪ 23 classes ▪ 15 Dutch language teachers 	Engagement: Student, teacher & observer Teacher support: Student	Leuven Involvement Scale (Laevers, 1994) Teacher Rating Scale of School Adjustment (TRSSA, Birch & Ladd, 1997; Valiente, Swanson, & Lemery-Chalfant, 2012) Teacher as Social Context Questionnaire (TASC-Q; Belmont et al., 1988; Sierens et al., 2009)
Chapter 3	Boys' and girls' perceptions of their actual teachers' autonomy support and structure and of teachers' autonomy support and structure in hypothetical scenarios (vignettes)	<ul style="list-style-type: none"> ▪ 377 students ▪ 54% boys, 46% girls ▪ Grade 8 ▪ 32 classes ▪ academic track ▪ 8 schools 	Teacher support: Student (actual teacher & vignettes)	Teacher as Social Context Questionnaire (TASC-Q; Belmont et al. 1988)
Chapter 4	Teacher gender differences in their supportive behavior towards students	<ul style="list-style-type: none"> ▪ 1,277 teachers ▪ 28.5% men, 71.5% women ▪ Teaching Grade 7 & 8 ▪ 59 schools 	Teacher support: Teacher	Teacher as Social Context Questionnaire (TASC-Q; Belmont et al. 1988) Patterns of Adaptive Learning Questionnaire (PALS; Midgley et al., 2000) Well-being instrument for teachers (Aelterman, Engels, Van Petegem, & Verhaeghe, 2007) Restricted Emotionality scale (Blazina et al., 2005) Adult Gender Identity Scale (Egan & Perry, 2001)

Table 1. Overview of the dissertation chapters

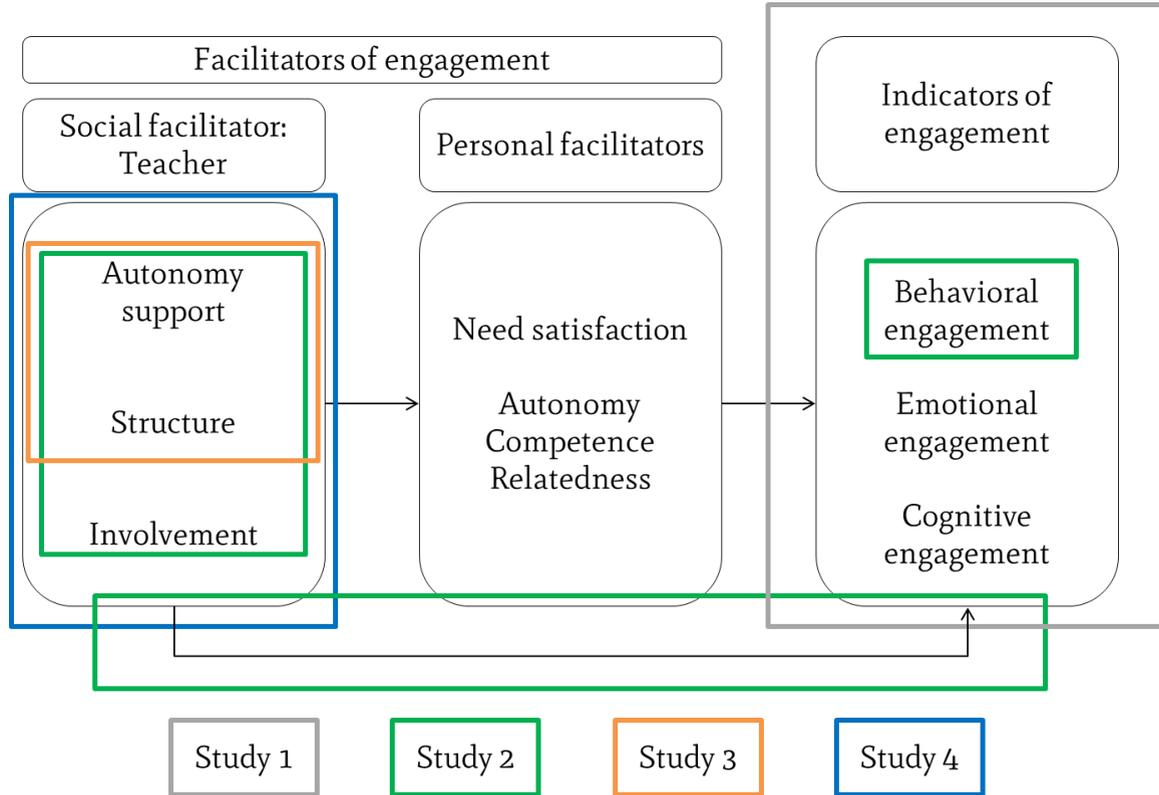


Figure 2. The content of the dissertation displayed in the adapted self-system processes model

CHAPTER 1

STUDENT ENGAGEMENT IN SECONDARY EDUCATION: REVIEWING THE GENDER GAP

Manuscript submitted for publication as Lietaert, S., Verschueren, K., Laevers, F., Buyse, E., & De Fraine, B. (2016). Student engagement in secondary education: Reviewing the gender gap.

Abstract

Student engagement is a widely investigated construct. Generally, boys show lower engagement than girls. However, student engagement is a broad concept, covering different dimensions and measurement levels. To better understand the gender gap in student engagement, this article reviewed studies (from 2000-2014) investigating gender differences in student engagement in secondary education, differentiating between three dimensions of engagement (i.e., behavioral, emotional, and cognitive dimension) and their subdimensions, on the one hand, and three measurement levels of engagement (i.e., school, subject, and activity level), on the other hand. In addition, we discovered several gaps in the literature on gender differences in student engagement that need to be addressed in future research. First, the results from this review study confirmed that girls generally showed higher engagement than boys. This sex difference appeared to be most consistent for behavioral engagement and for the school level measures. For subject and activity specific measures, the advantage of girls was less apparent. Second, evaluating the reviewed studies, several gaps could be identified. Of the few studies available for each different dimension and subdimension, most studies used school-level measures and student-reported data. Moreover, studies rarely focused on student gender as a key predictor and they only used sex to assess gender. Also, the relationship between the different engagement (sub)dimensions could be further investigated. In conclusion, this review study revealed the importance of taking into account the (sub)dimensions and levels of student engagement when investigating gender differences.

Keywords: student engagement, gender, sex, secondary education, systematic literature review

INTRODUCTION

Boys are generally less successful in terms of school achievement than girls and show higher dropout rates than girls, especially during secondary education (Archambault et al., 2009; Blondal & Adalbjarnardottir, 2012; Lamote et al., 2013). In turn, achievement and dropout are highly affected by student engagement (e.g., Fredricks et al., 2004; Lam et al., 2012), on which boys also generally score lower than girls. Thus, enhancing student engagement could be a way to minimize the gender gap in education and to eventually improve achievement and reduce dropout. Fortunately, student engagement is a malleable construct, which means it can be influenced by numerous social factors such as interactions at the school, teacher, and/or peer level (Fredricks et al., 2004).

Often, however, student engagement has been found to be an all-embracing construct, drawing from various theoretical foundations and comprising several dimensions (e.g., behavioral, emotional, and cognitive engagement) with many different operationalizations (e.g., Lam et al., 2012). This fragmented conceptual background makes it difficult to investigate gender differences in engagement. Generally, a gender gap in student engagement is found in favor of girls. However, this conclusion does not seem to hold for each of the student engagement dimensions separately. Therefore, the present review study wants to provide an overview by investigating the gender gap in student engagement and its specific (sub)dimensions for secondary education.

Student engagement: Finding the specifics in the all-embracing construct

The concept of ‘student engagement’ knows many operationalizations and often draws from different theoretical backgrounds (e.g., expectancy-value theory, achievement goal theory). Most of the definitions of ‘student engagement’ are based on the three-part typology that distinguishes between behavioral, emotional, and cognitive engagement (e.g., Fredricks et al., 2004). Often, a distinction is made between indicators and facilitators of student engagement (e.g., Skinner et al., 2009; Skinner & Pitzer, 2012). Indicators are descriptive parts, the observable representations present in the concept itself (e.g., students’ effort or feelings towards school). On the other hand, elements which may explain and enhance the indicators are considered as facilitators. They precede the actual engagement manifested through the indicators. Examples are

interactions with teachers, peers, and parents (i.e., social facilitators) or students' competence beliefs (i.e., personal facilitators). Moreover, some authors include outcome variables such as grades as part of student engagement (e.g., Archambault et al., 2009). In this overview, we explicitly focus on indicators of engagement and we do not consider facilitators and outcomes of student engagement.

Following the three-part typology on engagement indicators mentioned above, we further distinguish between behavioral, emotional, and cognitive engagement. First, *behavioral engagement* implies participation in school activities, conduct (school compliance and attendance), and participation and initiative in class (i.e., effort, persistence, concentration, attention, asking questions, discussing; Fredricks et al., 2004; Wang et al., 2011).

Second, *emotional engagement* is defined as students' affective reactions towards teachers, peers, and school involving three subdimensions (Wang et al., 2011). A first subdimension is valuing of school and education (Chouinard & Roy, 2008). Interest and enjoyment (or lack thereof) is a second subdimension and captures feelings of happiness, interest, boredom, frustration, and anger (Cleary & Chen, 2009; Dotterer et al., 2009). A third subdimension comprises orientation towards school and identification with school, often referred to as school belonging or school connectedness (Fredricks et al., 2004; Wang et al., 2011).

Finally, *cognitive engagement* covers the psychological investment in learning and contains two subdimensions. A first subdimension of cognitive engagement is students' achievement goals, which refer either to students' desire to develop their competence and understanding (mastery goal orientation) or to students' aims to show their competence (performance goal orientation) or avoid displaying their incompetence (performance avoidance orientation; Connell & Wellborn, 1991; Midgley et al., 2000). These achievement goals each entail a different kind of psychological investment. A second subdimension of cognitive engagement is self-regulated learning and strategy use (students' management of their efforts and completion of their work; applying strategies for learning the material, for setting goals and for solving problems; Fredricks et al., 2004; Wang et al., 2011).

It is advisable to distinguish between the dimensions and subdimensions because of the different consequences for educational practice (Fredricks et al., 2004). For example, a student who behaves poorly in school, but persists during classes, may have the same score on a composite measure of behavioral engagement as a student who

does not persist, but who behaves according to school rules. Therefore, interventions aimed at improving engagement need to focus on different issues for different (groups of) students, allowing to tackle low student engagement more efficiently.

Measurement levels of student engagement

In addition to distinguishing different dimensions of student engagement on a conceptual level, separate measurement levels can be defined as well. Student engagement can be measured at school level, subject level, and activity level (e.g., Skinner & Pitzer, 2012). Consequently, student engagement is not only to be measured by indications of cognitions, behaviors, and emotions related to the *school context in general*. It is also interesting to investigate *subject specific engagement*. For example, one student can be highly (behaviorally, emotionally, or cognitively) engaged during mathematics classes, but can show low engagement during language classes. Furthermore, *activity specific engagement* measures the engagement of students during one specific class activity, taking into account the classroom context (Meece et al., 2006; Skinner & Pitzer, 2012). For example, a student can be highly engaged during an individual task and show lower engagement during a group task, regardless of the specific subject. Consequently, a classification of student engagement across different dimensions (behavioral, emotional, and cognitive engagement) and measurement levels (school engagement, subject specific, and activity specific engagement) allows us to capture differences among and within students. For example, while a student can be interested in a specific subject (e.g., mathematics), during a particular activity, the student may exert no effort or may not pay attention. Figure 3 presents a grid combining the three student engagement dimensions with the three engagement levels. In the grey area of this grid, the various operationalizations can be categorized.

Gender differences in engagement

Gender differences in student engagement research predominantly have been assessed by measuring the sex of the students. The concepts of sex and gender are often used interchangeably in educational research. ‘Sex’ actually refers to the binary distinction between the ‘male’ and ‘female’ categories, whereas ‘gender’ aims to express the broader sociocultural values that indicate which roles, behaviors, activities and attributes are associated with being either a man or a woman (with ‘masculine’ and

STUDENT ENGAGEMENT LEVELS	STUDENT ENGAGEMENT DIMENSIONS		
	Behavioral engagement	Emotional engagement	Cognitive engagement
	Conduct Participation & initiative <ul style="list-style-type: none"> - effort - persistence - concentration - attention - asking questions - discussing 	Affective reactions towards peers and schools <ul style="list-style-type: none"> - Valuing of education - Interest & enjoyment - School belonging 	Psychological investment in learning <ul style="list-style-type: none"> - Achievement goals - Self-regulated learning & strategy use
School level			
Subject level			
Activity level			

Figure 3. Grid combining the three student engagement dimensions as described by Fredricks et al. (2004) with the engagement levels as described by Skinner & Pitzer (2011).

'feminine' being gender categories; Archer & Lloyd, 2002; McGeown, Goodwin, Henderson, & Wright, 2012). The measurement of these sociocultural values can be captured in the construct of 'gender identity'. Gender identity refers to the psychological representations of one's own masculine or feminine traits in relation to gender categories defined by sociocultural heritage (Perry & Pauletti, 2011; Tobin et al., 2010). The investigation of a student's gender identity can indicate how masculine or feminine a student feels and could provide additional information about gender differences in engagement.

Research aims

In order to adequately investigate gender differences in student engagement, the aims of this study are twofold. First, we strive to find, in current literature, patterns on gender differences in student engagement. More specifically, we want to provide an overview of literature on gender differences in each of the dimensions (i.e., behavioral, emotional, and cognitive) and subdimensions of student engagement, taking into account the measurement levels (i.e., school, subject, and activity level). This could eventually lead to interventions that aim to improve boys' and girls' engagement.

Secondary education appears to be the most crucial time during which the gender gap in education develops and will therefore be the age group on which this study focuses. Second, we aim to discover gaps in current literature on gender differences in student engagement in order to provide perspectives for future research on this topic. To realize these two aims, we conducted a systematic literature review.

METHOD

A stepwise procedure was applied to retrieve and select relevant studies for answering our research questions.

Inclusion and exclusion criteria

In order to conduct a specific literature search, the following inclusion and exclusion criteria were applied. First, publications often measured certain engagement dimensions or subdimensions, but reported on these measures without mentioning the word engagement (e.g., interest, motivation, valuing, self-regulated learning). We decided not to include these studies because we focus specifically on what current literature describes as ‘engagement’. Only articles that specifically mentioned the word ‘engagement’ when referring to the conceptual framework and the used measures in their study were taken into account. Second, every publication should contain a relevant measure of student engagement, meaning that the engagement measure used in the article should reflect (part of) the definition given in the conceptual review study of Fredricks et al. (2004), which has been widely accepted in engagement literature. Third, we only admitted studies reporting on empirical research investigating the relationship between gender and one or more measures of student engagement, specifically for Grade 7-12 students (12-18 years old). Fourth, only peer reviewed articles published in English were considered. Fifth, studies that reported on special education or focused only on a specific target population within the larger population of secondary school students (e.g., low SES students) were not included. Finally, the time span of the literature search reached from January 2000 to October 2014, in order to retrieve the most recent studies reporting on gender differences in engagement.

Search strategy

We carefully selected the keywords used for our literature search. Appendix 1 gives an overview of the search terms and combinations. These keywords were not combined with the keyword 'gender' or 'sex', in order to retrieve not only studies that explicitly focus on gender but also studies that control for gender in their analyses. The words 'classroom', 'school', 'student', 'adolescent', 'pupil', and 'child*' were not allowed more than ten words apart from the word 'engagement'. This rule was implemented because the word 'engagement' has a very broad meaning. For example, authors might use the word 'engagement' to refer to 'engaging' in a certain activity that is not necessarily linked to education or classroom practices. The topics mentioned in the NOT column were based on the search strategy in the review study of Stroet et al. (2013), which investigated the role of teacher support for students' engagement, also specifically for secondary education. These search terms were applied to the title, the abstract, and the keywords of the articles in the databases in order to obtain a specific focus on the topic of interest.

Identification of relevant studies

A systematic literature search was conducted using four databases: Science Citation Index Expanded, Social Sciences Citation Index, Arts & Humanities Citation Index (all available through Web of Science), and Educational Resources Information Centre (ERIC). Articles were screened for relevance on title, then abstract, and then full text article. Additional studies were obtained by examining the references of the selected articles, for which the same criteria for inclusion were applied. The retrieved articles were screened twice by the first author of this study in order to systematically decide on the relevance of the publications. When two or more articles reported on the same data, we selected one article based on three criteria, applied in the following hierarchical order: (1) measurement of gender differences (e.g., *t*-test yielded more specific information about sex differences than sex as a covariate in a model that did not focus on sex); (2) large sample size; and (3) publication date (most recent article). This was the case for the Maryland Adolescent Development in Context Study (MADICS), in which 23 schools from Washington DC took part (see Wang et al., 2011), for the Educational Longitudinal Study of 2002 (see Fan, 2011) and for studies using data from three public high schools in New South Wales with similar academic curriculums and socio-

economic positions (see Plenty & Heubeck, 2013). In total, 6 studies were excluded because of overlapping samples.

Analysis of the retrieved studies

To analyze the selected studies, we used a data extraction form containing (1) information on the engagement measure used in the study; (2) background information on the participants, country in which the study was conducted, and the course during which the measure was applied; (3) information on the gender measure used in the study (sex and/or a gender identity measure); (4) the results regarding gender differences in the engagement measures. The data extraction form was discussed among the authors (final version; see Appendix 2). Content analysis of the articles resulted in a categorization of the engagement measures used in the articles within the framework of Fredricks et al. (2004). Table 2 presents the selected studies in the grid that was introduced in Figure 3 and thus categorizes the studies according to the student engagement (sub)dimensions and levels.

RESULTS AND DISCUSSION

Description of the publications investigating gender differences in engagement

By applying the inclusion and exclusion criteria and the search strategy, our literature search resulted in 2,715 articles. After identifying the relevant studies and analyzing the retrieved studies in the data extraction form, we decided that 21 publications met the criteria. Articles not included in our final analyses (1) did not use engagement in the context of 'being engaged during class' but rather as 'being engaged in a particular activity' (merely in the sense of 'doing' an activity); (2) did not include gender in the analyses; (3) did not report on Grade 7-12 students (because they did not indicate grade level or age); and (4) did not define their measure as 'engagement'.

Table 2. Overview of the references of all included studies, organized by the engagement dimensions and the measurement level

Measurement level	Behavioral engagement	Emotional engagement	Cognitive engagement
School level	Composite		
		G > B	Cooper (2014) Darr (2012) Lam et al. (2012)
	General	General	
	G > B Johnson et al. (2001) Wang et al. (2011)	G > B Hoglund (2007) Wang et al. (2011)	
	G = B van Uden et al. (2014)		
	Effort	Valuing of school	Self- regulated learning
	G > B Fan (2011) Hoglund (2007) Martin (2007) Marks (2000) Skinner et al. (2008) Ueno & McWilliams (2010)	G > B Orthner et al. (2013) Martin (2007)	G = B van Uden et al. (2014) Wang et al. (2011)
	B > G Green et al. (2008)		G>B Martin (2007)
	Attitude towards homework	Interest and enjoyment	Mastery goal orientation
	G > B Lamote et al. (2013)	G > B Blondal & Abalbjarnardottir (2012) Skinner et al. (2012)	G > B Martin (2007)
	Absence	Disaffection (anxiety)	
	G = B Hoglund (2007)	G = B Skinner et al. (2008) Orthner et al. (2013) van Uden et al. (2014)	

Measurement level	Behavioral engagement	Emotional engagement	Cognitive engagement
		G > B	Martin (2007)
	Conduct		
	G > B		Blondal & Abalbjarnardottir (2012)
Subject level	Effort	Valuing of school	Self-regulated learning
	G = B	G = B	G > B
	Nie & Lau (2009) - language Plenty & Heubeck (2013) - math	Plenty & Heubeck (2013) - math	Archambault et al. (2012) - math Plenty & Heubeck (2013) - planning math G = B Plenty & Heubeck (2013) - task management math
		Disaffection (anxiety)	Mastery goal orientation
		G > B	G > B
		Plenty & Heubeck (2013) - math	Plenty & Heubeck (2013) - math
Activity level		Experience Sampling Method - Flow	
		G > B	
		Park et al. (2012) Shernoff & Schmidt (2008)	

Note. G = girl; B = boy

Interpretation of the engagement scales

The content analysis of the studies in the data extraction form resulted in several decisions about the engagement scales used in the retrieved publications. The scales that were specifically defined by the authors in accordance with the engagement (sub)dimensions distinguished by Fredricks et al. (2004) were considered in their original form. However, some scales were not ranked within a specific (sub)dimension of engagement according to our working definition. This was the case for the Motivation and Engagement Scale applied in the studies of Martin (2007) and Plenty and Heubeck (2013). Among the subscales of the Motivation and Engagement Scale (for the specific items, see Appendix 2), the scales ‘self-efficacy’, ‘uncertain control’, ‘failure avoidance’, and ‘self-handicapping’ were not sufficiently associated with the conceptual definition of engagement. We categorized ‘valuing of school’ under the emotional engagement subdimension valuing of school and ‘mastery orientation’ under the goal orientation subdimension of cognitive engagement. ‘Planning’ and ‘task management’ were classified under the self-regulated learning subdimension of cognitive engagement. ‘Persistence’ and ‘disengagement’ were each considered part of the classroom participation subdimension of behavioral engagement. ‘Anxiety’ was interpreted as a lack of interest and enjoyment. This is in line with Skinner et al.’s (2009) operationalization of emotional disengagement (in contrast to emotional engagement measured by interest and enjoyment). Another inexplicit measure was the scale used by Johnson, Crosnoe, and Elder (2001), who examined students’ level of participation in school by means of three items (i.e., “How many times in the past school year (1) have you skipped school”; (2) did you have trouble paying attention”; (3) did you have trouble getting your homework done”). We categorized this measure under behavioral engagement and were not able to distinguish any specific subdimensions because the subdimensions of ‘conduct’ and ‘effort and participation’ were measured in one scale. Ueno and McWilliams (2010) operated the same scale without the conduct measure, which allowed us to define their more specific measure as classroom participation (subdimension of behavioral engagement). Green, Rhodes, Hirsch, Suárez-Orozco, and Camic (2008) used the Academic Engagement Scale in which students had to classify themselves in either of the two groups for each of the items (e.g., “Some students always finish their work BUT other students often do not finish it”). This scale can also be assorted under the classroom participation subdimension of behavioral engagement.

Marks (2000) measured student engagement in instructional activity, which is a composite measure of effort, attentiveness, lack of boredom, and completing class assignments. These elements can also be categorized under classroom participation. The latter subdimension was also assigned to the scale of Nie and Lau (2009), measuring attention, effort and participation. The measure 'affective engagement' (e.g., "I like what I am learning in school") in the article of Lam et al. (2012) can be classified under the emotional engagement subdimension of interest and enjoyment. Orthner, Jones-Sanpei, Akos, and Rose (2013) measured psychosocial engagement by means of 'valuing of school', which we considered to be part of the valuing of school subdimension of emotional engagement. Orthner et al.'s (2013) 'school engagement' measure aimed to capture students' excitement of being in school and looking forward to learning. Here, the interest and enjoyment subdimension of emotional engagement is to be recognized. Fredricks et al. (2004) mentioned that engagement, as measured through the experience sampling method, can be considered as emotional engagement. Therefore, the articles applying this method (i.e., Park, Holloway, Arendtsz, Bempechat, & Li, 2012 and Shernoff & Schmidt, 2008) were discussed separately under emotional engagement. Within this experience sampling method, students receive signals at random time points during the day, after which they fill out a questionnaire about the activity they are performing at that moment. Specific items assess the challenges of the activity, the importance of the activity, and the mood of the student at the time he/she is beeped. This method originated in flow theory and aims at investigating 'flow' within a specific activity. When a person is in 'flow', he/she profoundly enjoys the activity and is completely absorbed by it. The activity is worth doing for the sake of the activity itself and not for a goal that lies outside the activity. There is a match between a person's skills and the challenges of the activity (Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). Fredricks et al. (2004) refer to the added value of the concept of flow to investigate the quality of an individual's engagement at the time of the activity.

Gender differences in student engagement dimensions and subdimensions

GENERAL STUDENT ENGAGEMENT

Three studies measured general student engagement by means of a composite measure (behavioral, emotional, and cognitive engagement) of student-reported

engagement. In all studies, using large datasets from the US (Cooper, 2014), New Zealand (Darr, 2012) and 12 countries (US and European and Asian countries; Lam et al., 2012), girls scored higher on student engagement than boys. Lam et al. (2012) calculated a Cohen's d effect size of .23. Our own calculations of Cohen's d for Cooper's (2014) study resulted in a value of .11. For the study of Darr (2012), we did not have sufficient information to provide the Cohen's d effect sizes. (For the articles we will be discussing, we calculated Cohen's d effect sizes where possible.)

Remarkably, each study applied a different measure of student engagement, although they were all based on Fredricks' et al. (2004) three-part typology of student engagement. Moreover, similar questionnaire items were not categorized under the same student engagement dimension in all studies. For example, Darr (2012) classified the question 'I like learning new things in school' and 'At school I really care that I do my best work' under the dimension of 'cognitive engagement'. According to the conceptualization used by Fredricks et al. (2004), the first question should be ranged under 'emotional engagement' and the second under 'behavioral engagement'. Lam et al. (2012) did list very similar questions (i.e., 'I like what I am learning in school' and 'I try hard to do well in school') under emotional engagement and behavioral engagement respectively.

Additionally, all studies measured student engagement through combining questions about for example behavior according to school rules, liking to go to school, and doing one's best at school. This may yield very different results as compared to separate measures for each student engagement dimension. Studies using such separate measures are discussed in the following section.

BEHAVIORAL ENGAGEMENT

For behavioral engagement, mostly student self-report measures have been used. Some studies applied a *composite measure of school conduct and classroom participation*, which did not allow us to make a distinction between the subdimension conduct in school in general (e.g., skipping school, getting into fights) and the subdimension active participation in class (e.g. paying attention, putting effort into activities). Two studies indicated that girls were more engaged than boys (Johnson et al., 2001; Wang et al., 2011). van Uden, Ritzen, and Pieters (2014) found no sex differences. A possible explanation for the difference with the other two studies is the fact that van Uden et al. (2014) measured subject specific student engagement by asking students

about their engagement for one particular class subject, whereas the other studies used a general measure. Unfortunately, van Uden et al. (2014) did not report on one specific class subject because all school teachers and their students were able to participate in the study and researchers examined the mean level of engagement over all subjects. Studies only investigating *classroom participation (effort and persistence)* also indicated that girls were more behaviorally engaged (Fan, 2011; Hoglund, 2007; Marks, 2000; Martin, 2007; Skinner et al., 2008; Ueno & McWilliams, 2010) and that boys were more behaviorally disengaged (Martin, 2007; Skinner et al., 2008). Only Green et al. (2008) demonstrated that boys were more engaged at a younger age (Grades 4-8), but that girls showed a more positive change in engagement over time. In contrast, Marks (2000; for Grade 5) and Skinner et al. (2008; for Grades 4-7) revealed sex differences in favor of girls, also for younger students. The results of Green et al. (2008) might differ from the results of other studies because of the use of a scale in which students needed to categorize themselves in either of two groups, rather than a scale in which students needed to decide to what extent one statement applied to them personally. For classroom participation in English lessons (first language) in Singapore, Grade 9 boys and girls did not differ in their engagement (Nie & Lau, 2009). For mathematics classes, Plenty and Heubeck (2013; Grades 7-9) did not find sex differences, neither for engagement, nor for disengagement. Compared to most studies indicating that girls showed higher engagement (and boys higher disengagement), the absence of sex differences in these studies might be due to the subject specific measure. Specifically for English or mathematics, boys' and girls' perceptions of engagement seem to align.

Only the study of Hoglund (2007) measured classroom participation and school absence (i.e., an element of conduct) with separate measures for the same data and found that, for *effort and persistence*, girls scored higher than boys. For students' *absences*, there were no significant sex differences. This might suggest that the largest sex differences in behavioral engagement in favor of girls were established for classroom participation, rather than for school conduct. This seems to be supported by the consensus in the publications measuring only classroom participation and the more diverse findings in the studies using a composite of classroom participation and school conduct. Nevertheless, for classroom participation, more studies were retrieved for this review study, which allowed us to draw more solid conclusions for this subdimension.

In addition, Blondal and Adalbjarnardottir (2012) investigated conduct at school separately, using the term 'negative school behaviors' (i.e., "I cut classes or skip

school” and “I get into many fights”) as a measure of behavioral disengagement and found that boys reported more negative behaviors than girls. When we compare this to the findings of Høglund (2007), we need to stress the difference between only measuring absence and measuring absence and negative behavior at school (e.g., fighting) in one scale. Perhaps, boys’ lower scores for school conduct are caused by their scores for negative behavior at school rather than by their absence scores. After all, absence has various causes not necessarily related to misconduct (e.g., illness). Moreover, not specifically related to the school context either, adolescent boys have been found to generally show more conduct problems, for example, higher physical aggression than girls (Zahn-Waxler, Crick, Shirtcliff, & Woods, 2006). Overall, a pattern emerges suggesting that boys score lower for behavioral engagement in general and for its various subdimensions. Only for the studies measuring subject specific behavioral engagement (i.e., Nie & Lau, 2009; van Uden et al., 2014), no sex differences were discovered.

Lamote et al. (2013) measured behavioral engagement by means of *‘attitude towards homework’*. This measure was used to indicate *‘conduct’* as a subdimension of behavioral engagement (Fredricks et al., 2004). Lamote et al. (2013) revealed three trajectories of behavioral engagement (i.e., high, high and decreasing, and low). Boys were more likely to be part of the high and decreasing and the low group than part of the high group, as compared to girls.

EMOTIONAL ENGAGEMENT

Most articles in this review study investigated behavioral engagement. The popularity of this dimension was confirmed by Skinner et al. (2008), who labeled the behavioral component as “prototypical of engagement” (p. 778). Nevertheless, also for emotional engagement, girls generally scored higher than boys did. When emotional engagement was evaluated with a *composite measure*, girls obtained higher scores than boys (Høglund, 2007; Wang et al., 2011). For the first subdimension, *valuing of school*, girls scored higher than boys in the study of Martin (2007) and in the study of Orthner et al. (2013). The latter took students’ sex into account in a model measuring the effect of an intervention aiming to improve students’ engagement. Plenty and Heubeck (2013), using the same scale as Martin (2007), but measuring valuing only for mathematics, did not find sex differences. For the second subdimension, identification with school or *school belonging*, Blondal & Adalbjarnardottir (2012) reported no sex differences. *Interest and*

enjoyment, the third subdimension, was measured in a few more studies. Blondal and Adalbjarnardottir (2012) discovered that girls scored higher than boys (Cohen's $d = .14$, own calculations). Skinner et al. (2008) measured emotional engagement (interest, enjoyment, enthusiasm) and emotional disaffection (boredom, anxiety, frustration). They demonstrated girls' higher emotional engagement (Cohen's $d = .21$, own calculations) and the absence of sex differences for emotional disaffection. Martin (2007) and Plenty and Heubeck (2013), on the other hand, found that girls showed more anxiety. The difference with the results of Skinner et al. (2008) might be due to the fact that only anxiety and not boredom and frustration were taken into account in the studies of Martin (2007) and Plenty and Heubeck (2013). It is remarkable that girls scored higher on one aspect of disengagement. However, this is in line with the fact that girls generally (not specifically related to school or class contexts) have been found to show higher anxiety than boys (Zahn-Waxler et al., 2006). Moreover, we might argue that girls' higher anxiety scores go hand in hand with girls' higher classroom participation. Because girls generally seem to put more effort into tasks and tend to be more persistent, they may develop more anxiety (e.g., worrying about getting good grades) than boys. After all, one element Zahn-Waxler et al. (2006) put forward for explaining the fact that girls generally showed higher anxiety is girls' higher feelings of blame and responsibility. The responsibility they feel for being persistent in class may thus explain their higher anxiety. Orthner et al. (2013), for Grade 6-8 students, did not demonstrate sex differences for interest and enjoyment, whereas they did find that girls valued school more than boys. van Uden et al. (2014) did not notice sex differences either for interest and enjoyment, or for either of the other student engagement dimensions. Two studies measured emotional engagement using the *experience sampling method* to capture activity specific engagement and demonstrated girls to be more engaged than boys (Park et al., 2012; Shernoff & Schmidt, 2008). Unfortunately, in these studies, there was no identification of the specific learning situation (e.g., subject, activity). Information about the specific activity would enhance possibilities for recommendations about improving the engagement of boys (and girls). Moreover, although Fredricks et al. (2004) categorized flow under emotional engagement, Shernoff and Csikszentmihalyi (2009) refer to the conceptualization of flow as the presence of high concentration, enjoyment, and interest during a particular activity. They further discuss that these elements entail cognitive processes, the demonstration of competence, the direction of attention and the occurrence of intrinsic motivation. Therefore, we could suggest that measuring flow is

valuable for identifying not only emotional engagement but also behavioral and cognitive engagement for one specific activity.

In conclusion, for general emotional engagement, girls scored higher than boys. For school belonging, only one study was retrieved, which found no sex differences. For valuing of school, where also only one study was retrieved, girls indicated to be more engaged than boys. For interest and enjoyment, two studies reported girls to be more interested and to enjoy school more than boys did. Two studies, of which one measured subject specific engagement (i.e., van Uden et al., 2014), did not find any sex differences. Nevertheless, for activity specific engagement (by means of the experience sampling method), girls scored higher than boys did.

Reflecting upon the results for behavioral and emotional engagement, we might notice more consensus for studies reporting on sex differences in the behavioral engagement subdimensions than in the emotional engagement subdimensions. Therefore, we suggest that the gender gap in favor of girls might be more pronounced for the behavioral engagement subdimensions than for the emotional engagement subdimensions. Behavioral and emotional engagement have been linked by Skinner et al. (2008), who suggested that emotional engagement can be considered as a predictor of behavioral engagement. They demonstrated that positive emotional engagement enhanced students' effort in learning activities and that negative emotional engagement reduced students' effort and persistence. When students find an activity interesting, they will put more effort into it and persist more, whereas the other way around (i.e., more effort and persistence influencing emotional engagement) did not appear to be true (Skinner et al., 2008). In addition, Williams et al. (2002), who interviewed students about their engagement, found that girls can put in effort without having to find the task interesting or fun. This may explain why, for emotional engagement, there were less apparent sex differences than for behavioral engagement, where girls explicitly scored higher.

COGNITIVE ENGAGEMENT

The few studies reporting on cognitive engagement yielded mixed results about sex differences. Most studies investigated the first subdimension, *self-regulated learning*. Archambault, Janosz, and Chouinard (2012) demonstrated that, for mathematics, girls showed higher cognitive engagement than boys did. Plenty and Heubeck (2013), also for mathematics, found girls to score higher for task management, but stated no sex

differences for planning. Nevertheless, Martin (2007), with the same scale, reported girls to score higher for task management and planning. However, he did not measure subject specific engagement. van Uden et al. (2014) and Wang et al. (2011) did not notice sex differences in cognitive engagement. Hoglund (2007) used a composite measure of behavioral and cognitive engagement (1) to measure teacher-reported attitude and effort on students' report cards in order to measure involvement in learning, participation, and persistence (behavioral engagement) and (2) to examine investment in learning, self-regulated motivation, and thoughtfulness (cognitive engagement). For this measure, girls scored significantly higher than boys, which is confirmed by our calculation of a high Cohen's *d* effect size of .50. For the second subdimension of cognitive engagement, *goal orientation*, Martin (2007) and Plenty and Heubeck (2013) demonstrated girls' higher mastery orientation. Performance orientation and performance-avoidance orientation were not investigated in these studies.

Gender identity

Taking into account students' gender identity in addition to their sex (Perry & Pauletti, 2011; Tobin et al., 2010) can increase insights in gender differences in student engagement. Surprisingly, only Ueno and McWilliams (2010) reported on gender identity in relation to engagement. They measured gender identity with items like frequency of crying, frequency of fighting, after which they identified gender-typed groups. For example, the frequency of fighting predicted a more masculine gender identity. They discovered that extremely gender-typed girls and boys (i.e., hyperfeminine or hypermasculine students) reported lower attention, persistence, and participation (i.e., behavioral engagement) than gender-typical girls and boys (i.e., girls and boys who behaved typically according to their sex). Gender atypical girls (i.e., girls acting more masculine) and gender-typical girls did not differ in their behavioral engagement. On the other hand, gender-atypical boys (i.e., boys acting more femininely) reported lower levels of behavioral engagement than gender-typical boys. According to the authors, these results stemmed from the strong emphasis on traditional gender behavior in educational settings and from students' and teachers' gender stereotyped expectations. Moreover, Ueno and McWilliams (2010) found that being an atypical boy is more negative for behavioral engagement than being an atypical girl. This may descend from the more negative social stigma towards boys' feminine behavior than towards girls' masculine behavior (Ueno & McWilliams, 2010). These findings disagree with Brozo

(2002), who argued that school contexts are characterized by activities and materials that are more feminine, which could be a reason for girls generally scoring higher for engagement. In order for this to coincide with these results, gender atypical boys (who see themselves as more feminine) should have scored higher than gender typical boys and higher than gender atypical girls. The finding that extremely gender-typed boys scored lower than gender-typical boys does confirm Brozo's (2002) argument, but the outcome that extremely gender-typed girls also scored lower again contrasts with this. It is possible that being extremely gender-typed is related to social pressure, which might inhibit students' active engagement in classroom settings.

In any case, these findings could widen our perspective on gender differences in student engagement suggesting that not all boys are at risk for low engagement, but that specific subgroups within the group of boys (and girls) could be more likely to show lower engagement.

Gaps and perspectives in research on gender differences in engagement

By systematically reviewing the existing research on gender differences in student engagement, this study also identified relevant gaps in the current literature that should be further addressed.

First, overall, we can conclude that for the different (sub)dimensions of student engagement, different gender results arise. The (sub)dimensions may all be part of one construct, i.e., student engagement, but they appear to relate differently to other variables, in this case students' sex. Therefore, it is highly relevant to consider the different (sub)dimensions of student engagement separately when it comes to investigating gender differences. Few articles in this review study reported on the same student engagement (sub)dimension, assessed with the same instrument. Consequently, for some (sub)dimensions, only tentative conclusions could be drawn, sometimes based on only one or two studies. To draw more valid conclusions, we want to reason for more research covering the different dimensions and subdimensions separately. In general, we argue in favor of more clarity when it comes to defining and operationalizing the student engagement (sub)dimensions, for example by situating the chosen measures clearly in the proposed multidimensional framework. In addition, the link among the student engagement dimensions seems to be underemphasized. For example, Skinner et al. (2008) found that emotional engagement measured in the fall, significantly predicted

the improvement of behavioral engagement from fall to spring. However, other studies did not investigate the links between the various engagement (sub)dimensions. Future research should focus on further clarifying the interrelations between behavioral, emotional and cognitive engagement (and their respective subdimensions).

Second, in the retrieved studies, student engagement was nearly always measured through student reports. Teacher reports, observations, and interviews were rarely used. Only the article of Hoglund (2007) measured behavioral engagement in three ways: (1) teacher-reported attitude and effort in order to measure behavioral and cognitive engagement; (2) school records of students' total number of absences during the school year; (3) students' self-reported behavioral and emotional engagement. The lack of teacher reports in secondary education, as compared to primary education, may be due to the opportunity in secondary education to rely on student reports as a valid assessment. Furthermore, observations and interviews are more time-consuming than student reports. Despite the frequent use of only student report to investigate engagement in secondary education, many researchers suggest the use of multiple informants to counter the limitations of one rating with the strengths of the other ratings (Doumen et al., 2012; Fredricks & McColskey, 2012).

Third, many articles used general engagement measures, but only a few measured subject specific engagement (i.e., Archambault et al., 2012; Nie & Lau, 2009; Plenty & Heubeck, 2013) or activity specific engagement (i.e., Park et al., 2012; Shernoff & Schmidt, 2008). Unfortunately, those studies measuring activity specific engagement did not elaborate on the kind of activity or course. However, information on the activity or subject could permit us to formulate more efficient practice-oriented suggestions on how to enhance students' engagement. For example, subject specific and activity specific interest in language were investigated by Graham, Tisher, Ainley, & Kennedy (2008), who found sex differences in favor of girls in topic interest (i.e., interest in a part of the school subject 'language') and no sex differences once students had chosen a text of interest. This corroborates the assumption that enhancing boys' engagement in language is possible if the students are provided with material that appeals to them. The role of the teacher thus seems to be crucial in this matter.

Fourth, very few studies were retrieved linking the sex of the students with (dimensions of) student engagement. Moreover, in most selected studies, sex was merely used as a covariate and not as a key variable in the analyses. These arguments call for more research specifically focusing on sex differences in engagement. This focus would

yield more accurate results on sex differences in the various (sub)dimensions because it will prevent us from having to compare studies using sex as a covariate in a model that focuses on other variables (e.g., the relation between engagement and achievement) and studies that specifically focus on investigating sex differences in engagement.

Finally, gender has been nearly always operationalized as sex in the retrieved studies, except in the study of Ueno and McWilliams (2010). Gender identity has not been very often used in educational research, especially not in combination with student engagement. Nevertheless, it could provide useful information that may nuance the sex differences in student engagement.

Limitations

Some limitations of this study should also be noted. First, the specific choices made in this study concerning the definition of engagement, the operationalization, and the target group of secondary school students, as discussed in the method section, were necessary for conducting a systematic review of the literature in this field. For example, despite our call for additional research regarding the different subdimensions of student engagement, it should be mentioned that some of these aspects may have been investigated, yet not labeled 'engagement'. In current literature, (sub)dimensions of student engagement are sometimes categorized under the concept 'motivation'. These studies could also yield interesting results regarding specific (sub)dimensions of engagement in relation to gender. For the sake of conceptual clarity, we decided not to include these articles in this literature review (see inclusion and exclusion criteria). Additional research could unravel this relationship between motivation and student engagement. Moreover, other selection criteria could add new insights. For example, comparing sex differences in student engagement for primary and secondary school could also produce interesting results. Second, sex differences may be overestimated because of publication bias, in the sense that research that does investigate sex differences might fail to report them because of the lack of significance. However, we intended to minimize this bias by integrating in this review study not only studies focusing on sex differences, but also studies that merely use sex as a control variable.

CONCLUSION

The aim of this review study was to examine the gender gap in current student engagement literature. To this end, the guiding framework of this study was based (1) on the three-part typology in which student engagement consists of a behavioral, emotional, and cognitive dimension and (2) on the distinction between the school, subject, and activity level of student engagement. Several interesting patterns were identified. Most studies reported on sex differences in behavioral engagement and demonstrated that, especially for classroom participation, girls scored higher than boys. For emotional engagement, the few retrieved studies resulted in no sex differences or girls reporting higher engagement than boys. The few studies measuring cognitive engagement found either no sex differences or indicated that girls adopted, more often than boys, self-regulated learning strategies. Girls also appeared to be more mastery oriented than boys. Remarkably, for subject specific measures of engagement, less apparent sex differences were demonstrated than for the general, school level measures. This underlines the importance of measuring gender differences in engagement specifically for different school subjects (and activities). Moreover, several gaps were discovered in current research on gender differences in engagement. Often, few studies per (sub)dimension of engagement were available to draw conclusions from. Furthermore, few studies focused on gender as a key variable related to engagement. Mostly, school level measures were used as operationalizations of engagement. More subject and activity specific measures could produce a more complete picture of gender differences in engagement. In addition, predominantly student-reported data were gathered in this context, which could be enriched, with for example, observer or teacher reports. Moreover, there is a lack of emphasis on the link between the student engagement dimensions. Finally, most studies concentrated only on sex to measure gender of the students, whereas a more sociocultural view on gender could yield additional insights.

Overall, our findings highlight the added value of taking the (sub)dimensions and measurement levels into account when investigating gender differences in student engagement. Furthermore, we want to emphasize the need for clarity in the conceptualization of student engagement and the highly required attention to gender differences in student engagement literature. In order to draw useful conclusions for educational practice, the research field on student engagement longs for more subject

specific and activity specific measures, based on data from multiple informants, which link student engagement to several aspects of the learning environment.

CHAPTER 2

THE GENDER GAP IN STUDENT ENGAGEMENT: THE ROLE OF TEACHERS' AUTONOMY SUPPORT, STRUCTURE, AND INVOLVEMENT

Manuscript published as Lietaert, S., Roorda, D., Laevers, F., Verschueren, K., & De Fraine, B. (2015). The gender gap in student engagement: The role of teachers' autonomy support, structure, and involvement. *British Journal of Educational Psychology*, 85 (4), 489-518.

Abstract

Background. The gender gap in education in favor of girls is a widely known phenomenon. Boys generally have higher dropout rates, obtain lower grades, and show lower engagement. Insight into factors related to these academic outcomes could help to address the gender gap.

Aims. This study investigated, for Dutch language classes, (1) how boys and girls differ in behavioral engagement, (2) which teacher support dimensions (autonomy support, structure, involvement) may explain sex differences in engagement (mediation hypothesis), and (3) whether and which of these teacher support dimensions matter more for boys' as opposed to girls' engagement (moderation or differential effects hypothesis).

Sample. A total of 385 Grade 7 students and their 15 language teachers participated in this study.

Methods. Teacher support was assessed through student reports. Student engagement was measured using student, teacher, and observer reports. By means of structural equation modeling, the mediating role of the teacher support dimensions for sex differences in behavioral engagement was tested. The potential differential role of the teacher support dimensions for boys' and girls' engagement was investigated through multigroup analysis.

Results. Boys were less engaged than girls and reported lower support from their teacher. Autonomy support and involvement partially mediated the relationship between sex and behavioral engagement. Autonomy support was demonstrated to be related to boys' engagement but not to girls'. Structure and involvement were equally related to the engagement of both sexes.

Conclusions. Although involvement and autonomy support partly explained the gender gap in engagement (mediation hypothesis), more support was found for differential effects of autonomy support on boys' versus girls' engagement (differential effects hypothesis).

Keywords: Student Engagement, Gender, Students' Sex, Teacher Support

INTRODUCTION

One of the most robust findings in educational research is the fact that boys, in general, show lower engagement and achievement at school and have higher dropout rates than girls (Van de gaer et al. 2006; Wang & Eccles, 2012). For example, in Grades 7-9, girls reported higher engagement than boys in a data set of 3,400 students in 12 countries (United States, European, and Asian countries; Lam et al., 2012). Cooper (2014) found the same results for 1,132 Grade 9-12 students in the United States. Moreover, in secondary education, student engagement appeared to decline for both sexes (Van de gaer et al., 2009; Wang & Eccles, 2012), with some studies indicating a larger decline for boys than for girls thus widening the gender gap (Chouinard & Roy, 2008; Dotterer et al., 2009; Watt, 2000). For instance, Lamote et al. (2013) followed a sample of 4,063 students from Flanders (Belgium) throughout secondary education and found that boys, more than girls, were likely to be part of the low engagement group or of the high and decreasing engagement group. This underlines boys' more negative engagement trajectories throughout secondary education. Consequently, it seems important to pay attention to the sex differences in secondary school students' engagement. The present study further investigates the gender gap in students' engagement and the role of teacher support herein.

Student engagement has been considered to be malleable through various contextual factors, such as teacher and peer support (Fredricks et al., 2004; Hafen et al., 2012). Among these factors, teacher support has been considered to be one of the most important (Allen et al., 2013; Lam et al., 2012; Roorda et al., 2011). In this perspective, this study examines whether sex differences in teacher support can explain the gender gap in secondary school students' engagement (i.e., mediation hypothesis). Three different teacher support dimensions (i.e., autonomy support, structure, and involvement), distinguished in self-determination theory (SDT; Ryan & Deci, 2000), are investigated. Moreover, evidence has been found for teacher support possibly being more important for the school adjustment of certain groups of students (e.g., for boys) (Hamre & Pianta, 2001; Roorda et al., 2011). Therefore, as a parallel hypothesis, we examine whether and which of these teacher support dimensions matter more for boys' as opposed to girls' engagement (i.e., moderation or differential effects hypothesis). In sum, these theoretical arguments provide us with two subjects of investigation that are considered relevant with regard to sex differences in engagement: (1) whether teacher support acts as an

explaining mechanism in the gender gap in students' engagement and (2) whether there are differential effects of teacher support for boys' as opposed to girls' engagement.

Behavioral engagement

In general, student engagement is considered to be a multidimensional construct (Fredricks et al., 2004). Most commonly, three dimensions are distinguished: The cognitive (i.e., psychological investment in learning: self-regulated learning and goal orientation), behavioral (i.e., participation in school activities, conduct, and participation and initiative in class) and emotional dimension (i.e., feelings towards school and learning, interest, and identification with school) (Fredricks et al., 2004). Research indicated that girls scored higher on most of these constructs, especially for behavioral engagement (Martin, 2007; Skinner et al., 2009; Wang & Eccles, 2012). This implies that girls generally exert more effort, participate more actively in class, and show higher attention and persistence than boys. Previous literature has provided some explanations for these sex differences in favor of girls, that is (1) girls also scored higher for the antecedents of engagement such as motivation (Sierens et al., 2009; Skinner & Pitzer, 2012; Watt, 2000), (2) the activities at school and the content of the school curriculum might be too feminine for boys due to the focus on language and verbal learning (Brozo, 2002; Geist & King, 2008). Because sex differences are more prominently present in behavioral engagement, this study specifically investigates this student engagement dimension.

Teacher support as an explaining factor for sex differences in engagement

In the literature, student engagement has been considered to be malleable by several factors, such as teacher support (e.g., Allen et al., 2013; Lam et al., 2012). It has also been found that boys tend to report lower levels of teacher support (Oelsner et al., 2011; Soenens et al., 2012; Van de gaer et al., 2006b; Vansteenkiste et al., 2012). A reason can be found with Younger et al. (1999), who suggested that teachers are less tolerant towards the negative behavior of boys, whereas they see the ideal student as 'female'. They associated this female behavior with, for example, more compliance, willingness to please, and better organizing skills. We might thus expect that boys' and girls' perceptions of teacher support can explain the gender gap in engagement. SDT (Ryan &

Deci, 2000) provides a theoretical framework for linking teacher support and student engagement. According to SDT, students have three basic psychological needs (i.e., the need for autonomy, competence, and relatedness). The fulfillment of these needs enhances students' engagement (e.g., Stroet et al., 2013; Vansteenkiste et al., 2012). Teachers can support students' needs by providing autonomy support (i.e., indicating the relevance of learning materials, providing choices, stimulating initiative), structure (i.e., providing clear guidelines and expectations, thorough assistance, competence-relevant feedback), and involvement (i.e., affective support, warmth, taking the perspective of the students) (Deci & Ryan, 2008; Reeve, 2002; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009).

Several empirical studies have found evidence for the link between (one of) these teacher support dimensions and engagement. For example, Marks (2000) proved that general teacher support was positively associated with student engagement for elementary as well as middle and high school students. Likewise, in their review study, Stroet et al. (2013) demonstrated that there was a positive relationship between teacher support and student engagement for young adolescents. More specifically for physical education, some studies confirmed the positive relationship between teacher support and engagement from an SDT perspective (see review study of Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2014). Most of these studies, however, only focused on general measures of teacher support. Stroet et al. (2013) confirmed that only a few studies investigated the unique contribution of each of the three teacher support dimensions from an SDT perspective for student engagement. Three relevant studies were found in this context. In a sample of Grade 3-5 students (Skinner & Belmont, 1993), students' perception of teacher structure positively influenced students' self-reported behavioral engagement. In addition, teacher-reported involvement and autonomy support influenced teachers' perceptions of students' behavioral engagement (Skinner & Belmont, 1993). Likewise, in a sample of Grade 1-12 students (Tucker et al., 2002), student-reported teacher involvement and autonomy support were both significant predictors of student-reported engagement, with involvement being the most important contributor. In contrast, structure only had an indirect effect on engagement (Tucker et al., 2002). Furthermore, for Grade 9-11 students, Jang et al. (2010) found that observed autonomy support as well as structure predicted students' collective behavioral engagement (overall classroom measure). However, only observed autonomy support, and not structure, predicted students' self-reported engagement. Involvement was not

inquired into. These findings suggest that autonomy support and involvement relate more directly to student engagement than structure does. Although these studies have investigated the link between teacher support and student engagement, they have not considered whether teacher support explains the gender gap in engagement. In the present study, we examine whether these three dimensions of teacher support can help to gain an insight into sex differences in engagement.

Differential effects of teacher support for boys' versus girls' engagement

In line with SDT, we could argue that teacher support is beneficial for all students' engagement, both boys' and girls' (Ryan & Deci, 2000). Nevertheless, the role of students' sex in SDT literature on teacher support and engagement has been underemphasized. In the review study of Stroet et al. (2013), very few articles investigated sex differences. In other studies, it has been suggested that the association between teacher support and student engagement might be different for boys versus girls. For example, according to the academic risk hypothesis (Hamre & Pianta, 2001), teacher support (i.e., an emotionally warm and caring, low-conflict teacher-student relationship) is considered to be more important for boys' engagement than for girls', because boys are more at risk for academic maladjustment (e.g., lower grades and motivation, deviant classroom behavior) and consequently have more to gain or to lose by the degree of support that teachers provide. Although some evidence has been found for the differential role of teacher support for boys' in comparison to girls' engagement (e.g., Marks, 2000), research focusing on the three separate dimensions of teacher support has been scarce. Below, we give an overview of existing research on the differential effect of the three teacher support dimensions and components thereof for boys' versus girls' engagement.

With regard to *involvement*, or the affective dimension of teacher support, a meta-analysis based on 99 studies (Roorda et al., 2011) revealed that affective teacher-student relationships were more important for boys' than for girls' school engagement. Likewise, Greene, Miller, Crowson, Duke, and Akey (2004) found that affective support in Grade 4 had more effect for boys' as opposed to girls' engagement in Grade 8. In contrast, Thijs and Verkuyten (2009) demonstrated that high teacher involvement was more positive for girls' engagement than for boys'. Other studies registered no sex

differences in the relationship between teacher involvement and student engagement (Hafen et al., 2012; Lam et al., 2012; Wang & Eccles, 2012).

Providing *structure* has generally been found to matter more for boys' engagement. Marks (2000) demonstrated that social support (i.e., teacher support in the sense of high expectations and helping students, which can be considered as components of structure) had a larger effect on boys' as opposed to girls' engagement. In line with these findings, positive feedback (another component of structure) was also proved to be more important for boys' motivation than for girls' (Katz, Assor, Kanat-Maymon, & Bereby-Meyer, 2006). In contrast, Tucker et al. (2002) found no sex differences in the relation between teacher structure and student engagement.

In the relationship between *autonomy support* and engagement, some studies discovered no sex differences (Hafen et al., 2012; Tucker et al., 2002). Other studies measuring only some components of autonomy support did suggest sex differences. For example, interview data indicated that boys considered the arrangement of fun activities, providing choices, making schoolwork relevant, and respecting students' perspectives as engaging practices (Martin, 2003). In addition, Geist and King (2008) argued that boys were generally more distracted than girls when quietly performing repetitive activities and suggested that boys profited from variation, exploring and hands-on activities. This could imply that offering choices in activities (i.e., component of autonomy support) is of particular importance for boys. Considering these limited and contradictory findings, we can conclude that additional research is needed (1) to expand this small body of literature and (2) to take into account the three teacher support dimensions in one model. Therefore, the present study investigates the differential effects of the three dimensions of teacher support for boys' versus girls' engagement.

The role of teacher support for boys' and girls' engagement: Mediation versus differential effects

In the present study, we formulate two alternative hypotheses because we aim to explore two possibilities for investigating the gender gap in the relationship between teacher support and student engagement.

First, we test the hypothesis that sex differences in teacher support explain the gender gap in engagement (i.e., mediation effect). As mentioned above, boys and girls seem to have different levels of school engagement (e.g., Marks, 2000) and teacher

support has been frequently found to predict student engagement (e.g., Stroet et al., 2013). Furthermore, some evidence has demonstrated that teachers generally provide more autonomy support and more structure and show more involvement towards girls than towards boys (e.g., Vansteenkiste et al., 2012). Hence, existing literature provided evidence for the three elements that are preconditions for investigating possible mediation effects (Baron & Kenny, 1986). However, current literature has not investigated the possibility that sex differences in teacher support might explain the sex differences in student engagement. Based on studies discussed by Stroet et al. (2013), we can conclude that up to now, there has been insufficient research on the possible mediating role of teacher support in the relationship between students' sex and student engagement.

Second, we test the hypothesis that teacher support has differential effects for boys' as opposed to girls' engagement. As mentioned above, the academic risk hypothesis (Hamre & Pianta, 2001) assumes that teacher support is more important for boys' as opposed to girls' engagement. Thus, although teacher support is essential for all individual students' engagement, it might be the case that for boys, teacher support is even more beneficial because boys appear to be more at risk for disengagement than girls.

Measuring student engagement: Student, teacher, and observer report

The present study combines student, teacher, and observer report to measure students' behavioral engagement. Many researchers have highlighted the benefits of using multiple perspectives to measure student engagement (e.g., student self-report, teacher report, interviews, observations) in order to counter shared method variance and to capture the complexity of certain behaviors and contexts more thoroughly (Cohen et al., 2011; Doumen et al., 2012). Nevertheless, student, teacher, and observer report have rarely been combined. The strength of combining the three measures minimalizes the disadvantages and highlights the advantages of each separate measure.

First, as far as we know, in secondary education, up to now, observations of student engagement have only been conducted by Hafen et al. (2012), by Jang et al. (2010) and by Reeve, Jang, Carrell, Jeon, and Barch (2004). In all these studies, student engagement was measured at classroom level (overall class engagement), which means that no sex differences could be examined. Only Jang et al. (2010) also measured

students' individual engagement. Observational data have the advantage of giving the most objective view of students' engagement. Moreover, often, observational data are based on smaller samples than student- or teacher-reported data because the former data collection is more time-consuming (Doumen et al., 2012; Fredricks & McColskey, 2012).

Second, student self-report questionnaires have been most commonly used in secondary education because students are highly capable of knowing whether they are engaged and their subjective perceptions of the learning environment are of absolute importance (Fredricks & McColskey, 2012; Skinner et al., 2009). An objective measure may consider students as being engaged, but if students do not feel engaged, there is still room for improvement in their level of engagement. However, students' lack of trust in the anonymity, possible socially desirable answers, and not understanding the questions may inhibit accurate results (Fredricks & McColskey, 2012). These possible disadvantages raise the need for more objective measures (e.g., observations) or other perspectives (e.g., teacher report).

Third, teacher reports for measuring student engagement have been used more often with younger students, for whom valid self-reports are more difficult to obtain (Fredricks & McColskey, 2012). Teachers have a good image of how students behave in class because they observe their day-to-day behavior (Skinner et al., 2009). However, as Skinner et al. (2009) mentioned, teachers may not notice students' disengagement because students sometimes tend to only act compliantly when they know the teacher looks at them or calls upon them. Moreover, this appears to happen more often with girls than with boys (Williams et al., 2002). This kind of bias could be countered by measuring student report as well. Also, teachers' perceptions of students may color their judgments (e.g., over-rating the engagement of students with higher grades; Doumen et al., 2012). Moreover, in relation to the sex of the student, teachers may have a more positive attitude towards girls than towards boys because, according to Younger et al. (1999), they see girls as the perfect students. This may result in higher teacher-reported engagement for girls than for boys.

Because student, teacher, and observer report can each be biased in their own specific way and because sex-related biases are of utmost importance to counter in this study, we decide to use all three measures combined in a model testing the relationship between teacher support and engagement for boys and girls.

Aims and research questions

This study aims to extend previous research by investigating the explaining (i.e., mediating) role of teacher support (autonomy support, structure, and involvement) for differences in the behavioral engagement of boys versus girls. Furthermore, we examine whether teacher support is found to relate more to boys' engagement as opposed to girls' (i.e., differential effects). This study focuses on behavioral engagement during Dutch language classes because boys are particularly at risk for low behavioral engagement (e.g., Martin, 2007) during language classes (Meece et al., 2006). Teacher, student, and observer reports were used to measure students' behavioral engagement. Students reported on the degree of teacher support they received.

Three research questions guide this study:

1. How do boys and girls differ regarding their behavioral engagement and regarding their perceived support (autonomy support, structure, and involvement) from their Dutch language teacher?
2. Which teacher support dimensions (autonomy support, structure, and involvement) can explain the relationship between sex and students' behavioral engagement (mediation effects)?
3. Does teacher support matter more for boys' as opposed to girls' behavioral engagement and for which specific teacher support dimensions (autonomy support, structure, involvement) is this the case (differential effects)?

METHOD

Participants

Participants were part of six secondary schools in Flanders (Belgium). The schools were randomly selected from a disproportionally stratified sample of 59 schools. Equal distribution of the schools according to three criteria was demanded: (1) geographical distribution in the Flemish community, (2) urban versus rural location, and (3) publicly run versus privately run educational network. Data were collected from September to November 2012. Grade 7 students from 23 classes ($N = 385$; 13 general track classes and 10 vocational track classes; 58% boys, 42% girls) completed questionnaires about perceived teacher support and their engagement in Dutch

language classes. This took place during school time under the supervision of a researcher who explained the purpose of the questionnaire and the procedure and who answered students' questions. In three of these six schools (12 classes; six general track classes and six vocational track classes), the engagement of 10 randomly selected students per class ($N = 156$; 62% boys, 38% girls) was observed during six Dutch language classes, with a total of 12 observations per student. The observers were two researchers and two master students. All four observers were trained by means of the manual of the Leuven Involvement Scale (Laevers, 1994), videotaped examples, and observations in real classroom settings. The results were discussed by all observers and were compared to the examples and theory in the manual. The Dutch language teachers also rated the engagement of the observed students in a questionnaire. In the other three schools, the Dutch language teachers rated the engagement of 10 randomly selected students per class.

Measures

OBSERVER REPORT OF BEHAVIORAL ENGAGEMENT.

The Leuven Involvement Scale (Laevers, 1994) was used to observe students' activity specific engagement during Dutch language classes. Each individual student was observed during a maximum of 12 2-min intervals and their engagement was rated on a 9-point scale (1 = *not engaged at all*; 9 = *highly engaged, never distracted*). Observations began approximately 10 min after the start of a lesson of 50 min and ended 5 min before the end of the lesson. Scores were averaged across intervals to obtain a general measure for observed behavioral engagement. Excellent inter-rater reliability in previous research ($r = .75-.90$; Doumen et al., 2012; Laevers & Laurijssen, 2001) was replicated here. The intra-class correlation coefficient between four observers who double-coded 15 students was excellent ($\rho_{ICC} = .91$). Cross-informant convergence with teacher reports of engagement was found by Doumen et al. (2012).

TEACHER REPORT OF BEHAVIORAL ENGAGEMENT.

To measure teacher reports of students' behavioral engagement, Dutch language teachers filled out the subscale Cooperative Participation (seven items; e.g., 'Listens carefully to the teacher's instructions and directions') of the Teacher Rating Scale of School Adjustment (TRSSA; Birch & Ladd, 1997). Items were rated on a 3-point

scale ranging from 1 (*does not apply*) to 3 (*certainly applies*). Reliability and validity of this scale were shown in previous research (e.g., Doumen et al., 2012). Cronbach's α in the present study was .88.

STUDENT REPORT OF BEHAVIORAL ENGAGEMENT.

Students filled out the subscale Cooperative Participation (seven items; e.g., 'I listen carefully to the teacher's instructions and directions') of the student report version of the TRSSA (Birch & Ladd, 1997). Items were rated on a 3-point scale ranging from 1 (*does not apply*) to 3 (*certainly applies*). Valiente, Swanson, and Lemery-Chalfant (2012) were the first to use this student report scale of the TRSSA and found acceptable reliability ($\alpha = .64$). Cronbach's α in the present study was .88.

TEACHER SUPPORT.

Students' perceptions of support received from their Dutch language teacher were assessed by means of the short Dutch version of the Teacher As Social Context Questionnaire (TASC-Q, Belmont et al., 1988; Sierens et al., 2009) with subscales for Autonomy support (eight items; e.g., 'My Dutch teacher listens to my ideas'), Structure (eight items; e.g., 'My Dutch teacher tells me what he/she expects from me in class'), and Involvement (eight items; e.g., 'My Dutch teacher likes me'). All items were answered using a 5-point scale, ranging from 1 (*completely disagree*) to 5 (*completely agree*). Reliability and validity were proved in previous studies (see Vansteenkiste et al., 2009). For this study, a confirmatory factor analysis was conducted. Satisfactory model fit was reached, $\chi^2(101)$, $p < .001$, CFI = .91, TLI = .89, RMSEA = .08, SRMR = .05, when six items for autonomy support ($\alpha = .83$), five items for structure ($\alpha = .78$), and five items for involvement ($\alpha = .86$) were retained.

Data analyses

To detect sex differences for all investigated variables, t -tests were performed and Cohen's d effect sizes were calculated. Next, to test whether the teacher support dimensions mediated the relationship between sex and behavioral engagement, mediation analyses were carried out in Mplus (Muthén & Muthén, 1998-2012). Furthermore, the possible differential role of teacher support for boys' as opposed to girls' behavioral engagement was investigated by means of multigroup analysis in Mplus (Muthén & Muthén, 1998-2012). Behavioral engagement, the dependent variable, was

entered as a latent factor with student, teacher, and observer report of behavioral engagement as observed indicators. The Full Information Maximum Likelihood Estimation option in Mplus was used to account for missing data.

RESULTS

Sex differences in engagement and teacher support

Table 3 presents the descriptive statistics and correlations for all study variables. The *t*-tests indicated that girls reported higher behavioral engagement than boys (see Table 3). In addition, teachers and independent observers also rated girls' engagement higher than boys'. Girls also reported significantly higher teacher support (all three dimensions) than boys. Moreover, the Cohen's *d* values for the sex differences in student-reported, teacher-reported, and observer-reported engagement were .54, .43, and .42, respectively. The Cohen's *d* values for the sex differences in autonomy support, structure, and involvement were .52, .60, and .31, respectively.

Furthermore, as can be seen in Table 3, significant positive correlations were found between students' perceived teacher support and student-rated engagement. Moreover, the teacher support variables were also significantly and positively correlated with teacher and observer reports of engagement (except involvement and observer report of engagement).

Explaining the gender gap in student engagement through teacher support: A structural mediation model

To investigate the explaining role of teacher support with regard to the gender gap in student engagement, we constructed a structural model with behavioral engagement as a latent dependent variable, with student, teacher, and observer report of engagement as indicators. To estimate the mediating role (Holmbeck, 1997) of the teacher support variables, three models were tested and compared. Model 1 was the direct effects model including only sex and behavioral engagement. Model 2 was the full mediation model, in which only the indirect relations between sex and engagement were modelled and the direct relationship between sex and engagement was constrained to zero. Model 3 was the partial mediation model including both the direct and indirect relationship between sex and behavioral engagement.

Table 3. Means, *t*-tests, Cohen's *d* effect sizes and correlations between the teacher support variables and the behavioral engagement variables.

Variable	Girls			Boys			<i>t</i>	<i>d</i>	1	2	3	4	5	6
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>								
1. Autonomy	163	3.95	.66	227	3.58	.76	-5.02***	.52	-	.71**	.58**	.54**	.28**	.30**
2. Structure	161	3.84	.70	227	3.40	.77	-5.77***	.60		-	.59**	.49**	.27**	.32**
3. Involvement	162	3.44	.74	227	3.02	.83	-5.24***	.31			-	.49**	.22**	.16
4. Engagement (student report)	160	2.67	.30	225	2.46	.46	-4.99***	.54				-	.39**	.34**
5. Engagement (teacher report)	93	2.68	.38	146	2.50	.46	-3.13**	.43					-	.33**
6. Engagement (observer report)	59	2.61	.53	97	2.40	.48	-2.59*	.42						-

p* < .05; *p* < .01; ****p* < .001.

For full mediation, Model 2 and Model 3 needed to fit the data equally well. The use of bootstrapping allowed to test for significance of the indirect effects. Models fitted the data equally well when at least two of the following requirements were met: $\Delta\chi^2$ non-significant at $p < .050$, $\Delta CFI < .010$, or $\Delta RMSEA < .015$ (Cheung & Rensvold, 2002).

The direct effects model (Model 1) indicated a good model fit, $\chi^2(2) = 0.587$, $p = .75$; $RMSEA = .000$; $CFI = 1.00$. Both the full mediation model (Model 2), $\chi^2(9) = 16.304$, $p = .06$; $RMSEA = .044$; $CFI = .990$, and the partial mediation model (Model 3), $\chi^2(8) = 10.662$, $p = .22$; $RMSEA = .028$; $CFI = .996$, yielded a good fit. However, deviance tests indicated that Model 3 fitted the data better than Model 2, $\Delta\chi^2(1) = 5.624$, $p = .02$; $\Delta RMSEA = .016$. Thus, the indirect effect via teacher support was significant ($B = .20$; 95% CI [0.14, 0.26]; bootstrap = 5,000), whereas the direct effects also remained significant. This implies that the teacher support variables only partially mediated the relationship between sex and student engagement.

In all models, student-, teacher-, and observer-reported behavioral engagement were highly significant indicators of the latent construct behavioral engagement (see Figure 4 for loadings in Model 3). Furthermore, all paths were significant except for the path between teacher structure and behavioral engagement. The effect sizes of the relationships between sex and the three dimensions of teacher support ($\beta = .25$, $p < .001$; $\beta = .28$, $p < .001$; $\beta = .26$, $p < .001$ for autonomy support, structure, and involvement, respectively) confirmed the gender gap in students' perceptions of teacher support in favor of girls.

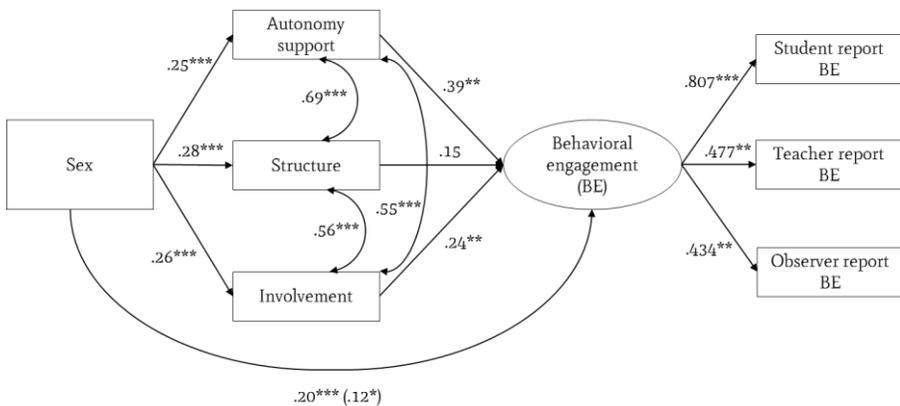


Figure 4. Structural model of the direct and indirect effects (Model 3) of the relationship between students' sex and students' behavioral engagement, mediated by teacher support (autonomy support, structure, involvement). Standardized beta coefficients are shown. *Note.* * $p < .05$, ** $p < .01$, *** $p < .001$.

The specific indirect effect with structure as a mediator was not significant ($\beta = .04$; $p = .18$), whereas autonomy support and involvement as mediators did yield a small, yet significant indirect effect between sex and behavioral engagement ($\beta = .10$; $p = .001$ and $\beta = .06$; $p = .01$, respectively).

Because of the small and partial mediation effects, we also tested an alternative hypothesis. This hypothesis involved switching the dependent variable and the mediators. Thus, we studied whether behavioral engagement is a mediator for sex differences in teacher support. Indeed, it is possible that when students (i.e., boys) show less engagement in class, their teachers become less supportive.

For the mediation model with engagement as a mediator, both the full mediation model (Model 2), $\chi^2(11) = 14.775$, $p = .06$; RMSEA = .029; CFI = .995, and the partial mediation model (Model 3), $\chi^2(8) = 10.662$, $p = .22$; RMSEA = .028; CFI = .996, yielded a good fit. Here, deviance tests indicated that Model 2 and Model 3 fitted the data equally well, $\Delta\chi^2(3) = 4.113$, $p = .25$; Δ RMSEA = .001; Δ CFI = .001. Thus, engagement may be seen as fully mediating sex differences in students' perceptions of teacher support.

When we compared the two alternative mediation models by means of the Akaike information criterion (AIC), the model in which engagement was used as a mediator (AIC = 2956.025) appeared to be slightly better than the model in which teacher support was used as a mediator (AIC = 2957.912).

The role of teacher support to promote girls' versus boys' engagement

To assess the possible differential role of teacher support for boys' engagement as opposed to girls', multigroup analyses were conducted.

A model was tested for boys and girls in which student-, teacher-, and observer-reported engagement were considered as indicators of the latent construct behavioral engagement and autonomy support, structure, and involvement were included as predictors.

A stepwise procedure was applied. First, a freely estimated model was tested (Model 1). Second, the indicators of behavioral engagement were constrained to be equal for boys and girls (Model 2), after which the covariances between the predictors were also constrained (Model 3). Third, the paths between each teacher support variable and engagement were, one by one, constrained to be equal across boys and girls (Models 4, 5,

and 6). Paths can be considered equal across groups if the model has a fit comparable to (or better than) the previous model (Holmbeck, 1997). Paths were considered invariant across students' sex when at least two of the following requirements were met: $\Delta\chi^2$ nonsignificant at $p < .050$, $\Delta\text{CFI} < .010$, and $\Delta\text{RMSEA} < .015$ (Cheung & Rensvold, 2002).

Table 4. Fit indices of the multigroup models with parameters free and constrained for boys/girls

	χ^2	p	CFI	RMSEA
Model 1	13.747 (14)	.469	1.000	.000
Model 2	18.287 (17)	.371	.993	.019
Model 3	20.016 (20)	.457	1.000	.002
Model 4	24.450 (21)	.272	.981	.028
Model 5	20.218 (21)	.508	1.000	.000
Model 6	20.272 (22)	.566	1.000	.000

Note. Model 1: Freely estimated; Model 2: Indicators for BE constrained; Model 3: Indicators for BE and covariances constrained; Model 4: Indicators for BE, covariances and path autonomy support-engagement constrained; Model 5: Indicators, covariances, and path structure-engagement constrained; Model 6: Indicators, covariances, and paths structure-engagement and involvement-engagement constrained

Table 5. Differences in fit indices for the free and constrained models

	$\Delta\chi^2$	p	ΔCFI	ΔRMSEA	
Model 2 - Model 1	4.540 (3)	.209	.007	.019	Model 2 = Model 1
Model 3 - Model 2	1.729 (3)	.631	.000	.002	Model 3 = Model 2
Model 4 - Model 3	4.434 (1)	.035	.019	.026	Model 3 > Model 4
Model 5 - Model 3	.202 (1)	.653	.000	.002	Model 5 = Model 3
Model 6 - Model 5	.054 (1)	.816	.000	.000	Model 6 = Model 5

Note. Model 1: Freely estimated; Model 2: Indicators for BE constrained; Model 3: Indicators for BE and covariances constrained; Model 4: Indicators for BE, covariances and path autonomy support-engagement constrained; Model 5: Indicators, covariances, and path structure-engagement constrained; Model 6: Indicators, covariances, and paths structure-engagement and involvement-engagement constrained

Table 4 presents the fit indices of all the tested models and Table 5 presents the comparisons of the fit indices of these models. Model 6 was found to have the best model fit, $\chi^2(22) = 10.272, p = .566$; CFI = 1.000; RMSEA = .000. In this model, indicators of student engagement, the covariances between the teacher support variables, and the paths between structure and engagement and between involvement and engagement were constrained across sex. Because Model 3 had a significantly better fit than Model 4, $\Delta\chi^2(1) = 4.43, p = .035$; $\Delta CFI = .019$; $\Delta RMSEA = .026$, the path between autonomy support and behavioral engagement was not constrained to be equal for boys and girls. Figure 5 presents the standardized beta coefficients of the final model (Model 6) for boys and for girls. For boys, autonomy support was a significant predictor of behavioral engagement, whereas autonomy support was not significantly related to behavioral engagement for girls. In contrast, structure and involvement were significant predictors of behavioral engagement for both boys and girls.

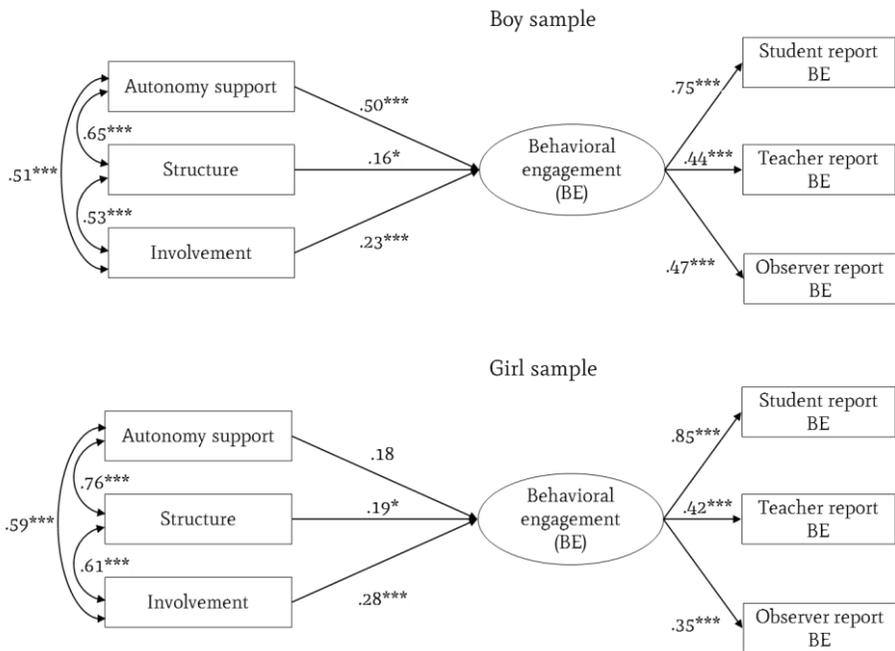


Figure 5. Teacher support variables as predictors for behavioral engagement with student report, teacher report, and observer report as indicators. Standardized beta coefficients for Model 6 are shown for the boy and girl sample.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

DISCUSSION

This study investigated the gender gap in student engagement by exploring two paths, that is (1) the explaining role of three teacher support dimensions (i.e., autonomy support, structure, and involvement) for sex differences in student engagement and (2) the differential effects of teacher support for student engagement. Doing so, engagement was measured from a student, teacher, and observer perspective for Dutch language classes.

First, it was demonstrated that boys showed lower behavioral engagement than girls. This sex difference was found for student, teacher, and observer ratings, showing its robustness across informants. Moreover, boys showed lower perceptions of all teacher support dimensions for Dutch language than girls. These findings confirm previous literature demonstrating the gender gap in engagement (e.g., Lam et al., 2012; Marks, 2000) as well as in students' perceptions of teacher support (Oelsner et al., 2011; Vansteenkiste et al., 2012). Previous literature provides several explanations for these sex differences. For example, it was found that for antecedents of behavioral engagement such as motivation, interest, and self-regulation (Skinner & Pitzer, 2012), girls also score higher than boys

(e.g., Sierens et al., 2009; Watt, 2000). A related explanation for these results can be found in Brozo's (2002) argumentation that many activities and materials in the school curriculum, especially in language education, are more matching with girls' than with boys' interests. In particular, the intensive use of language and verbal learning as opposed to more visual and active learning can be seen as indicators for the more feminine characterization of (language) education (Brozo, 2002; Geist & King, 2008). These feminine aspects may explain girls' higher engagement and more positive perceptions of teacher support. Furthermore, the question rises whether teachers truly interact differently with boys than with girls or whether these sex differences are only present in students' perceptions of teacher support. Meece et al. (2006) found that boys indeed have more interactions with teachers than girls because boys are more often called upon for answering questions and because boys receive more positive as well as negative feedback (e.g., acknowledgement, criticism) from their teachers. Moreover, teachers tend to be less tolerant towards boys' misbehavior than towards girls' (Younger et al., 1999). These differences may stem from teachers' different perceptions of boys as opposed to girls. As Younger et al. (1999) argued, teachers see the ideal student as female

due to the perception that girls are more compliant, willing to please, better organized, and better communicators than boys.

Second, the current study also provides an explanation for the gender gap in behavioral engagement. Support was found for the first hypothesis, that is, that the gender gap can be explained by teacher support. Autonomy support and involvement partially mediated the relationship between sex and student engagement, suggesting that boys' lower perceptions of autonomy support and involvement help explain the gender gap in student engagement. Both autonomy support and involvement were found to have unique effects in relation to behavioral engagement. In contrast, differences in boys' and girls' perceptions of structure did not explain sex differences in engagement. This is in line with previous research finding structure to be the least important predictor of student engagement, whereas autonomy support and involvement relate more directly to student engagement (e.g., Jang et al., 2010; Skinner & Belmont, 1993; Tucker et al., 2002). In general, however, mediated effects were small. Moreover, an alternative model in which engagement was a mediator between students' sex and teacher support yielded a slightly better model. This means that boys' perceptions of their teachers as less supportive are also explained by their lower levels of engagement. Additional research on reciprocal effects between teacher support and engagement could deepen insights into this important classroom dynamic. Skinner and Belmont (1993) demonstrated reciprocal effects between teacher support (i.e., autonomy support, structure, and involvement) and student engagement (i.e., behavioral and emotional) for Grade 3-5 students. Hafen et al. (2012) and Van Ryzin (2011) discovered reciprocal effects between student engagement and autonomy support for high school students.

Third, we also found support for the second hypothesis, that is, the differential role of teacher support for sex differences in student engagement. Autonomy support was demonstrated to be significantly related to boys' engagement, but not to girls' engagement, whereas structure and involvement were equally related to boys' and girls' engagement. Moreover, the largest effect size in the model for boys was found for autonomy support, showing that it is a key predictor of boys' behavioral engagement. In contrast, the effect of autonomy support on engagement was not significant for girls. The results concerning autonomy support confirm hypotheses from the academic risk perspective (Hamre & Pianta, 2001) and are in line with the literature suggesting that providing choice and indicating relevance may be more important for boys' engagement than for girls' (Geist & King, 2008; Martin, 2003). A possible explanation for this

differential role of autonomy support could be that girls tend to be more likely to put effort into boring tasks than boys (Williams et al., 2002). In order for boys to put effort into a task and thus be behaviorally engaged, the task needs to be appealing to them. Then, in fact, the provision of choice and freedom in the task and indicating the relevance of the task, which are core elements of autonomy support, seem highly relevant for boys but not for girls. However, we should keep in mind that we only measured boys' and girls' behavioral engagement, not the underlying reasons for being engaged. Although girls may be more behaviorally engaged and are more likely to put effort into tasks, the reason for their engagement may be controlled (i.e., doing an activity because feeling pressed) rather than autonomous (i.e., doing an activity with a feeling of choice or willingness; Deci & Ryan, 2008). Future research should investigate the quality of girls' and boys' motivation in addition to their engagement and perceptions of teacher support.

For structure and involvement, associations with engagement were the same for boys and girls. Thus, we could not confirm the academic risk hypothesis (Hamre & Pianta, 2001) for structure and involvement, nor could we support previous findings that teacher support is more important for boys' than for girls' engagement (Roorda et al., 2011; Suldo et al., 2009). Instead, our findings are more in line with literature reporting no sex differences in the relationship between these two teacher support dimensions (i.e., structure and involvement) and engagement (Lam et al., 2012; Tucker et al., 2002; Wang & Eccles, 2012). Due to the systematic examination of all three teacher support dimensions together, this study allowed for additional insight into the inconsistent findings in literature. Nevertheless, future research should continue focusing on these differential effects for boys' versus girls' engagement to see whether these results could be replicated in various settings.

When comparing evidence for the mediation hypothesis versus the differential effects or moderation hypothesis, we can conclude that there is more support for the differential effects hypothesis. Teacher support mediated sex differences in engagement, but only partially. Moreover, an alternative model with engagement acting as a mediator fitted at least equally well. In the differential effects model, all relationships between the teacher support variables and engagement were significant, except the one between autonomy support and engagement for girls. In other words, whereas teacher structure and involvement contributed to the engagement of both girls

and boys, autonomy support proved to be specifically relevant for the engagement of boys.

Implications for educational practice

These findings generate relevant implications for educational practice. First, the gender gap in student engagement and in students' perceptions of teacher support was confirmed. It is important that teachers are aware of the fact that boys are more at risk to show lower behavioral engagement than girls and that they perceive teacher support to be lower.

Second, it is interesting for teachers to know that boys' lower behavioral engagement is related to their lower perceptions of teacher autonomy support and involvement. It has been proved that awareness of a certain problem or situation can stimulate change in teachers' behaviors (Spilt, Koomen, Thijs, & van der Leij, 2012). Training programs for teachers could thus challenge teachers to reflect upon this phenomenon for their own practice: Is this gender gap present in my classes and which of the boys are actually less engaged and perceive me to be less supportive? Do I often mention the relevance of the learning material(i.e., autonomy support)? and Do I show interest in my students(i.e., involvement)? Because it has been argued that education might align more with the interests and preferences of girls (e.g., verbalization, intensive use of language; e.g., Brozo, 2002), trying to address the gender gap in educational practice, it could be interesting to challenge schools' perceptions of what constitutes an optimal learning environment (for both sexes). For example, schools might be stimulated to apply more visual and active approaches in addition to the common verbal learning (see Brozo, 2002). Linking this with autonomy support, for instance, teachers could provide students with both a visual and a verbal approach to the subject matter. Then students could choose which approach they find more suitable.

Third, if teachers really interact differently with boys versus girls (see Meece et al., 2006; Younger et al., 1999), education faces the challenge of countering possible stereotypical images of boys as being misbehaved and of girls as being compliant. In conclusion, critical reflection on gender differences in educational practice and raising teachers' awareness concerning gender stereotypes could enhance boys' (and girls') engagement in class and at school.

Fourth, our results revealed that for both boys and girls, structure and involvement were related to their engagement. For boys, an additional focus on

autonomy support can be desirable because the present study indicated that autonomy support appeared to be a protective factor specifically for boys' engagement. Thus, by focusing more on autonomy support, the gender gap in engagement may be reduced. Teachers could be made aware of the importance of teacher support for daily class practice and of the difference in importance of autonomy support for boys versus girls. Encouragement to focus on autonomy support to enhance boys' engagement could be advisable. In this respect, adequate guidance in what exactly constitutes this autonomy support is necessary. It has been demonstrated that teachers are very well able to learn this practice of being autonomy-supportive, for which SDT offers a practical, theoretically well founded framework (e.g., Reeve, 2006). However, caution is needed not to confirm gender stereotypical thinking of teachers, which could widen the gender gap (Heemskerk, van Eck, Kuiper, & Volman, 2012; Martino, Lingard, & Mills, 2004). Moreover, due to increased attention to autonomy support for boys, girls might experience feelings of unfairness if they noticed that teachers were more autonomy supportive towards boys. It is thus advisable, when establishing interventions for teachers to bridge the gender gap in engagement, to guide teachers thoroughly in applying elements of autonomy support, structure, and involvement in their classrooms.

Limitations and suggestions for future research

Some limitations should be mentioned when interpreting the findings in this study. First, we investigated a modest sample size, especially for the observational measure. This study should be replicated with a larger sample to confirm the robustness of the results. Also, because of the limited number of classes, combined with the use of multigroup analyses, we were not able to take into account the multilevel structure of our data. Still, exploratory analyses in Mplus with the `type=complex` command, which controlled for the multilevel structure in the data, yielded very similar results. Further research on larger samples and involving more classes is recommended to test whether conclusions hold if nesting of students in classes is accounted for.

Second, the current cross-sectional study does not allow to examine reciprocal effects. Reciprocal effects between teacher support and student engagement seem plausible, given previous research (see Hafen et al., 2012; Skinner & Belmont, 1993; Van Ryzin, 2011) and the current study's finding that alternative models in which the mediator and the outcomes were reversed showed similar model fit. Therefore, the results call for further longitudinal research to clarify the directionality of the effects.

Third, the analyses for Dutch language in this study should be replicated for other school subjects. This will allow a comparison between these results and, for example, the results for mathematics, for which Meece et al. (2006) found that boys were generally more engaged.

Fourth, these results should be replicated not only for behavioral engagement, but also for cognitive and emotional engagement in order to draw additional conclusions about the various student engagement dimensions.

Finally, we only used student report for measuring teacher support. Future research using observations of teacher support in addition to (teachers' and) students' perceptions of teacher support will contribute to more profound conclusions on whether teachers truly interact differently with boys as opposed to girls.

Conclusions

We demonstrated strong evidence for the gender gap in favor of girls in student engagement (students' self-report, teacher report, and observer report) and in students' perceptions of teacher support. Moreover, autonomy support and involvement partially explained sex differences in behavioral engagement. Stronger evidence was found for differential effects of teacher support. Autonomy support appeared to be only relevant for boys' engagement, but not for girls', whereas structure and involvement have been demonstrated to be equally important predictors of boys' and girls' engagement. Although caution is needed not to widen the gender gap by proposing interventions specifically directed to boys or to girls, schools and teachers should be made aware of this gender gap and of the importance of different teacher support dimensions in explaining and bridging gender differences in engagement.

CHAPTER 3

INTERPRETING BOYS' AND GIRLS' PERCEPTIONS OF TEACHER SUPPORT: COMPARING PERCEPTIONS OF ACTUAL AND HYPOTHETICAL TEACHERS

Manuscript submitted for publication as Lietaert, S., Vandecandelaere, M., Verschueren, K., Laevers, F., & De Fraine, B. (2016). Interpreting boys' and girls' perceptions of teacher support: Comparing perceptions of actual and hypothetical teachers.

Abstract

This study investigates differences in boys' and girls' perceptions of their actual teachers and of teachers' autonomy support and structure as depicted in hypothetical vignettes. The results demonstrate that boys considered their actual teachers to be less supportive for both dimensions. Boys were less negative than girls about a hypothetical teacher that provided low structure, whereas they were less positive than girls about a teacher that provided high autonomy support. We suggested that boys' and girls' perceptions of the vignettes might differ according to what teacher behavior they consider important. The discussion centers on what constitutes high autonomy support and structure for both boys and girls.

Keywords: Teacher autonomy support, teacher structure, students' sex, students' gender, vignette, student perceptions

INTRODUCTION

Teachers' supportive behavior in class has been found to predict students' motivation and engagement (Lam et al., 2012), well-being (Engels, Aelterman, Van Petegem, & Schepens, 2004), and achievement (Allen et al., 2013). In secondary education, many studies have investigated teacher support through student questionnaires (see Assor, Kaplan, & Roth, 2002; Marks, 2000; Sierens et al., 2009; Vansteenkiste et al., 2012). For example, students are asked whether the teacher gives them choices about how to perform their tasks in class, or how well the teacher provides help when a student has to deal with a problem.

Few studies have investigated whether perceptions of teacher support differ according to particular student characteristics, such as sex. It has been found that boys generally show lower engagement, motivation, and achievement in school than girls (Lam et al., 2012). As teacher support is an important predictor of these student outcomes, closer investigation of sex differences concerning students' perceptions of teacher support is necessary. Previous research has demonstrated that boys generally consider their teachers to be less supportive than girls do (Lietaert, Roorda, Laevers, Verschueren, & De Fraine, 2015; Vansteenkiste et al., 2012). The current study examines sex differences in students' perceptions of teacher support.

An issue that needs careful consideration is to what extent these perceptions reflect the actual behavior of teachers and to what extent they are biased due to personal interpretation. First, within these measures, it remains unclear if the actual supportive behavior of teachers differs towards boys versus girls. The body of literature reporting on observations of sex differences in teacher-student interactions, has indicated that boys generally receive more negative feedback than girls (often for the same behavior) (Consuegra et al., 2015; Meece et al., 2006). It could thus be possible that students' perceptions reflect the actual supportive behavior of their teachers. Second, however, students' perceptions of teacher support may be influenced by what they experience to be important. Boys and girls may consider different teacher behaviors to be more important, which may lead to different evaluations of the same behavior (see Suldo et al., 2009).

The present study aims to address the measurement issue of students' perceptions of teacher support in two steps. First, we investigate boys' and girls' perceptions of their actual teachers' supportive behavior. We expect, based on previous

research, boys to perceive their teachers to be less supportive than girls do. Second, we examine boys' and girls' perceptions about the teacher behavior in several scenarios describing a classroom situation (vignette). By presenting all students with the same scenario, we can control the behavior of the teacher. This allows us to detect more accurately the differences in boys' and girls' perceptions of teacher support.

Teacher support: Autonomy support and structure

The current study applies the framework of self-determination theory (SDT) for defining teacher support. SDT posits that teacher support, more specifically autonomy support, structure, and involvement can satisfy the students' basic psychological needs for autonomy, competence, and relatedness respectively. This need satisfaction should promote motivation (e.g., Ryan & Deci, 2000; Sierens et al., 2009), engagement (e.g., Tucker et al., 2002), and eventually achievement (Skinner & Pitzer, 2012). Indeed, previous research has demonstrated that teacher support is highly related to positive student outcomes such as well-being (e.g., Suldo et al., 2009), engagement (e.g., Green et al., 2008; Jang et al., 2010; Lietaert et al., 2015; Thijs & Verkuyten, 2009; Tucker et al., 2002), and achievement (Allen et al., 2013). This study focuses on two dimensions of teacher support, i.e., autonomy support and structure. Autonomy support entails the provision of choice to students (or giving a rationale when choices cannot be permitted) and indicating the relevance of the learning material. Moreover, autonomy supportive teachers avoid using controlling language (e.g., "you should") and treat students with respect by taking their perspectives and acknowledging their feelings (e.g., listening to their opinions). Four subdimensions can thus be distinguished: choice, relevance, control, and respect (Belmont et al., 1988; Connell, 1990; Sierens et al., 2009; Vansteenkiste et al., 2012)

Providing structure means that teachers clearly formulate and communicate their expectations about students' behavior in class, set clear limits, and are contingent herein. Moreover, structuring teachers present students with challenging yet attainable tasks. Moreover, they provide competence-relevant feedback, encourage students and express their confidence in students' competences to attain their learning goals. Here, we can discern the subdimensions of expectations, contingency, adjustment/monitoring, and help/support (Belmont et al., 1988; Connell, 1990; Sierens et al., 2009; Vansteenkiste et al., 2012).

Boys' and girls' perceptions of teacher support

The majority of the studies on teacher support have used students' perceptions to measure teachers' supportive behavior towards students (e.g., Lietaert et al., 2015; Sierens et al., 2009; Tucker et al., 2002; Vansteenkiste et al., 2012). Mostly, in studies based on SDT, teacher support has been measured by means of the Teacher As Social Context Questionnaire (TASC-Q; Belmont et al., 1988). The questions of the short student version of the TASC-Q for autonomy support and structure are listed in Table 6.

Research investigating students' perceptions of teacher support has repeatedly discovered that boys perceive their teachers to be less supportive than girls do (Lietaert et al., 2015; Oelsner et al., 2011; Vansteenkiste et al., 2012). When it comes to these boys' and girls' perceptions of autonomy support and structure, Vansteenkiste et al. (2012) found that, compared to boys, Grade 7 to 12 girls perceive their teachers to be more autonomy supportive and to provide more clear expectations (a subdimension of structure). Lietaert et al. (2015) confirmed these findings for Grade 7 girls, who perceived their teachers as more autonomy supportive and structuring than boys did.

Table 6. Autonomy support and structure questions from the TASC-Q

Autonomy support	Structure
My teacher gives me a lot of choices about how I do my schoolwork.	Every time I do something wrong, my teacher acts differently.
My teacher doesn't give me much choice about how I do my schoolwork.	My teacher keeps changing how he/she acts towards me.
My teacher is always getting on my case about schoolwork.	My teacher doesn't make it clear what he/she expects from me in class.
It seems like my teacher is always telling me what to do.	My teacher doesn't tell me what he/she expects from me in school.
My teacher listens to my ideas.	My teacher shows me how to solve problems for myself.
My teacher doesn't listen to my opinion.	If I can't solve a problem, my teacher shows me different ways to try to.
My teacher talks about how I can use the things we learn in school.	My teacher makes sure I understand before he/she goes on.
My teacher doesn't explain why what I do at school is important to me.	My teacher checks to see if I'm ready before he/she starts a new topic.

Although these perception differences of teacher support might be explained by differences in teachers' actual supportive behavior, this study focuses on the specific perception differences between boys and girls concerning teacher support. Perhaps, boys and girls each might consider different elements of teacher support to be more important, which could serve as an explanation for different perceptions of teacher support. Several articles seem to suggest that girls find the individual relationship with the teacher more meaningful, whereas boys perceive various elements of autonomy support and structure to be more relevant.

First, girls appear to find the *individual relationship* with the teacher more important than boys. Thijs and Verkuyten (2009) demonstrated that teacher involvement (i.e., affection and concern with individual students) was more important for girls' engagement than for boys'. The authors suggested that girls might be more sensitive towards the emotional aspects in interactions with others. Suldo et al. (2009) performed qualitative analyses of girls' and boys' preferences concerning teacher behavior. The authors examined sex differences in students' perceptions of supportive teacher behavior by means of focus group interviews. The students were asked what elements constitute highly supportive behavior. Girls mentioned the following elements almost twice as much as boys: "taking action to improve students' moods and emotional states", "showing interest in students' well-being" and "showing interest in individual students' progress". These studies seem to indicate that for girls, elements of the individual, personal relationship with the students are more important than for boys.

Second, also in the study of Suldo et al. (2009), boys seemed to mention more often several elements that can be seen as *structure*. For example, boys, compared to girls, considered a manageable workload and fair punishment twice as important. These elements can be ensured through communicating expectations, which is one of the subdimensions of structure. Treating students similarly was also stated twice as often by boys than by girls. This can be established through contingency, another subdimension of structure. Boys also suggested, more often than girls, that "encouraging questions and providing feedback about performances" (e.g., rewards, constructive feedback, compliments) are important elements of good teacher support. Geist and King (2008) have explained these preferences of boys by emphasizing that boys need more learning incentives and challenges than girls. This questioning and feedback can be categorized under the adjustment/monitoring subdimension of structure. Additionally, boys mentioned elements within the theme called "being sensitive to the entire class'

understanding of the content and helping to improve students' achievement" more often than girls. These elements can be considered as help/support (i.e., the last subdimension of structure). Katz et al. (2006) pointed out that boys see positive feedback more as an acknowledgement of their competence, whereas girls may perceive feedback as more controlling. This might explain why boys list these elements of feedback more often than girls do when referring to supportive teacher behavior.

Third, we might suggest that boys also find several elements of *autonomy support* more important than girls do. For example, in the study of Suldo et al. (2009), it was proved that boys considered the following theme five times as important as girls: "giving students what they want in the sense of providing fun activities (e.g., free time, sports, field trips)". Providing fun activities may require that teachers provide students with choices (subdimension of autonomy support). Furthermore, such actions are generally based on respect for students' preferences and on listening to their opinions, which are all part of autonomy support. In Martin's (2003) interviews with boys about what motivates them, several elements of autonomy support were also felt to be of utmost importance. These boys indicated that good supportive teacher behavior mostly consists of providing choices, making lessons interesting and fun, striking a balance between order and a relaxed atmosphere, respecting students' views, and not treating them as children. In their interviews with boys and girls about language learning, Williams et al. (2002) discovered that both boys and girls explained that girls more often have the tendency to make dull material interesting themselves, whereas boys need to enjoy the content. As an explanation for this issue, Geist and King (2008) suggested that boys seem to be more distracted from repetitive activities and hope that teachers will offer interesting material. Often, offering choice, explaining the relevance of the learning material, and respecting students' opinions, all elements of autonomy support that were also indicated in Martin's (2003) interviews, are effective ways to render class more enjoyable (Reeve, 2006). These results may suggest that boys find autonomy support more important. As a consequence, boys may thus perceive the same autonomy supportive behavior to be less supportive because they may have higher expectations than girls about their teachers when it comes to this teacher support dimension.

To conclude, in addition to the findings that boys perceive their teachers to be less supportive than girls do, it seems that (1) girls consider the interpersonal relationship with the teacher to be more meaningful and that (2) boys give priority to several elements of structure and (3) autonomy support.

Teachers' actual supportive behavior towards boys and girls

An effective way to discover whether teachers act differently towards boys versus girls, is to observe classroom situations, more specifically teachers' supportive behavior towards each student and towards groups of students.

Several studies have examined specific interactions during classes. Here, individual teacher-student interaction patterns could be inquired into, as well as sex differences (overview, see Consuegra et al., 2015).

Girls generally have been found to receive more structure in the sense of positive feedback and approval, regardless of their skill level (Consuegra & Engels, forthcoming; Harrop & Swinson, 2011). Additionally, girls were given more instruction and redirection and technical information (Harrop & Swinson, 2011; Nicaise, Cogérino, Fairclough, Bois, & Davis, 2007). Boys also seemed to receive structure in the sense of questioning and organization feedback (Nicaise et al., 2007; Younger et al., 1999). Moreover, boys appeared to be more often the subject of controlling teacher behavior because they are generally more often criticized and have been found to receive more reprimands, less approval for social behavior, and more disapproval than girls (Consuegra & Engels, forthcoming; Nicaise et al., 2007; Harrop & Swinson, 2011; Younger et al., 1999). This might suggest that teachers are less autonomy supportive towards boys than towards girls.

Controlling the classroom situation when measuring students' perceptions of teacher support: the use of vignettes

On the one hand, measuring students' perceptions of teacher support is very valuable because students' opinions on the learning environment have been proved to be highly important for their feelings of motivation, engagement, and well-being (see Thijs & Verkuyten, 2009; Vansteenkiste et al., 2012). On the other hand, when students evaluate teacher support, both the actual behavior of the teacher and the interpretation of the students might play a role and cannot be distinguished. Sex differences in students' perceptions may thus be confounded by actual differences in teacher behavior towards boys versus girls and by sex differences in students' personal interpretation of teacher behavior.

Presenting students with the same hypothetical situation might serve as a way to filter out teachers' differential treatment of students. Consequently, differences in

perceptions cannot be due to different teacher behavior. Rather, differences in perceptions can be understood as differences in the personal evaluation of the same teacher behavior. Within the framework of SDT, researchers have experimented with the use of vignettes to examine students' opinions of teacher behavior. For example, Reeve, Bolt, and Cai (1999) and Pavri and Monda-Amaya (2001) applied vignettes to examine students' opinions on teachers' supportive behavior towards hypothetical students who are faced with a problem. More recently, similar vignettes have been used to tap into parents' supportive behavior. Van Petegem, Soenens, Vansteenkiste, and Beyers (2015) investigated adolescents' psychological reactance towards autonomy-supportive, neutral and controlling hypothetical situations. Chen, Beyers, and Vansteenkiste (2013) examined differences in Belgian and Chinese students' perceptions of parental support based on a generally controlling vignette, a guilt-inducing vignette, and an autonomy-supportive vignette.

Hypotheses

The current study aims to investigate differences in boys' and girls' perceptions of (1) their actual teachers, and of (2) a hypothetical teacher in a scenario.

The first objective of this study is to investigate whether boys and girls find their actual teachers equally supportive concerning autonomy support and structure. We hypothesize, in line with current literature, that boys rate their teachers to be less supportive than girls do, both for autonomy support and structure.

The second objective of this study is to examine whether boys and girls differ in how they perceive the support of a teacher in a scenario describing a classroom situation (vignette). These perceptions are assumed not to depend on actual differences in teacher behavior towards boys and girls. Four vignettes were administered: A low autonomy supportive (controlling) vignette, a high autonomy supportive vignette, a low structuring vignette, and a high structuring vignette. Half of the students evaluated the low autonomy supportive and high structuring scenario and the other half evaluated the high autonomy supportive and low structuring scenario. Before investigating sex differences for each of the four vignettes separately, two preliminary analyses are conducted. First, we explore whether boys and girls can *discriminate between a low autonomy supportive (controlling) situation and a high autonomy supportive situation and between situations with a low and high provision of structure*. This informs us if students recognize the low supportive situations to be less supportive than the high supportive

situations. We hypothesize that boys and girls both will be able to discriminate between a low and a high supportive situation. This might mean that the low and high supportive vignettes respectively describe lower and higher supportive behavior. Second, we analyze, for autonomy support and structure, *whether the distance between the low and high vignette scores is the same for boys as for girls*. In other words, we examine whether boys and girls differ in how far apart their low and high scores are. Because boys and girls each have been found to consider different aspects of teacher support important, there might be differences in how they perceive the various vignettes. This may result in a larger distance between the low and high scores for either boys or girls. The main inquiry concerning this second objective is to investigate *sex differences for each of the four vignettes separately*. In other words, we examine whether for each specific situation, boys and girls perceive the described teacher behavior in the same way. We formulate two hypotheses here: (1) We can hypothesize that boys and girls differ in their scores for the same teacher in the same scenario because boys and girls seem to ascribe different values to certain teacher behaviors; (2) We can also hypothesize that girls perceive the teachers in these scenarios to be more supportive than boys do because the perception differences in actual teacher support that have been demonstrated in previous literature are also in favor of girls. The latter hypothesis presumes that the differences in perceptions of actual teacher behavior are at least partially a consequence of differences in appreciation, rather than of differences in the actual teacher behavior. Finally, we investigate whether boys and girls differ in their opinions on the *relevance and credibility* of the vignette situations. In line with previous research on students' perceptions of teacher support, we expect that, compared to girls, boys believe the high supportive situations to be less credible and relevant and the low supportive situations to be more credible and relevant.

METHOD

Participants

The participants were 377 Grade 8 students (54% boys, 46% girls) from 32 classes of the academic track in eight secondary schools in Flanders, Belgium. These eight schools were part of a larger disproportionally stratified sample of 59 schools. The selection of these schools was based on (1) geographical distribution in the Flemish

community, (2) urban versus rural location, and (3) publicly run versus privately run educational network. Generally, in Flanders, the majority of students in Grade 8 of secondary education follows the academic track. In our sample, only 16% of the students followed the vocational track, whereas 84% was part of the academic track. Therefore we chose to focus on the latter group of students only.

Students filled out questionnaires during school time under the supervision of the researchers in April and May 2014.

Measures

AUTONOMY SUPPORT AND STRUCTURE.

Students rated their teachers with the Teacher As Social Context Questionnaire (TASC-Q; Belmont et al., 1988; Sierens et al., 2009). The subscales for Autonomy Support (e.g., 'My teachers give me a lot of choice about how to do my schoolwork') and Structure (e.g., 'My teacher tells me what he/she expects from me in class') counted respectively six ($\alpha = .84$) and five items ($\alpha = .79$) for this study. Questions were rated on a 5pt Likert scale, ranging from 1 (*completely disagree*) to (*completely agree*). This scale construction was based on the confirmatory factor analyses carried out in the research of Lietaert et al. 2015 (see Chapter 2), in which part of these students were questioned when they were in Grade 7. Reliability and validity were proved in previous studies (see Vansteenkiste et al., 2009).

VIGNETTES.

The procedure for developing the vignettes was based on the research of Chen et al. (2013) and Van Petegem et al. (2015).

Appendix 3 contains the description of the four vignettes. The vignettes were intended to describe (1) a low autonomy supportive situation, (2) a high autonomy supportive situation, (3) a low structuring situation, and (4) a high structuring situation. Intentionally, the sex of the teacher was not mentioned in the scenarios. The vignettes were developed by one of the authors in agreement with a secondary school teacher who also coaches teachers in this subject matter. The definitions of autonomy support and structure, as developed within SDT, were taken as a theoretical background. For face validity purposes, it was evaluated if all of the elements seen as subdimensions of autonomy support (choice, control, respect, relevance) and structure (contingency,

expectations, help/support, adjustment/monitoring) that are part of the TASC-Q (see Table 6), were present. After reading the vignette, students filled out the respective subscale (i.e., autonomy support or structure) of the TASC-Q about the situation they had just read. The items of the subscales were identical to the ones in the study of Lietaert et al. (2015) (see Chapter 2), including six items for autonomy support ($\alpha = .82$ for the low autonomy supportive situation; $\alpha = .90$ for the high autonomy supportive situation) and five items for structure ($\alpha = .79$ for the low structure situation; $\alpha = .80$ for the high structure situation).

A pilot version of these situations was presented to 10 randomly chosen secondary school students (who were not part of the questionnaire sample) for readability, credibility, and relevance.

In the final version of the questionnaire, one question about credibility (i.e., 'Do you think youngsters your age ever experienced such a situation?') and one question about relevance (i.e., 'How relevant is this situation for the school/schools you have been part of?') were included. As in the study of Chen et al. (2013), a 7-point scale was used ranging from 1 (*completely disagree*) to 7 (*completely agree*). The means and standard deviations presented in Table 7 indicate that both boys and girls found the situations moderately relevant ($3.21 < M < 5.12$) and relatively credible ($5.25 < M < 5.98$). The sex differences for relevance and credibility, indicated in Tables 8 and 9, will be discussed in the results section.

Half of the students (aimed for 50% boys and 50% girls) of each class received a questionnaire with a high autonomy supportive situation and a low structuring situation. The other half of the students (again aimed at 50% boys and 50% girls) received a questionnaire with a low autonomy supportive situation and a high structuring situation. Both groups were confronted first with a high supportive situation (i.e., in the first group the autonomy supportive one and in the second group the structuring one).

Data analyses

Linear regression analyses were conducted to investigate sex differences in autonomy support and structure of both the actual teachers and the teachers in the scenarios. The analyses were carried out in Mplus (Muthén & Muthén, 1998-2012), using a sandwich estimator to control for the nesting of students in classes (ICC; $\rho = .00-.09$). Little's MCAR test ($\chi^2 = 8.150$ (7); $p = .32$) confirmed that the data were missing

completely at random. This allowed us to use the Full Information Maximum Likelihood Estimator (Muthén & Muthén, 1998-2012).

With respect to the first objective, both autonomy support and structure were entered in the model simultaneously, to account for correlations between these two teacher support variables.

For the second objective, we first tested whether both boys and girls can discriminate between a low and a high supportive situation. In other words, we tested whether the difference between the low and high supportive situations (for autonomy support and structure) was significant for both boys and girls. Second, we investigated whether the scores for the low and high supportive vignettes (both for the autonomy supportive and the structuring vignettes) were further apart or closer together for boys than for girls. We thus examined the distance between the low and high scores for boys versus girls for the vignettes for autonomy support and for the vignettes for structure. To this end, for investigating autonomy support, we constructed two variables: One combining the scores on the high and low autonomy supportive situations and one variable indicating whether students filled out the high or low autonomy supportive situation. In the regression model, an interaction term was constructed, including the sex of the student and the variable indicating whether it concerned a low or high autonomy supportive situation. By adding this interaction term, we could investigate sex differences in the distance between the low and high autonomy supportive scores. The same was done for the structure vignettes. In our main analyses of the second objective, we examined whether possible sex differences in autonomy support and structure were present for the high and low supportive situations. To this end, four linear regression analyses were conducted for each vignette situation separately. This allowed us to test more specifically the sex differences in students' answers to the vignettes. Finally, to investigate the sex differences in the relevance and credibility of the vignette situations, we also conducted linear regression analyses for each of the vignettes.

Table 7. Means and standard deviations for boys' and girls' (1) perceptions of their actual teachers' autonomy support and structure (scales ranging from 1 to 5), (2) of each of the four vignettes (scales ranging from 1 to 5) and (3) of the credibility and relevance for each of the four vignettes (scales ranging from 1 to 7)

Variable		Boys			Girls		
		<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Autonomy support	Autonomy support actual teachers	202	3.46	.67	174	3.67	.57
	Low autonomy support vignette	81	2.22	.80	98	2.23	.80
	Credibility low autonomy support vignette	81	5.31	1.23	98	5.29	1.15
	Relevance low autonomy support vignette	81	4.22	1.41	98	3.84	1.35
	High autonomy support vignette	98	4.08	.75	68	4.35	.75
	Credibility high autonomy support vignette	96	5.25	1.19	68	5.75	1.01
	Relevance high autonomy support vignette	96	4.97	1.30	68	5.12	1.31
	Structure	Structure actual teachers	202	3.36	.68	174	3.53
	Low structure vignette	93	2.46	.84	68	1.96	.61
	Credibility low structure vignette	92	5.30	1.27	68	5.50	1.17
	Relevance low structure vignette	92	3.76	1.61	68	3.21	1.46
	High structure vignette	79	3.77	.64	97	3.77	.83
	Credibility high structure vignette	79	5.70	1.13	96	5.98	.93
	Relevance high structure vignette	79	4.99	1.32	95	4.93	1.27

RESULTS

The means and standard deviations of (1) students' perceptions of their actual teachers, (2) students' perceptions of the four vignettes, and (3) students' perceptions of the credibility and relevance of these four vignettes are presented in Table 7.

Table 8. Credibility of the vignettes, for boys and girls

Variable	Credibility low autonomy support vignette		Credibility low structure vignette	
	β	SE	β	SE
Intercept	4.493***	.24	4.35***	.35
Girl	-.00	.09	.07	.08

Variable	Credibility high autonomy support vignette		Credibility high structure vignette	
	β	SE	β	SE
Intercept	4.63***	.27	5.52***	.40
Girl	.21**	.07	.14*	.07

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 9. Relevance of the vignettes, for boys and girls

Variable	Relevance low autonomy support vignette		Relevance low structure vignette	
	β	SE	β	SE
Intercept	3.04***	.21	2.40***	.17
Girl	-.14*	.06	-.17	.10

Variable	Relevance high autonomy support vignette		Relevance high structure vignette	
	β	SE	β	SE
Intercept	4.63***	.27	3.86***	.25
Girl	.21**	.07	-.02	.09

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

The results for the first objective of this study, presented in Table 10, indicated that girls rated their actual teachers higher both for autonomy support ($M = 3.67$ for girls; $M = 3.46$ for boys; $\beta = .17$, $p = .00$) and structure ($M = 3.36$ for boys; $M = 3.53$ for girls; $\beta = .13$, $p = .04$). The correlation between the two teacher support variables was also significant ($r = .73$; $p = .00$).

Table 10. Results of regression analyses for sex differences in students' perceptions of their actual teachers' autonomy support and structure

Variable	Autonomy support		Structure	
	β	SE	β	SE
Intercept	5.47***	.31	5.11***	.30
Girl	.17**	.06	.13*	.06

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Concerning our preliminary analyses for the second objective, we first discovered that both boys and girls were able to discriminate between the high and low structuring vignette ($\beta = .78, p = .00$ for girls; $\beta = .66, p = .00$ for boys) and between the high and low autonomy supportive vignette ($\beta = .81, p = .00$ for girls; $\beta = .77, p = .00$ for boys). Second, Figures 6 and 7 illustrate the distance between the low and high vignette scores for boys versus girls, based on the mean values and standard deviations in Table 7. Figures 6 and 7 show that girls scored the teachers in the high autonomy supportive situation higher and the teachers in the low structuring situation lower. Table 11 presents the findings of the moderation analyses that tested if these distances between these high and low scores were significantly different for boys versus girls. The results for the interaction effect between the low/high vignette situation and sex demonstrated a significant difference between the low and high vignette scores for boys and girls for structure ($\beta = .21, p = .00$), yet not for autonomy support ($\beta = .09, p = .16$). In other words, the distance between the low and high answers is significantly larger for girls than for boys. Additionally, for structure, generally, boys seemed to score the low structuring vignette higher ($\beta = -.23, p = .00$). For autonomy support, no significant sex differences in the mean score of both vignettes were found, which demonstrates that boys' and girls' means ($M = 3.15$ for boys; $M = 3.29$ for girls) of the low and high autonomy supportive situations were not significantly different.

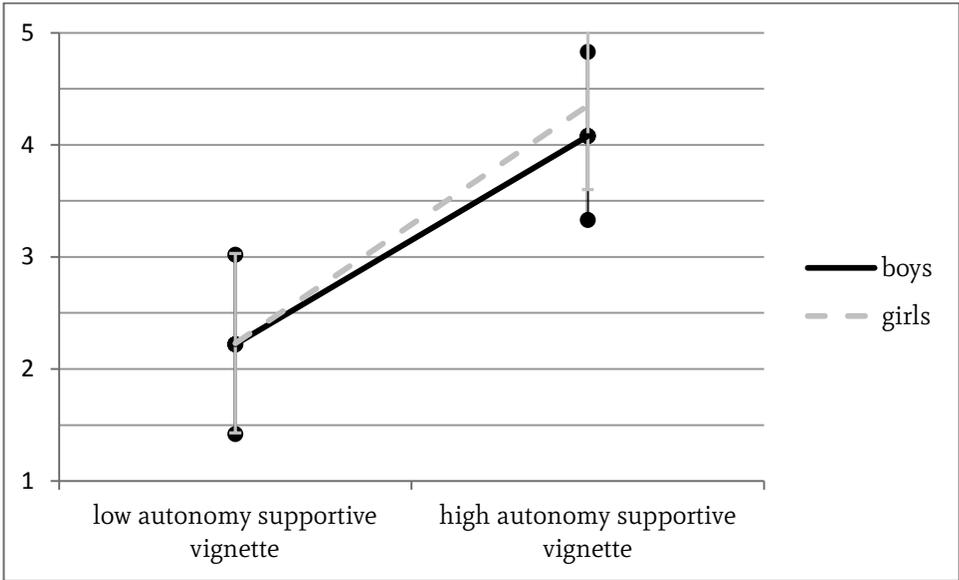


Figure 6. Graph of mean responses and standard deviations for boys' and girls' answers to the high and low autonomy supportive vignettes, illustrating the non-significant difference between the low and high vignette scores for boys versus girls.

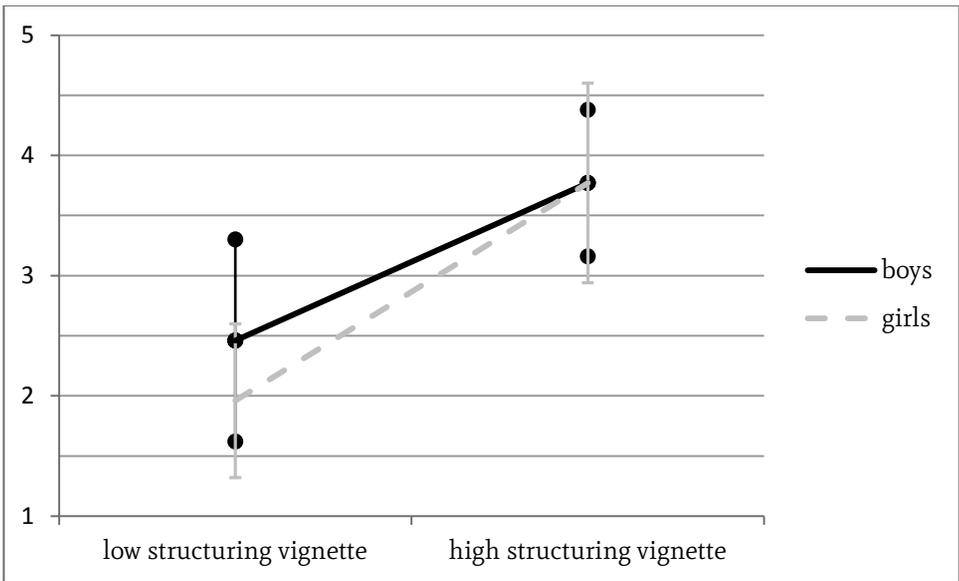


Figure 7. Graph of mean responses and standard deviations for boys' and girls' answers to the high and low structuring vignettes, illustrating the significant difference between the low and high vignette scores for boys versus girls.

Table 11. Results of regression analyses for differences in scores on the low and high structure and autonomy vignettes for boys and girls

Variable	Autonomy support vignettes		Structure vignettes	
	β	SE	β	SE
Intercept	1.77*	.12	2.27*	.16
Girl	.01	.04	-.23*	.05
High situation	.74*	.05	.61*	.04
Interaction high situation & girl	.09	.06	.21*	.06

Note. * $p < .001$.

In the main analyses for the second objective, we investigated the sex differences for the specific scenarios, i.e., for the low autonomy supportive situation and high autonomy supportive situation separately and for the low structuring and the high structuring situation separately. The results, presented in Table 12, reflect Figures 6 and 7 illustrating that boys rated the teacher in the low structuring situation significantly higher than girls did ($M = 2.46$ for boys; $M = 1.96$ for girls; $\beta = -.32$, $p = .00$). Reversely, the higher ratings of girls versus boys for the high autonomy supportive situation approached significance ($M = 4.08$ for boys, $M = 4.35$ for girls; $\beta = .19$, $p = .05$). For the low structuring situation, the distribution of the boys' answers was significantly more scattered than girls' answers ($SD = .84$ for boys; $SD = .61$ for girls; $F = 14.42$; $p = .00$). Nevertheless, no significant differences between boys' and girls' perceptions were found for the high structuring situation and for the low autonomy supportive situation. In fact, for these two situations, the mean values of boys' and girls' scores are (almost) identical for the low autonomy supportive situation ($M = 2.22$; $M = 2.23$ respectively) and for the high structuring situation ($M = 3.77$ for boys and girls). Finally, boys and girls did not differ in their opinions on the credibility of the low autonomy supportive vignette ($M = 5.31$ for boys; $M = 5.29$ for girls; $\beta = -.00$, $p = .94$) and the low structuring vignette ($M = 5.30$ for boys; $M = 5.50$ for girls; $\beta = .07$, $p = .35$) (see Tables 8 and 9). However, girls found the high supportive vignettes to be more credible than boys did, both for the autonomy supportive situation ($M = 5.25$ for boys; $M = 5.75$ for girls; $\beta = .21$, $p = .00$) and the structuring situation ($M = 5.70$ for boys; $M = 5.89$ for girls; $\beta = .14$, $p = .04$).

Concerning the relevance of the vignettes, remarkably, boys found the low autonomy supportive vignette significantly more applicable to the schools they were part of ($M = 4.22$ for boys; $M = 3.84$ for girls; $\beta = -.14$, $p = .02$) whereas girls found the high autonomy supportive vignette significantly more applicable to the schools they were part

of ($M = 4.08$ for boys; $M = 4.35$ for girls; $\beta = .21$, $p = .00$) (see Tables 8 and 9). For the relevance of the structure vignettes, no significant sex differences were found.

Table 12. Results of regression analyses for sex differences in students' perceptions of the four different vignettes (low and high situations separately)

Variable	Low autonomy support vignette		Low structure vignette	
	β	SE	β	SE
Intercept	2.80**	.23	3.12**	.15
Girl	.01	.06	-.32**	.06

Variable	High autonomy support vignette		High structure vignette	
	β	SE	β	SE
Intercept	5.39**	.62	5.01**	.29
Girl	.19*	.09	-.00	.09

Note. * $p = .05$, ** $p < .001$.

DISCUSSION

A rather small body of literature addressed differences in boys' and girls' perceptions of teacher support. Do boys and girls think differently about their teachers? Which aspects of teacher support are more important to boys and which to girls? Are these sex differences in students' perceptions of teachers support due to differences in opinions between boys and girls (regardless of the teachers' possible differential behavior towards boys and girls)? Because it is often assumed that students' perceptions of teacher support reflect the actual supportive behavior and that these perceptions are the same for both boys and girls, research lacks information about perception differences between boys and girls.

The present study attempted to unravel part of this ambiguity about sex differences in students' perceptions of teacher support. To this end, students were asked to assess the autonomy support and structure of their actual teachers. Yet, these assessments may cause interpretation issues, since various explanations can be found for possible differences in boys' and girls' perceptions of their teachers. On the one hand, teachers might in fact interact differently with boys than with girls, hence boys and girls will assess their teachers differently. On the other hand, simply the perceptions of the students might differ because it cannot be controlled for what situation students think of when assessing their teachers and how much importance students ascribe to

various classroom situations and interactions with their teachers. The latter might still cause different perceptions in spite of teachers' equal behaviors towards boys and girls.

In order to clarify these issues we explored possible differences in boys' and girls' perceptions of the same situation. Students were presented with vignettes in which they needed to evaluate the autonomy support or structure of the teacher in the specific situation. Because these scenarios were identical for each student, we were able to control the behavior of the teacher in these situations. Moreover, students were encouraged to think about the same situation, namely the concrete scenario described in the vignette. This way, differences in perceptions could be interpreted as a different appreciation of teacher behavior.

Students' perceptions of their actual teachers

This study found that boys and girls indeed perceived their actual teachers' supportive behavior differently. Both for autonomy support and structure, girls found their teachers to be more supportive than boys did. This confirms the findings of Lietaert et al. (2015) and Vansteenkiste et al. (2012), who investigated students' perceptions of teacher support. These student opinions may reflect teachers' actual behavior because previous research reporting on observations of teacher-student interactions had indicated that both for elements of autonomy support and structure, teachers were less supportive towards boys than towards girls (e.g., Consuegra & Engels, forthcoming; Harrop & Swinson, 2011; Nicaise et al., 2007; Younger et al., 1999).

Students' perceptions of the vignettes

Both boys and girls were able to discriminate between the low and the high autonomy supportive and structuring situations. This could mean that both boys and girls acknowledged the low supportive vignettes to be less supportive than the high supportive vignettes. Additionally, the distance between the scores for the low supportive vignette and high supportive vignette did not differ between boys and girls for autonomy support. Yet, for structure, girls' scores were further apart than boys'. This means that for autonomy support, both boys and girls answered in an equally extreme way. For structure, girls seemed to answer more extremely than boys. The specific results for each vignette yielded additional information. There were no differences between boys' and girls' perceptions of the low autonomy supportive and high structuring vignette.

However, boys scored the low structuring vignette higher and girls scored the high autonomy supportive vignette higher.

THE HIGH AUTONOMY SUPPORT VIGNETTE

Girls rated the teacher in the high autonomy supportive situation as significantly more autonomy supportive than boys did. In other words, for a situation that was described as highly autonomy supportive, girls thought the teacher provided more autonomy support. Boys thus seemed to be less positive about the high autonomy support that was provided in the vignette.

Students' impressions of the credibility and relevance of the vignettes may help to interpret these results. Girls scored significantly higher on the question if youngsters their age had experienced this kind of situation (credibility) for the scenarios in which high supportive teacher behavior was described. This might suggest that girls have a more positive image of teachers' supportive behavior in general. Moreover, this could explain their higher scores for their actual teachers' autonomy support and structure and for the high autonomy supportive situation. Additional interesting sex differences appeared when students were asked if the low and high autonomy supportive situations were applicable to the schools they were part of (*relevance*). Boys indicated the low autonomy supportive situation to be more applicable, whereas girls found the high autonomy supportive situation more applicable. This relates to our findings that girls also found their actual teachers to be more autonomy supportive and that they experienced the teacher in the high autonomy supportive vignette to be more supportive than boys did.

The results for this high autonomy supportive vignette indicate that even for the same autonomy supportive situation, boys generally considered it to be less supportive than girls do. The high autonomy supportive situation is one in which the teacher clearly communicates the expectations towards students, yet lets students choose if they work together or not and explains the relevance of why they need to do the exercises. Although this is generally considered as autonomy supportive behavior, boys might still think of this as limiting their freedom because of the expectations that were formulated (e.g., 'It is important that you make sure not to bother the others while working.'). The elements of fun and a relaxed atmosphere are often highlighted by boys (Martin, 2003; Suldo et al., 2009) and might not have been taken into consideration enough in this vignette. Other elements that are often emphasized by boys and that are

lacking in our vignette might be humor, the very open provision of choice, and a more neutral perception of the school subject. In this vignette, the final sentences reveal that the subject matter in that lesson is French (second language). It has been proved that boys are generally less motivated for language learning (Williams et al., 2002), which might affect students' perceptions of a classroom situation for the particular subject.

THE LOW STRUCTURE VIGNETTE

Boys rated the teacher in the low structuring situation significantly higher than girls did. This means that boys, more than girls, felt the same teacher, who was described as providing low structure, to be more structuring. Boys were thus less negative towards low structure than girls. Additionally, the sex differences in the standard deviations suggested that girls' perceptions of this teacher were more unanimous.

In contrast to the results of the high autonomy supportive vignette, these results could not be explained by boys' and girls' differences in how relevant or credible they believed this situation to be. No sex differences were found for the credibility and the relevance of the low structuring situation.

Nonetheless, boys' less negative scores for the low structuring scenario could be interpreted by examining the content of this specific vignette. The situation that represents a low provision of structure is one in which the teacher does not help the student adequately. The individual student still does not know how to proceed. Girls might be more sensitive to this kind of situations because they indicate, more often than boys, that the emotional state of students is an important part of teachers' supportive behavior in class (Suldo et al., 2009). Girls also find it more important that a teacher makes sure an individual student understands the material and provides assistance accordingly (Suldo et al., 2009). Boys, on the other hand, find it much more important that a teacher makes sure the entire class understands the material and that the entire class is satisfied with the content and arrangements during the lesson (Suldo et al., 2009). The research of Thijs and Verkuyten (2009) confirms this, as they found that for girls, the individual relationship with the teacher was more important. The authors connected these results with earlier findings in literature suggesting that female students find relational aspects and personal connections to others more important than male students do. The weight girls attach to this situation might therefore be greater and could thus explain why they, compared to boys, perceive the teacher in this scenario to be less supportive.

THE HIGH STRUCTURE VIGNETTE

Boys and girls did not differ in their perceptions of the teacher in the high structure vignette. These findings contradict our arguments for explaining the sex differences in the low structuring situation, namely the importance boys and girls ascribe to certain teacher behavior. Boys appear to find elements of structure much more important than girls do (Geist & King, 2008; Suldo et al., 2009) and boys see feedback (structure) as a sign of their competence whereas girls experience it as a way to control them (Katz et al., 2006). If this was the case, boys, as opposed to girls, might have perceived the same high structuring situation to be more supportive.

Another explanation would be that both boys and girls consider this high structuring scenario as highly supportive. We might suspect that if these students' actual teachers had been highly supportive and equally supportive for both sexes, no differences would have been noticed for the students' perceptions of their actual teachers' provision of structure. Based on the findings from this vignette, it might be carefully speculated that the actual teachers are less structuring towards boys than towards girls.

THE LOW AUTONOMY SUPPORT VIGNETTE

Boys and girls both found the low autonomy supportive situation to be rather unsupportive. Based on previous literature (Martin, 2003; Suldo et al., 2009), we might expect boys to score the teacher in this vignette to be even less supportive, because they attach fairly substantial importance to various elements of autonomy support (e.g., providing fun activities, giving choices to students, not treating students as children). However, boys' and girls' almost identical answers for this situation suggest that both boys and girls consider low autonomy support to be unsupportive. They have a similar opinion on the controlling behavior of the teacher. Here too, we might suspect that if these students' actual teachers had shown low autonomy support and had been equally unsupportive for both sexes, no differences would have been noticed for the students' perceptions of their actual teachers' autonomy support. It could, however, be speculated now that, based on this vignette, the actual teachers might in fact be less autonomy supportive towards boys than towards girls.

Implications for educational practice

Our interpretation of boys' higher tolerance of low structure suggests that teachers need to be aware of what boys find more important (i.e., the entire classroom's understanding) and of what girls give priority to (i.e., the individual attention and feedback stemming from affective attention) within the dimension of structure.

Moreover, we want to stress the need for evaluating what constitutes autonomy support. Apparently, boys find the autonomy supportive teacher not as supportive as girls do. Educational theory and practice should assess concrete examples of the provision of choice, the indication of relevance, teachers' respect towards students, and teachers' non-controlling language. This is highly relevant because these subdimensions might not be seen as equally supportive by boys and girls. Recent findings of Lietaert et al. (2015) underline this importance, especially for boys, who indeed indicated their actual teachers to be less autonomy supportive. The authors found that autonomy support of teachers appeared to be more important for the engagement of boys.

In teacher training, these vignettes might be used as practical examples of positive and negative reactions of a teacher towards students. Teachers might reflect upon these situations by linking them with their own behavior.

To conclude, as Sierens et al. (2009) stressed, we suggest that a synergy between autonomy support and structure is the most effective for predicting students' motivation and engagement. Teachers need to constantly ask themselves if they provide structure to their students, yet keeping in mind to be autonomy supportive.

Limitations and future research

We first want to underline that these vignettes need further optimization. They now appear to inform us about students' preferences concerning teacher behavior. Our interpretations about boys' and girls' preferences are to be confirmed through additional research. Questions to be examined are the following: 'What teacher behavior do boys and girls consider as important for their engagement, well-being and achievement?', 'To what extent do these opinions differ?', 'What elements underlie of these different opinions?' Additionally, involvement, the third teacher support dimension, should be investigated.

Second, future research should also attend how it could be controlled for that students reflect about their actual teachers while reading the example in the vignette. Attempting to keep the scenario in the vignettes as neutral as possible is one element to

ensure this. However, associations with reality can never be fully controlled for. Therefore, observations of teacher support, interviews with students and teachers, and teacher reports should add the necessary insights for interpreting students' perceptions of such vignettes and of their actual teachers.

Third, a disadvantage of using vignettes is the absence of non-verbal communication. Using video examples of such situations might counter this limitation.

Fourth, the low and high scenarios are not each other's opposites. In such concrete situations, full opposition is not entirely possible, yet, it might cause different high and low scores for different situations. Moreover, in the high autonomy supportive scenario, the final sentence is articulated by a student, whereas in all other scenarios, the teacher ends the conversation. This might also affect the students' way of perceiving the situation. Students might also be biased by the first vignette while answering the second. In spite of the fact that they each received a positive and a negative one and that both groups started with the positive one, these situations might have influenced each other. Future research should also investigate the effect of giving each student a low and a high scenario of the same teacher support dimension. Additionally, a specific example in the subject of French language is presented in the high autonomy supportive vignette, which might also yield different answers than for example mathematics or science would have. In other words, the choices concerning the content of the vignettes might affect the results of the students. Therefore, this research calls for replications with other examples and combinations of such vignettes.

Fifth, one might question the coincidence of one group of students receiving the low autonomy supportive and high structuring vignette (both yielding non-significant sex differences) and the other group receiving the high autonomy supportive and low structuring vignette, for which significant sex differences were demonstrated. However, for each class, it was randomly decided which half of the class filled out either of the two combinations. Therefore, we want to rule out this bias as an explanation for the differences between these two sets of situations.

Sixth, a limitation and, yet, an advantage of using vignettes is that other students cannot influence the situations. The studies of Estell and Perdue (2013) and De Wit, Karioja, and Rye (2010) found no sex differences in students' perceptions of teacher support, but they did demonstrate differences in peer support, where girls perceived the support of their peers to be higher than boys did. This could indicate that other students influence classroom situations such as the one described in the vignettes. A

disadvantage is that these vignettes might not be a realistic representation of the classroom dynamic, where peer interaction is constantly present. Conversely, the absence of peer influence is an advantage, allowing us to more exclusively investigate students' perceptions of the teachers' supportive behavior.

Finally, future research that is able to use larger samples to test the vignettes should also include students in the vocational track and should test for the effects of student background characteristics (e.g., age, achievement level).

Conclusion

Two elements emerged from our investigation of the vignettes. First, we suggest that boys and girls each find different teaching behaviors important, as interpreted based on boys' higher tolerance towards the low structuring vignette and girls being more positive about the high autonomy supportive vignette. Moreover, the content of the vignettes could be responsible for some of the differences between boys' and girls' opinions. Other vignettes with different situations should complement our insights. Second, because no sex differences were found in two of the four scenarios and because of the hypothesis above, we do not want to rule out what has been proved in previous literature about teachers' differential treatment of boys and girls.

CHAPTER 4

TEACHER SUPPORT: THE ROLE OF TEACHERS' SEX AND SOCIOCULTURAL GENDER DIFFERENCES

Manuscript submitted for publication as Lietaert, S., Van Maele, D., Laevers, F., Verschueren, K., & De Fraine, B. (2016). Teacher support: The role of teachers' sex and sociocultural gender differences.

Abstract

Investigating the role of teachers' gender for six teacher support aspects, this study showed that male and female secondary school teachers each scored high on different aspects of teacher support. Additional analyses demonstrated that two sociocultural gender characteristics (restricted emotionality and pressure for gender conformity) mediated most sex differences in teacher support. Moreover, multigroup analyses revealed that these gender characteristics were negatively associated with teacher support for both male and female teachers. Thus, schools that aspire to teachers' supportive behaviors and attitudes can focus on stimulating teachers to express their emotions in class and school and on countering gender stereotypes.

Keywords: Teacher sex; gender conformity; (restricted) emotionality; teacher support

INTRODUCTION

Currently, education is characterized by an unbalance between the numerous female and the few male teachers in schools. In Europe in 2013, for lower secondary education, 70% of the teachers were women (European Commission EACEA Eurydice, 2013). Secondary education in Flanders (i.e., the Northern part of Belgium, where the current study was carried out), for the school year 2013-2014, counted 63.6 % female teachers (Flemish Department of Education and Training, 2015). Consequently, the teaching profession has the connotation of requiring more 'feminine' characteristics (Brozo, 2002; Martino, 2008). In addition, the school environment has often been perceived as rather feminine because students' behavior according to the female gender role is preferred (i.e., dependent, cooperative, social behavior in contrast to independent, assertive, and competitive behavior; Heyder & Kessels, 2013). This view on teaching as a feminine profession, the school as being a feminine environment, and the presence of more female teachers are part of what is called the 'feminization of education' (Carrington et al., 2007; Martino, 2008). A general concern of this feminization arose when it was found that boys showed lower academic performance than girls and dropped out of school more frequently (Lamote et al., 2013; Wang & Eccles, 2012).

Moreover, in Western countries, schools believed female teachers not to provide adequate masculine role models for boys. Hence, many schools, in order to maintain an equilibrium of male and female teachers, actively recruited male teachers because they would add the necessary masculinity to the teaching staff while also providing boys with male role models (Ammermüller & Dolton, 2006; Cushman, 2007; Marsh et al., 2008; Mills et al., 2004; Martino, 2008).

Despite this pursuit of a 'gender balanced' teaching staff in educational practice, to date, many studies have found no evidence for the benefits of male teachers for boys' motivation and performance and concluded that male and female teachers are equally capable of motivating boys (and girls) and of enhancing their performance (e.g., Carrington et al., 2007; de Zeeuw et al., 2014; Lahelma, 2000; Marsh et al., 2008). These studies investigating the role of teachers' sex (i.e., a teacher being male or female) for student outcomes have not often concentrated on assessing teachers' supportive behavior or attitudes in class. It is this teacher support that has been proved to be important for student outcomes (Skinner et al., 2008). Moreover, literature on teacher

gender has rarely considered 'gender' as a broader, sociocultural construct than merely sex differences.

The current study, first, examines sex differences in teacher support, drawing from various theoretical backgrounds on teachers' supportive behavior and attitudes. Second, two sociocultural gender characteristics are considered. One characteristic is emotionality or teachers' ability to express emotions, which has been seen as a feminine trait (O'Neil, 2008). A second characteristic is teachers' pressure for gender conformity. This sociocultural gender variable can be seen as a part of a person's gender identity (Egan & Perry, 2001). This study will link both restricted emotionality and pressure for gender conformity with teachers' supportive behaviors and attitudes.

Teacher support: Differences between male and female teachers

Teacher support has been considered to be an important predictor of several student outcomes, such as student well-being, motivation, and achievement (e.g., Skinner et al., 2008). Several research traditions emphasize different aspects of teacher support. In order to profoundly investigate the distinct aspects that seem to be most relevant for secondary education, this study draws from three research traditions: Self-determination theory, achievement goal theory, and social constructivism.

First, in *self-determination theory (SDT)*, teacher support is defined as autonomy support (i.e., non-controlling language, providing choice, indicating relevance), structure (i.e., competence-relevant feedback to match students' competences, clear sets of goals for students, clear guidelines and expectations), and involvement (i.e., quality of the emotional, interpersonal relationship) (Deci & Ryan, 2008). These three teacher support dimensions ought to fulfill the students' need for autonomy, competence, and relatedness. In its turn, this need fulfillment promotes autonomous motivation and engagement in students (Deci & Ryan, 2008; Stroet et al., 2013).

Second, *achievement goal theory* puts forward mastery approaches (i.e., classroom strategies which stem from the belief that students' goal for working in class is to develop their competencies) and performance approaches (i.e., classroom strategies which descend from the belief that students' goal for working in class is to demonstrate their competencies) to instruction (Ames, 1992; Midgley et al., 2000). Although these goal orientation approaches are not to be seen as each other's opposites, it has been asserted that a mastery approach to teaching is generally associated with better student outcomes than a performance approach (Roeser, Marachi, & Gehlbach, 2002).

Third, a distinction can be made between a student-centered or learner-centered orientation, as opposed to a content-centered orientation to teaching. A student-centered orientation aligns with the *social constructivist* tradition, which states that learning in the classroom is actively and jointly constructed by the teacher and students in interaction with each other (Davis, 2003). The emphasis is on the individual student, who processes the information that is constructed and where the teacher facilitates the learning process. This orientation highlights the emotional and cognitive needs of the student instead of focusing primarily on the curriculum or content to be learnt (Cornelius-White, 2007; Opdenakker & Van Damme, 2006). Teacher empathy, warmth, self-awareness, non-directivity, and encouragement of critical thinking (instead of memorizing) are key elements for student-centered education (Cornelius-White, 2007). Student-centered education is related to higher engagement and achievement, lower dropout and is associated with increases in student participation, initiative, satisfaction, and motivation (Cornelius-White, 2007). In primary education, personal, emotional closeness between students and teachers is seen as a natural element of the classroom environment, whereas in secondary education, elements characterizing this closeness (e.g., talking about personal issues), are more often seen as uncomfortable instead of positive for classroom interactions (Hargreaves, 2000). Therefore, we aim to investigate teachers' opinions on these interpersonal relations with students (i.e., merely teaching the content, or also being sensitive to students' non-cognitive needs).

Stroet et al.'s (2013) review study on need-supportive teaching (for which autonomy support, structure, and involvement are important teaching dimensions) in secondary education identified no studies reporting on teacher support in relation to teachers' sex. Moreover, only two of their selected studies measured teachers' perceptions of teacher support, both of which did not include teachers' sex. The authors argued for more research on this topic. In order to broaden the literature on sex differences in teacher support, as seen from the three aforementioned theoretical perspectives, the current study investigates the relationship between teachers' sex and teachers' perceptions of their support.

Of the few articles discussing aspects of teacher support in relation to the teachers' sex, Opdenakker and Van Damme (2006), examining teachers teaching Grade 8 students, found that male teachers reported better class management than female teachers, although no differences between male and female teachers were noticed concerning a learner- versus content-centered teaching style. In contrast, for teachers

teaching Grade 4-8 students, the study of Rubie-Davies et al. (2012) showed that female teachers proclaimed better classroom management than male teachers and better instructional strategies (i.e., student-centered teaching). Rubie-Davies et al. (2012) also demonstrated that female teachers seemed to primarily adopt a mastery approach to teaching, whereas male teachers indicated to mainly adopt a performance approach. Furthermore, Opdenakker, Maulana, and Den Brok (2012) found, as reported by Grade 7 students, that male teachers were friendlier and more cooperative, whereas female teachers were stricter. This might suggest that male teachers use less controlling language, which has been considered part of autonomy support within SDT. Furthermore, Van Houtte (2007) revealed that female secondary school teachers had less trust in students than male teachers. Trust is measured here as the trust in students to work together without supervision, or the fact that students can be trusted to correct their own tests. These elements also relate to autonomy support. If teachers believe that students can be trusted to work independently, they will provide them with more choices and exercise less control. Moreover, Lam, Tse, Lam, and Loh (2010) examined male and female primary school teachers' differences in teaching practice concerning reading literacy. Female teachers more often created same ability groups for reading, helped pupils to understand new vocabulary in texts, and gave more assignments to describe the style and structure of the text. Male teachers, on the other hand, engaged more often in whole class reading and read more often aloud themselves. They made more use of instruction manuals as reading texts, whereas female teachers more often read longer books with chapters. Male teachers also more often let students compare what they had read with their own experiences. From these elements, we could hypothesize that female teachers more often have the intention to provide structure. The small groups allow them to give students accurate feedback and guidance. They put a stronger focus on providing clear guidelines and expectations towards learning a new text through the reading activities they most frequently use (i.e., identifying new vocabulary, style and structure of the text), whereas male teachers rather stress the relevance (part of autonomy support) of a text by letting students relate it to previous experiences. The use of instruction manuals, which directly relates to the relevance of reading comprehension, is another example of male teachers' autonomy supportive behavior.

Teacher's gender: A broad conceptualization

Only taking into account male versus female sex can be narrowing when investigating gender differences. During the last few decades, masculinity and femininity have been highlighted more often, where both males and females can identify with masculine and feminine traits. In this view, gender is seen as a sociocultural entity where roles and expectations are important to consider (Vantieghem et al., 2014). Examples of feminine traits are 'cooperative', 'gentle', 'sensitive', and 'obedient', whereas examples of masculine traits are 'active', 'rebellious', 'inattentive', 'aggressive', 'independent', and 'competitive' (Schneider & Coutts, 1979). In this study, we include both sex and two sociocultural aspects of teacher gender (i.e., two elements that transcend the dichotomous perception of male versus female) that are of considerable importance for teachers' professional functioning: (1) restricted emotionality (which has been seen as a masculine trait) and (2) pressure for gender conformity (in order to include the fact that people could feel pressure to act according to feminine or masculine traits).

To discuss the first sociocultural aspect of gender, i.e., *restricted emotionality*, we draw from research investigating emotions in educational contexts. The expression of emotions has been associated with femininity, as opposed to the rational and detached behavior associated with masculinity (Schneider & Coutts, 1979; Zembylas, 2003).

Before the 1980's, the emphasis was on suppressing emotions in educational contexts because showing emotions would inhibit adequate knowledge transfer to students. During the 1980's and 1990's, the rather feminine characteristic of expressing emotions was recognized as a valuable trait in educational contexts and as central to the teaching profession, because emotions are at the basis of social relations in the school and classroom context (Hargreaves, 1998; Zembylas, 2003). O'Connor (2008) discussed that emotionality and the proclaimed expression thereof shapes teachers' professional identities. These identities are socially situated within the experiences teachers have and are related to teachers' professional functioning, for example their caring relationships with students. Emotions are thus not to be seen separate from teachers' professional behavior. After all, empathy, or the ability to know what others feel, want, or think in certain situations, is an important part of supportive teacher behavior (Cornelius-White, 2007; Deci & Ryan, 2008). Therefore, we would expect teachers who are well able to express their emotions to be also more supportive towards their students. In gender literature, O'Neil, Helms, Gable, David, and Wrightsman (1986) investigated restricted

emotionality (i.e., the inability to express emotions) as an element of gender role conflict in men. Expressing emotions has been seen as feminine and thus problematic for men, stemming from a fear of femininity (Koberg & Cushmir, 1991; O'Neil, 2008). Previous literature has associated restricted emotionality with anxiety, stress, lower professional commitment, lower perceived work competence, and lower well-being and highlighted the importance of learning to express feelings (Chusmir & Koberg, 1988; O'Neil, 2008; Wolfram, Mohr, & Brochert, 2009). This also supports our hypothesis that teachers with more trouble to express their emotions will show lower teacher support. Given that emotionality is associated with femininity, we might also expect female teachers to be generally better at expressing their emotions than male teachers.

The second sociocultural aspect of gender we take into account in this study is *pressure for gender conformity* (Egan & Perry, 2001), or the extent to which a person feels pressured by the environment to relate to his/her own sex. Pressure for gender conformity has been considered to be part of a person's gender identity (Egan & Perry, 2001). Gender identity refers to how masculine or feminine a person feels, in which a person's interest, behavior, appearance, traits, and attitudes are taken into account (Vantieghem et al., 2014). O'Neil (2008) found that pressure for gender conformity had a negative impact on professional functioning, which might suggest that teachers who experience more pressure to conform will report lower teacher support. For example, Mills, Haase, and Charlton (2008), who challenged societal expectations about men in the job of teaching, argued that when hiring more men in education, these men are often expected to bring a certain masculinity to the job. These social expectations threaten to inhibit the (professional) identity of the male teachers actually choosing for this job because this alleged identity is not necessarily in line with these masculine characteristics of the male teachers actually choosing for this job (Mills et al., 2008).

In sum, we could state that both sociocultural aspects of gender shape teachers' professional identity. O'Connor (2008) sees the concept of professional identity as having both a reflective and an active dimension, in which the first refers to individual reflection and the second to social interaction. He underlines that teachers' emotions are central to this reflection and this interaction and, according to Hargreaves (1998), an inevitable part of teaching itself. Therefore, this study investigates (restricted) emotionality or the (in)ability to express emotions. A second element of sociocultural gender, i.e., felt pressure for gender conformity, relates to the component of social interaction within a teachers' professional identity. Social interactions are accompanied

by societal expectations within the specific teaching context. Expecting a male teacher to act masculine or a female teacher to act feminine might be part of these context bound societal expectations.

O'Neil (2008) argued that the way men think about their gender roles (e.g., conformity to masculine behavior) affects their restricted emotionality. The more men feel pressured to conform to masculine behavior, the more they would be unable or unwilling to express their emotions. Thus, when a male teacher feels obliged to be masculine, he might show less emotions because emotionality is associated with femininity. It is therefore important to examine these sociocultural gender aspects together in one model.

Although the above findings suggest that both restricted emotionality and pressure for gender conformity shape teachers' professional functioning, the international literature lacks research on the interplay between teachers' gender seen as a sociological entity and teacher support. Both sociocultural gender characteristics may help to understand (variations in) male and female teacher support.

Aims and research questions

Previous literature has shown that teachers' perceptions/beliefs about their own educational practice influence actual teacher instruction and eventually student outcomes (Rubie-Davies et al., 2012). Moreover, the teaching profession has been argued to involve a social component. Throughout interactions with others (e.g., students and colleagues), teachers develop beliefs about themselves as a professional and about the teaching profession. These beliefs shape teachers' professional identities (Kelchtermans, 2009; O'Connor, 2008). The focus of this study is on teachers' beliefs about their teacher support and about two aspects of sociocultural gender (i.e., emotionality and pressure for gender conformity) that have been found to relate to teachers' professional identity. To this end, teacher-reported data were used.

First, this study explores sex differences in teachers' perceptions of various teacher support variables, relying on the three theoretical perspectives as described above.

Second, we examine if male and female teachers report differences in two sociocultural aspects of gender: (1) restricted emotionality or the inability to express emotions, which has been more often associated with men than with women; (2)

pressure for gender conformity or the extent to which teachers feel obliged to relate to what is considered to be typically masculine (for male teachers) or feminine (for female teachers) behavior.

Third, it is investigated whether restricted emotionality and pressure for gender conformity can explain possible differences in teacher support. Following the idea that biological gender differences might be nuanced through differences in sociocultural gender aspects, we might expect that restricted emotionality and pressure for gender conformity mediate the sex differences in teacher support.

Fourth, this study intends to assess whether there are differences between male and female teachers in the relationship between the gender variables (emotionality and pressure for gender conformity) and the teacher support variables. Despite the possibly explaining role of the sociocultural gender variables for teacher support, there might still be differences for male and female teachers on how these gender variables relate to their teacher support. For example, this enhancement of emotional expression might be differently related to male teachers' supportive behavior in comparison to female teachers' support.

To summarize, we considered four research questions in this study:

1. Do male and female teachers differ in perceptions of their support (i.e., autonomy support, structure, mastery approach, performance approach, student-centered teaching, content-centered teaching)?
2. Do male and female teachers differ in their perceptions of restricted emotionality (RE) and pressure for gender conformity (PGC)?
3. Do restricted emotionality and pressure for gender conformity explain possible sex differences in teacher support?
4. Do restricted emotionality and pressure for gender conformity relate differently to teacher support for male versus female teachers?

METHOD

Participants

In 59 randomly selected schools in Flanders, Belgium, a total of 1,244 teachers (28.5% males, 71.5% females), teaching in Grades 7 and 8, participated. This proportion

of male versus female teachers is consistent with the proportion of male and female teachers in Europe (European Commission EACEA Eurydice, 2013). A slightly lower proportion of male teachers is found here in comparison to Flanders in general. This might partly be due to the fact that the reported statistics for Flanders also included teachers teaching in upper secondary education. According to the reported European statistics, a more equal distribution can be noticed between male and female teachers teaching in upper secondary education, whereas this is not the case for lower secondary education.

The schools were randomly selected from a disproportionally stratified sample of 59 schools. Equal distribution of the schools according to three criteria was demanded: (1) geographical distribution in the Flemish community, (2) urban versus rural location, and (3) publicly run versus privately run education. Data were collected from September to November 2012 and a response rate of 69.5% was reached. The teachers completed a paper-and-pencil questionnaire asking for personal information and their opinion on several aspects of their professional functioning. Only validated (sub)scales of existing questionnaires were used. All questionnaires were processed anonymously.

Teacher's average age was 40.1 years ($SD = 10.3$). The average teaching experience was 14.7 years ($SD = 9.87$).

Measures

TEACHER SUPPORT.

Measures for teacher support, derived from self-determination theory, were autonomy support (i.e., 'I try to give my students a lot of choices about classroom assignments') and structure (i.e., 'When I discipline my students, I always explain why') and counted respectively 9 items ($\alpha = .75$) and 15 items ($\alpha = .78$). These scales were part of the teacher report measure of the TASC-Q (Wellborn, Connell, Skinner, & Pierson, 1992). Items were translated into Dutch and rated on a four-point scale ranging from 0 (*completely disagree*) to 3 (*completely agree*).

Scales from achievement-goal theory were mastery approaches (i.e., 'I consider how much students have improved when I give them report card grades. '), counting 3 items ($\alpha = .66$) and performance approaches (i.e., 'I display the work of the highest achieving students as an example. '), counting 5 items ($\alpha = .78$). Both are subscales from

the Patterns of Adaptive Learning Questionnaire (PALS; Midgley et al., 2000). Items were translated into Dutch and were measured on a 5-point scale ranging from 0 (*completely disagree*) to 4 (*completely agree*).

Student-centered (i.e., 'The most rewarding thing of teaching is personal contact with students') and content-centered teaching (i.e., 'My most important job as a teacher is to teach students the content of a certain school subject') were measured using respectively 3 items ($\alpha = .62$) and 5 items (.76) from two subscales from the well-being instrument for teachers (Aelterman, Engels, Van Petegem, & Verhaeghe, 2007). Items were the original Dutch items and were answered on a 7-point scale ranging from 0 (*completely disagree*) to 6 (*completely agree*).

SOCIOCULTURAL GENDER.

Measures for teachers' gender were Dutch translations of (1) the restricted emotionality scale (i.e., 'It's hard for me to talk about my feelings with others') (see Blazina et al., 2005; O'Neil et al., 1986) with 9 items ($\alpha = .93$) answered on a 6-point scale ranging from 0 (completely disagree) to 5 (completely agree), and (2) pressure for gender conformity (i.e., 'I get upset when someone says that I am acting masculine/feminine') from the Adult Gender Identity Scale (Egan & Perry, 2001). The 8 items ($\alpha = .83$) for this scale were answered on a 4-point scale ranging from 0 (completely disagree) to 3 (completely agree).

Data analyses

To address the first two research questions, we conducted *t*-tests and calculated Cohen's *d* in order to obtain information about the significance of the differences in teacher support between male and female teachers. The third and fourth research question were answered by testing the proposed models by means of structural equation modeling in Mplus (Muthén & Muthén, 1998-2012). For the third research question, mediation analyses were performed to examine the explaining role of restricted emotionality and pressure for gender conformity for the sex differences in teacher support. For the fourth research question, multigroup analyses were carried out to test the differential role of restricted emotionality and pressure for gender conformity for male and female teachers' perceptions of their supportive behavior and attitudes.

Item parcels were created of most scales that were used in the models. Because of the large number of items and the restrictions due to sample size, opting for item

parcels is an adequate way to test a measurement model and account for measurement error (Little, Cunningham, Shahar, & Widaman, 2002). Random parceling by means of dividing the even and the odd items into two different parcels was applied in this study for Restricted Emotionality, Pressure for Gender Conformity, Autonomy Support and Structure. Because of the smaller number of items (between 3 and 5 items) for Student-centered Teaching, Content-centered Teaching, Mastery Approach, and Performance Approach, the separate items were used as indicators.

Before testing the mediation models and the multigroup models, we evaluated whether the scales in the measurement model were invariant across teachers' sex. To that end, we tested a model in which the factor loadings and item intercepts for all variables were constrained to be equal for male and female teachers. This model yielded an acceptable model fit ($\chi^2(524) = 1286.527$; RMSEA = .051; CFI = .908), which means that the scales could be considered invariant across teachers' sex.

The FIML option in Mplus was used to account for missing data. This was allowed because our data were MCAR for all items, as confirmed by Little's MCAR test ($\chi^2(40296) = 30538.96$; $p = 1.00$).

We calculated the ICC for each scale and item parcel of the dependent variables in a two-level model in which teachers were situated within schools. We concluded that with $\rho = .00-.05$ for the teacher support variables as dependent variables, there was too little between-group variability to conduct multilevel analyses.

The reference-group method, discussed by Little, Slegers, and Card (2006) and Geiser (2012), was used to identify the latent variables in this model. This method allows to freely estimate the latent means and variances of the latent variables in order to compare several groups. By using this reference-group method, we fixed the variance of the latent constructs to 1.0 and the latent mean to 0.0. In our reference group (i.e., male teachers), the intercepts showed the value of 0.0 and the residual variances had a value of 1.0. Little et al. (2006) discussed the use of this method in the following way: *"This direct estimation approach has an advantage over examining the standardized solution because a researcher can conduct direct tests of any cross-group differences in the strengths of the associations by using nested-model chi-square difference tests"* (p. 67).

Moreover, in this study, we applied the difference test suggested by Cheung and Rensvold (2002) for comparing mediation models and for assessing cross-group differences. They indicated that Chi-square differences should be complemented with differences in CFI and RMSEA, which are not sensitive to sample size. Models fit the

data equally well when at least two of the following requirements are met: $\Delta\chi^2$ non-significant at $p < .050$, $\Delta\text{CFI} < .010$, or $\Delta\text{RMSEA} < .015$ (Cheung & Rensvold, 2002).

Finally, as in the study of Rubie-Davies et al. (2012), arguing on the basis of several reviewed studies that teaching experience is related to teacher beliefs, we decided to control for teaching experience in all analyses.

RESULTS

Sex differences in teachers' perceptions of support, restricted emotionality, and pressure for gender conformity

First, the correlation matrix, displayed in Table 13, shows the interrelations of all teacher support variables and the gender variables for all participants. The correlations among the teacher support variables indicated that mastery approach and student-centered teaching were positively correlated with each other and negatively associated with content-centered teaching. Mastery and performance approach were positively and moderately correlated ($r = .27^{**}$), which proves that the two approaches are not necessarily each other's opposites. Negative relations were found between the sociocultural gender variables and mastery approach, student-centered teaching, autonomy support, and structure. Positive relations were identified with content-centered teaching and performance approach. These interrelations will be further reported on, namely when discussing the mediation model.

Second, it was investigated whether male and female teachers differed in their perceptions of teacher support and in their perceptions of their restricted emotionality and pressure for gender conformity. Table 13 summarizes the t -test results and Cohen's d effect sizes. Female teachers scored higher for structure ($t = -3.23^{**}$; $d = -.23$) and student-centered teaching ($t = -2.08^*$; $d = -.14$), whereas male teachers scored higher for autonomy support ($t = 2.11$; $d = .13$), content-centered teaching ($t = 2.34^*$; $d = .14$), mastery approach ($t = 3.47^{**}$; $d = .23$), and performance approach ($t = 8.48^{***}$; $d = .53$). Cohen's d calculations suggested small effect sizes for most teacher support variables and a medium effect size for performance approach. Male teachers scored higher for both pressure for gender conformity ($t = 7.37^{***}$; $d = .49$) and restricted emotionality ($t = 5.59$; $d = .37$).

Table 13. Correlations between all study variables, means and standard deviations for male and female teachers, *t*-tests and Cohen's *d* effect sizes

Variable	1	2	3	4	5	6	7	8	Male teachers			Female teachers			<i>t</i>	<i>d</i>
									<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>		
1. Mastery approach	-	.27***	.16***	-.09**	.28***	.09**	-.08**	-.04	345	2.19	.71	876	2.03	.71	3.47**	.23
2. Performance approach		-	-.06*	.20***	-.02	-.13***	.07*	.16***	345	1.64	.70	877	1.28	.66	8.48***	.53
3. Student-centered teaching			-	-.17***	.18***	.33***	-.18***	-.12***	346	4.77	.84	878	4.88	.72	-2.08*	-.14
4. Content-centered teaching				-	-.26***	-.13***	.15***	.20***	341	3.30	.81	875	3.19	.76	2.34*	.14
5. Autonomy support					-	.28***	-.17***	-.19***	331	1.60	.32	849	1.56	.28	2.11*	.13
6. Structure						-	-.22***	-.30***	337	2.10	.21	861	2.16	.30	-3.23**	-.23
7. Restricted emotionality							-	.25***	337	1.89	1.00	866	1.54	.89	5.59***	.37
8. Pressure for gender conformity									346	1.25	.51	878	1.02	.43	7.37***	.49

Note. **p* < .05, ***p* < .01, *** *p* < .001.

Overall, small to medium sex differences were found in the teacher support variables and medium sex differences were demonstrated for restricted emotionality and pressure for gender conformity.

The explaining role of restricted emotionality and pressure for gender conformity for sex differences in teacher support

Because (small to medium) sex differences in all teacher support variables were established and because restricted emotionality and pressure for gender conformity were significantly related to teachers' sex and to the teacher support variables, it was interesting to examine whether restricted emotionality and pressure for gender conformity mediated the sex differences in the teacher support variables (see Baron & Kenny, 1986).

To investigate the mediating role of restricted emotionality and pressure for gender conformity, we tested a structural model in which six teacher support variables (i.e., autonomy support, structure, student-centered teaching, content-centered teaching, mastery approach, and performance approach) were entered as dependent latent variables. Both restricted emotionality and pressure for gender conformity were entered as mediators, also as latent variables. The mediating role of restricted emotionality and pressure for gender conformity was examined by comparing three models (see Holmbeck, 1997). Model 1 tested the direct relations between teachers' sex and the teacher support variables. In Model 2, the full mediation model, only the indirect relations between teachers' sex and the teacher support variables, via restricted emotionality and pressure for gender conformity, were included. In Model 3, partial mediation was tested by also including the direct relations between teachers' sex and the teacher support variables. For full mediation, Model 2 and Model 3 needed to fit the data equally well (see criteria of Cheung & Rensvold, 2002; $\Delta\chi^2$ non-significant at $p < .050$, $\Delta CFI < .010$, or $\Delta RMSEA < .015$). The significance of the indirect effects was tested through the Model Indirect command with bootstrapping (bootstrap = 5000). In line with the t -tests, Model 1 (see Figure 8) or the direct effects model ($\chi^2(183) = 730.256$; $p = .00$; $RMSEA = .05$; $CFI = .910$) indicated that sex differences were present in all teacher support variables. When we compared the full mediation model ($\chi^2(279) = 864.655$; $p = .00$; $RMSEA = .047$; $CFI = .914$; see Model 2) with the partial mediation model ($\chi^2(273) = 862.064$; $p = .00$; $RMSEA = .047$; $CFI = .918$; see Model 3), we found that both models fitted the data equally well ($\Delta\chi^2(6) = 2.591$, $p = .86$; $\Delta RMSEA = .000$; $\Delta CFI = .004$). This led us to

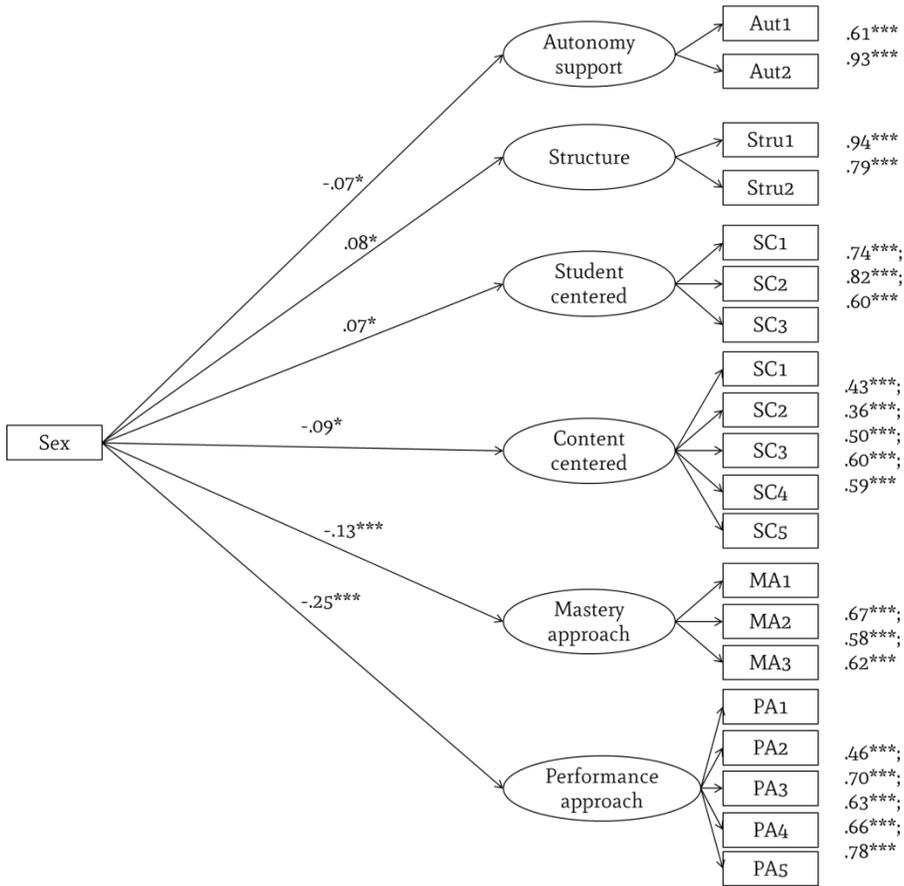


Figure 8. Direct effects model of the relationship between teachers' sex and all teacher support variables. Fit indices: $\chi^2(183) = 730.256, p = .000; RMSEA = .050; CFI = .910$.
Note. * $p < .05$, ** $p < .01$, *** $p < .001$; Male was coded 0, female was coded 1.

the conclusion that full mediation was present and that restricted emotionality and pressure for gender conformity mediated the sex differences in the teacher support variables. Table 14 presents the values and confidence intervals of the standardized total indirect effects and the specific indirect effects through restricted emotionality and pressure for gender conformity. Figure 9 displays the findings from Model 2 with its standardized values for all indicators, intercorrelations, and the indirect effects between sex and each of the teacher support variables. Concerning the specific effects, Model 2 demonstrated that the small indirect effects for structure, student-centered teaching, and content-centered teaching were significant for both restricted emotionality ($\beta = .05***; \beta = .04***; \beta = -.03$ respectively) and pressure for gender conformity ($\beta = .07***; \beta =$

.05***, $\beta = -.10$ ***) respectively as mediators ($\beta = .12$ ***; $\beta = -.09$ ***; $\beta = -.13$ *** for the total effect). The significant indirect relation with performance approach was only mediated by pressure for gender conformity ($\beta = -.13$ ***) and not by restricted emotionality. These results imply that restricted emotionality and pressure for gender conformity may explain why female teachers scored higher for structure and for student-centered teaching and why male teachers scored higher for content-centered teaching. However, for performance approach, only pressure for gender conformity may explain that male teachers scored higher. The fact that male teachers scored higher for autonomy support and mastery approach could not be accounted for by restricted emotionality and pressure for gender conformity. Regarding the relation between the

Table 14. Standardized beta-values for the indirect effects (total and specific for RE and PGC) and confidence intervals for the relationship between teachers' sex and all six teacher support variables

Variable	Total indirect effect		Indirect effect via RE		Indirect effect via PGC	
	β	95% CI	β	95% CI	β	95% CI
Autonomy	.03	[.01;.06]	.02*	[.01;.04]	.01	[-.02;.04]
Structure	.12***	[.10;.15]	.05***	[.04;.07]	.07***	[.04;.10]
Student-centered	.09***	[.06;.12]	.04***	[.02;.05]	.05**	[.03;.08]
Content-centered	-.13***	[-.17;-.10]	-.03**	[-.05;-.02]	-.10***	[-.12;-.07]
Mastery approach	.01	[-.03;.04]	.02	[.00;.03]	-.01	[-.05;.02]
Performance approach	-.13***	[-.16;-.10]	.00	[-.02;.01]	-.13***	[-.06;-.09]

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

sociocultural gender variables and the teacher support variables, Model 2, along with the correlations between the gender variables and the teacher support variables (see Table 13), showed that a significant negative relationship was found between restricted emotionality and autonomy support ($\beta = -.09$ *), structure ($\beta = -.23$ ***), student-centered teaching ($\beta = -.17$ ***), and mastery approach ($\beta = -.08$ *). A significant positive relationship was also noticed with content-centered teaching ($\beta = .14$ ***). Furthermore, a significant negative relationship was demonstrated between pressure for gender conformity and structure ($\beta = -.17$ ***) and between pressure for gender conformity and student-centered teaching ($\beta = -.13$ ***). Finally, pressure for gender conformity was ascertained to positively relate to content-centered teaching ($\beta = .26$ ***) and

performance approach ($\beta = .31^{***}$). These results suggest that the more teachers are able to express their emotions and the less they feel pressed to conform to gender stereotypes, (1) the more they report to adopt dimensions of teacher support that are related to positive student outcomes (i.e., autonomy support, structure, student-centered teaching, mastery approach) and (2) the less they report to adopt dimensions of teacher support that are less related to positive student outcomes (e.g., content-centered teaching and performance approach).

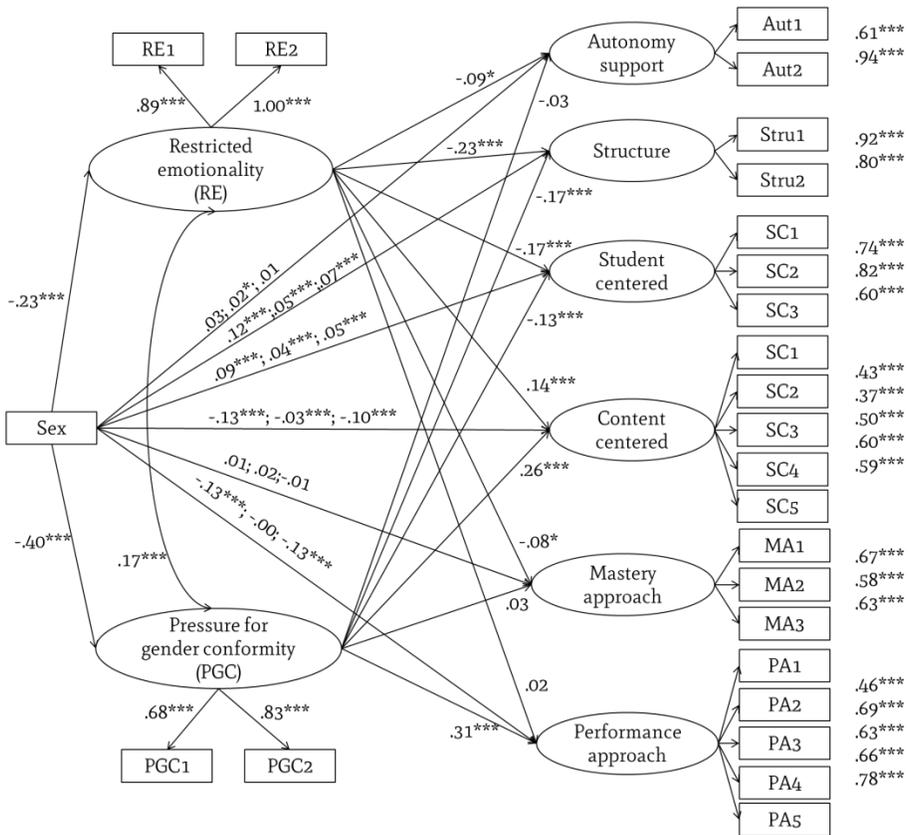


Figure 9. Full mediation model (Model 2) with restricted emotionality and pressure for gender conformity as mediators for the relationship between teachers' sex and teacher support. Fit indices: $\chi^2(263) = 965.318$; $p = .000$; RMSEA = .047; CFI = .921. The paths between sex and the teacher support variables contain three effect sizes for the indirect effects, i.e., total indirect effect; specific indirect effect via RE; specific indirect effect via PGC. Note. * $p < .05$, ** $p < .01$, *** $p < .001$; Male was coded 0, female was coded 1.

Concerning the relationship between the control variable teaching experience and the other variables, we found that teaching experience was only significantly positively related to structure ($\beta = .07^*$) and to student-centered teaching ($\beta = .11^{**}$). Moreover, a small effect indicated that teachers with more teaching experience scored lower for RE ($\beta = -.01^*$).

The role of restricted emotionality and pressure for gender conformity for male and female teachers' teacher support

To test the hypothesis that restricted emotionality and pressure for gender conformity might be differently related to male versus female teachers' support, we conducted multigroup analyses. We tested several models with restricted emotionality and pressure for gender conformity as independent variables and the six teacher support variables as dependent variables.

In order to adequately investigate sex differences in the interplay of all variables in our model, a stepwise procedure was applied. In each step, constraints were added to the model in order to examine whether the tested paths were to be considered equal for both male and female teachers. Each time, the new model was compared to the previous model (see criteria by Cheung & Rensvold, 2002) in order to retain the best fitting and most parsimonious model. When a more parsimonious model is retained, this means that the paths are to be thought of as invariant across teachers' sex. This then would suggest that male and female teachers did not differ concerning the respective paths. Table 15 presents the fit indices of all tested models. Table 16 shows the differences in fit indices between these models. First, a model was tested (Model 1) in which the factor loadings and the item intercepts for all variables were constrained to be equal for both male and female teachers. This first model was based on the measurement model for investigating invariance across teachers' sex for the various scales used in this study. Because this measurement model yielded an acceptable fit ($\chi^2(524)=1286.527$; RMSEA = .051; CFI = .908), we tested a model in which also the structural paths between the gender variables and the teacher support variables were estimated. This model was also found to have an acceptable model fit. Second, we compared this Model 1 to a next model (Model 2) in which all relationships with the control variable teaching experience were fixed. This model fitted the data equally well, thus we continued by testing the difference with Model 3, in which also the correlations between the teacher support variables were fixed. These were also invariant across male and

female teachers, which allowed us to additionally fix the path between restricted emotionality and pressure for gender conformity (Model 4). This yielded an equally

Table 15. Fit indices of the multi-group models with parameters free and constrained for male/female teachers

	χ^2 (df)	p	CFI	RMSEA
Model 1	1354.708 (524)	.000	.902	.051
Model 2	1367.320 (532)	.000	.902	.051
Model 3	1387.061 (547)	.000	.901	.050
Model 4	1391.903 (548)	.000	.901	.050
Model 5	1398.417 (554)	.000	.901	.050
Model 6	1411.667 (560)	.000	.900	.050

Note. Model 1: Factor loadings and item intercepts constrained; Model 2: Factor loadings, item intercepts and relations with control variable ‘teaching experience’ constrained; Model 3: Factor loadings, item intercepts, relations with control variable ‘teaching experience’, and covariances between dependent variables constrained; Model 4: Factor loadings, item intercepts, relations with control variable ‘teaching experience’, covariances between dependent variables, and covariances between independent variables constrained; Model 5: Factor loadings, item intercepts, relations with control variable ‘teaching experience’, covariances between dependent variables, covariances between independent variables and relations between restricted emotionality and all teacher support dimensions constrained; Model 6: Factor loadings, item intercepts, relations with control variable ‘teaching experience’, covariances between dependent variables, covariances between independent variables, relations between restricted emotionality and all teacher support dimensions and relations between pressure for gender conformity and all teacher support dimensions constrained (= all paths constrained).

Table 16. Differences in fit indices for the free and constrained models

	$\Delta\chi^2$	p	Δ CFI	Δ RMSEA	
Model 2 - Model 1	12.612 (8)	.1259	.000	.002	Model 2 \approx Model 1
Model 3 - Model 2	19.741 (15)	.1820	.001	.001	Model 2 \approx Model 3
Model 4 - Model 3	4.842 (1)	.0277	.000	.000	Model 4 \approx Model 3
Model 5 - Model 4	6.514 (6)	.3681	.000	.000	Model 5 \approx Model 4
Model 6 - Model 5	13.25 (6)	.0392	.001	.000	Model 6 \approx Model 5

fitting model after which we constrained the paths between restricted emotionality and all teacher support variables (Model 5). Finally, the paths between pressure for gender conformity and all teacher support variables were constrained in addition (Model 6). Again, these equality constraints did not result in a loss of model fit. Figure 10 presents the final model and its relationships between the gender variables and the teacher support variables for both male and female teachers.

Thus, following this procedure, we found that the model testing the relationship between the gender variables and the six teacher support variables was invariant across sex. In other words, for both male and female teachers, no significant differences were discovered for the relationship between being able to express their emotions and teacher support and between feeling pressed to conform to gender stereotypes and teacher support.

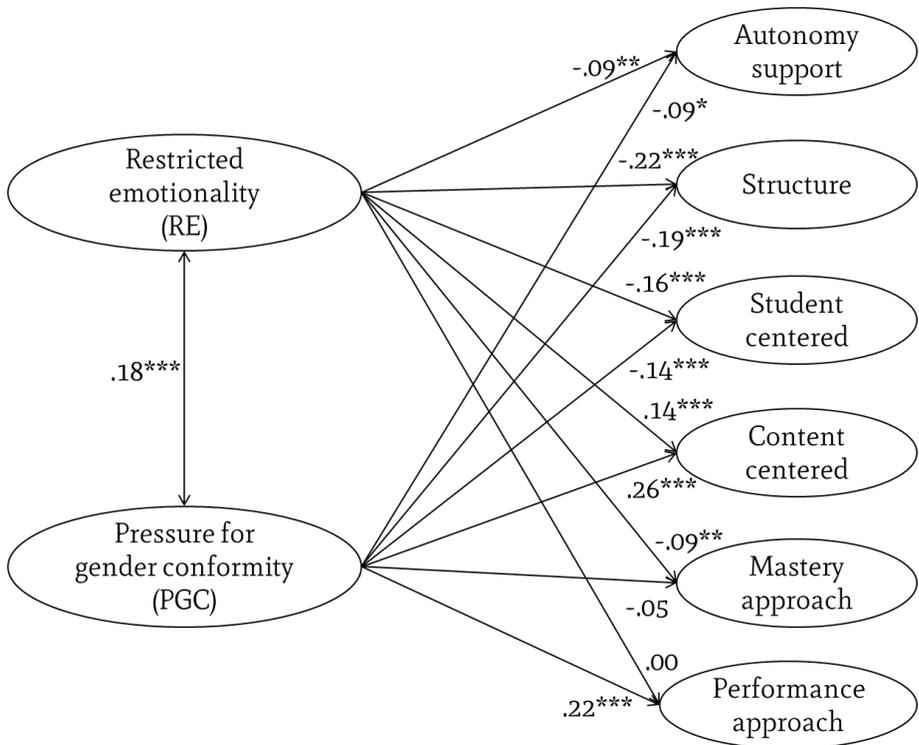


Figure 10. Relationships between gender variables (restricted emotionality and pressure for gender conformity) and teacher support variables, invariant across male and female teachers. Fit indices: $\chi^2(560) = 1411.667$; $p = .000$; RMSEA = .050; CFI = .900.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

DISCUSSION

The purpose of the current study was to identify sex differences in several dimensions of teachers' supportive behavior and attitudes and to clarify the role of two sociocultural gender aspects (i.e., restricted emotionality and pressure for gender conformity) for these teacher support dimensions.

Sex differences

It was demonstrated that male and female teachers reported to provide different kinds of support to students. These sex differences were fairly small, yet significant. Interestingly, there seems to be no such thing as 'the better sex'. Male and female teachers each scored higher for different aspects of teacher support. Male teachers generally reported to be more autonomy supportive and more goal oriented in general (mastery and performance oriented) whereas female teachers rated themselves higher for providing structure and taking a student-centered teaching approach. Male teachers indicated to take a more content-centered teaching approach. This is partly in line with Rubie-Davies et al.'s (2012) findings that female teachers scored higher for student-centered teaching and male teachers for performance approach. Yet, Rubie-Davies et al. (2012) discovered, as opposed to the current study, that female teachers felt to adopt a mastery approach more often. Not in line with these findings either are the results of Opdenakker and Van Damme (2006), who identified no sex differences in student- and content-centered teaching. Additionally, the results of the present study confirm our hypotheses concerning male teachers scoring higher for autonomy support and female teachers for structure, based on the research of Opdenakker et al. (2012), Van Houtte (2007), and Lam et al. (2010).

These sex differences suggest the possible value of recruiting both male and female teachers, as they each report to bring different elements of positive teacher support to the classroom. Yet, today, still more women choose for the job of teaching. Also, it is often disapproved of when schools select a male or a female applicant only based on his/her sex because this can be seen as an unfair and unacceptable practice.

The mediating role of sociocultural gender aspects for sex differences in teacher support

Thus, whereas sex is generally a fixed, dichotomous entity, sociocultural aspects of gender are more malleable. This would yield possibilities for useful practical implications concerning gender differences in teaching staff. Because of the lack of previous research on this role of gender as a sociocultural construct for teachers' supportive behavior, this study aimed to examine whether two sociocultural aspects of gender (i.e., restricted emotionality and pressure for gender conformity) explain the sex differences encountered in male and female teachers' support. In doing so, our study not only contributes to research on the antecedents of teacher support, but equally, and maybe even more importantly, to research on the nature and role of teachers' gender. We discovered that both sociocultural aspects of teachers' gender, i.e., restricted emotionality and pressure for gender conformity, might explain why female teachers scored higher for structure and student-centered teaching and why male teachers indicated to take a more content-centered approach. Only pressure for gender conformity might explain why male teachers scored higher for performance approach. For autonomy support and mastery approach, other elements than the investigated gender variables might play a role in the fact that male teachers scored higher. In other words, the effects of sex was still relevant for autonomy support and mastery approach, whereas for structure, student-centered teaching, content-centered teaching, and performance approach, differences between male and female teachers disappeared when we took into account teachers' ability to express emotions and the pressure they feel to conform to gender stereotypes.

The role of restricted emotionality and pressure for gender conformity for teacher support

Notable results were also demonstrated for the relationship between the sociocultural gender variables and the teacher support variables. The less teachers could express their emotions, the more they were likely to report a content-centered teaching approach and a performance approach. Furthermore, the more teachers found it difficult to express their emotions, the less likely they declared to provide structure and autonomy support and to apply a mastery approach and a student-centered approach to teaching. These four teacher support aspects, i.e., autonomy support, structure, mastery approach, and student-centered teaching, have been proved to enhance students'

motivation and well-being and are thus associated with teachers' positive professional functioning (Stroet et al., 2013; Roeser et al., 2002; Cornelius-White, 2007). Restricted emotionality and pressure for gender conformity both have been found to have a negative impact on teachers' professional functioning. This might explain the positive relationship in the current study between restricted emotionality and pressure for gender conformity on the one hand and content-centered teaching and performance approach on the other hand. Both content-centered teaching and performance approach entail elements that create a certain distance between teacher and student, for which emotions are less needed than for the other teacher support dimensions. For content-centered teaching, a teacher specifically focuses on the content and the curriculum to be learned, and not on the student he/she is interacting with. When a teacher emphasizes displaying competencies among students and thus adopts a performance approach, there is not much attention to, preceding this outer display, the process of what a student is capable of. Yet, it is in this process that emotional interactions between teacher and student are highly required.

We also demonstrated a significant relationship between pressure for gender conformity and teacher support. The more teachers feel pressed to conform to their own sex, the more they reported to adopt a content-centered approach and a performance approach, whereas the lesser they reported to provide structure and to have a student-centered approach to teaching. Both content-centered teaching and a performance approach mainly focus on elements external to the actual teacher-student relationship such as the subject matter and the showing of competencies to others. Because experiencing pressure for gender conformity entails an awareness of and a possible adaptation to one's social environment, a high level of pressure for gender conformity might explain why teachers become more oriented toward elements external to the teacher-student relationship rather than towards their actual interactions with students.

In addition, we could evidence that the associations between restricted emotionality and pressure for gender conformity on the one hand and the teacher support variables on the other hand were not significantly different for male versus female teachers.

These results generate useful implications for schools and teacher educators. Not being able to be authentic is at the core of feeling restricted to express emotions (inside and outside the classroom) and of feeling pressed to conform to certain social norms (i.e., the socially constructed idea of what is male or female behavior) (O'Neil et al.

1986; Mills et al., 2008). Moreover, Tiedemann (2002) found that teachers' gender stereotypes color their beliefs about students' efforts and ability. Thus, a school climate that tries to counter these stereotypes seems to improve chances of having teachers who believe they are more supportive and eventually of providing adequate teacher support for all students.

Schools might reflect on why teachers feel to be or not to be able to express emotions or why they might feel compelled to conform to gender expectations. We suggest three issues that could be relevant to consider. First, possibly, teachers in particular might feel these societal expectations to create more stress for them than for other employees, because in the teaching job, their whole personality serves as an example for students. From this perspective, they might have more trouble expressing their emotions because emotionality might be seen as unprofessional and they might feel more pressure to conform to gender stereotypes that characterize our society. For example, a female teacher might feel pressured to act feminine because of students' and parents' images of being a female (teacher). Second, concerning emotionality, our current society knows a contradiction between showing emotions as a weakness in one's personality and showing emotions as an asset indicating a person's empathy. This ambiguity could hamper teachers' expression of emotions. The latter, however, is an element indispensable for teachers' professional functioning. O'Connor (2008) suggested to value this showing of emotions in professional contexts such as education. Third, there might be differences between schools regarding the emotionality and pressure for gender conformity of teachers. If so, what aspects of the school climate affect teachers' beliefs?

Accordingly, schools and teacher education programs should attend to these issues: (1) helping teachers to deal with societal expectations about conforming to gender stereotypes and with expectations of teachers as a role model; (2) acknowledging that emotions are necessary for showing empathy towards students and promoting the expression of emotions as a positive part of professional functioning; (3) discussing with other schools how the school climate might affect teachers' beliefs (about emotionality and gender stereotypes).

A possible explanation for finding no significant differences between male and female teachers in the relationship between the gender variables and teacher support, might be that the teaching profession attracts people, either male or female, with a particular profile. Because teaching is still considered to be a 'feminine job', the

male teachers choosing for the job might not be the very “typical” males. Unfortunately, when hiring more men in education, it is often expected they would bring a certain typical masculinity to the job. Counting on male teachers to be typical for all men in general might enhance their felt pressure for gender conformity and could inhibit their (professional) identity because this personal identity is not necessarily in line with hegemonic characteristics of masculinity (Mills et al., 2008).

Limitations and future research

A few limitations of this study should also be acknowledged. First, we used measures of teachers’ self-reported teacher support. These self-reports might be a reflection of teachers’ actual supportive behaviors and attitudes in class, but they might also be a representation of what male and female teachers perceive as desirable teacher support. Future research should complement the findings of the present study with findings from for example videotaped episodes of teaching, transcripts of teacher-student interactions, and student-reported teacher support. This would allow us to confirm and substantiate our conclusions about classroom practices with more concrete examples.

Second, the kind of courses, and whether they are perceived by teachers and students as more masculine or feminine, might also play a role for sex differences in teacher support. Unfortunately, we did not have sufficient information on the subjects taught by each teacher. It might be interesting for future research to compare the relationship between teachers’ sex and teacher support for subjects that are considered to be masculine and feminine.

Third, we were not able to link this teacher data to student outcome variables. Estimating the effects of these teacher support variables, and the sex differences herein, on students’ motivation and achievement should also yield noteworthy conclusions.

Fourth, due to the correlational nature of this study, we were not able to test the directionality of the relationships between the gender variables and the teacher support variables. Future research should clarify these causal relations. For example, we might also suggest testing a model in which pressure for gender conformity precedes restricted emotionality. Previous literature has associated emotionality with femininity. Hence, when men feel pressure to conform to a masculine gender stereotype, they might therefore refrain from expressing their emotions. When women feel pressure to conform to a feminine gender stereotype, this might result in a higher emotional expression. This

possible interplay between both gender variables should thus be further investigated, preferably in longitudinal designs.

Fifth, in this study, the affective relationship between teacher and students, which has also been proved effective for student outcomes (see Roorda et al., 2011), has only been emphasized in the student-centered approach to teaching. Therefore, in addition to the current three perspectives on teacher support, the interpersonal perspective that combines attachment theory with social-motivational theory (Wubbels & Brekelmans, 2005; Zijlstra, Wubbels, Brekelmans, & Koomen, 2013), could add useful insights. Especially for affiliation (i.e., proximity, warmth and supportive emotional interaction with the student), gender differences could be interesting to investigate in addition to the current teacher support dimensions.

Finally, future research should concentrate on why male teachers feel more pressured to conform to the male stereotype than female teachers feel pressured to conform to the female stereotype (e.g., due to ideas about social roles of men and women) and on how to reduce this pressure for especially men, but also for women. Future research should examine other aspects of gender in relation to teacher support. For example, now, emotionality, which has been thought of as a feminine trait, was taken into account. Additional analyses should reveal the potential effects of elements that are socially more associated with masculinity, such as the urge for competition (see masculine traits in Schneider & Coutts, 1979). For example, male teachers' higher scores for performance approach might be related to the element of competition because the outer display of what someone is capable of and the focus on presenting oneself in comparison to others can be seen as part of a competitive attitude.

CONCLUSION

Male and female teachers each seemed to apply different kinds of teacher support that have been proved to benefit student outcomes. Male teachers reported to be more autonomy supportive and to adopt a mastery approach to teaching, whereas female teachers indicated to provide more structure and to be more student-centered. These findings demonstrate the value of recruiting both male and female teachers. Yet, schools need to be careful in concluding to employ more male teachers in order to establish a better balance in supportive teaching styles within the staff. In addition to the sex differences in teacher support, this study also discovered that two sociocultural

gender elements (i.e., being able to express emotions and feeling pressure for gender conformity) might explain the sex differences in several dimensions of teacher support. Additionally, both for male and female teachers, being able to express emotions and not feeling pressured to conform to a certain stereotype of one's own sex are positively related to several teacher support dimensions (i.e., autonomy support, structure, student-centered teaching, and mastery approach) that appeared to be beneficial for several student outcomes (e.g., motivation and achievement). Feeling pressure for gender conformity and feeling restricted in expressing emotions also seem to relate to content-centered teaching and a performance-oriented approach, both of which have been proved to negatively affect student motivation and achievement. Schools that aim for their staff to demonstrate positive supportive behaviors toward students should attend to constructing a school climate that stimulates all teachers, men and women, to express their emotions and that does not pressure them to be a masculine male or feminine female teacher.

GENERAL DISCUSSION

The purpose of this dissertation was to address the gender gap in secondary school students' engagement and in students' and teachers' perceptions of teacher support. Student engagement is a highly relevant variable that predicts school outcomes such as achievement and dropout. Boys are generally less engaged than girls at school and during classes. Fortunately, engagement has been found to be a malleable construct, which implies it can be enhanced by targeting various predictors. One of the most important predictors appears to be teacher support. Boys also generally report their teachers to be less supportive than girls do. This dissertation investigated, in a first study, the gender gap in student engagement by means of a literature review in order to find patterns in boys' and girls' behavioral, emotional, and cognitive engagement at the general school level, the subject level, and the activity level. Additionally, several gaps in research on gender differences in student engagement were discussed. A second study examined students' engagement in Dutch language classes based on three perspectives (student, teacher, and observer report) and the role of students' perceptions of teacher support (autonomy support, structure, and involvement) for boys' and girls' engagement. It was investigated whether teacher support was able to explain sex differences in student engagement and whether it could play a protective role for boys' as opposed to girls' engagement. In a third study, differences were explored in boys' and girls' perceptions of their actual teachers' supportive behavior and of hypothetical teachers in several scenarios. Students' assessments of their actual teachers aimed to replicate previous findings indicating that boys generally perceive their teachers to be less supportive than girls do. Additionally, by letting students evaluate the scenarios, this study intended to discover perception differences between boys and girls about teachers' supportive behavior, ruling out the effect of possible differences in teachers' actual behavior. After all, boys and girls might have different views on how supportive their teachers are and on what constitutes good teacher support. A final study investigated differences between male and female teachers' supportive behavior for several teacher support dimensions and examined the role of two sociocultural gender variables: (1) the ability to express emotions and (2) feelings of pressure to conform to gender stereotypes. In doing so, this study aspired to broaden insights into sex differences in teachers' supportive behavior towards students. By including the role of two sociocultural gender variables for these sex differences in teacher support, this study aimed to nuance the debate about the recruitment of male versus female teachers.

The present concluding section first provides an overview of and discussion on the findings of the four studies in this dissertation. Next, implications for educational practice and research are formulated. Finally, the limitations of the present research are framed.

OVERVIEW

Chapter 1, the review study that aimed to unravel sex differences in student engagement, brought to light that the most consistent sex differences were found for behavioral engagement, more specifically for classroom participation. For this dimension and subdimension of student engagement, girls almost consistently scored higher than boys. For emotional and cognitive engagement, either girls generally scored higher, or no sex differences were found at all. Moreover, the study revealed that for subject specific engagement, less manifest sex differences could be discovered than for the school level measures of engagement, on which girls generally scored higher. The study also demonstrated that little research has investigated sex differences in the various (sub)dimensions of student engagement and that school level measures were used more often than subject and activity specific measures. Additionally, student-reported data were most commonly applied, whereas, for example, observer and teacher report were scarcely used. Furthermore, most studies examined sex differences and did not pay attention to sociocultural gender differences. Finally, the relationships between the various dimensions of engagement should be further explored (for instance, the possible predicting role of emotional engagement for behavioral engagement, see Skinner et al., 2008).

Chapter 2 aimed to address several of the shortcomings discovered in study 1 by investigating sex differences in student, teacher, and observer report of engagement and by investigating the dimension of behavioral engagement, specifically for Dutch language classes (subject specific measure). Additionally, sex differences in the relationship between students' perceptions of three teacher support dimensions (autonomy support, structure, involvement) and engagement were tested. The study revealed that, from all three perspectives, boys were less engaged than girls for Dutch language classes. Boys also reported their Dutch language teacher to be less supportive than girls did. Moreover, autonomy support and involvement partially mediated the sex

differences in behavioral engagement. The most notable finding was that autonomy support was related to boys', but not to girls' engagement and thus, that this autonomy support could function as a protective factor for boys' engagement. Structure and involvement were equally related to boys' and girls' engagement.

The purpose of *Chapter 3* was to more profoundly investigate students' perceptions of teacher support. These perceptions (used in Chapter 2) might be a reflection of teachers' actual supportive behavior where teachers might be less supportive towards boys than towards girls. Yet, these sex differences in students' perceptions of teacher support might also reflect differences in how boys and girls perceive (similar) classroom situations. Chapter 3 aimed to present boys and girls with the same scenarios (vignettes), i.e., the same teacher behavior, in order to detect perception differences between boys and girls. The sex of the teacher was not mentioned in these descriptions. Four vignettes that each described a classroom situation were administered: A high and a low autonomy supportive scenario and a high and a low structuring scenario. In each class, half of the students assessed the high autonomy supportive and low structuring vignette and the other half assessed the low autonomy supportive and high structuring vignette. It was found that, in addition to boys' lower perceptions of their actual teachers' autonomy support and structure, sex differences in boys' and girls' perceptions were present for two of the four vignettes. For the low structuring situation, boys were less negative about the teachers' behavior than girls, whereas for the high autonomy supportive situation, girls were more positive about the teachers' behavior than boys. As an explanation for these findings, we suggested that the perceptions of the scenarios might differ according to what teacher behavior boys and girls consider to be important. Because no sex differences were found in two of the situations (i.e., high structure and low autonomy support), the hypothesis that sex differences in student ratings of their (actual) teachers' behavior are indicative of differences in teachers' interactive behavior towards boys and girls remains a plausible explanation.

Discussing boys' and girls' perceptions of teacher support could raise questions about differences between male and female teachers and their supportive behavior in class. Therefore, *Chapter 4* aimed to investigate sex differences in teachers' supportive behavior in class. Additionally, two sociocultural gender variables were

introduced in order to nuance and explain the possible differences between male and female teachers. Remarkable findings were that male teachers reported to give more autonomy support, whereas female teachers indicated to provide more structure for students. Additionally, male teachers found they were more focused on the learning content whereas female teachers reported to be more student-centered. Male teachers were also more goal-oriented, resulting in their higher perceptions of their mastery approach and performance approach. In addition, mediation analyses revealed that these sex differences in several teacher support dimensions could be explained by teachers' (self-reported) restricted emotionality (i.e., difficulty to express emotions) and pressure for gender conformity (i.e., feeling pressured to conform to stereotypical ideas about one's own sex). Both of these sociocultural gender variables were negatively related to dimensions of teacher support that were most beneficial for student outcomes (i.e., autonomy support, structure, student-centered teaching, mastery approach). This was the case for both male and female teachers. Thus, the better teachers were able to express their emotions and the less they felt pressured to conform to male or female gender stereotypes, the higher they scored themselves for the most beneficial teacher support dimensions.

DISCUSSION

Boys' and girls' engagement

Chapter 1 reviewed previous research on student engagement and found that, especially for classroom participation (i.e., effort, persistence, concentration, attention, asking questions, discussing; Fredricks et al., 2004) - a subdimension of behavioral engagement - a gender gap was present, with boys generally showing lower engagement than girls. For the other dimensions, the gap seemed less manifest. In some of the retrieved studies, girls even scored higher for emotional and cognitive engagement. A remarkable finding was that studies using subject specific measures of engagement seemed to find less sex differences for these various subjects. This contradicts the review study of Meece et al. (2006), which found that girls were more engaged for languages whereas boys were more engaged for mathematics. Based on this study of Meece et al. (2006) and based on the suggestion we made in Chapter 1 to investigate engagement more specifically for each course, in Chapter 2, we examined students' engagement for

Dutch language classes. In line with the findings for classroom participation in Chapter 1, girls' higher classroom participation was confirmed through not only student report, but also teacher report and observer report. Referring to both Chapters 1 and 2, we can conclude that, at least for language, girls showed higher engagement than boys, especially when considering students' classroom participation. In Chapter 2, we formulated an explanation for the gender gap in student engagement, based on previous research. It was suggested that girls might also score higher for the antecedents of student engagement, such as motivation. These antecedents can be categorized under the personal facilitators in the self-system processes model (Wellborn et al., 1990; see Figure 1 in the General Introduction) and thus can be considered as factors that precede engagement (Skinner & Pitzer, 2012). As we argued in Chapter 2, these facilitators, or the underlying reasons for being engaged, can differ for each student. For instance, although girls tend to be more engaged than boys, the reasons for their engagement may be based on autonomous motivation (i.e., doing an activity by choice or out of willingness), but also on controlled motivation (i.e., doing an activity because of external or internal pressure) (Deci & Ryan, 2008). Future research should investigate this role of motivation for boys' and girls' (behavioral) engagement.

Boys' and girls' perceptions of teacher support

This dissertation aimed to examine the role of teacher support as a facilitator of student engagement. To this end, Chapter 2 investigated elements of teacher support that might bridge the gender gap in student engagement. Chapters 3 and 4 yielded additional information about boys' and girls' and male and female teachers' perceptions of teacher support.

AUTONOMY SUPPORT

The most notable findings throughout this dissertation concern the teacher support dimension of autonomy support. We discovered in Chapter 2 (specifically for Dutch language) and in Chapter 3 (in general) that boys considered their teachers to be less autonomy supportive than girls did. Additionally in Chapter 2, it was found that autonomy support was related to boys' engagement, but not to girls'. This implies that, in order to be engaged in class, boys may benefit more than girls from the provision of choice, the indication of relevance, being treated with respect by teachers, and the use of informative instead of controlling language. Moreover, Chapter 3 revealed that for the

same description of a high autonomy supportive situation, boys reported the teacher to be less supportive than girls did. These results thus suggest that boys seem to set the bar for autonomy support higher than girls and that girls seem to be more easily satisfied with a lower autonomy support. Additionally, Chapter 2 found that for boys, autonomy support might be especially important for their engagement in class. The combination of these findings could be rather alarming because boys may expect more autonomy support from their teachers than girls, whereas, simultaneously, boys' engagement seems to profit more from this autonomy support than girls'.

STRUCTURE

Chapters 2 and 3 demonstrated that boys considered their teachers to provide less structure than girls did. Chapter 2 indicated that structure is related to both boys' and girls' engagement. In Chapter 3, it was found that boys appeared to evaluate the low structuring scenario less negatively. We investigated the content of the vignette and discovered this vignette was an example of low structuring support towards an individual student. The teacher intended to proceed with the lesson for the sake of the entire classroom. We interpreted this as low structuring because the specific student in the situation did not receive enough support. Yet, boys, as opposed to girls, experienced this behavior as more positive, possibly because they find interventions for the whole classroom to be more useful than girls do (see findings of Suldo et al., 2009). Different elements of structure may thus be evaluated in a different way by boys and girls.

INVOLVEMENT

Following Thijs and Verkuyten (2009), we may expect girls to consider teacher involvement to be more important. Roorda et al. (2011), on the other hand, found affective teacher-student relationships (related to involvement) to be more important for boys' engagement. Chapter 2 of this dissertation established involvement to be equally related to boys' and girls' engagement. Hence, our data indicated that teacher involvement will not reduce the gender gap in student engagement.

TEACHERS' ACTUAL SUPPORTIVE BEHAVIOR?

Based on the absence of sex differences for two of the four vignettes in Chapter 3 and boys' lower perceptions of their actual teachers, found in both Chapter 2 and Chapter 3, we cannot rule out that teachers are in fact less autonomy supportive and structuring towards boys. However, we want to argue not to dismiss this hypothesis, as in

previous literature on teacher-student interactions, it has been confirmed that teachers, for example, give more negative feedback to boys and more praise to girls (Consuegra & Engels, forthcoming; Nicaise et al., 2007; Younger et al., 1999).

A match between male teachers and boys and between female teachers and girls?

A clear-cut answer to the question if male teachers are better for boys and female teachers for girls requires investigating the combination of boys' and girls' engagement, motivation, or achievement and their male and female teachers' supportive behavior. This dissertation was not able to explore this combination, yet the findings in Chapters 2, 3, and 4 might help to understand the issue.

In Chapter 4, male teachers reported to provide more autonomy support than female teachers did. In Chapter 2, autonomy support (as reported by students) was found to relate especially to boys' engagement and Chapter 3 discovered that boys considered the same high autonomy supportive behavior to be less supportive than girls did. Aligning these results, it may be hypothesized that men might be better teachers for boys. After all, if male teachers indeed provide more autonomy support and boys are more in need of this autonomy support for their engagement and set the bar for what constitutes autonomy support higher than girls, male teachers and boys might make a better match.

Additionally, in Chapter 4, female teachers considered themselves to be more student-centered, whereas male teachers reported to focus more on the learning content (content-centered). This element of focusing on students' needs versus focusing on the learning material is recognizable in the low structuring scenario that was presented to the students and discussed in Chapter 4. For this vignette, boys scored the teacher, who was in fact low structuring, higher than girls did. In this example, the interpersonal relationship with a student was disregarded in order for the teacher to continue with the planned lesson for the entire class. We found an explanation in previous research indicating that girls perceive this interpersonal relationship to be more important whereas boys find responsiveness towards the entire class more important (Suldo et al., 2009; Thijs & Verkuyten, 2009). Thus, the approach the teacher displayed in the vignette could be considered as rather content-centered and less student-centered. Based on these findings, it may be (tentatively) suggested that there is also a match between the more student-centered approach of female teachers and the need of girls for a more

interpersonal, individual approach. Additionally, the match between the more content-centered approach of male teachers and boys' indicated preference for a more whole class approach focusing on the learning goals (see Suldo et al., 2009) could also be hypothesized.

Nevertheless, the additional findings in Chapter 4 also nuance these hypothesized matches. We found that both restricted emotionality and pressure for gender conformity mediated the sex differences foremost in structure, student- and content-centered teaching, and in teachers' performance approach. The fact that male teachers scored higher for content-centered teaching and performance approach and that female teachers scored higher for student-centered teaching and structure might thus be explained by the fact that male teachers showed higher pressure for gender conformity and found it more difficult to express emotions. Additionally, the multigroup analyses indicated that for both male and female teachers, expressing emotions and not feeling pressured to conform to gender stereotypes are related to their higher perceptions of positive teacher support. Hence, both expressing and understanding emotions and the absence of pressure to conform to gender stereotypes might nuance the sex differences in several teacher support variables.

Yet, in order to confirm or counter these matches between male teachers and boys and female teachers and girls, more research is needed that actually links the supportive behavior of male and female teachers and the classroom behavior and perceptions of male and female students.

SUGGESTIONS FOR EDUCATIONAL PRACTICE

After considering all studies in this dissertation and their merits for educational practice, it seemed useful to reflect upon several questions that were relevant throughout the writing process and that emerged again while discussing this work.

Are we closer to bridging the gender gap?

The studies in this dissertation showed a gender gap in student engagement and in students' perceptions of teacher support. Boys were generally less engaged in

class (specifically in Dutch language classes) and perceived their teachers to be less supportive than girls did.

Based on Chapter 2, we know that teacher support, and more specifically autonomy support, has the potential to bridge the gender gap in student engagement. Indeed, autonomy support has been proved to relate to especially boys' engagement. Moreover, Chapter 2 indicated that boys' lower perceptions of teacher support might explain their lower levels of engagement. Focusing on the gender gap in students' perceptions of teacher support can thus be a first step in bridging the gender gap in student engagement. Two practical suggestions for addressing the sex differences in perceptions of teacher support can be formulated.

First, it needs to be *evaluated whether enough autonomy support is provided for students*. To this end, specific observation of boys (and actually of all students) in class may be interesting to detect whether, for example, they are provided with enough choice. Combining this with additional interviews with students about their feelings concerning autonomy support, it can become clear how we can adapt the autonomy supportive behavior to boys' needs. These observations and interviews could for example confirm the research of Williams et al. (2002) highlighted in Chapter 2. The authors suggest that girls are more likely to put effort into boring tasks than boys, which might explain the differential effect of autonomy support for boys' and girls' engagement. For boys, apparently, the initial task needs to be appealing. Possibly, they assume the teacher to guarantee the task to be interesting, for instance by providing them choices and freedom in the task or by indicating its relevance. Hence, to make a task interesting, taking into account several subdimensions of autonomy support is important. We suggest that possibly, for boys, it may be more useful than for girls to re-evaluate the content of a task and determine whether enough interesting aspects are present for each student. This can be ensured by indicating why students need to do the specific task and by providing choices within the task or letting students choose one out of various tasks. For example, Graham et al. (2008) discovered that when students were able to choose a reading text, boys did no longer show less interest in language learning than girls. In any case, we suggest that autonomy support deserves a more prominent place in secondary education. Self-determination theory can provide a comprehensive framework for improving autonomy supportive practices.

Second, *profound reflection upon the content of the various subdimensions of autonomy support, structure, and involvement* could generate more insight in the gender

gap in teacher support. This dissertation might function as a starting point for further unravelling this complex matter. For example, findings in Chapter 3 suggested that sex differences may appear in perceptions of the personal relationship versus the classroom approach when providing structure, where girls possibly prefer the first and boys the second approach. Thus, additional investigation is needed concerning which elements within the teacher support dimensions are sensitive to sex differences. Educational practice could take part in this investigation by observing students and questioning them about their perceptions of the classroom situation and more specifically the supportive behavior of the teacher. This should provide teachers with adequate information on how to approach each student (not only the group of boys or the group of girls) in order for each student to be engaged. Teacher training should also raise awareness of these (sub)dimensions of teacher support and how they affect student engagement. Subsequently, student teachers should be able to prepare their lessons with these (sub)dimensions in mind. By way of exercise, student teachers could evaluate teacher support in video-taped lessons by, for example, classifying situations into the teacher support dimensions and subdimensions. Afterwards, they should be able to prepare their lessons bearing in mind the teacher support (sub)dimensions. Of course, not all supportive behavior can be prepared in advance, yet the reflection upon these dimensions might help student teachers to automatize some of the supportive behavior that needs to be exerted in class.

To conclude, based on Chapter 2, we want to stress the importance of both structure and involvement for boys' and girls' engagement and the potential protective role of autonomy support for boys' engagement. Teachers should thus continue to reflect upon their own teaching behavior and evaluate the autonomy support, structure, and involvement they provide for their students.

What about the teachers' actual behavior towards boys and girls?

Several findings in this dissertation suggested that we cannot dismiss the hypothesis that teachers might in fact be less supportive towards boys. Teachers should be made aware of the fact that they possibly perceive boys and girls differently and that they may thus be less supportive towards either one or the other group. After all, Consuegra, Engels, and Willegems (in press) found, based on video-stimulated recall interviews, that teachers often commented more negatively upon boys than upon girls.

Additionally, it has been established that teachers give more negative feedback to boys than to girls (Consuegra & Engels, forthcoming; Nicaise et al., 2007; Younger et al., 1999).

Do we need more men in our schools?

Chapter 4 concluded that it is valuable to recruit both male and female teachers in schools because in general, they each score higher for different dimensions of teacher support. Nevertheless, the expression of emotions and the absence of pressure to conform to gender stereotypes might nuance these sex differences, for both male and female teachers. We could suggest, based on Chapter 4, that neither specifically men nor women are needed when a school wants to pursue good teacher support. Our findings seem to indicate that for both male and female teachers, expressing emotions and not feeling pressured to conform to gender stereotypes are related to positive teacher support. Additionally, we discovered that sex differences in these two sociocultural gender variables might explain the sex differences in some teacher support dimensions. The findings that female teachers reported to be better at expressing emotions and that male teachers felt more pressure for gender conformity might explain female teachers' higher scores for structure and student-centered teaching and male teachers to score higher for content-centered teaching and performance approach. On the one hand, this is a relief in the sense that a good teacher does not need to be either a man or a woman and that characteristics that are in fact malleable, also matter and have the potential to explain the sex differences in their perceptions of support. On the other hand, male teachers seem to have more trouble expressing emotions and they appear to feel more pressured to conform to the male stereotype than female teachers feel to conform to the female stereotype. Hence, further investigation of what underlies these sex differences in restricted emotionality and pressure for gender conformity is essential. Moreover, emotionality and the absence of pressure for gender conformity need to be maintained in school teams, which can be a challenge because this calls for an open atmosphere in the entire school. The reflective questions we formulated in Chapter 4 are highly relevant for maintaining this openness.

How to handle boys and girls?

What is the best teacher support for boys? And how do we need to handle girls? Those questions often pop up in practice when introducing the theme of teacher

support and sex differences among students. Unfortunately, we are not able to provide golden tips and tricks for each of the sexes. On the contrary, as Heemskerk et al. (2012) indicated in their report on interviews with boys concerning classroom approaches, we need to be careful not to confirm gender stereotypical thinking of teachers. The latter could widen the gender gap in both students' perceptions of teacher support and in engagement. Tips on how to specifically handle boys versus girls might enhance these stereotypes. Therefore, we suggest that teachers should know that boys appear to be less engaged during (language) classes, specifically participate less in class and that they have lower (see Chapter 2 and 3) and possibly different (see Chapter 3) perceptions of teacher support than girls. Yet, teachers should also be aware that their supportive behavior is necessary for each student, no matter the sex. Subsequently, teachers should evaluate which kind of support has been effective for which student. Teachers might thus reflect upon several questions: 'Are the boys in my class less engaged than the girls? Do these boys consider me, as a teacher, to be less supportive? Do I provide choices during my lessons (i.e., autonomy support)? Do I give students constructive feedback (i.e., provision of structure)? Which students may have a higher need to hear the relevance of this specific task (i.e., autonomy support)?'. The vignettes that were used in Chapter 3 could also be used to this purpose, such that teachers first reflect upon a hypothetical situation and then upon their own practice. Observations of their own lessons by means of video-tapes or having colleagues observe some of their lessons may help teachers to evaluate and enhance their supportive behavior (Tripp & Rich, 2012).

Chapters 2 and 3 discovered sex differences in students' perceptions of teacher support. In Chapter 2, we were able to link these perceptions to students' engagement. These findings and previous research on the impact of teacher support on student outcomes seem to imply that students' perceptions of their teachers are important for students' functioning at school. Hence, teachers should not only reflect upon their own behavior through analyzing observations of themselves, as suggested above. They should also be aware of their influence on students. Teachers might for example (1) observe the effect of their actions on students' engagement or (2) evaluate their lesson planning and supportive behavior in class based on students' feedback about the lessons and about the teacher-student interactions. In the context of the Procrustes project, two instruments, developed at the Centre for Experiential Education, were used to serve these respective purposes. First, the Leuven Involvement Scale (Laevens, 1994) was used to let teachers reflect about their students' engagement. Teachers were trained to

recognize signals of engagement such as concentration, persistence, precision, and reaction time and the absence of these signals in some students. An important part of the reflection process consisted of raising teachers' awareness about their role in the engagement or disengagement of students. Second, an instrument called JoPSi (Jongeren Procesgericht Screeningsinstrument; Process Oriented Screening Instrument for Adolescents; Laevers, CEGO, & Onderwijs Maak Je Samen, 2015), was administered. This instrument assessed, for several school subjects separately, students' perceptions of teacher support, the learning environment in general, and students' well-being and engagement. Afterwards, teachers were confronted with the general class results of this assessment and were asked to reflect upon their teaching based on their students' indications of the aforementioned variables.

SUGGESTIONS FOR FUTURE EDUCATIONAL RESEARCH

Combining the teacher support dimensions

Often, in educational research, there is a plea for the synergy of autonomy support and structure, meaning that the combination of the two teacher support dimensions yields the best student outcomes (Sierens et al., 2009). Because of their synergistic relationship, we included both autonomy support and structure in Chapters 2, 3, and 4 and investigated gender differences for both support variables in the same model. In Chapter 2, we also included involvement in order to take into account all three teacher support dimensions that SDT considers valuable for need fulfillment. In Chapter 4, we also examined goal orientation and student- versus content-centered teaching. Because autonomy support and structure have been found to synergize and because a more complete picture of a teachers' supportive behavior might be shown, we want to underline that both dimensions should be investigated together. Including also a third dimension, depicting the affective teacher-student relationship (e.g., involvement – see Chapter 2, or student-centered teaching – see Chapter 4), would provide even more insight into teachers' supportive behavior.

Empathy as the base for teacher support

In Chapter 4, a rather strong link was found between the sociocultural gender variables and structure. This means that the more teachers think they can express their emotions and the less they feel pressured to conform to expectations related to their own sex, the more they indicate to provide structure. Moreover, the result that female teachers scored higher than male teachers for structure was explained by these two sociocultural gender variables. The expression of emotions was also positively related to autonomy support. Based on these findings, we might indicate that expressing emotions is an essential asset for providing autonomy support and structure to students. These findings could thus serve as evidence for SDT, which asserts that being responsive towards students' needs is an important part of teacher support (Deci & Ryan, 2008). We can suggest that being responsive to students' needs requires teachers to talk about and understand their own emotions and the emotions of their students.

Equal benefits of teacher support for all students?

SDT literature states that all three teacher support dimensions are beneficial for all students. The findings in Chapter 2 seem to confirm that indeed autonomy support, structure, and involvement are related to students' engagement (student, teacher, and observer report). Nevertheless, both Chapter 2 and Chapter 3 indicated that the importance of these teacher support dimensions may be different for boys versus girls. Chapter 2 revealed that autonomy support is related to boys' engagement and not to girls'. This is in line with the academic risk hypothesis (Hamre & Pianta, 2001), according to which teacher support is more important for boys' engagement than for girls' because boys are more at risk for academic maladjustment (e.g., deviant behavior, lower achievement) and thus may be more sensitive to the supportive behavior of the teacher. In Chapter 3, boys and girls, in two out of four examples, differed in their opinions on the same teacher support. For example, boys appeared to find the high autonomy supportive situation less supportive than girls did and they were less negative towards a low structuring situation than girls. These findings seem to suggest that boys and girls each find different elements of teacher support important. If, in future research these separate subdimensions could be linked with for example boys' and girls' engagement, not each subdimension of teacher support might appear to be equally beneficial for boys and girls.

LIMITATIONS AND FUTURE RESEARCH

The following section acknowledges the limitations of the present research and proposes several suggestions for future research in this specific area.

Future research should broaden the investigation of sex differences in students' perceptions of teacher support by including *students' gender, i.e., the sociocultural gender differences*. Within the Procrustes project, this path has already been opened. Vantieghem and Van Houtte (2015) examined students' gender differences in motivation and found for example that gender-typical girls scored the highest for autonomous motivation whereas gender-typical boys scored lower. However, these boys still scored higher than both the atypical boys and girls. Using the Procrustes-data, Huyge, Van Maele, and Van Houtte (2015) discovered that boys felt less school belonging (emotional engagement) than girls. Moreover, they demonstrated that students with traditional beliefs about gender roles also reported lower school belonging. These findings, including variables based on the sociocultural view on gender, nuance the boy-girl dichotomy. Additional research is needed that can relate various sociocultural gender variables to engagement and students' perceptions of teacher support.

Observations, interview data, or teacher report of teacher support are essential in order to investigate the more specific elements within each teacher support dimension. This should allow to distinguish between, for example, choice, relevance, and respect within the autonomy support dimension. Interview data may, for example, result in the finding that boys consider the elements of choice and relevance more important, whereas girls possibly indicate the element of respect to be more important. Teachers perhaps consider themselves as highly capable of handling students with respect, whereas they may struggle more with providing choice or indicating the relevance of the learning material. Additionally, observations can contribute to a more objective view on for example differences in male and female teachers' supportive behavior.

Replicating the vignette study in Chapter 3 with scenarios concerning *involvement* should yield additional information on this third dimension of teacher support. Not only for involvement, but for *all teacher support dimensions, replication of the vignette study* is advisable. Different situations that need to be evaluated by students could reveal other interesting differences in students' perceptions of the dynamic in the classroom and of teacher-student interactions.

An investigation of *other dimensions of engagement*, not only behavioral engagement, should also produce more noteworthy results concerning sex differences. We could expect though, based on the review study in Chapter 1, that sex differences would be less obvious in this investigation. Moreover, as briefly discussed above, future research on individual teacher-student interactions should further clarify the discussion about male teachers being better for boys and female teachers being better for girls. The combination of the findings from Chapters 2, 3, and 4 seemed to suggest some matches between girls' preferences of teacher support and female teachers' supportive behavior, on the one hand, and between boys' preferences and male teachers' supportive behavior, on the other hand. Nevertheless, the overall results of Chapter 4 seem to indicate that sociocultural gender variables, for instance expressing emotions, may be at least as important for teacher support as the sex of the teacher as such. Because of the small body of research regarding this topic, we argue in favor of additional research linking teachers' and students' sex and the interplay of sociocultural gender factors. Unfortunately, conducting this kind of research can be difficult because of the overrepresentation of women in educational settings, which often results in limited data.

Chapter 2 did not investigate the mediating role of motivation in the relationship between teacher support and student engagement. It might be interesting for future research to address whether autonomous or controlled motivation explains the relationship between teacher support and student engagement in the same way for boys and for girls. The data collection for the Procrustes project contained information about boys' and girls' autonomous and controlled motivation for Dutch language classes. This information is discussed here as a starting point for future research and has not been reported in the studies of this dissertation. The table with the means, standard deviations, and *t*-tests is presented in Appendix 4. We found no significant sex differences for controlled motivation, whereas for autonomous motivation for these Dutch language classes, girls scored significantly higher than boys. It should thus be interesting to examine, for boys versus girls, the role of this autonomous motivation in the relationship between teacher support and engagement.

Additionally, sex differences in students' perceptions of teacher support and engagement and the relationship between the two should be investigated for *other courses* than Dutch language. Examining for example mathematics, sciences, other languages or arts will provide more insight into the complexity of sex differences in the classroom. The data in the Procrustes project also allowed us to explore sex differences

in behavioral engagement and teacher support for mathematics courses. This information is an interesting addition to the findings in Chapter 2, but unfortunately exceeded the scope of that study. Therefore, we discuss the comparison of the findings for Dutch language and mathematics in this section. The table with the means, standard deviations, and *t*-tests is presented in Appendix 4. It was found that students, teachers, and independent observers indicated no sex differences in behavioral engagement during mathematics classes. Concerning teacher support, boys found their mathematics teacher to be less autonomy supportive and less structuring than girls did. For involvement, no significant sex differences were demonstrated. For mathematics, boys reported higher autonomous motivation than girls, which is the opposite as for Dutch language. For controlled motivation, no sex differences were found. In conclusion, for Dutch language classes, the most striking differences appeared. After all, students, teachers, and observers indicated that girls were more engaged than boys. Moreover, girls reported to be more autonomously motivated. For mathematics, students, teachers, and observers did not record sex differences. Nevertheless, boys appeared to be more autonomously motivated for mathematics than girls. These insights suggest that interesting results could emerge from future research investigating sex differences in various school subjects.

Longitudinal research is needed especially to test the directionality of the relationship between teacher support and engagement. Previous literature found reciprocal effects between teacher support and student engagement (Hafen et al., 2012; Van Rynzin, 2011). Chapter 2 confirmed that the reverse model (i.e., engagement mediating the sex differences in teacher support) also yielded a good fit. Further investigation of the interplay between all teacher support dimensions and the various student engagement dimensions could deepen the current insights. Testing such a model for boys versus girls will deliver more information on how the various dimensions of teacher support affect boys' and girls' engagement and how this, in turn, influences boys' and girls' perceptions of teacher support. The Procrustes data could serve to investigate these longitudinal relationships between teacher support and student engagement in future research.

Finally, this dissertation did not investigate the effect of teacher support and student engagement on *students' cognitive outcomes*. Examining the impact of boys' and girls' engagement on performances for various class subjects will also lead to interesting conclusions. After all, previous literature found engagement to affect students'

performances (Lam et al., 2012) and established that boys and girls perform differently for different courses (e.g., girls scoring higher for language and boys for mathematics, OECD, 2012).

In spite of these limitations, this dissertation found a gender gap in student engagement, based on student, teacher, and observer report. Moreover, a gender gap in students' and teachers' perceptions of teacher support was discovered. Additionally, this work proved that specifically autonomy support is more related to boys' engagement than to girls' and that the different subdimensions within autonomy support and structure may function differently for boys versus girls. Finally, we were able to shed some light on differences between male and female teachers' supportive behavior and on two sociocultural gender variables that could nuance these sex differences.

REFERENCES

A

- Aelterman, A., Engels, N., Van Petegem, K. & Verhaeghe, J.P. (2007). The well-being of teachers in Flanders: The importance of a supportive school culture. *Educational Studies*, 33(3), 285-298.
- Allen, J., Gregory, A., Mikami, A., Lun, J., Hamre, B., & Pianta, R. (2013). Observations of effective teacher-student interactions in secondary school classrooms: Predicting student achievement with the classroom assessment scoring system - secondary. *School Psychology Review*, 42(1), 76-98.
- Ames, C. (1992) Classrooms: goals, structures, and student motivation. *Journal of Educational Psychology*, 84(3), 261-271.
- Ammermüller, A., & Dolton, P.J. (2006). Pupil-teacher gender interaction effects on scholastic outcomes in England and the USA. *ZEW-Centre for European Economic Research Discussion Paper*, (06-060).
- Archer, J., & Lloyd, B. (2002). *Sex and Gender* (2nd Ed.). Cambridge, UK: Cambridge University Press.
- Archambault, I., Janosz, M., Fallu, J.-S., & Pagani, L. (2009). Student engagement and its relationship with early high school dropout. *Journal of adolescence*, 32(3), 651-670.
- Archambault, I., Janosz, M., & Chouinard, R. (2012). Teacher Beliefs as Predictors of Adolescents' Cognitive Engagement and Achievement in Mathematics. *Journal of Educational Research*, 105(5), 319-328.
- Assor, A., Kaplan, H., & Roth, G. (2002). Choice is good, but relevance is excellent: Autonomy-enhancing and suppressing teacher behaviors in predicting student's engagement in school work. *British Journal of Educational Psychology*, 72(2), 261-278.

B

- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182.
- Belmont, M., Skinner, E., Wellborn, J., & Connell, J. (1988). *Teacher as social context: A measure of student perceptions of teacher provision of involvement, structure, and autonomy support (Tech. Rep. No. 102)*. Rochester, NY: University of Rochester.

- Birch, S. H., & Ladd, G. W. (1997). The teacher-child relationship and children's early school adjustment. *Journal of School Psychology, 35*(1), 61-79.
- Blazina, C., Pisecco, S., & O'Neil, J. M. (2005). An Adaptation of the Gender Role Conflict Scale for Adolescents: Psychometric Issues and Correlates With Psychological Distress. *Psychology of Men & Masculinity, 6*(1), 39-45.
- Blondal, K. S. & Adalbjarnardottir, S. (2012). Student Disengagement in Relation to Expected and Unexpected Educational Pathways. *Scandinavian Journal of Educational Research, 56*, 85-100.
- Brozo, W. G. (2002). *To be a boy, to be a reader: Engaging teen and preteen boys in active literacy*. Newark, DE: International Reading Association.

C

- Carrington, B., Francis, B., Hutchings, M., Skelton, C., Read, B., & Hall, I. (2007). Does the gender of the teacher really matter? Seven- to eight-year-olds' accounts of their interactions with their teachers. *Educational Studies, 33*(4), 397-413.
- Chen, B., Beyers, W., & Vansteenkiste, M. (2013). *The universal and culture specific character of basic psychological need satisfaction*. Doctoral dissertation.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255.
- Chouinard, R., & Roy, N. (2008). Changes in high-school students' competence beliefs, utility value and achievement goals in mathematics. *British Journal of Educational Psychology, 78*(1), 31-50.
- Chusmir, L. H., & Koberg, C. S. (1988). Gender identity and sex role conflict among working women and men. *Journal of Psychology, 122*(6), 567-575.
- Cleary, T. J. & Chen, P. P. (2009). Self-regulation, motivation, and mathematics achievement in middle school: Variations across grade level and mathematics context. *Journal of school psychology, 47*(5), 291-314.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education (7th ed.)*. London, UK: Routledge.
- Connell, J.P. (1990). Context, self and action: A motivational analysis of self-system processes across the lifespan. In D. Cicchetti (Ed.), *The self in transition: From infancy to childhood*. Chicago: University of Chicago Press.

- Connell, J. P. & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In M.R.Gunnar & L. A. Sroufe (Eds.), *Self processes and development* (pp. 43-77). Hillsdale, NJ: Lawrence Erlbaum.
- Consuegra, E., & Engels, N. (forthcoming). Effects of professional development on teachers' gendered feedback patterns, students' misbehavior and students' sense of equity: results from a one-year quasi-experimental study. *British Educational Research Journal*.
- Consuegra, E., Engels, N, Lombaerts, K. (2015). *Gendered teacher-student classroom interactions in secondary education: perception, reality and professionalism*. Doctoral dissertation.
- Consuegra, E., Engels, N., & Willekens, V. (in press). Using videostimulated recall to investigate teacher awareness of explicit and implicit gendered thoughts on classroom interactions. *Teachers and Teaching: Theory and Practice*.
- Cooper, K. S. (2014). Eliciting engagement in the high school classroom A mixed-methods examination of teaching practices. *American Educational Research Journal*, 51(2), 363-402.
- Cornelius-White, J. (2007). Learner-centered teacher-student relationships are effective: A meta-analysis. *Review of Educational Research*, 77(1), 113-143.
- Cushman, P. (2007). The male teacher shortage: A synthesis of research and worldwide strategies for addressing the shortage. *KEDI Journal of Educational Policy*, 4(1), 79-98.

D

- Darr, C. W. (2012). Measuring student engagement: The development of a scale for formative use. In S. L. Christenson, A. L. Reschly & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 707-723). New York, NY: Springer.
- Davis, H. A. (2003). Conceptualizing the role and influence of student-teacher relationships on children's social and cognitive development. *Educational Psychologist*, 38(4), 207-234.
- De Wit, D. J., Karioja, K., & Rye, B. J. (2010). Student perceptions of diminished teacher and classmate support following the transition to high school: are they related to declining attendance? *School Effectiveness and School Improvement*, 21(4), 451-472.

de Zeeuw, E. L., van Beijsterveldt, C. E., Glasner, T. J., Bartels, M., de Geus, E. J., & Boomsma, D. I. (2014). Do children perform and behave better at school when taught by same-gender teachers? *Learning and Individual Differences*, 36, 152-156.

Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology*, 49(1), 14-23.

Dotterer, A., McHale, S., & Crouter, A. (2009). The development and correlates of academic interests from childhood through adolescence. *Journal of Educational Psychology*, 101(2), 509-519.

Doumen, S., Koomen, H. M., Buyse, E., Wouters, S., & Verschueren, K. (2012). Teacher and observer views on student-teacher relationships: Convergence across kindergarten and relations with student engagement. *Journal of School Psychology*, 50(1), 61-76.

E

Engels, N., Aelterman, A., Van Petegem, K., & Schepens, A. (2004). Factors which influence the well-being of pupils in Flemish secondary schools. *Educational Studies*, 30(2), 127-143.

Egan, S., & Perry, D. (2001). Gender identity: A multidimensional analysis with implications for psychosocial adjustment. *Developmental Psychology*, 37(4), 451-463.

Estell, D. B., & Perdue, N. H. (2013). Social support and behavioral and affective school engagement: the effects of peers, parents, and teachers. *Psychology in the Schools*, 50(4), 325-339.

European Commission EACEA Eurydice (2013). *Key data on Teachers and School Leaders in Europe. 2013 Edition*. Luxembourg: Publications Office of the European Union. 144 pp.

F

Fan, W. (2011). Social influences, school motivation and gender differences: an application of the expectancy-value theory. *Educational psychology*, 31(2), 157-175.

Flemish Department of Education and Training [Vlaams Departement Onderwijs en Vorming] (2015). *Flemish Education in Figures 2013-2014*. Flemish Ministry of Education and Training Department of Education and Training [Vlaams Ministerie van Onderwijs en Vorming Departement Onderwijs en Vorming]: Brussels.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59-109.

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: A comparative analysis of various methods and student self-report instruments. In S. L. Christenson, A. L. Reschly & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 763-782). New York, NY: Springer.

G

Geist, E. A., & King, M. (2008). Different, not better: Gender differences in mathematics learning and achievement. *Journal of Instructional Psychology*, 35(1), 43-52.

Geiser, C. (2012). *Data analysis with Mplus*. New York, NY: Guilford Press.

Graham, J., Tisher, R., Ainley, M., & Kennedy, G. (2008). Staying with the text: the contribution of gender, achievement orientations, and interest to students' performance on a literacy task. *Educational psychology*, 28(7), 757-776.

Green, G., Rhodes, J., Hirsch, A. H., Suárez-Orozco, C., & Camic, P. M. (2008). Supportive adult relationships and the academic engagement of Latin American immigrant youth. *Journal of School Psychology*, 46(4), 393-412.

Greene, B. A., Miller, R. B., Crowson, H. M., Duke, B. L., & Akey, K. L. (2004). Predicting high school students' cognitive engagement and achievement: Contributions of classroom perceptions and motivation. *Contemporary Educational Psychology*, 29(4), 462-482.

H

Hafen, C. A., Allen, J. P., Mikami, A. Y., Gregory, A., Hamre, B., & Pianta, R. C. (2012). The pivotal role of adolescent autonomy in secondary school classrooms. *Journal of Youth and Adolescence*, 41(3), 245-255.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72(2), 625-638.

- Hargreaves, A. (1998). "The Emotional Practice of Teaching." *Teaching and Teacher Education*, 14(8), 835-854.
- Harrop, A., & Swinson, J. (2011). Comparison of teacher talk directed to boys and girls and its relationship to their behavior in secondary and primary schools. *Educational Studies*, 37(1), 115-125.
- Heemskerk, I., van Eck, E., Kuiper, E., & Volman, M. (2012). *Succesvolle onderwijsaanpakken voor jongens in het voortgezet onderwijs [Successful educational approaches for boys in secondary education]*. Rapport 878, ISBN 90-6813-938-9. Amsterdam, the Netherlands: Kohnstamm Instituut.
- Heyder, A., & Kessels, U. (2013). Is school feminine? Implicit gender stereotyping of school as a predictor of academic achievement. *Sex roles*, 69(11-12), 605-617.
- Hoglund, W. L. G. (2007). School functioning in early adolescence: Gender-linked responses to peer victimization. *Journal of educational psychology*, 99(2), 683-699.
- Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, 65(4), 599-609.
- Huyge, E., Van Maele, D., & Van Houtte, M. (2015). Does students' machismo fit in school? Clarifying the implications of traditional gender role ideology for school belonging. *Gender and Education*, 27(1), 1-18.

J

- Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It's not autonomy support or structure, but autonomy support and structure. *Journal of Educational Psychology*, 102(3), 588-600.
- Johnson, M. K., Crosnoe, R., & Elder Jr, G. H. (2001). Students' attachment and academic engagement: The role of race and ethnicity. *Sociology of Education*, 74(4), 318-340.

K

- Katz, I., Assor, A., Kanat-Maymon, Y., & Bereby-Meyer, Y. (2006). Interest as a motivational resource: Feedback and gender matter, but interest makes the difference. *Social Psychology of Education*, 9(1), 27-42.

- Kelchtermans, G. (2009). Who I am in how I teach is the message: self-understanding, vulnerability and reflection. *Teachers and Teaching: theory and practice*, 15(2), 257-272.
- Koberg, C. S., & Chusmir, L. H. (1991). Sex role conflict in sex-atypical jobs: A study of female-male differences. *Journal of Organizational Behavior*, 12(5), 461-465.
- L
- Laevers, F. (Ed.) (1994). *Defining and assessing quality in early childhood education (Vol. 16)*. Leuven: Leuven University Press.
- Laevers, CEGO, & Onderwijs maak je samen (2015). *Looqin Jopsi: Jongeren Proces Gericht Screening Instrument [Process Oriented Screening Instrument for Adolescents]*. Unedited pilot version.
- Laevers, F., & Laurijssen, J. (2001). *Well-being, involvement, and satisfaction of pupils in nursery and elementary school: A guide to systematic observation and survey*. Internal report, Katholieke Universiteit Leuven, Center for Nursery and Elementary Education.
- Lahelma, E. (2000). Lack of male teachers: a problem for students or teachers? *Pedagogy, Culture and Society*, 8(2), 173-185.
- Lam, S.-F., Jimerson, S., Kikas, E., Cefai, C., Veiga, F. H., Nelson, B., . . . Zollneritsch, J. (2012). Do girls and boys perceive themselves as equally engaged in school? The results of an international study from 12 countries. *Journal of School Psychology*, 50(1), 77-94.
- Lam, R. Y. H., Tse, S. K., Lam, J. W., & Loh, E. K. (2010). Does the gender of the teacher matter in the teaching of reading literacy? Teacher gender and pupil attainment in reading literacy in Hong Kong. *Teaching and Teacher Education*, 26(4), 754-759.
- Lamote, C., Speybroeck, S., Van Den Noortgate, W., & Van Damme, J. (2013). Different pathways towards dropout: The role of engagement in early school leaving. *Oxford Review of Education*, 39(6), 739-760.
- Lietaert, S., Roorda, D., Laevers, F., Verschueren, K., & De Fraine, B. (2015). The gender gap in student engagement: The role of teachers' autonomy support, structure, and involvement. *British Journal of Educational Psychology*, 85(4), 489-518.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural equation modeling*, 9(2), 151-173.

Little, T. D., Slegers, D. W., & Card, N. A. (2006). A non-arbitrary method of identifying and scaling latent variables in SEM and MACS models. *Structural Equation Modeling*, 13(1), 59-72.

M

Marks, H. M. (2000). Student engagement in instructional activity: Patterns in the elementary, middle, and high school years. *American Educational Research Journal*, 37(1), 153-184.

Marsh, H. W., Martin, A. J., & Cheng, J. H. (2008). A multilevel perspective on gender in classroom motivation and climate: Potential benefits of male teachers for boys? *Journal of educational psychology*, 100(1), 78-95.

Martin, A. J. (2003). Boys and motivation. *The Australian Educational Researcher*, 30(3), 43-65.

Martin, A. (2007). Examining a multidimensional model of student motivation and engagement using a construct validation approach. *British Journal of Educational Psychology*, 77(2), 413-440.

Martino, W. J. (2008). Male teachers as role models: Addressing issues of masculinity, pedagogy and the re-masculinization of schooling. *Curriculum Inquiry*, 38(2), 189-223.

Martino, W., Lingard, B., & Mills, M. (2004). Issues in boys' education: A question of teacher threshold knowledges? *Gender and Education*, 16(4), 435-454.

McGeown, S., Goodwin, H., Henderson, N., & Wright, P. (2012). Gender differences in reading motivation: does sex or gender identity provide a better account? *Journal of research in reading*, 35(3), 328-336.

Meece, J. L., Glienke, B. B., & Burg, S. (2006). Gender and motivation. *Journal of School Psychology*, 44(5), 351-373.

Midgley, C., Maehr, M. L., Hruda, L. Z., Anderman, E., Anderman, L., Freeman, K. E., Gheen, M., Kaplan, A., Kumar, R., Middleton, M. J., Nelson, J., Roeser, R., & Urdan, T., (2000). *Manual for the Patterns of Adaptive Learning Scales (PALS)*, Ann Arbor, MI: University of Michigan.

- Mills, M., M. Haase, & E. Charlton (2008). Being the 'Right' Kind of Male Teacher: The Disciplining of John. *Pedagogy, Culture & Society*, 16(1), 71-84.
- Mills, M., Martino, W., & Lingard, B. (2004) Attracting, recruiting and retaining male teachers: policy issues in the male teacher debate. *British Journal of Sociology of Education*, 25(3), 355-369.
- Muthén, L. K., & Muthén, B. O. (1998-2012). *Mplus user's guide (7th ed.)*. Los Angeles, CA: Author.

N

- Nicaise, V., Cogérino, G., Fairclough, S., Bois, J., & Davis, K. (2007). Teacher feedback and interactions in physical education: Effects of student gender and physical activities. *European Physical Education Review*, 13(3), 319-337.
- Nie, Y., & Lau, S. (2009). Complementary roles of care and behavioral control in classroom management: The self-determination theory perspective. *Contemporary Educational Psychology*, 34(3), 185-194.

O

- O'Connor, K. E. (2008). 'You Choose to Care': Teachers, Emotions and Professional Identity. *Teaching and Teacher Education*, 24(1), 117-126.
- O'Neil, J. M., Helms, B. J., Gable, R. K., David, L., & Wrightsman, L. S. (1986). Gender-role conflict scale: College men's fear of femininity. *Sex Roles*, 14(5-6), 335-350.
- O'Neil, J. M. (2008). Summarizing 25 Years of Research on Men's Gender Role Conflict Using the Gender Role Conflict Scale New Research Paradigms and Clinical Implications. *The Counseling Psychologist*, 36(3), 358-445.
- OECD (2013). *Results from PISA 2012 - Belgium*. PISA, OECD Publishing.
- OECD (2015). *The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence*. PISA, OECD Publishing. <http://dx.doi.org/10.1787/9789264229945-en>
- Oelsner, J., Lippold, M. A., & Greenberg, M. T. (2011). Factors influencing the development of school bonding among middle school students. *The Journal of Early Adolescence*, 31(3), 463-487.

- Opdenakker, M. C., Maulana, R., & den Brok, P. (2012). Teacher-student interpersonal relationships and academic motivation within one school year: Developmental changes and linkage. *School Effectiveness and School Improvement*, 23(1), 95-119.
- Opdenakker, M-C., & Van Damme, J. (2006). Teacher characteristics and teaching styles as effectiveness enhancing factors of classroom practice. *Teaching and Teacher Education*, 22(1), 1-21.
- Orthner, D. K., Jones-Sanpei, H., Akos, P., & Rose, R. A. (2013). Improving middle school student engagement through career-relevant instruction in the core curriculum. *The Journal of Educational Research*, 106(1), 27-38.

P

- Park, S., Holloway, S., Arendtsz, A., Bempechat, J., & Li, J. (2012). What makes students engaged in learning? A time-use study of within- and between-individual predictors of emotional engagement in low-performing high schools. *Journal of youth and adolescence*, 41(3), 390-401.
- Pavri, S., & Monda-Amaya, L. (2001). Social support in inclusive schools: Student and teacher perspectives. *Exceptional children*, 67(3), 391-411.
- Perry, D. G. & Pauletti, R. E. (2011). Gender and Adolescent Development. *Journal of research on adolescence*, 21(2), 61-74.
- Plenty, S., & Heubeck, B. G. (2013). A multidimensional analysis of changes in mathematics motivation and engagement during high school. *Educational Psychology*, 33(1), 14-30.

R

- Reeve, J. (2002). Self-determination theory applied to educational settings. In E. L. Deci & R.M. Ryan (Eds.), *Handbook of self-determination* (pp. 183-203). Rochester, NY: University of Rochester Press.
- Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *The Elementary School Journal*, 106(3), 225-236.
- Reeve, J., Bolt, E., & Cai, Y. (1999). Autonomy-supportive teachers: How they teach and motivate students. *Journal of Educational Psychology*, 91(3), 537-548.

- Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing high school students' engagement by increasing their teachers' autonomy support. *Motivation and Emotion, 28*(4), 147-169.
- Roeser, R.W., Marachi, R., & Gehlbach, H. (2002). A goal theory perspective on teachers' professional identities and the contexts of teaching. In C. Midgley (Ed.), *Goals, goal structure, and patterns of adaptive learning* (pp. 205-242). Mahway, NJ: Lawrence Erlbaum.
- Roorda, D. L., Koomen, H. M. Y., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher-student relationships on students' school engagement and achievement: A meta-analytic approach. *Review of Educational Research, 81*(4), 493-529.
- Rubie-Davies, C. M., Flint, A., & McDonald, L. G. (2012). Teacher beliefs, teacher characteristics, and school contextual factors: What are the relationships? *British Journal of Educational Psychology, 82*(2), 270-288.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.

S

- Schneider, F., & Coutts, L. (1979) Teacher orientations towards masculine and feminine: Role of sex of teacher and sex composition of school. *Canadian Journal of Behavioural Science, 11*(2), 99-111.
- Shernoff, D. J., Csikszentmihalyi, M., Schneider, B., & Shernoff, E. S. (2003). Student engagement in high school classrooms from the perspective of flow theory. *School psychology quarterly, 18*, 158-176.
- Shernoff, D. J., & Schmidt, J. A. (2008). Further evidence of an engagement-achievement paradox among US high school students. *Journal of youth and adolescence, 37*, 564-580.
- Sierens, E., Vansteenkiste, M., Goossens, L., Soenens, B., & Dochy, F. (2009). The interactive effect of perceived teacher autonomy-support and structure in the prediction of self-regulated learning. *British Journal of Educational Psychology, 79*(1), 57-68.
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85*(4), 571-581.

- Skinner, E., Kindermann, T., & Furrer, C. (2009). A motivational perspective on engagement and disaffection: Conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement, 69*(3), 493-525.
- Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology, 100*(4), 765-781.
- Skinner, E. A., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 21-44). New York, NY: Springer.
- Soenens, B., Sierens, E., Vansteenkiste, M., Dochy, F., & Goossens, L. (2012). Psychologically controlling teaching: Examining outcomes, antecedents, and mediators. *Journal of Educational Psychology, 104*(1), 108-120.
- Spilt, J., Koomen, H., Thijs, J., & van der Leij, A. (2012). Supporting teachers' relationships with disruptive children: The potential of relationship-focused reflection. *Attachment & Human Development, 14*(3), 305-318.
- Stroet, K., Opdenakker, M. C., & Minnaert, A. (2013). Effects of need supportive teaching on early adolescents' motivation and engagement: A review of the literature. *Educational Research Review, 9*, 65-87.
- Suldo, S. M., Friedrich, A. A., White, T., Farmer, J., Minch, D., & Michalowski, J. (2009). Teacher support and adolescents' subjective well being: A mixed methods investigation. *School Psychology Review, 38*(1), 67-85.

T

- Tiedemann, J. (2002). Teachers' gender stereotypes as determinants of teacher perceptions in elementary school mathematics. *Educational Studies in mathematics, 50*(1), 49-62.
- Thijs, J., & Verkuyten, M. (2009). Students' anticipated situational engagement: The roles of teacher behavior, personal engagement, and gender. *The Journal of Genetic Psychology, 170*(3), 268-286.

- Tobin, D., Menon, M., Menon, M., Spatta, B., Hodges, E., & Perry, D. (2010). The intrapsychics of gender: a model of self-socialization. *Psychological review*, 117(2), 601-622.
- Tucker, C. M., Zayco, R. A., Herman, K. C., Reinke, W. M., Trujillo, M., Carraway, K., . . . Ivery, P. D. (2002). Teacher and child variables as predictors of academic engagement among low-income African American children. *Psychology in the Schools*, 39(4), 477-488.
- Tripp, T. R., & Rich, P. J. (2012). The influence of video analysis on the process of teacher change. *Teaching and Teacher Education*, 28(5), 728-739.

U

- Ueno, K. & McWilliams, S. (2010). Gender-Typed Behaviors and School Adjustment. *Sex roles*, 63, 580-591.

V

- Valiente, C., Swanson, J., & Lemery-Chalfant, K. S. (2012). Kindergartners' temperament, classroom engagement, and student-teacher relationship: Moderation by effortful control. *Social Development*, 21(3), 558-576.
- Van de gaer, E., De Fraine, B., Pustjens, H., Van Damme, J., De Munter, A., & Onghena, P. (2009). School effects on the development of motivation toward learning tasks and the development of academic self-concept in secondary education: A multivariate latent growth curve approach. *School Effectiveness and School Improvement*, 20(2), 235-253.
- Van de gaer, E., Pustjens, H., Van Damme, J., & De Munter, A. (2006a). The gender gap in language achievement: The role of school-related attitudes of class groups. *Sex Roles*, 55(5), 397-408.
- Van de gaer, E., Pustjens, H., Van Damme, J., & De Munter, A. (2006b). Tracking and the effects of school-related attitudes on the language achievement of boys and girls. *British journal of sociology of education*, 27(3), 293-309.
- Van de gaer, E., Pustjens, H., Van Damme, J., & De Munter, A. (2008). Mathematics participation and mathematics achievement across secondary school: The role of gender. *Sex Roles*, 59(7-8), 568-585.

- Van den Berghe, L., Vansteenkiste, M., Cardon, G., Kirk, D., & Haerens, L. (2014). Research on self-determination in physical education: Key findings and proposals for future research. *Physical Education and Sport Pedagogy*, 19(1), 97-121.
- Van Gundy, K. (2002). Gender, the assertion of autonomy and the stress process in young adulthood. *Social Psychology Quarterly*, 65(4), 346-363.
- Van Houtte, M. (2007). Exploring teacher trust in technical/vocational secondary schools: Male teachers' preference for girls. *Teaching and Teacher Education*, 23(6), 826-839.
- Van Landeghem, G., Goos, M., & Van Damme, J. (2010). Early school leavers in Flanders. Evolution of unqualified dropout until 2007 [Vroege schoolverlaters in Vlaanderen. Evolutie van de ongekwalificeerde uitstroom tot 2007]. Leuven: Steunpunt SSL, rapport nr. SSL/OD1/2009.25
- Van Landeghem, G., & Van Damme, J. (2007). Birth cohorts in Grades 9-12 of regular fulltime secondary education. Evolution from 1989-1990 until 2005-2006 [Geboortecohorten in de tweede en derde graad van het voltijds gewoon secundair onderwijs. Evolutie van 1989-1990 tot 2005-2006.] Leuven: Steunpunt SSL-rapport SSL/OD1/2007.02
- Van Petegem, S., Soenens, B., Vansteenkiste, M., & Beyers, W. (2015). Rebels with a cause? Adolescent Defiance From the Perspective of Reactance Theory and Self-Determination Theory. *Child Development*, 86(3), 903-918.
- Van Ryzin, M. J. (2011). Protective factors at school: Reciprocal effects among adolescents' perceptions of the school environment, engagement in learning, and hope. *Journal of Youth and Adolescence*, 40(12), 1568-1580.
- van Uden, J. M., Ritzen, H., & Pieters, J. M. (2014). Engaging students: The role of teacher beliefs and interpersonal teacher behavior in fostering student engagement in vocational education. *Teaching and Teacher Education*, 37, 21-32.
- Vansteenkiste, M., Sierens, E., Soenens, B., Luyckx, K., & Lens, W. (2009). Motivational profiles from a self-determination perspective: The quality of motivation matters. *Journal of Educational Psychology*, 101(3), 671-688.
- Vansteenkiste, M., Sierens, E., Soenens, B., Goossens, L., Dochy, F., Aelterman, N., & Beyers, W. (2012). Identifying configurations of perceived autonomy support and structure: Associations with self-regulated learning, motivation and problem behavior. *Learning and Instruction*, 22(6), 431-439.

Vantieghem, W., & Van Houtte, M. (2015). Differences in Study Motivation Within and Between Genders An Examination by Gender Typicality Among Early Adolescents. *Youth & Society*, 0044118X15602268.

Vantieghem, W., Vermeersch, H., & Van Houtte, M. (2014). Why “Gender” disappeared from the gender gap:(re-) introducing gender identity theory to educational gender gap research. *Social Psychology of Education*, 17(3), 357-381.

W

Wang, M. T., & Eccles, J. S. (2012). Social support matters: Longitudinal effects of social support on three dimensions of school engagement from middle to high school. *Child Development*, 83(3), 877-895.

Wang, M.-T., Willet, J., & Eccles, J. (2011). The assessment of school engagement: examining dimensionality and measurement invariance by gender and race/ethnicity. *Journal of school psychology*, 49, 465-480.

Watt, H. M. G. (2000). Measuring attitudinal change in mathematics and English over the 1st year of junior high school: A multidimensional analysis. *The Journal of Experimental Education*, 68(4), 331-361.

Wellborn, J., Connell, J., Skinner, E., & Pierson, L. (1992). *Teacher as social context (TASC)*. Rochester, NY: University of Rochester.

Williams, M., Burden, R., & Lanvers, U. (2002). ‘French is the language of love and stuff’: Student perceptions of issues related to motivation in learning a foreign language. *British Educational Research Journal*, 28(4), 503-528.

Wolfram, H. J., Mohr, G., & Borchert, J. (2009). Gender role self-concept, gender-role conflict, and well-being in male primary school teachers. *Sex roles*, 60(1-2), 114-127.

Wubbels, T., & Brekelmans, M. (2005). Two decades of research on teacher-student relationships in class. *International Journal of Educational Research*, 43, 6-24.

Y

Younger, M., Warrington, M., & Williams, J. (1999). The gender gap and classroom interactions: Reality and rhetoric? *British Journal of Sociology of Education*, 20(3), 325-341.

Z

- Zahn-Waxler, C., Crick, N. R., Shirtcliff, E. A., & Woods, K. E. (2006). The origins and development of psychopathology in females and males. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology, Vol 1. Theory and method* (2nd ed., pp. 76-138). Hoboken, NJ: JohnWiley & Sons.
- Zembylas, M. (2003). Caring for teacher emotion: reflections on teacher selfdevelopment. *Studies in Philosophy & Education, 22*(2), 103-125.
- Zijlstra, H., Wubbels, T., Brekelmans, M., & Koomen, H. M. Y. (2013). Child perceptions of teacher interpersonal behavior and associations with mathematics achievement in Dutch early grade classrooms. *The Elementary School Journal, 113*(4), 517-540.

APPENDICES

APPENDIX 1: APPENDIX TO CHAPTER 1

Overview of keywords

Key concepts

classroom NEAR/10 engagement OR school NEAR/10 engagement OR student NEAR/10 engagement OR adolescent NEAR/10 engagement OR pupil NEAR/10 engagement OR child* NEAR/10 engagement

AND

student OR child OR adolescent OR school OR education OR classroom

NOT

preschool* OR kindergarten OR “elementary school” OR “elementary education” OR “elementary student*” OR “primary school*” OR “primary education” OR “elementary math*” OR “elementary language*” OR “elementary spelling” OR “elementary reading” OR “elementary writing” OR “elementary physic*” OR elementary science” OR “graduate school*” OR “graduate student*” OR “undergraduate school*” OR “undergraduate student*” OR “physic*education” OR college* OR university* OR “higher education” OR “adult education” OR ‘special need*’

APPENDIX 2: APPENDIX TO CHAPTER 1

Overview of the included studies organized alphabetically by author

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Archambault, Janosz, Chouinard (2012)	1364	Grades 7-11	Canada	Math	sex	Cognitive engagement: subscale of the Echelle multidimensionnelle de motivation pour les apprentissage scolaires (EMMAS; Ntamakiliro, Monnard, & Gurtner, 2000) measuring the time and effort students were ready to invest in mathematics-related activities (7pt; alpha = .85; sample item: "How much time are you ready to spend on mathematics?").	Girls higher cognitive engagement in mathematics (beta = .245; $t = 2.90^*$; $SD = .08$). Tested in model estimating teacher beliefs as predictors for cognitive engagement, controlling for achievement, engagement T1.
Blondal & Adalbjarnardottir (2012)	832	Age 14	Iceland	General	sex	Three measures of disengagement: (1) Negative school behaviors (= behavioral engagement) (4 items; 3pt; alpha = .67; sample items: "I cut classes or skip school", "I get into many fights"); (2) Academic disinterest (= emotional disengagement) (3 items; 5pt; alpha = .74; sample item: "I am not interested in my studies"); (3) School disidentification (= emotional disengagement) (3 items; 5pt; alpha = .72; sample item: "I am not happy at school")	Boys more behaviorally disengaged than girls ($M = 1.46$ for boys; $M = 1.32$ for girls; $F = 19.6^{***}$). Boys more academic disinterest than girls ($M = 2.62$ for boys; $M = 2.46$ for girls; $F = 4.3^*$). No sex differences for school disidentification.
Cooper (2014)	1132	Grade 9 to 12	US	Mean of math, science, arts, language & social studies	sex	Survey of the National Center for School Engagement (2006): 5 school engagement items (5pt; alpha = .76; sample items: "How often do you do all of your work in this class?", "How happy are you when you are in this class?", "If you don't understand something in this class, how often do you try to figure it out?")	Girls score higher on school engagement than boys do (M girls = 3.73 $SD = .89$; M boys = 3.63 $SD = .91$; significant difference at $p < .05$ based on one way ANOVA with scheffé-test, no numbers available in the article).

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Darr (2012)	8500	Grade 7-10	New Zealand	General	sex	"Me and my school": General measure of school engagement, using items capturing emotional, cognitive and behavioral engagement based on Fredricks et al. (2004): 15 items (sample items: "Most mornings I look forward to going to school" (emotional engagement); "I think it is important for me to behave well at school." (behavioral engagement); "I like learning new things in school" (cognitive engagement)).	In grade 7, girls score higher than boys do. Decline for both sexes from Grade 7 to Grade 10. For girls, however, the decline is much greater than for boys. In Grade 10, median engagement scores for both boys and girls are the same.
Fan (2011)	16252	Grade 10	US	General	sex	Behavioral engagement scale measuring students' effort and persistence (based on Birch & Ladd, 1998; Fredricks et al., 2004; Skinner & Belmont, 1993; Wellborn & Connell, 1987) (4pt; alpha = .87; sample item: "Puts forward best effort when studying") (idem Fan & Williams, 2010)	Girls higher behavioral engagement than boys (beta = .15**; effect size = .32).
Green, Rhodes, Hirsch, Suárez-Orozco, & Camic (2008)	139	Time 1: Grade 4-8; Time 2: age 11-16; Time 3: age 14-19	US, born in Mexico	General	sex	Academic Engagement Scale asking about behaviors considered necessary for school success (4 pt, summed: ranging from 3 to 12; alpha = .69 - .80; sample item: "Some students always finish their work BUT other students often do not finish it." (same statements about finishing homework and paying attention in class) (= behavioral engagement)). Participants were asked whether they are more like the first or second group. First group indicates high engagement.	Boys higher engagement at Time 1 (intercept) ($B = -4.66$; $SE = 2.11$, $p = .03$; effect size = .18). Girls more positive changes in engagement over time (slope) ($B = 2.16$, $SE = .96$; $p = .03$; effect size = .19)

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Hoglund (2007)	337	Mean age = 12.5	Canada	General	sex	School engagement measured by (1) teacher-reported attitude and effort on students' final report cards in the five core subjects (English or French, math, science, language arts, and social studies): wants to measure cognitive engagement (investment in learning, self-regulated motivation, thoughtfulness) and behavioral engagement (involvement in learning, self-directed participation, persistence on academic tasks) (5 items; 3pt scale; alpha = .91; scores averaged within each subject across three report card terms and then across subjects); (2) school records of students' total number of absences during the school year: aim to measure negative behavioral engagement; (3) Self-reported behavioral and emotional engagement on the School Engagement Questionnaire (Furrer & Skinner, 2003): Behavioral engagement: students' involvement in learning, including participation in class activities, concentration, and persistence (5 items; 4pt; alpha = .85; sample item: "Listen carefully in class"); Emotional engagement: Students' affective reactions in class, including interest, enjoyment of class and learning, and sense of belongingness (5 items; 4pt; alpha = .86; sample item: "I feel interested in class").	Girls higher on cognitive engagement (attitude and effort; teacher report) (M girls = 1.72 SD = .34; M boys = 1.53 SD = .41; F = 20.55**). No significant differences for absences (M girls 1.01 SD = .31; M boys = 1.04 SD = .33; F = .55). Girls higher behavioral engagement (M girls = 2.41 SD = .51; M boys = 2.19 SD = .64; F = 11.71**). Girls higher emotional engagement (M girls = 2.11 SD = .56; M boys = 1.87 SD = .75; F = 11.03**)
Johnson, Crosnoe, & Elder (2001)	10586	Middle school: 2482; High school: 8104	US	General	sex	Composite measure for engagement in school: level of participation in school (= behavioral engagement) (5pt; alpha = .61; 3 items measuring how many times in the past school year students had skipped school, had trouble paying attention and had trouble getting homework done)	Girls more engaged than boys in middle school (beta = .15***) and in high school (beta = .10***)

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Lam et al. (2012)	3400	Grade 7-9	12 countries (Austria, Canada, China, Cyprus, Estonia, Greece, Malta, Portugal, Romania, South Korea, UK, US)	General	sex	Newly developed scale with three subscales (Lam et al., 2009): (1) Affective Engagement Subscale measuring students' liking for learning and school (9 items; 5pt; alpha = .78; sample item: "I like what I am learning in school"); (2) Behavioral engagement measuring persistence and effort in learning (12 items; 5pt; alpha = .78; sample item: "I try hard to do well in school"); (3) Cognitive engagement measuring students' use of meaningful information processing strategies in learning (12 items; 5pt; alpha = .78; sample item: "When I study, I try to connect what I am learning with my own experiences.") Average score was used of all three scales to indicate 'student engagement'.	Girls higher student engagement than boys (M girls = 3.44 SD = .56; M boys = 3.31 SD = .56; Cohen's d effect size = .23)
Lamote, Speybroeck, Van Den Noortgate, Van Damme (2013)	4063	Grade 7 to 12	Belgium, Flanders	General	sex	Schoolvragenlijst Voortgezet Onderwijs: (1) behavioral engagement: attitude towards homework (5 items; alpha = .82); [(2) Emotional engagement: relationship with teachers (10 items; alpha = .88; sample items: "I feel at ease with most of the teachers.", "There are enough teachers who listen patiently when I ask something.")]	Three trajectories of behavioral engagement: high, high and decreasing and low: Boys are more likely to be part of the high and decreasing and the low group than part of the high group. [Two trajectories of emotional engagement: high and low: Boys are more likely to be part of the low group.]
Marks (2000)	3669	Grade 5, 8 & 10	US	Math & social sciences (no separate results)	sex	Student engagement in instructional activity: Composite measure of (1) student effort (item: "In social studies/mathematics class, how often do you try as hard as you can?"); (2) attentiveness (item: "How often do you pay attention in this class?"); (3) Lack of boredom in class (item: "Often I feel bored in this class." (R)); (4) Completing class assignments (item: "About how often do you complete your assignments for this class?") (4 items; 5pt; alpha = .69).	Girls more engaged than boys in elementary (beta = .30***), middle (beta = .25***), and high school (beta = .28***).

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Martin (2007)	12237	Grade 7-12	Australia	General	sex	Motivation and Engagement Scale - High School: 11 factors for measuring engagement and motivation on a 7pt scale: Each factor has four items. Adaptive cognition includes self-efficacy (e.g. "If I try hard, I believe I can do my schoolwork well"), valuing school (e.g. "Learning at school is important to me") and mastery orientation (e.g. "I feel very pleased with myself when I really understand what I'm taught at school"). Adaptive behavior includes planning (e.g. "Before I start an assignment I plan out how I am going to do it"), task management (e.g. "When I study, I usually study in places where I can concentrate") and persistence (e.g. "If I can't understand my schoolwork at first, I keep going over it until I understand it"). Maladaptive cognition includes anxiety (e.g. "When exams and assignments are coming up, I worry a lot"), uncertain control (e.g. "I'm often unsure how I can avoid doing poorly at school") and failure avoidance (e.g. "Often the main reason I work at school is because I don't want to disappoint my parents"). Maladaptive behavior includes self-handicapping (e.g. "I sometimes don't study very hard before exams so I have an excuse if I don't do as well as I hoped") and disengagement (e.g. "I often feel like giving up at school").	No sex differences for self-efficacy, failure avoidance and uncertain control. Girls higher on mastery orientation (beta = .11*), valuing of school (beta = -.08*), planning (beta = -.11*), study management (beta = -.12*), persistence (beta = -.08*); anxiety (beta = -.22). Boys higher on self-handicapping (beta = .06*) and disengagement (beta = .05*).
Nie & Lau (2009)	3196	Grade 9	Singapore	English	sex	Student report of attention effort, and participation in classroom activities (bases on Steinberg et al., 1992; Wellborn & Connell, 1987) (5 items; alpha = .86; sample item: "In my English class I pay attention well.")	No sex differences in engagement (beta = .004)

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Orthner, Jones-Sanpei, Akos, & Rose (2013)	3649	Grade 6-8	US	General	sex	Measuring psychosocial student engagement: 2 scales: (1) School Valuing: School valuing subscale derived from the Student Identification with School measure (Voelkl, 1996) measuring students' belief that school is important and provides an opportunity to learn useful information that he or she will find helpful or useful in the future (7 items: 5pt: alpha = .79; sample item: "School is not a waste of time"; (2) School Engagement: School Success Profile School Engagement subscale (Bowen, Rose, & Bowen, 2005) measuring the extent of the student's excitement of being in school and looking forward to learning at school (3 items: 5pt: alpha = .801; sample item: "School is fun and exciting")	Effects of two interventions for improving students' engagement were tested. Two models were fitted. In both models, boys score significantly lower on valuing of school (beta = 1.74*** and 1.77***) and no significant sex differences found for school engagement (beta = 1.16 and 1.15)
Park et al. (2012)	94	Grade 9	US	General, but activity specific	sex	Emotional engagement measured by means of the Experience Sampling Method, in which students have to fill out a questionnaire during their activity at different time points according to a random signal (3 items; 5pt; alpha = .67; item interest: "Was the activity interesting?", item concentration: "How hard were you concentrating?" and enjoyment: "Did you enjoy what you were doing?")	Girls score significantly higher than boys do for emotional engagement (M girls = 2.81 SD = .99; M boys = 2.67 SD = .97; F = 8.46)

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Plenty & Heubeck (2013)	784	Grade 7-9	Australia	Math	sex	Adapted specifically for mathematics from the Motivation and Engagement Scale - High School (see Martin, 2007): 11 factors for measuring engagement and motivation on a 7pt scale: Each factor has four items. Adaptive cognition includes self-efficacy (e.g. "If I try hard, I believe I can do my schoolwork well"), valuing school (e.g. "Learning at school is important to me") and mastery orientation (e.g. "I feel very pleased with myself when I really understand what I'm taught at school"). Adaptive behavior includes planning (e.g. "Before I start an assignment I plan out how I am going to do it"), task management (e.g. "When I study, I usually study in places where I can concentrate") and persistence (e.g. "If I can't understand my schoolwork at first, I keep going over it until I understand it"). Maladaptive cognition includes anxiety (e.g. "When exams and assignments are coming up, I worry a lot"), uncertain control (e.g. "I'm often unsure how I can avoid doing poorly at school") and failure avoidance (e.g. "Often the main reason I work at school is because I don't want to disappoint my parents"). Maladaptive behavior includes self-handicapping (e.g. "I sometimes don't study very hard before exams so I have an excuse if I don't do as well as I hoped") and disengagement (e.g. "I often feel like giving up at school").	No significant differences for self-efficacy ($F = .29$), Valuing ($F = .65$), planning ($F = 1.83$), persistence ($F = 3.55$), self-handicapping ($F = .42$), disengagement ($F = .71$). Girls score higher on mastery orientation ($F = 6.91^{**}$), task management ($F = 5.66^{**}$), anxiety ($F = 39.96^{***}$), failure avoidance ($F = 8.93$), uncertain control ($F = 21.10^{***}$).
Shernoff & Schmidt (2008)	586	Grade 10 and 12	US	General, but activity specific measure	sex	Engagement measured by means of the Experience Sampling Method (students received signals during the day after which they had to fill out a questionnaire about the activity they were involved in at that moment). A composite measure based on flow theory adopted from Shernoff et al. (2003) (9pt scale; 3 items; alpha = .64: item concentration: "How well were you concentrating?", item Enjoyment: "Did you enjoy what you were doing?", item interest: "Was this activity interesting?")	Girls score higher for engagement than boys do ($B = .20^*$)

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
Skinner, Furrer, Marchand & Kindermann (2008)	805	Grade 4-7	US	General	sex	Behavioral and emotional engagement and disaffection (Skinner et al., 1990; 1998; Wellborn, 1991). (1) Behavioral engagement measuring effort, attention, and persistence (5 items; alpha = .71-.72). Behavioral disaffection measuring lack of effort and withdrawal from learning activities (5 items; alpha = .65-.70). (3) Emotional engagement measuring emotions indicating students' motivated participation during learning activities (6 items; alpha = .83-.84). (4) Emotional disaffection measuring emotions indicating students' motivated withdrawal or alienation during learning activities (10 items; alpha = .84-.84)	Girls score higher for behavioral engagement (M girls = 3.47 SD = .44; M boys = 3.31 SD = .52; t = -5.16***). Girls score higher for emotional engagement (M girls = 3.09 SD = .60; M boys = 2.96 SD = .66 t = -3.14**). Boys score higher on behavioral disaffection (M girls = 1.87 SD = .06; M boys = 2.06 SD = .61; t = 4.88***). No significant sex differences on emotional disaffection (M girls = 2.17 SD = .62; M boys = 2.19 SD = .63; t = .45).
Ueno & McWilliams (2010)	1995	Grade 8-12	US	General	sex & gender identity: gender type measure (Cleveland et al., 2001; Urdy & Chantala, 2004)	Based on measure of Johnson, Crosnoe, and Elder (2001). Two items measuring engagement (4pt; items: "Since school started this year, how often have you had trouble paying attention in school?", "How often have you had trouble getting your homework done?"; alpha = .70)	Girls show higher school engagement than boys do (t = 6.42*** M girls = 5.85 SD = 1.74; M boys = 5.55 SD = 1.84). Extremely gender-typed boys and girls show lower student engagement than gender-typical boys and girls do (t = -5.65*** for girls and t = -3.49*** for boys). Gender-atypical girls show no differences with gender-typical girls concerning engagement. Gender-atypical boys show lower student engagement than gender-typical boys do (t = -4.08***). For boys, as opposed to girls, the disadvantage of gender-atypical behavior for school engagement is greater (t = -3.54***).

Author	Sample size	Students' age	Country	School subject	Gender measure	Measurement of engagement	Results on gender and engagement
van Uden, Ritzzen, & Pieters (2014)	2288	Mean age: 17,10 years old (SD = 3.26)	The Netherlands	Mean of several school subjects	sex	Final instrument based on Appleton, Christenson, Kim, and Reschly (2006), Archambault et al. (2009) and Reschly and Christenson (2006). Behavioral engagement (6 items; sample item: "I am often late for this class"; lambda = .68); Emotional engagement directed at the subject (5 items; sample item: "I like this class."; lambda = .86); Emotional engagement directed at the teacher (6 items; sample item: "This teacher treats me fairly."; lambda = .92); Cognitive engagement (8 items; sample item: "When I do well at school it is because I work hard"; lambda = .85)	No sex differences for behavioral engagement, emotional engagement directed at the subject, emotional engagement directed at the teacher and cognitive engagement.
Wang, Willet, & Eccles (2011)	1103	Grade 8	US	General	sex	Newly developed instrument based on Fredricks et al. (2004) with two scales for each engagement dimension: (1) behavioral engagement (alpha = .82): attentiveness (3 items; 5 pt; sample item: "How often do you have trouble paying attention in class?"; alpha = .79) and school compliance (4 items; 5pt; sample item: "How often have you been involved in a physical fight?"; alpha = .83); (2) emotional engagement (alpha = .86): school belonging (5pt; 3 items; sample item: "I feel happy and safe in this school."; alpha = .82) and valuing of school education (5 items; 5pt; sample item: "I have to do well in school if I want to be a success in life; alpha = .85); (3) Cognitive engagement (alpha = .82): self-regulated learning (4 items; 5pt; sample item: "How often do you try to figure out problems and planning how to solve them?"; alpha = .78) and cognitive strategy use (4 items; 5pt; sample item: "How often do you try to relate what you are studying to other things you know about?"; alpha = .80).	Boys reported lower behavioral engagement (difference = -.39, $z = -2.59^*$, $d = .25$) and lower emotional engagement (difference = -.46, $z = -4.22^{***}$, $d = .32$). No significant sex differences for cognitive engagement (difference = -.06, $z = -.59$, $d = .07$).

Note: When reliability scores for the instruments or specific information about gender differences (beta-values, *t*-values, *F*-values, effect sizes) are not given, no exact information on these items is given in the article.

APPENDIX 3 : APPENDIX TO CHAPTER 3

Vignettes of low and high autonomy supportive teacher behavior and of low and high provision of structure.

Low autonomy supportive (controlling) behavior

In the first part of the lesson you and your classmates were taught some new material. Then some exercises were classically done and discussed. Now everyone is asked to do some more exercises. This is what is said before you all start working:

Student: "Can we work together?"

Teacher: "No, you can't. At a test, you will need to work on your own too."

Student: "Are we supposed to work as in the example? Because I would handle it differently."

Teacher: "We have just gone through the exercises step by step. We'll do it this way now, otherwise it'll become too confusing."

Student: "What do you mean, confusing?"

Teacher: "Everyone will do something else then and so you will make mistakes more easily."

Student: "Phew, Why do we have to do these anyway?"

Teacher: "Because these are simply the exercises which are in your book. At the exam, the questions will be the same, you know."

High autonomy supportive behavior

In the first part of the lesson you were taught some new material. Then some exercises were classically done and discussed. Now you are asked to do some more exercises. This is what is said before you start working:

Student: "Can we work together?"

Teacher: "You can choose. You can work on your own or you can discuss some difficult things with some other students. Anyway, it is important to work quietly so as not to disturb the others."

Student (Charlie): "Are we supposed to work as in the example? Because I would handle it differently."

Teacher: "How would you tackle it then? Could you explain by means of the first question? The students who like to start doing the exercises can do so. You can also listen to Charlie's approach." (Charlie explains his method.)

Teacher: "Well done! That works too! Go ahead!"

Student: "Why do we need to do these exercises?"

Teacher: "Well, you see, I frequently needed French actually. For example, when you go for a drink or a snack somewhere in France, or in Wallonia, or in Brussels, people sometimes don't speak Dutch. Then it is really easy to be able to order something in French."

Student: "Yes, that's true! We always go on holiday in France and my parents order things in French then."

Low provision of structure

In the first part of the lesson you were taught some new material. Now is the time for exercises. The teacher says you can ask questions when you are in trouble. You don't understand question 6a and you raise your hand. The teacher comes over to your place. This is the conversation between the teacher and you:

You: "I don't understand this question quite well."

Teacher: "Then read it once more. When you still have questions, you can always ask them."

You: "Is it the same as in the preceding question? Did I do things correctly with the preceding question?"

Teacher: "No, there's something wrong here. Just read the question again. We are really going to take the following exercise now."

Teacher (to the class): "Things not finished are to be done at home. We are taking exercise 8 now."

High provision of structure

In the first part of the lesson you were taught some new material. Now is the time for exercises. The teacher says you can ask questions when you are in trouble. You don't understand question 6a and you raise your hand. The teacher comes over to your place. This is the conversation between the teacher and you:

You: "I don't understand this question quite well."

Teacher: "That's possible. Is it not clear what you are supposed to do or can't you carry out the assignment?"

You: "I don't know. I simply don't get it."

Teacher: "Shall we go through the question step by step then? It says: 'Derive the meaning of the words in bold from the context.'"

You: "Actually I don't understand the word 'context'."

Teacher: "Ah! That's not easy indeed. Maybe we should have a closer look at that word together."

Teacher (to the class): "Does anybody remember the meaning of the word 'context'?"

Other student: "I didn't understand it either, but Charlie has just explained me it means you have to try to understand the word in bold by searching the sentences surrounding the word. The sentences in the neighborhood are the 'context' actually. When you read these sentences, you mostly know what the word in bold means."

Teacher: "That was a terrific explanation! It's completely right. Indeed, the context is the part of the text from which you can derive the meaning of a word unknown to you."

Teacher (to you): "Have you understood the explanation? Can you start working now?"

You: "Yes, now I can."

Teacher (to the class): "The exercises on this page could be finished in this lesson. When you get stuck, ask another student for help or come to me for help. That way, we will succeed in finishing everything."

APPENDIX 4 : APPENDIX TO THE GENERAL DISCUSSION

Table presenting the means, standard deviations, and *t*-tests of autonomous and controlled motivation for Dutch language, as an addition to the analyses of behavioral engagement and teacher support of Grade 7 students in Chapter 2.

Variable	Girls			Boys			<i>t</i>
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	
Autonomous motivation Dutch language	163	3.42	.77	227	3.10	.88	-3.81***
Controlled motivation Dutch language	163	2.89	.71	227	2.93	.75	.51

Table presenting the means, standard deviations, and *t*-tests of behavioral engagement, teacher support, and autonomous and controlled motivation of Grade 7 students for *mathematics*, as an addition to the analyses for Dutch language in Chapter 2.

Variable	Girls			Boys			<i>t</i>
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	
1. Autonomy support	163	3.76	.67	228	3.60	.65	-2.57*
2. Structure	162	3.74	.67	227	3.54	.70	-2.86**
3. Involvement	162	3.54	.70	227	3.44	.73	-1.35
4. Engagement (student report)	163	2.63	.33	227	2.61	.42	-.53
5. Engagement (teacher report)	58	2.60	.43	.89	2.46	.48	-1.76
6. Engagement (observer report)	59	2.60	.46	99	2.59	.52	-.16
7. Autonomous motivation	163	3.42	.77	227	3.10	.88	-3.81***
8. Controlled motivation	163	2.89	.71	227	2.93	.75	.51