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Teacher job satisfaction: the importance of school working conditions and teacher characteristics

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ABSTRACT

Given that teacher shortage is an international problem, teacher job satisfaction merits closer attention. Not only is job satisfaction closely related to teacher retention, but it also contributes to the well-being of teachers and their students, overall school cohesion and enhanced status of the teaching profession. This study investigates the relations between teacher job satisfaction, school working conditions and teacher characteristics for eighth grade mathematics teachers. The study employs TIMSS 2015 (Trends in International Mathematics and Science Study) data from Sweden. Confirmatory factor analysis and structural equation modelling are used as main methods. Results demonstrate a substantial association between school working conditions and teacher job satisfaction. More specifically, teacher workload, teacher cooperation and teacher perceptions of student discipline in school were the factors most closely related to teacher job satisfaction. As to teacher characteristics, female teachers, teachers with more exposure to professional development and more efficacious teachers tended to have higher levels of job satisfaction. In addition, it was found that the relationship between the extent of teacher cooperation and job satisfaction was more pronounced for male teachers, while student discipline was more important for job satisfaction of teachers with lower self-efficacy beliefs. Implications for policy are further discussed.

Background

While the role of teachers’ work for student outcomes is widely recognised, the question whether teachers are content with their working environment is often overlooked (Bascia & Rottmann, 2011; Liang & Akiba, 2017). Meanwhile, teacher job satisfaction has many important and far-reaching implications. First, it contributes to teacher well-being as satisfied teachers are less susceptible to stress and burnout (Kyriacou & Sutcliffe, 1977; Skaalvik & Skaalvik, 2011). In addition, there is evidence that students of teachers who are content with their job also feel better (Collie, Shapka, & Perry, 2012; Spilt, Koomen, & Thijs, 2011). Furthermore, satisfied teachers offer higher instructional quality and better learning support for their students (Klumsmann, Kunter, Trautwein, Lüdtke, & Baumert, 2008; Kunter et al., 2013). Finally, content teachers demonstrate stronger job commitment and...
are less prone to leave the profession (Blömeke, Houang, Hsieh, & Wang, 2017; Klassen & Chiu, 2011), which is especially crucial in times when teacher turnover is high.

Increasing teacher turnover rates and a subsequent shortage of qualified teachers is a growing concern internationally (European Commission, 2018; Ingersoll, 2017). Teacher turnover comprises interrelated notions of teacher migration and attrition, where migration describes teachers moving to other schools, while attrition pertains to teachers leaving the profession altogether (Ingersoll, 2001; Rinke, 2008). However, regardless the type of turnover, there are always negative consequences for a particular school from which a teacher is departing. Ronfeldt, Loeb, and Wyckoff (2013) suggest a disruptive impact of turnover beyond compositional changes in teacher quality, especially in lower-performing schools. Besides affecting student learning and motivation, teacher turnover negatively affects faculty collegiality and trust and leads to a loss of institutional knowledge, which is critical for supporting student learning. In the end, overall school performance is affected (Ingersoll, 2001; Ingersoll & Smith, 2004).

**An international perspective on teacher working conditions**

International research evidence suggests that a diminishing prestige of the teaching profession together with dissatisfying working environment is the prevailing reason for teacher turnover, with salaries being only a minor source of dissatisfaction (Borman & Dowling, 2008; Ingersoll & Smith, 2004; TemaNord, 2010). Moreover, inadequate working conditions of a school undermine the status of the profession and make it difficult to recruit new teachers (Ingersoll, 2001). Yet, even recruiting more teachers may not solve the turnover problem as long as large numbers of the new teachers will be leaving schools, discontent with their professional status and working environment (Ingersoll, 2017; Sutcher, Darling-Hammond, & Carver-Thomas, 2016). In addition, as brought forward by Ronfeldt et al. (2013) the recruiting, hiring, and training of new teachers requires significant financial costs. These costs drain resources that might otherwise be spent on ameliorating schools’ working environment, which is a crucial step towards retaining qualified teachers (Borman & Dowling, 2008). Therefore, policy measures to tackle the teacher crisis are increasingly shifting towards teacher retention efforts (Ingersoll, 2017; Sibieta, 2018; Sutcher et al., 2016; Worth & De Lazzari, 2017). Such efforts are especially crucial for teachers of mathematics and sciences, which are at a higher risk of attrition compared to other groups of teachers (Ingersoll & May, 2012; Sibieta, 2018).

Teacher turnover is not a recent phenomenon, dating back as early as the middle of the twentieth century (Levin, 1985; Rumberger, 1985), yet having risen dramatically in the past few decades (Lindqvist, Nordånger, & Carlsson, 2014). This rise is often attributed to the neoliberal policies in education, and the introduction of the New Public Management (NPM), with the focus on standards, a quantified performance, and competition (Ball, 2003). These affected teachers and their work in many countries in Europe, e.g. England, France and Scandinavia, as well as New Zealand and the US (Carlgren & Klette, 2008). In the current study we mainly draw on research from the UK and the US, where the marketisation trends had the most profound impact on teachers, which is evidenced by an amassing research literature; and Sweden – the focus of this inquiry. Thus, the themes of the challenged teacher traditional professional values and identities, the threat to teacher professional judgement and autonomy, and a tendency towards de-professionalisation of the teaching
profession are recurring in research from the US and the UK (Ball, 2003; Hextall & Mahony, 2000; Zeichner, 2010). Increasing teacher stress and frustration have been linked to a higher emphasis on teacher performance and accountability, paired with an increased workload in these countries (Ingersoll, 2017; Perryman, Ball, Maguire, & Braun, 2011; Zeichner, 2014). Moreover, transformed teacher relationships have also been ascribed to marketisation trends in education. Thus, the relationships with parents and students were affected, resulting in a more intense interaction with parents and a stronger student position as a “customer” (Ball, 2003). Increased competition and ranking requirements impacted schools as organisations, eroding collegial relations between teachers as well as challenging relationships with school leadership (Evetts, 2009; Perryman, 2006; Zeichner, 2014).

**Teacher working conditions: the Swedish case**

While it is a challenging undertaking to compare teacher situations across the national contexts, it appears that the effects of the neo-liberal policies on the Swedish education system, and teacher situation in particular, have been akin to those in the United States and the UK. In fact, as Lundahl (2016) points out, while the effects of the marketisation trend in education have been similar across the Nordics, in Sweden, its economic, social, academic and professional impact on schools and teachers was most intense. Indeed, the changes under the 1990s reform involved a total restructuring of the Swedish school system, with deregulation, decentralisation and marketisation/customer choice becoming its key characteristics (Carlgren & Klette, 2008). Competition and external pressure rather than professional values came to steer teachers’ work. In this regard, Sweden stands out as being “similarly unique” in relation to its Nordic neighbours, while remaining “uniquely similar” (Weiner, 2002) with respect to its English-speaking counterparts.

Thus, Sweden has been experiencing a similar unsettling trend of raising rates of teacher turnover during the past forty years, which has accelerated during the 1980s and 1990s (Lindqvist & Nordänger, 2016). Consequently, in the next decade the nation will witness an alarming shortage of certified teachers with about 80,000 school teacher vacancies to be filled by 2031 (The Swedish National Agency for Education, 2018). Yet, recruiting new teachers may be a challenging task as only 11% of teachers in Sweden think that society values the teaching profession (OECD, 2019), which further exacerbates the problem of teacher retention.

Akin to international trends, marketisation of education and the accompanying new public management elements, introduced in the late 1980s, are also widely cited in the Swedish context as reasons for teachers’ increased stress, distortion of professional values and identities, and impaired relations with students, colleagues, school leaders and parents (Dovemark & Holm, 2017; Lundahl, Arreman, Holm, & Lundström, 2013; Lundström & Holm, 2011). As attested by Lindqvist et al. (2014), the impact of the 90s reforms would become apparent in the decades to follow, so results of the studies conducted at the turn of the 21st century could shed light on the changes in teacher situation in the context of the neo-liberal policies.

Further illustrating Sweden’s “unique similarity” in the international context are the analogous calls for policy measures to improve teachers’ working conditions in order to tackle the issue of teacher turnover in Sweden. These measures include, but are not limited to strengthening support functions for teachers, reduced administrative work, and
widening opportunities for professional development (The Swedish National Agency for Education, 2018). Yet another similar feature of the Swedish teacher shortage phenomenon is that it is more accentuated for mathematics and science teachers (Statistics Sweden, 2018). This is alarming since student mathematics knowledge is highly correlated with knowledge in other theoretical domains and highly predictive of student overall school, post-secondary success and future earnings (Hein, Smerdon, & Sambolt, 2013; Siegler et al., 2012). In addition, in Sweden, teacher education with a specialisation in mathematics is a requirement for holding a position as teacher in mathematics above primary level. It therefore requires substantial time investments from the side of an individual teacher candidate and considerable costs for society as teacher education is free of charge.

With these implications in mind, this study aims to acquire a better understanding of the relationship between school working conditions and teacher job satisfaction for Swedish eighth grade mathematics teachers. Identifying those working conditions which promote teacher job satisfaction could inform policy about the aspects of school working environment needing improvement, thus promoting teacher retention (Kyriacou, 2001). Moreover, different factors may contribute to job satisfaction of teachers differing in their personal and professional background characteristics, thus requiring a more nuanced investigation.

What influences teacher job satisfaction?

In this section, we take a closer look at the conceptualisation of teacher job satisfaction, as well as its predictors described in previous research, such as school working conditions and teacher characteristics. Even though the focus of the study is on teacher job satisfaction, the literature on closely associated factors, such as teacher turnover and retention, was also reviewed.

In this study, we use the definition of job satisfaction provided by Evans (1997), who describes it as “a state of mind determined by the extent to which the individual perceives her/his job-related needs to be met” (p. 328). In addition, two main components in teacher job satisfaction are recognised: job comfort and job fulfilment. The former refers to how satisfactory job conditions and circumstances are to an individual, while the latter refers to the extent of one’s satisfaction by personal accomplishments within meaningful aspects of the job (Evans, 1997).

School working conditions

In their review of the school working environment, Bascia and Rottmann (2011) reinstate the importance of working conditions in schools not only for teacher motivation, effectiveness and job satisfaction but also for student opportunities to learn. Previous research has recognised some of the most crucial factors, which ensure quality of teachers’ work: adequate resources, feasible workload, collegial cooperation, opportunities for professional development, leadership support and decision-making opportunities, to name just a few.

In the international context, Sims (2017, 2018) analysed teacher data in 35 countries worldwide from Teaching and Learning International Survey (TALIS) 2013 – an international study of school learning environments and working conditions. It was found that
student discipline and teacher cooperation were positively related to teacher job satisfaction in all countries.

A considerable amount of research on the role of working conditions for teachers’ career trajectories was conducted in the US. For example, Ingersoll (2001), on the basis of a nationally representative dataset of over 6,000 US elementary and secondary school teachers, has found that schools with higher levels of leadership support, better student discipline, and higher degrees of autonomy and decision-making opportunities had lower rates of teacher turnover. In their meta-analysis of 63 factors that moderate teacher attrition in the US, Borman and Dowling (2008) found that schools where teachers were offered administrative support, mentoring programs at early career stages and opportunities for networking and cooperation, had lower attrition rates when compared to schools without these features.

Johnson, Kraft, and Papay (2012) investigated the effects of school working conditions on teacher job satisfaction and career intentions in the US context. The study revealed that among the employed categories of teacher working conditions, the ones of social nature were the most important. Thus, the effects of collegial support, principal’s leadership, and school culture of trust and respect were almost double the effect of school material resources.

On the basis of TALIS 2013 data for England, Sims (2017) identified school leadership, career advancement opportunities and student discipline as significant correlates of teacher job satisfaction. Recently, a longitudinal study of school working conditions on teacher job satisfaction and burnout has been carried out in Finland (Malinen & Savolainen, 2016). Based on a survey of 642 Finnish middle school teachers, the study found that teachers who rated teacher collaboration and student behaviour higher at the beginning of the school year, were more satisfied with their jobs at the end of the school year. Since most research on teacher job satisfaction is cross-sectional, the above study makes an important contribution to the field by employing a longitudinal design.

School composition

School composition is an important environmental factor for teacher job satisfaction and turnover intentions as, paired with teacher knowledge and skills, it shapes the academic and social climate in the school.

A secondary analysis of TALIS 2013 data provided cross-national evidence that, once controlled for school working conditions, student body characteristics became insignificant in their relation to job satisfaction (Sims, 2017). Results of the studies on teacher turnover in the US, however, are somewhat contradictory. Thus, Ingersoll (2001), Borman and Dowling (2008) demonstrated that schools with higher concentrations of students from low SES backgrounds, low average student performance and a diverse ethnic student population had higher odds of teacher attrition. Simon and Johnson, on the other hand, found that, when student body composition was examined together with other school working conditions, the effect of the former on job satisfaction was no longer present (2015). Meanwhile, in England, Sims’s (2017) secondary analysis of TALIS 2013 data showed that student body composition was no longer significant in its relation to job satisfaction under control for school working environment. Similar results were arrived at in Norway in the study of 523 senior high school teachers in nine randomly selected
Norwegian schools (Skaalvik & Skaalvik, 2016). The study did not find an effect on student diversity, as measured by teacher perceptions of variation in student needs and abilities, on teacher turnover intentions (Skaalvik & Skaalvik, 2016).

**Teacher characteristics**

Studies of job satisfaction and teacher retention usually use teacher personal characteristics such as age and gender, teacher professional characteristics such as years of teaching experience, degree level and type, participation in professional development programs, and teacher motivational beliefs, e.g. self-efficacy.

**Personal characteristics**

Sims (2018) presented cross-country evidence of teachers’ age being weakly correlated with job satisfaction, while gender had no effect. Studies on teacher turnover from the US demonstrate that young teachers depart from schools at higher rates than their middle-aged colleagues and that women are more likely to leave schools (Borman & Dowling, 2008; Guarino, Santibanez, & Daley, 2006; Ingersoll, 2001; Kukla-Acevedo, 2009). These results may be mainly attributed to the fact that younger female teachers leave schools for reasons of family rearing; however, these teachers are also more prone to return to teaching afterwards (Allen, 2005).

Generally, research on teacher gender and job satisfaction is characterised by a large degree of inconsistency even within identical national contexts. Thus, one study of English teachers’ job satisfaction revealed no significant gender differences (Crossman & Harris, 2006), while in another, women were found to be more satisfied with the teaching job (Poppleton & Riseborough, 1990). In a similar vein, findings of a number of studies in the US and Canadian context on the link between job satisfaction and teacher gender are far from consistent, pointing to higher levels of job satisfaction of either women (Liu & Ramsey, 2008; Ma & MacMillan, 1999) or men (Klassen & Chiu, 2010; Mertler, 2002). While such mixed results could be mainly attributed to the different operationalisations of job satisfaction and other features of study design, the above studies concurred in their explanation of the resulted gender differences. Thus, differences in job satisfaction in these studies were mainly attributed to variations in teacher perceptions of working conditions. For instance, women were found to perceive student behaviour problems and teaching workload as more stressful, and, consequently, had lower levels of job satisfaction (e.g. Klassen & Chiu, 2010). With an exception of Poppleton & Riseborough’s study (1990), which acknowledged complex socio-cultural factors involved in teachers’ perceptions of job satisfaction, the majority of the reviewed studies have disregarded the complexity of gender as a social construct, which may also vary over space and in time (Johnson & Repta, 2011). For example, in Sweden, over the past half a century, social constructions of a teacher position varied greatly, ranging from “distinctly gendered” (Berge, 2004, p. 29) to gender-neutral ones.

**Professional characteristics**

As important constituents of professional expertise, teacher subject-matter knowledge, teaching experience and professional development may affect job satisfaction and thereby the tendency to move between schools or quit the profession altogether. In
the international context, teachers majoring in STEM subjects (science, technology, engineering and mathematics) were less likely to move between schools, while there was no association found between teachers’ majors in STEM subjects and job satisfaction (Sims, 2018). A review of 91 studies of teacher turnover in the US (Allen, 2005) presented limited evidence as to subject-matter knowledge or teacher certification positively affecting teacher retention, while the studies provided moderate evidence on mathematics and science teachers being more likely to leave teaching than teachers in other subjects. The report also presented strong evidence on secondary and high school teachers being more prone to attrition than elementary teachers (Allen, 2005). In England, recent evidence suggested higher attrition rates for mathematics, science and language teachers (Worth & De Lazzari, 2017).

From an international perspective no effects on teacher job satisfaction were found on the basis of TALIS study results. (Sims, 2018). However, such findings may be attributed to the fact that these relations do not have a linear pattern. Thus, a meta-analysis of factors contributing to teacher turnover in the US concludes that teaching experience and turnover follow a U-shape curve, with novice and veteran teachers being more prone to depart from the profession compared to their mid-career colleagues (Guarino et al., 2006). In particular, teacher attrition is more likely during the first 5 years in service (Ingersoll, 2001, 2017).

In turn, in England, teaching experience revealed a curvilinear relationship with job satisfaction, with mid-career teachers demonstrating lower levels of job satisfaction (Crossman & Harris, 2006), while in Canada, a curvilinear relationship followed the U-shaped pattern similar to the one described in the US context (Klassen & Chiu, 2010).

In sum, previous research on effects of teaching experience on teacher job satisfaction is still contradictory and likely dependent on country-specific features of school systems as well as labour market conditions for teachers (Kukla-Acevedo, 2009). Moreover, an accumulating amount of international evidence suggests that the relations between teaching experience and job satisfaction follow a non-linear pattern. In contrast, research on the link between teacher participation in professional programs and job satisfaction offers considerably more consistent results. From an international perspective, a positive association between teacher professional development and job satisfaction has been found in both cross-national (Sims, 2018) and single-country studies (Ma & McMillan; Kraft, Marinell, & Shen-Wei Yee, 2016; Liu & Ramsey, 2008).

Motivational beliefs
Previous research has established an important contribution of teacher motivational beliefs on job satisfaction and retention plans. Studies have in particular addressed self-efficacy, which is a central concept within social cognitive theory (Bandura, 1986, 1997). A core attribute of human agency, self-efficacy beliefs determine how individuals perceive and handle challenges, and deal with failures (Bandura, 1997). Research on determinants of teacher job satisfaction has found consistent mitigating effects of teacher self-efficacy beliefs on stressful school working environment internationally, e.g. in Spain, Norway and Canada (Betoret, 2009; Collie et al., 2012). Higher levels of teacher self-efficacy beliefs were also linked to higher job satisfaction and lower turnover intentions (Klassen & Chiu, 2010; Skaalvik & Skaalvik, 2014). Moreover, Klassen and Chiu (2011) concluded that teacher self-efficacy moderated the effect of stressful working conditions on teacher occupational
commitment. Similarly, Collie et al. (2012) in a study of the relations between teacher stress, self-efficacy and job satisfaction of Canadian teachers attested that, when stressful working conditions are coupled with a strong sense of teacher self-efficacy, they are viewed as challenges possible to overcome, and therefore do not affect job satisfaction negatively.

**Interaction between teacher characteristics in their relation to job satisfaction**

A number of studies have explored the interaction between teacher personal characteristics and professional qualifications. In the US context, Krieg (2006) found that high-quality 4th-grade female teachers were less likely to leave the profession, while for men, attrition was not influenced by teacher quality. In their turn, Ingersoll, Merrill, and May (2014) explored the interaction between teaching experience and teacher qualifications on a nationally representative sample of the novice teachers in the US to conclude that for beginning teachers' retention, the degree and certification mattered little, while training in pedagogy and teaching methods was critical. Further, Klassen and Chiu (2011) suggested that self-efficacy may interact with teaching experience in its effects on teacher turnover in Canada. They concluded that teacher self-efficacy levels are low for inexperienced teachers, are at their peak for mid-career teachers, and in decline for teachers in pre-retirement stage. This interplay provides additional support to the curvilinear shape of the relationship between experience and teacher turnover presented earlier.

In summary, when it comes to the relations between teacher professional characteristics, teacher turnover intentions and job satisfaction, results are somewhat inconclusive for most aspects of teacher qualification, which is probably due to various measures of teacher quality used in the international literature (Borman & Dowling, 2008). On the other hand, there is a higher degree of consistency when it comes to the influence of teacher demographic characteristics, such as age, on job satisfaction and risk for attrition. Still, the effects of teacher gender are rather mixed; one of the reasons for this may be the interaction with other professional and personal factors, as well as working environment aspects specific to a particular grade, domain level and school characteristics. In addition, gender differences may be studied in the framework of institutionalised gender roles (Acker, 1995; Johnson & Repta, 2011; Weiner, 2006) in the teaching profession. Finally, besides an immediate context of the relevant grade-level, subject-matter and school type, these also need to be situated in a broader context of the national educational system. Regarding teacher motivational beliefs, in particular teacher self-efficacy, findings have been rather conclusive, partly due to recent efforts to establish a conceptually unambiguous and valid measure of self-efficacy (Zee & Koomen, 2016). Still, considering the inherent complexity, it is important to address grade and domain specificity when investigating issues related to teacher job satisfaction (Blömeke et al., 2017).

**Teacher job satisfaction in the Swedish context**

In Sweden, the role of school working conditions for teacher job satisfaction has not been given the attention it deserves. There are only a few studies which have addressed the role of school working conditions for teacher professional well-being. For example, Jacobsson, Pousette, and Thylefors (2001) analysed predictors of teacher stress among about 1000 school teachers from 27 schools. In an analysis comprising 12 school factors,
student misbehaviour, work demands and negative feedback from students, colleagues and the principal, were shown to be the strongest predictors of teacher stress. Allodi and Fischbein (2012) investigated perceptions of working conditions for more than 700 Swedish junior high school teachers from 32 schools. Results showed that women were less satisfied with their teaching workload, and that younger teachers perceived having less professional autonomy than their more experienced colleagues. In addition, the study found between-school differences in teacher perceptions of working environments, especially regarding reward and workload satisfaction aspects, suggesting that Swedish teachers are faced with working conditions of varying quality.

As evident, the attempts to study relations between working environment of the school and teacher job satisfaction in Sweden are still rather scarce. Moreover, as pointed out by Rinke (2008), despite the fact that significant interactions have been previously found between teacher background characteristics and workplace conditions, much previous research on teacher job satisfaction and retention has tended to treat individual and contextual characteristics separately. This is also apparent from our brief account of the Swedish research in the area, where studies have either focused on school working conditions or teacher characteristics. The study by Allodi and Fischbein (2012) stands out in this respect, drawing on both individual teacher and contextual school factors when studying relations to teacher job satisfaction.

Considering the above-mentioned background, the current study aims to investigate how the following factors are related to teacher job satisfaction:

(a) school working conditions  
(b) teacher characteristics.

Method

Data sources and sample

The data in the present study were obtained from the International Association for the Evaluation of Educational Achievement (IEA) Trends in International Mathematics and Science Study (TIMSS) 2015. TIMSS is a regularly recurring assessment of fourth- and eighth-grade students’ mathematics and science achievement conducted on a four-year cycle. The international design of the TIMSS study is described in the TIMSS 2015 framework (Mullis & Martin, 2013) as well as in the technical report (Martin, Mullis, & Hooper, 2016). In 2015, 46 countries participated in the survey for grade 8. The database holds information provided by students, their teachers and their principals. In Sweden, 150 schools, 200 teachers and 4090 students in grade 8 participated in the study in 2015 (The Swedish National Agency for Education, 2016). The current study uses the Swedish data from grade 8 mathematics teachers.

Variables and measures

Teacher assessment of their satisfaction with the job as well as working conditions most often cited in the literature (student discipline, leadership support, school resources,
teacher cooperation and teacher workload) were retrieved from the international TIMSS database (Table 1).

The items denoting teacher job satisfaction were recoded so that higher values correspond to higher levels of job satisfaction. It can be observed that the largest variation in teacher perceptions of job satisfaction concerned the item "I am going to continue teaching as long as I can", while teachers’ views were most unanimous for the item "I am enthusiastic about my job". Cronbach’s alpha for teacher job-satisfaction scale was .87 for six items.

All of the reliability indices for the items denoting aspects of school working conditions were good to excellent with .84 for student discipline (five items), .87 for leadership support (three items), .76 for school resources (five items), .86 for teacher cooperation (six items), and .71 for teacher workload (five items). Higher scores on these aspects represent better working conditions.

Teacher self-efficacy items were recoded in order for higher values to denote higher levels of self-efficacy. Cronbach’s alpha for teacher self-efficacy was .87 for six items. It can be observed that teachers were rather confident in performing various teaching tasks, with somewhat lower self-efficacy reported for developing student critical thinking.

In addition, teacher demographic and professional characteristics, such as gender, experience, teacher certification, mathematics and mathematics education as a major, and number of hours of professional development, were used. A standard deviation of classroom achievement level (ACH_sd) and a classroom mean of the number of books at home (BOOKS_m) were used as indicators of student achievement heterogeneity/social composition, respectively. ACH_sd purported to capture the achievement heterogeneity in the classroom, which is not necessarily higher in classrooms with lower-SES students. However, given higher levels of achievement heterogeneity, teachers may perceive their working conditions as more problematic. BOOKS_m aimed to capture school segregation with respect to student social background. Manifest variables’ correlations are presented in Table 2.

It can be observed that well-qualified teachers in terms of teacher certification, major in mathematics and mathematics education, and teaching experience are not clustered in classes with higher-SES or higher achieving students. Therefore, it may be concluded that no selection effects are present.

**Methods of analysis**

Many phenomena studied in social science are not readily observable. They are often complex in nature and a number of indicators may be needed to more fully capture their multifaceted meaning. Job satisfaction is an example of such a complex construct that cannot be immediately observed. A latent variable approach has the potential to better represent the theoretical frame of reference than would be possible with single or few manifest variables. Thereby, the use of latent variables adds to the measurement’s construct validity. Additionally, in contrast to manifest variables, latent variables are free from errors of measurement, since the unique part of the variance is separated from the unexplained part in the statistical formulation of the variable (Gustafsson, 2009). The analytical methods used in this study were mainly confirmatory factor analysis and a
Table 1. Descriptive statistics of the study’s variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator/Statement</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher job satisfaction</strong></td>
<td>How often do you feel the following way about being a teacher?-Never-sometimes-often-very often</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>3.12</td>
<td>0.74</td>
</tr>
<tr>
<td>SAT_prof</td>
<td>I am content with my profession as a teacher</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>3.23</td>
<td>0.70</td>
</tr>
<tr>
<td>SAT_teach</td>
<td>I am satisfied with being a teacher in this school</td>
<td>195</td>
<td>2</td>
<td>4</td>
<td>3.26</td>
<td>0.65</td>
</tr>
<tr>
<td>SAT_enth</td>
<td>I am enthusiastic about my job</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>3.16</td>
<td>0.71</td>
</tr>
<tr>
<td>SAT_inspire</td>
<td>My work inspires me</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>3.32</td>
<td>0.70</td>
</tr>
<tr>
<td>SAT_cont</td>
<td>I am going to continue teaching as long as I can</td>
<td>191</td>
<td>1</td>
<td>4</td>
<td>2.96</td>
<td>0.90</td>
</tr>
<tr>
<td><strong>Student discipline</strong></td>
<td>Thinking about your current school, indicate the extent to which you agree with the following statement – Disagree a lot-disagree a little-agree a little-Agree a lot</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>3.12</td>
<td>0.61</td>
</tr>
<tr>
<td>DISP_behave</td>
<td>Students behave in an orderly manner</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.99</td>
<td>0.90</td>
</tr>
<tr>
<td>DISP_respect</td>
<td>Students are respectful of the teachers</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.91</td>
<td>0.95</td>
</tr>
<tr>
<td>DISP_property</td>
<td>Students respect school property</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.99</td>
<td>0.90</td>
</tr>
<tr>
<td>DISP_rules</td>
<td>This school has clear rules about student conduct</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.91</td>
<td>0.95</td>
</tr>
<tr>
<td>DISP_enforce</td>
<td>This school’s rules are enforced in a fair and consistent manner</td>
<td>191</td>
<td>1</td>
<td>4</td>
<td>2.94</td>
<td>0.68</td>
</tr>
<tr>
<td><strong>Leadership support</strong></td>
<td>How would you characterise each of the following within our school? – Very low-low-medium-high-very high</td>
<td>193</td>
<td>1</td>
<td>5</td>
<td>2.93</td>
<td>1.02</td>
</tr>
<tr>
<td>LEAD_coop</td>
<td>Collaboration between school leadership and teachers to plan instruction</td>
<td>193</td>
<td>1</td>
<td>5</td>
<td>3.12</td>
<td>1.00</td>
</tr>
<tr>
<td>LEAD_teach</td>
<td>Amount of instructional support provided to teachers by school leadership</td>
<td>193</td>
<td>1</td>
<td>5</td>
<td>3.19</td>
<td>0.98</td>
</tr>
<tr>
<td>LEAD_develop</td>
<td>School leadership’s support for teachers’ professional development</td>
<td>193</td>
<td>1</td>
<td>5</td>
<td>3.19</td>
<td>0.98</td>
</tr>
<tr>
<td><strong>School resources</strong></td>
<td>In your current school, how severe is each problem? – Serious problem-moderate problem-minor problem-not a problem</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.77</td>
<td>0.92</td>
</tr>
<tr>
<td>RES_space</td>
<td>Teachers do not have adequate workspace</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.92</td>
<td>0.86</td>
</tr>
<tr>
<td>RES_material</td>
<td>Teachers do not have adequate instructional materials and supplies</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.91</td>
<td>0.95</td>
</tr>
<tr>
<td>RES_maintain</td>
<td>The school classrooms need maintenance work</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.99</td>
<td>0.90</td>
</tr>
<tr>
<td>RES_tech</td>
<td>Teachers do not have adequate technological resources</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.91</td>
<td>0.95</td>
</tr>
<tr>
<td>RES_support</td>
<td>Teachers do not have adequate support for using technology</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.91</td>
<td>0.86</td>
</tr>
<tr>
<td><strong>Teacher cooperation</strong></td>
<td>How often do you have the following types of interactions with other teachers? – Never or almost never-sometimes-often-very often</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.86</td>
<td>0.78</td>
</tr>
<tr>
<td>COOP_discuss</td>
<td>Discuss how to teach a particular topic</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.61</td>
<td>0.89</td>
</tr>
<tr>
<td>COOP_prepare</td>
<td>Collaborate in planning and preparing instructional materials</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.61</td>
<td>0.89</td>
</tr>
<tr>
<td>COOP_share</td>
<td>Share what I have learned about my teaching experiences</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.96</td>
<td>0.76</td>
</tr>
<tr>
<td>COOP_ideas</td>
<td>Work together to try out new ideas</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.42</td>
<td>0.80</td>
</tr>
<tr>
<td>COOP_curr</td>
<td>Work as a group on implementing the curriculum</td>
<td>193</td>
<td>1</td>
<td>4</td>
<td>2.38</td>
<td>0.85</td>
</tr>
<tr>
<td>COOP_ensure</td>
<td>Work with teachers from other grades to ensure continuity in learning</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.03</td>
<td>0.92</td>
</tr>
<tr>
<td><strong>Teacher workload</strong></td>
<td>Indicate the extent to which you agree with the following statement – Agree a lot-agree a little-disagree a little-disagree a lot</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.38</td>
<td>0.80</td>
</tr>
<tr>
<td>LOAD_content</td>
<td>I have too much material to cover in class</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.39</td>
<td>0.98</td>
</tr>
<tr>
<td>LOAD_hours</td>
<td>I have too many teaching hours</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>1.96</td>
<td>0.78</td>
</tr>
<tr>
<td>LOAD_assist</td>
<td>I need more time to assist individual students</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>1.45</td>
<td>0.63</td>
</tr>
<tr>
<td>LOAD_admin</td>
<td>I have too many administrative tasks</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>1.87</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>Teacher self-efficacy</strong></td>
<td>In teaching mathematics to this class, how would you characterise your confidence in doing the following? – low-medium-high-very high</td>
<td>192</td>
<td>1</td>
<td>4</td>
<td>3.03</td>
<td>0.73</td>
</tr>
<tr>
<td>TSE_inspire</td>
<td>Inspiring students to learn mathematics</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.83</td>
<td>0.70</td>
</tr>
<tr>
<td>TSE_interest</td>
<td>Adapting my teaching to engage student interest</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.83</td>
<td>0.70</td>
</tr>
<tr>
<td>TSE_value</td>
<td>Helping students appreciate the value of learning mathematics</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.91</td>
<td>0.69</td>
</tr>
<tr>
<td>TSE_facil</td>
<td>Facilitating the understanding of struggling students</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.92</td>
<td>0.70</td>
</tr>
<tr>
<td>TSE_relevant</td>
<td>Making mathematics relevant to students</td>
<td>195</td>
<td>1</td>
<td>4</td>
<td>2.84</td>
<td>0.66</td>
</tr>
<tr>
<td>TSE_critic</td>
<td>Develop student ability to think critically</td>
<td>194</td>
<td>1</td>
<td>4</td>
<td>2.77</td>
<td>0.69</td>
</tr>
</tbody>
</table>
structural equation modelling. The analyses were conducted on the teacher level. Analyses were carried out with Mplus 8 software.

Model fit was evaluated using recommended fit indices: The \( \chi^2 \) goodness-of-fit test was used. Considering that the \( \chi^2 \) is sensitive to sample-size, it was combined with three other fit indices. RMSEA (Root Mean Square Error of Approximation) takes both the number of observations and free parameters into account. A RMSEA-value of 0.05 indicates a close fit, while a value of 0.08 has been suggested as acceptable (Loehlin, 2004). The CFI (Comparative Fit Index) is a fit index that depends on the average size of the correlations in the data. CFI should be as close to 1.0 as possible and 0.95 is considered as an acceptable value. SRMR (The Standardised Root Mean Square Residual), which is a measure of residuals computed separately for within and between levels, was also used. The value of SRMR has been suggested to be 0.08 or less for the model to be accepted (Brown, 2014; Hu & Bentler, 1999).

**Procedure**

In a first step, latent variables for teacher job satisfaction, aspects of school working conditions and teacher self-efficacy beliefs were defined in corresponding measurement models. The second step was to relate teacher job satisfaction to (a) school working conditions, (b) teacher characteristics. Thus, in a series of structural equation models, the relations between each of the aspects of school working conditions: student discipline leadership support, teacher cooperation, school resources, teacher workload, student classroom social composition, achievement heterogeneity and teacher job satisfaction
were modelled. Finally, a more thorough investigation of the interaction between teacher characteristics and school working conditions was carried out. Therefore, a series of interactions were performed between those variables indicating teacher characteristics and school working conditions, which were significantly related to teacher job satisfaction in the previous step. In order to visually explore the nature of the potential interactions, their graphical analyses were additionally performed.

Results

In the following section, latent measurement models of teacher job satisfaction, school working conditions and teacher self-efficacy are formulated and evaluated, and results of structural models are presented. As all analyses were carried out on teacher level, student SES and achievement heterogeneity were aggregated measures (mean of books at home and the standard deviation of mathematics achievement, respectively) on classroom level.

A latent model of teacher job satisfaction

First, a latent model of the study’s outcome measure, teacher job satisfaction, (JOBSAT) was formulated (Figure 1). In the SEM models, ellipses or circles denote latent constructs, and manifest variables are shown in squares or rectangles. The model obtained an excellent fit to the data. The indicator “My work inspires me” had the highest factor loading (.82), and others ranged from .57 to .80.

The pairs of items “I am content with my profession as a teacher” and “I am satisfied with being a teacher in this school” shared substantial commonalities in terms of job comfort, while the items “I am enthusiastic about my job” and “I am proud of the work I do” shared substantial commonalities in terms of job fulfilment, as per Evans (1997) definition. The introduction of corresponding correlated residuals has led to an improved model fit.

Figure 1. A measurement model of teacher job satisfaction. Model fit: Chi2/df = 13.65/7; CFI = .983; RMSEA = .071; SRMR = .024.
Further, the latent models of school working conditions and teacher self-efficacy were formulated, their fit and factor loadings presented in Table 3.

The measurement models of student discipline and school resources obtained a good fit after the introduction of correlated residuals. For the model of student discipline, residuals were correlated between the items "Disp_rules" and "Disp_enforce", which likely share a substantial commonality regarding the compliance with school rules. For the model of school resources, items “Res_tech” and “Res_support” most certainly have a common substantive ground with regard to schools’ reinforcing the use of technology.

### Which factors are related to teacher job satisfaction?

The research questions were addressed by means of structural equation modelling in a series of models where the relations of school working conditions, teacher characteristics and teacher job satisfaction were explored.

### Relations between school working conditions and teacher job satisfaction

First, we modelled the relations between each of the aspects of school working conditions: student discipline (STUDISP), leadership support (LEADSUP), teacher cooperation (TCOOP), school resources (SCHRES), teacher workload (TLOAD), student classroom social composition (BOOKS_m), achievement heterogeneity (ACH_sd) and teacher job satisfaction (JOBSAT), and one by one (see Table 4).

All of the models’ fit were from satisfactory to excellent, except for the model of leadership support, whose fit was poor in terms of RMSEA (Wang & Wang, 2012); thus leading to its exclusion from further modelling. Besides, the regression coefficients of the relations between student characteristics BOOKS_m and ACH_SD and JOBSAT were non-significant, therefore the corresponding variables were dropped in further analysis.
It can be observed that all other aspects of working conditions were significantly related to teacher job satisfaction. TCOOP, SCHRES and STUDISP had a moderate relation with JOBSAT of .35, .34 and .32, respectively, while TLOAD had a somewhat weaker yet positive relation to JOBSAT at .23.

We then entered the different aspects of working conditions in the model simultaneously to examine their joint impact on teacher job satisfaction. As the link between SCHRES and JOBSAT became insignificant, it was removed to arrive at the final model of teacher working conditions and job satisfaction (See Figure 2).

All of the three remaining aspects of school working conditions remained moderately related to teacher job satisfaction. Teacher cooperation had the strongest relation to job satisfaction (.30), followed by student discipline (.25) and workload (.20). It should be noted that teacher cooperation was correlated with student discipline at .19.

**Relations between teacher background characteristics and job satisfaction**

In this step, the relations between teacher background characteristics and job satisfaction were addressed. In the following structural models, job satisfaction was related to teacher gender (T_GEN), teaching experience (T_EXP), teacher certification in mathematics (T_CERT), teacher majoring in mathematics (T_MATH), mathematics education (T_MATHED), hours devoted to professional development (T_PROF) and teacher self-efficacy (TSE). Teacher characteristics were entered in the model one by one (see Table 5).

Results demonstrated that, teacher gender, the amount of professional development and teacher self-efficacy beliefs were related to job satisfaction. The association with teacher gender was .18, meaning that women reported somewhat higher levels of job satisfaction than their male colleagues. The amount of professional development was positively related to job satisfaction at .28, meaning that teachers with longer exposure to professional development tended to be more satisfied with the job. Finally, higher levels of teacher self-efficacy beliefs were related to higher levels of job satisfaction at .42, thus indicating that more efficacious teachers were also more satisfied with their job. Other teacher characteristics without statistically significant relations to job satisfaction were removed from subsequent modelling (see Figure 3).
So far, the present investigation supports that teacher job satisfaction is significantly related to a few of the tested predictors. Teacher cooperation, a feasible workload and student discipline all were positively associated with teacher job satisfaction. The amount of exposure to professional development influenced job satisfaction in a positive way. In addition, women had in general higher levels of job satisfaction. Perhaps more interestingly, teachers with higher levels of self-efficacy beliefs were more satisfied with their job.
Given the results of this study up to this point, as well considering findings from previous research, it would be reasonable to assume that school working conditions may be perceived differently by teachers with different characteristics, i.e. gender, the extent of professional development and self-efficacy beliefs. This was tested in the following step.

**Exploring the moderating roles of teacher characteristics**

First, an interaction between the above teacher characteristics was tested, but no significant interaction was estimated. In the next steps, a series of interactions were performed between the variables indicating teacher characteristics (teacher gender, the amount of professional development, self-efficacy beliefs) and the variables indicating teacher working conditions (student discipline, teacher cooperation, teacher workload). The estimated models can be specified as is depicted in Equation (1).

\[
JOBSAT = b_1 \cdot WorkCond + b_2 \cdot Teach\_Char + b_3 \cdot WorkCond \cdot Teach\_Char + e.
\]  

(1)

Models 1–3 (see Table 6) investigated the interactions between teacher characteristics and the three working conditions. In Model 1, the interaction between the amount of professional development and the three aspects of school working conditions was examined. The amount of professional development did not reveal any significant interactions with the aspects of school working conditions.

In Model 2, the interaction between teacher self-efficacy and school working conditions was investigated. Results showed that \(TSE\) interacted significantly with \(STUDISP\) at \(-.17\), while there was no significant interaction with \(TCOOP\) or \(TLOAD\). In interpreting the marginal effects of Model 2, the coefficient of \(STUDISP\) captures the effect of \(STUDISP\) on
JOBSAT when TSE is zero. As the effect of student discipline on job satisfaction varies on the values of the continuous (latent) variable TSE, a more comprehensible way to provide a substantively meaningful description of the effect may be a graphical illustration of the differentiated effects.

Therefore, in order to describe the effect of student discipline on job satisfaction as a function of teacher self-efficacy beliefs, we plotted the effect in Mplus by illustrating the influence of STUDISP on JOBSAT for different TSE values. As may be seen in Figure 4, the low TSE and high TSE expressions correspond to TSE values of −1 SD and +1 SD. The plot thus shows the effect of STUDISP on JOBSAT at 1 SD below and 1 SD above the mean of TSE, and 95% confidence bands are also given (see Figure 4).

It can be observed that for TSE values 1 SD above the mean, the effect of student discipline on job satisfaction remains relatively stable. Thus, job satisfaction for teachers with high efficacy beliefs tends not to be much influenced by student discipline. However, for teacher self-efficacy levels 1 SD below the mean, the relationship between student discipline and job satisfaction tends to be positive. Thus, for teachers with lower levels of self-efficacy, perceptions of better student discipline lead to higher levels of job satisfaction, while perceptions of discipline problems are associated with lower levels of job satisfaction.

Finally, in Model 3 the interaction between teacher gender and the three aspects of school working conditions was examined. Results showed a significant interaction of −.16 between T_Gen and TCOOP, while there were no significant interactions found between STUDISP and TLOAD. A graphical representation the interaction between T_Gen and TCOOP sheds light on the marginal effects. The graph is presented in Figure 5.

As presented in the graph, job satisfaction of male teachers is to a greater extent influenced by teacher cooperation. The steepness of the slope for men points to the fact that male teachers working in schools characterised by higher levels of cooperation, tend to be much more satisfied with their job than male teachers in other schools. Women, who generally had higher levels of job satisfaction, also had higher levels of job-satisfaction when experiencing higher levels of teacher cooperation, but not at the same magnitude as men. Results of the interaction analyses are summarised in Table 6.

### Table 6. The moderation effects of teacher characteristics on the relations between school working conditions and teacher job satisfaction.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDISP</td>
<td>.47 (.22)*</td>
<td>0.15 (.081)</td>
<td>.14 (.109)</td>
</tr>
<tr>
<td>TCOOP</td>
<td>.29 (.27)</td>
<td>0.22 (.075)*</td>
<td>.41 (.103)*</td>
</tr>
<tr>
<td>TLOAD</td>
<td>.01 (.26)</td>
<td>0.28 (.074)*</td>
<td>.22 (.101)*</td>
</tr>
<tr>
<td>T_Prof</td>
<td>.15 (.082)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSE</td>
<td></td>
<td>0.37 (.080)*</td>
<td></td>
</tr>
<tr>
<td>T_Gen</td>
<td></td>
<td></td>
<td>.19 (.065)*</td>
</tr>
<tr>
<td>T_Prof x STUDISP</td>
<td>−.10 (.080)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T_Prof x TCOOP</td>
<td>−.02 (.094)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T_Prof x TLOAD</td>
<td>.08 (.089)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSE x STUDISP</td>
<td></td>
<td>−.17 (.071)*</td>
<td></td>
</tr>
<tr>
<td>TSE x TCOOP</td>
<td></td>
<td>.03 (.068)</td>
<td></td>
</tr>
<tr>
<td>TSE x TLOAD</td>
<td></td>
<td>.02 (.063)</td>
<td></td>
</tr>
<tr>
<td>T_Gen x STUDISP</td>
<td></td>
<td></td>
<td>.01 (.076)</td>
</tr>
<tr>
<td>T_Gen x TCOOP</td>
<td></td>
<td>−.16 (.072)*</td>
<td></td>
</tr>
<tr>
<td>T_Gen x TLOAD</td>
<td></td>
<td>.05 (.067)</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at p < .05
Figure 4. Moderating effect of teacher self-efficacy on the relationship between student discipline and teacher job satisfaction.

Figure 5. Moderating effect of teacher gender on the relationship between teacher cooperation and teacher job satisfaction.
Discussion

This study aimed to investigate the relations between teacher job satisfaction, school working conditions and teacher characteristics. It also examined interactions between the above factors in their relation to teacher job satisfaction.

School working conditions

When analysed simultaneously, three aspects of the working environment were significantly related to teacher job satisfaction – student discipline, teacher cooperation and teacher workload. School material resources became insignificant when considered along with other working conditions. This is in line with previous research (e.g. Johnson et al., 2012), which shows that working conditions of a social nature are more important to teachers than material ones. This certainly should not be interpreted as unimportance of well-maintained school premises, sufficient workspace, teaching and learning materials, but only as these factors having less weight compared to relations with students and colleagues.

Teacher perceptions of their workload had a direct significant association with teacher job satisfaction, yet was uncorrelated with other aspects of working conditions or with teacher characteristics. These findings are consistent with the results from Skaalvik and Skaalvik (2016), who found that an excessive workload was directly significantly related to emotional exhaustion and motivation to quit teaching, yet was not related to teacher self-efficacy beliefs. A concern with Swedish teachers’ excessive workload was already voiced in previous studies (e.g. Allodi & Fischbein, 2012). Results of our study reiterate the importance of a feasible workload for teachers’ job satisfaction.

Teacher cooperation and student discipline also turned out as important for teacher perceptions of job satisfaction, a result well corroborated by previous research (Borman & Dowling, 2008; Ingersoll, 2017; Sims, 2017). Besides, in our study these factors were correlated, which can be attributed to the fact that both are a reflection of the school social climate, characterised by mutually supportive relationships between students and teachers.

Finally, school composition was not related to teacher job satisfaction. This is consistent with a number of studies where either the absence of an effect of student composition on teacher job satisfaction, or its disappearance after controlling for other aspects of school environment has been reported (Simon & Johnson, 2015; Sims, 2018).

In regard to those aspects of working conditions, which demonstrated links with teacher job satisfaction in this study, it is important to keep potential reciprocity in mind. A number of longitudinal studies have found bi-directional relations between school working conditions and teacher well-being (Hakanen, Bakker, & Schaufeli, 2006; Salanova, Bakker, & Llorens, 2006; Simbula, Guglielmi, & Schaufeli, 2011). For example, Simbula et al. (2011), in a longitudinal study of Italian secondary school teachers found that, not only were job resources related to work engagement, but also the more engaged employees were more prone to resource mobilisation, such as cooperation with colleagues. In a similar vein, teachers with higher levels of job satisfaction in the current study may perceive student discipline and workload as being at adequate levels by mobilising the necessary resources in order to tackle these job demands.
**Teacher characteristics**

Among the teacher characteristics examined, teacher gender, the amount of participation in professional development and teacher self-efficacy beliefs had a significant positive association with teacher job satisfaction. Teacher certification to teach mathematics may not have revealed any association with teacher job satisfaction due to the lack of variation, as 82% of Swedish teachers reported having certification to teach mathematics. The same reason might hold true for teachers’ major, as most teachers majored in either mathematics or mathematics education. As for teaching experience, it may not have revealed any link with job satisfaction due to the non-linear relationship between the two.

The amount of participation in professional development was positively related to teacher perceptions of job satisfaction. This result, in line with a number of previous findings, stresses the role of professional development not only for enhancing instructional quality but also as a factor promoting teacher retention through raising teacher satisfaction with the job (Ingersoll et al., 2014; Kraft et al., 2016). These relations, however, may also be reciprocal as teachers who feel more content with the job might be more inclined to participate in professional development programs (see, e.g. Nir & Bogler, 2008).

Teacher self-efficacy beliefs revealed a moderate positive relationship with teacher job satisfaction. These results are in line with social cognitive theory, which ascribes self-efficacy a leading role in driving one’s behaviour by setting endeavouring goals and exerting extra efforts towards achieving them. Here, too, a two-way link may be equally valid, as positive affective dispositions may breed higher assessments of one’s own capabilities (Bandura, 1986, 1997).

Women were in our study more satisfied with their job compared to their male colleagues. Previous research has not established consistent links between teacher gender and job satisfaction, and has rarely viewed gender as a complex socially constructed phenomenon particular to certain cultural and temporal contexts. Thus, on one hand, gender differences in our study can be viewed in the global context of the impact of marketisation trends in education. This impact comprised the de-professionalisation of the teaching profession and its further feminisation (Weiner, 2006). Hence, that women in our study are more satisfied with the teaching job may be explained by the fact that they are more accepting of their “traditional” roles of caring, nurturing and educating (Acker, 1995), while men might feel less suited for this role and thus less content. Further, teacher salary levels, a lack of career advancement, and occupational prestige of the profession, assumed to be sufficient for the “feminized” occupation, could be another source of dissatisfaction for men in teaching (Berge, 2004; Drudy, Martin, O’Flynn, & Woods, 2005). On the other hand, in interpretation of this study’s results one needs to consider that they refer to Swedish, eighth-grade mathematics teachers. Viewing the results from this narrower contextual perspective reveals other important nuances. First, with gender equality being a highly prioritised social sphere in Sweden, the attractiveness of the teaching profession in terms of work–life balance may be equally appreciated by men (Weiner, 2006). Next, mathematics has always been viewed as a “masculine” domain, and the proportion of men both within this domain and at the secondary school level has been relatively high in Sweden, as compared to social sciences and lower educational levels (Weiner, 2006). The above factors challenge the seemingly obvious reasons behind higher levels of women’s satisfaction with the teaching job in the Swedish context.
Therefore, the influence of the global tendencies on the local contexts might have important implications for both men’s and women’s perceptions of their roles as teachers. To further complicate matters, the above factors may also considerably vary in importance at different life and/or career stages of both women and men (Hodkinson & Sparks, 1997). Therefore, drawing far-reaching conclusions on the reasons for varying perceptions of job satisfaction for women and men should be avoided. It is apparent that a deeper investigation of gender differences in teacher job satisfaction is warranted in prospective studies (Berge, 2004; Klassen & Chiu, 2010).

The importance of different teacher perceptions of working conditions for job satisfaction

In the present study, teacher gender was found to interact with teacher cooperation levels. Thus, higher levels of teacher cooperation carried more weight for male teachers’ job satisfaction. This finding is in line with the results of Ma and MacMillan’s study (1999), who found that job satisfaction of male teachers was much more dependent on the school’s organisational culture, as compared to female teachers. Moreover, our results point to a difference in job satisfaction among male teachers, as the ones working in schools with higher levels of teacher cooperation are much more satisfied than their colleagues in less cooperative school environments. According to the notion of gendered organisational dynamics (Acker, 1995), a certain behaviour might be expected from men or women in terms of interaction with colleagues. Thus, it may be assumed that women have a natural ability to cooperate with others, while men are expected to work in a more competitive manner. Results of our study challenge this assumption, suggesting that collegial cooperation is nevertheless important for the job satisfaction of male teachers – an issue certainly meriting a deeper investigation. Moreover, Darling-Hammond, Hyler, and Gardner (2017) described the conceptualisation of ongoing professional learning as being part of a collective effort, rather than only an individual undertaking, as the next emerging horizon for teacher learning. Certainly, more focus on such professional development may increase the attractiveness of the teaching profession overall.

Further, teacher self-efficacy beliefs were found to moderate the effects of student discipline on job satisfaction. This corroborates the findings by Collie et al., (2012) regarding the differing impact of working conditions for teachers with varying levels of self-efficacy beliefs. Results of this study suggest that teachers with higher self-efficacy levels did not perceive student discipline as an obstacle to their job satisfaction. In contrast, for less efficacious teachers, the perception of student discipline in school was critical. However, the two-way relationship may be considered possible as successful experiences of improving student behaviour may enhance teacher self-efficacy beliefs, thus sustaining their satisfaction with the job.

Conclusions

This study aimed to investigate the relations between school working conditions and teacher characteristics on job satisfaction of eighth-grade mathematics teachers in Sweden. Among aspects of school working conditions, teacher workload, teacher cooperation and student discipline were most important for teacher job satisfaction. Female
teachers, teachers with more experience of professional development and more efficacious teachers tended to have higher levels of job satisfaction. In addition, teacher cooperation carried much more importance for male teachers’ job satisfaction, while teacher perceptions of student discipline in school were crucial for job satisfaction of the least efficacious teachers.

**Limitations and further research**

This study suffers from several limitations. First, despite the fact that TIMSS questionnaire included quite a few aspects of the school working environment, some of those included in the vast body of literature in the field could not be considered. Moreover, as this study employed data from the eighth grade mathematics teachers in Sweden, the generalisability of the results may be limited to this particular group of teachers. Second, the interplay between school environmental factors and various teacher characteristics is complex, and the internal structure of the relationships need to be explored in greater detail. As some relations may be reciprocal, prospective studies should pay a closer attention to directionality. Third, a cross-sectional design of the TIMSS study may not allow for causal inferences. Therefore, a trend analysis of teacher job satisfaction, which would include a longitudinal component at the country level, is warranted. Finally, as a number of countries are facing large teacher shortages for many decades ahead, comparative research on factors promoting teacher retention is highly relevant.

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**References**


