



Research paper

Pupil-teacher ratio, disciplinary problems, classroom emotional climate, and turnover intention: Evidence from a randomized control trial



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HIGHLIGHTS

- Teachers who experienced discipline problems, had stronger intentions to leave their job.
- When discipline problems were present, the classroom emotional climate was reported by students to be poorer.
- Classroom emotional climate related to turnover intentions in the one-teacher classes, but not the two-teacher classes.
- A second teacher resource might reduce the negative relation between classroom emotional climate and intention to leave.

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ABSTRACT

High turnover among teachers can threaten students' academic achievement. Thus, the current study investigated the associations between discipline problems, classroom emotional climate (CEC), and teachers' turnover intention. Moreover, a randomized control design was employed to examine whether including another teacher in the class, moderated the association between CEC and turnover intention. 5830 students in first grade, and 300 class-teachers participated in the study. Significant relationships between discipline problems and CEC and between discipline problems and turnover intention was revealed. Moreover, CEC was associated with turnover intention in the one-teacher classes, whereas the same association was non-significant in the two-teacher classes.

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1. Introduction

Teaching is one of the professions with particularly high turnover rates. Previous studies found that turnover rates among teachers are higher compared to other professions (Griffeth & Hom, 2001; Ingersoll et al., 2016), and they can be considered a global problem (Ingersoll, 2001). Still, school leaders and policymakers often focus on teacher recruitment policies, rather than the role teacher turnover plays in the contribution of teacher shortages (Carver-Thomas & Darling-Hammond, 2019).

Within organizational psychology, *turnover* is widely used as the subject-specific term for quitting one's job. A more specific definition of turnover is "an employee's voluntary severance of employment ties" (Hom & Griffeth, 1995). Another concept

inspired by and strongly related to actual turnover is turnover intention. The turnover intention is more concerned with an attitude, or cognition towards quitting the job and has been found to be the strongest predictor of actually quitting the job (Rubenstein et al., 2018). Research conducted by Ingersoll et al. (2014) in the United States showed that nearly 50 percent of teachers in public school quit their job before they have reached their fifth year of teaching (Ingersoll et al., 2014). A more recent study by Sutchter et al. (2019) suggested that teachers quitting their job is a fundamental cause of teacher shortages in the United States accounting for nearly 90% of annual teacher demand. The number of teachers leaving the profession has also been found to be high in England, China, and Australia, for instance (Hong, 2012). In Norway, where the current study was conducted, teachers' turnover rates are also high. As part of their study, Tiplic et al. (2015) requested information from the Norwegian Association of Local and Regional Authorities in Norway with regard to teacher turnover. Specifically, it

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was revealed that approximately 33% of beginning teachers who started teaching in 2006 had left the teaching profession entirely after five years.

Generally, turnover affects the efficiency of organizations negatively (Griffeth & Hom, 2001). Furthermore, research has shown that turnover can decrease team performance (Ton & Huckman, 2008), implying that turnover might have negative consequences also for the employees who stay. The literature on teacher turnover has generally distinguished between teachers moving between schools (migration) and teachers leaving the occupation entirely (attrition; Ingersoll, 2001). However, regardless of this distinction, Ingersoll (2001) pointed out, the negative effects of teachers' turnover, on the organization overall remains the same. Teachers quitting their job can have serious consequences. Teacher turnover has been reported to be associated with low quality of student education and decreased student achievement (Ronfeldt et al., 2013), and student learning (Kini & Podolsky, 2016). Moreover, the harmful effects on student achievement persisted after controlling for teacher quality (Ronfeldt et al., 2013). Ronfeldt et al. (2013) further demonstrated a negative effect of teachers' turnover not only on the performance of their students but also on other students in a school, supporting its disruptive influence on all students within a school.

Understanding the factors that lead employees to quit their job is critical for increasing organizational effectiveness (Griffeth & Hom, 2001). Thus, it is not surprising that for decades researchers have been trying to identify the factors leading to teacher turnover. During the '80s and '90s, most research generally focused on individual teacher characteristics to explain teacher turnover (Ingersoll, 2001), including age, gender and qualifications (for meta-study on the associations between teacher characteristics and turnover, see Guarino et al., 2006). Already at the beginning of the 21st century, Ingersoll (2001) criticized the extensive focus on teacher characteristics as an explanatory factor for teacher turnover and turnover intention. Ingersoll (2001) concluded that rather than focusing on recruitment programs and the employment of new teachers to solve staffing problems, the causes of teacher turnover should be addressed at an organizational level. Perhaps as an answer to Ingersoll's (2001) criticism, a substantive shift within the field of teacher turnover research throughout the 20th century put more emphasis on the relationship of organizational factors and teachers' perceptions of their work conditions with teacher turnover. In their meta-analysis on teacher turnover, Borman and Dowling (2008) also included factors related to teachers' working conditions. In line with Ingersoll's (2001) findings, they concluded that working conditions were much more prominent for predicting turnover than what had been emphasized in the literature previously. Conclusively, when studying teacher turnover and turnover intentions, the focus should primarily be on organizational factors rather than on teacher characteristics.

It is well established that stressful work conditions are organizational factors of significance, that may increase turnover intentions (for a meta-analysis see Podsakoff et al., 2007). However, exactly which work characteristics that can be considered as stressful, may vary from occupation to occupation. Thus, it is not surprising that a recent review concluded that future research on turnover and its antecedents should be more context-specific, implying that the specific work setting should be taken into account (Hom et al., 2017). Based on this review (Hom et al., 2017), it is reason to believe that focusing on context specific factors would also be valuable in the study of teachers' turnover intention, and that stressors relevant for the teaching profession, should be included. Student misbehaviors and disciplinary problems are aspects of the job which teachers perceive as especially stressful (for meta-study see Aloe et al., 2014), and student discipline was

previously found to relate to teacher turnover (Ingersoll, 2001). Thus, including disciplinary problems as a variable when studying teacher's turnover intentions, must be considered especially relevant. The CEC is another aspect of teachers' work-conditions that can have an impact on their intention to quit. For instance, it is well recognized that both school climate (Jia et al., 2016) and classroom climate (Fortin et al., 2006) predict student dropout from school, and it has been suggested that the classroom emotional climate may have implications for the teacher outcomes as well (Jennings & Greenberg, 2009). According to Hamre and Pianta (2007) classrooms with a positive emotional climate are characterized by friendly, warm, and respectful relations. Moreover, Rubenstein et al. (2018) concluded that employees are less likely to quit when working in positive work climates. Still, to the best of knowledge, previous studies have not yet investigated how the CEC relates to teachers' turnover intentions.

Support from other individuals can improve our ability to cope, functioning as a buffer against stress (Baumeister & Leary, 1995). Moreover, regarding turnover intention, social support has been proven to interact with stress factors at work in predicting intention to quit among various employees (Kim & Stoner, 2008), including teachers (Ingersoll, 2001). The significance of social support for teacher turnover was also demonstrated in a more recent study by Carver-Thomas and Darling-Hammond, 2019 where data from the U.S. Department of Education, National Center for Education Statistics Schools and Staffing Survey was applied. Particularly, results showed that teachers who experienced lack of support from administration were more than twice as likely to quit their present job. In their daily work, teachers are, to a large extent, isolated from their co-workers in the classroom (Dorman, 2003). Thus, many teachers might experience a shortage when it comes to social support from colleagues. However, adding an additional teacher resource in the classroom, might function as an aspect of social support for class teachers, as the extra teachers can assist the class teachers in their daily tasks. When the teacher feels more supported, this might again buffer the negative effects from stress factors at work, thereby preventing teachers' intentions to quit.

As noted above, it has been suggested that future research on turnover and its antecedents should be more context specific (Hom et al., 2017), which can also be considered valuable in the study of turnover intention. In the current study this call is followed, by including work factors specifically relevant for the teaching profession when predicting teacher's intention to quit their job. Specifically, associations between disciplinary problems, CEC and teachers' turnover intentions are examined. Moreover, a randomized control trial is applied, where the intervention classes were given an extra teacher resource, to further investigate the moderating effect of the number of teachers (one versus two teachers) in the classroom on the associations between CEC and teachers' turnover intention.

2. Review of literature and research questions

2.1. Turnover and turnover intention

An extensive number of studies have been conducted on the topic of turnover during the last century (see Hom et al., 2017). Whereas the concept of turnover relates to actual behavior, which in this context implies quitting the job, the turnover intention is more concerned with an attitude, or cognition towards quitting the job. Before 1974, organizational psychology showed little interest in studying intentions in general (Steel & Ovalle, 1984). However, in the years following, the interest in turnover intentions increased remarkably, and as early as 35 years ago, Steel and Ovalle (1984) confirmed in their meta-analysis that intentions to quit or stay in

the job strongly predicted actual turnover. The origin of the assumed association between turnover intention and quitting the job comes from Ajzen and Fishbein's theory (1977) of behavioral intentions, attitudes, and actions. Ajzen and Fishbein (1980) demonstrated that a person's intention to engage in a specific behavior is the best predictor of whether that person will engage in that behavior. Overall, employees' cognitions related to turnover have been a common topic of research on both management and organizational behavior (Chen et al., 2011), and several studies have demonstrated a strong relationship between turnover intention and turnover. For instance, in a meta-study by Griffeth et al., (2000) on several antecedents of turnover, turnover intention was found to be the strongest predictor of actually quitting the job, and similar findings were revealed in a more recent meta-study (Rubenstein et al., 2018). Conclusively, turnover intention is an essential factor to consider in when trying to anticipate teachers' future turnover.

2.2. Theoretical framework: the stressor – strain perspective and hindrance and challenge stressors

Turnover research has adopted the stressor-strain perspective, which states that work stressors are associated with turnover and turnover intention (Schaubroeck et al., 1989). The underlying theory is that individuals exposed to stressors at work may experience various strain outcomes, for instance, anxiety and exhaustion. Feelings of strain can potentially lead to negative emotions. In trying to cope with negative emotions, the individual might withdraw from work both emotionally and physically (Schaubroeck et al., 1989). However, in a more recent meta-study on associations between stressors, attitudes, and turnover, Podsakoff et al. (2007) extended the work of Schaubroeck et al. (1989) by utilizing the challenge stressors-hindrance stressor framework originally modeled by Cavanaugh and colleagues (Cavanaugh et al., 2000). The challenge stressor – hindrance stressor framework distinguished between hindrance stressors and challenge stressors. Whereas challenge stressor promotes achievement and growth, hindrance stressor relates to work circumstances that constrain the individuals' achievement of valued goals (Cavanaugh et al., 2000). Based on a meta-analysis of 183 samples, Podsakoff et al. (2007) concluded that whereas hindrance stressors were positively related to turnover intentions, challenge stressors had the opposite relation, confirming that it is worthwhile to distinguish between types of stressors when investigating relationships between various stressors and turnover intention.

Distinguishing between hindrance stressors and challenge stressors have also been found to be valuable when including social support as a moderator in work stress models, often referred to as “the buffering hypothesis”. Social support as a stress buffer in the work context was initially highlighted in the job demand controls support model (Karasek & Theorell, 1990). However, although the buffering hypothesis has been cited numerous times in various journals, the support for it has been scarce (Daniels & De Jonge, 2010), and meta-analyses have generally failed to find support for its significance (e.g., Häusser et al., 2010; Van der Doef & Maes, 1999). It has been suggested that one reason for the lack of support concerning the buffering hypothesis is the failure to distinguish between hindrance and challenge stressors (Dawson et al., 2016). Moreover, this assumption has been confirmed in studies where social support was found to buffer the strain associated with hindrance stressors but not strain associated with challenge stressors (Dawson et al., 2016). In sum, the abovementioned findings provide support for the need to distinguish between hindrance and challenge stressors not only when investigating the association between stressors and turnover intentions, but also when including

social support as a moderator of these relations. In the current study we theorize that when disciplinary problems are present, students will report of a poorer CEC which again will relate to higher turnover intentions. Thus, the main focus of the current study is on hindrance stressors, and not challenge stressors. In line with previous studies where it has been confirmed that social support will buffer the strain of hindrance stressors (Dawson et al., 2016) it is assumed that social support (measured as adding an extra teacher resource), will buffer the association between CEC and turnover intention. Thus, based on our study content, we apply the theoretical framework developed by Podsakoff et al. (2007), as their theory emphasizes that hindrance stressors relates to turnover intentions, and that social support can moderate these associations.

2.3. Disciplinary problems and CEC

Student misbehaviors are defined as behaviors that interrupt the systematic order in the classroom (Finn et al., 2008). Misbehaviors in the classroom relate to cutting class or being late, students leaving their seats, interrupting or not following instructions, not completing tasks, and cheating (Finn et al., 2008). In practice, disciplinary problems and student misbehaviors are often applied interchangeably, but conceptually, student misbehavior falls under the category of disciplinary problems (Aloe et al., 2014; Reyes et al., 2012). Extensive disciplinary problems may influence the school and class environment negatively. For instance, student misbehavior has been found to affect the overall school climate negatively (Barnes et al., 2006; Mitchell et al., 2010), and it has also been found to be associated with social and emotional interactions at the classroom level (Reyes et al., 2012). The quality of social and emotional interactions in the classroom, both between and among teachers and students, is referred to as the classroom emotional climate (CEC) (Pianta et al., 2008). As noted previously, classrooms with a positive emotional climate are characterized by friendly, warm, and respectful relations (Hamre & Pianta, 2007). On the contrary, in classrooms where the emotional climate is negative, mistrust and disrespect dominate the atmosphere. Generally, in the study of CEC, most studies have utilized observation data, whereas few studies have been concerned with measuring the relationships between students through student reports. Still, student reports are most reliable when measuring CEC, as student's perceptions of the environment likely determine their behaviors to greater extent than any objective indicator of the same environment (Lüdtke et al. 2009).

Moreover, concerning the measurement of student misbehavior, previous studies suggested investigating the extent to which teacher ratings reflect objective behavior problems (Aldrup et al., 2018). Thus, in the current study, we examined teacher reports of disciplinary problems and its association with student reports of the CEC. In doing so, it was possible to further reduce common method bias (Podsakoff & Organ, 1986) and add information about whether teacher perceptions of discipline problems are aligned with and related to student perceptions of interactions in the classroom.

2.4. Disciplinary problems and CEC as antecedents of turnover intention: direct and indirect associations

Disorder in the classroom may not only negatively affect students but can have negative consequences for teachers as well. For teachers, disciplinary problems in classrooms can be severe work-related stressors (Buchanan, 2010), and teachers perceive student misbehaviors as especially stressful (see Aloe et al., 2014, for a meta-study). As noted previously, hindrance stressors relate to

work circumstances that constrain the individuals' achievement of valued goals (Cavanaugh et al., 2000). Most teachers want to ensure that their students learn, which is a highly valued goal. However, in classrooms where disciplinary problems are prevailing, teachers have less energy and resources available to administer lessons as planned and attain teaching objectives. This has also been confirmed in previous research, where teachers reported that maintaining discipline in the classroom was extremely energy-consuming, making the teaching difficult to conduct (Skaalvik & Skaalvik, 2015). In sum, these findings provide further support that disciplinary problems in the classroom are a form of hindrance stressor that prevents teachers from accomplishing their valued goal of teaching their students.

An exhaustive number of studies have demonstrated that work stress, in general, is a strong predictor of turnover (for a meta-study see Rubenstein et al., 2018), supporting the hindrance/challenge stressor theoretical framework (Podsakoff et al., 2007). When it comes to disciplinary problems, student misbehavior in the classroom was found to relate positively to turnover and turnover intention among teachers (Kelly, 2004; Ingersoll, 2001; Skaalvik & Skaalvik, 2011). In addition to having a direct effect on turnover and turnover intention, disciplinary problems have also been found to relate indirectly to turnover intention through other variables, for instance, emotional exhaustion (Skaalvik & Skaalvik, 2011; Tsouloupas et al., 2010) and job satisfaction (Skaalvik & Skaalvik, 2011). These findings are in line with the stressor-strain model and the hindrance/challenge stressor framework, suggesting that stressors affect certain job attitudes, which again predict turnover intentions (Podsakoff et al., 2007). Similarly, one could also expect that teachers' perceptions of disciplinary problems could relate indirectly to their intention to quit through the emotional climate in the classroom. For instance, previous research has suggested that a positive organizational climate might determine whether certain antecedents lead to turnover (Li et al., 2010). The reason why climate might play such a role is that individuals actively interact with and adapt to their environment, and through this process, they acquire essential information concerning their attachment to the organization (Li et al., 2010; Smith-Crowe et al., 2003). If we consider that teachers spend most of their time at work in the classroom, it is reasonable to assume that the emotional climate in the classroom might determine whether teachers' perceptions of disciplinary problems lead to turnover intention.

Classroom climate has been well established as a predictor of students' well-being and academic outcomes (for meta-study see Haertel et al., 1981; Hattie, 2009; Mashburn et al., 2008), and thus should be included in future studies. Moreover, as noted previously, it is firmly established that both school climate (Jia et al., 2016) and classroom climate (Fortin et al., 2006) predict student dropout from school. In addition, the school climate has been found to predict the chronic absence from school of students (Van Eck et al., 2017). Although most studies on CEC have been concerned with studying its effects on student outcomes, including student well-being, it has been suggested that the climate in the classroom may have implications for teacher well-being as well (Aloe et al., 2014; Jennings and Greenberg, 2009). Besides being a predictor of teacher well-being, the climate in the classroom might also be associated with turnover intention. As already mentioned, the classroom climate has been found to predict student dropout from school. In the same manner, one might assume that the emotional climate in the class can contribute to teachers' intention to quit their jobs. For instance, teachers' exposure to a negative classroom climate in their everyday teaching may provoke negative feelings, resulting in more salient intentions of wanting to leave the job entirely.

2.5. Pupil-teacher ratio as an aspect of social support

Social support can broadly be defined as "the availability of helping relationships and the quality of those relationships" (Leavy, 1983, p. 5), and it has been included in work-stress research as a fundamental variable based on the recognition that the need for positive social relationships is both fundamental and universal for all human beings (Baumeister & Leary, 1995). A considerable amount of research has shown that individuals who lack supportive relationships report higher stress compared to those who perceive their relationships as supportive (Baumeister & Leary, 1995). This is partly because having other human beings available for support can improve our ability to cope, functioning as a buffer against stress (Baumeister & Leary, 1995). This has also been proven to be the case in the school setting. For instance, previous research has revealed that social support from school staff could foster teachers' emotional well-being and protect them against the deleterious effects of negative events (Leithwood et al., 1996; van Dick & Wagner, 2001). These findings are in accordance with the buffering hypothesis (Karasek & Theorell, 1990). Further, social support has been proven to interact with stress factors at work in predicting turnover intention (Kim & Stoner, 2008), and similar findings have also been found for teachers (Pomaki et al., 2010).

Previous research has found that teaching is among the professions with the highest levels of job stress (Stoerber & Rennert, 2008), and teachers are, to a large extent, isolated from their co-workers in the classroom (Dorman, 2003). Thus, many teachers might experience that social support from colleagues is lacking. One way to increase social support for teachers could be to increase the pupil-teacher ratio in the classroom. When teachers have an extra teacher resource to rely on, they might feel more supported. However, previous studies on pupil-teacher ratio have generally focused on reducing the size of the class (Solheim & Opheim, 2018). For instance, Wang and Eccles (2016) found that a reduction in class-size was related to more positive perceptions of classroom climate. Wasdorp and colleagues calculated pupil-teacher ratio by dividing the total number of students in the school by the total number of teachers and found that a lower pupil-teacher ratio was positively associated with bullying (Waasdorp et al., 2011). Larger class-size was also found to predict aggressive behaviors of children in the classroom (Finn et al., 2003). Borman and Dowling (2008) included pupil-teacher ratio as a moderator in their meta-analyses on teacher turnover and found that pupil-teacher ratio did not moderate turnover rates among teachers. However, studies reviewed in their analysis measured pupil-teacher ratio in terms of the class-size, or as the average number of teachers divided by all students in the respective schools. Few studies have measured pupil-teacher ratio at the class level by adding a teacher as an additional resource in the class. However, in a more recent study by Author (2019) pupil-teacher ratio was measured by adding a teacher in the classroom rather than reducing class size. The results revealed that pupil-teacher ratio significantly moderated the association between teacher-reported burnout and student reported classroom emotional climate, indicating that measuring pupil-teacher ratio at the class level by deploying an extra teacher can be valuable.

2.6. The present study

In the current study, the first aim was to explore the associations between disciplinary problems, CEC, and turnover intentions. The second aim was to examine whether adding an extra teacher resource in the intervention classes moderated the association between CEC and teachers' turnover intention. The design of the study limits the possibility of drawing conclusions regarding causal

relationships between disciplinary problems, CEC and turnover intention. However, based on the abovementioned research and theory, the direction of relationships was determined in advance. Four hypotheses were proposed. The first hypothesis proposed that the teacher-reported discipline problems in the classroom will be negatively related to the student-reported overall classroom climate. Since the previous studies have suggested investigating whether teacher ratings of student misbehavior reflect objective indicators, the current study adds to the research field by investigating how teacher reports on disciplinary problems relate to student reports of CEC. Second, in line with Podsakoff et al.'s, (2007) theoretical framework, disciplinary problems were considered to be a hindrance stressor; therefore, the second hypothesis proposed that teachers' perceptions of disciplinary problems will relate positively to turnover intentions. Third, evidence suggests that the climate to which individuals are exposed in the work setting is associated with turnover intention (Rubenstein et al., 2018). Thus, a negative association between CEC and turnover intentions was suggested. Fourth, it was assumed that teacher-reported disciplinary problems might relate indirectly to turnover intention through student reports of CEC. Thus, a negative association between CEC and turnover intentions was proposed. Finally, in line with the buffering hypothesis, which proposes that social support can moderate the negative effects of hindrance stressors (Leithwood et al., 1996; van Dick & Wagner, 2001), it is assumed that having an additional teacher in the class might have implications for the associations between CEC, and turnover intention. To the best of knowledge, previous studies have not yet investigated whether having an extra teacher resource might moderate the associations between CEC and teachers' turnover intention. Thus, the current study makes a unique contribution to the field and serves to further clarify the relationships between the factors at the classroom level and teachers' intention of leaving their job.

Fig. 1 pictures a model of the current study and reflects the abovementioned hypotheses.

3. Method

3.1. Context

Data applied in the current study were part of a large intervention project called "Two Teachers." The main aim of the Two Teachers project was to investigate the effects of pupil-teacher ratio on student outcomes, where the measurement of pupil-teacher ratio related to the number of teachers in the class (one versus two teachers). One hundred fifty schools in the Southern part of Norway, located in 53 different municipalities and nine counties, were part of the project. Two classes from each of the 150 schools participated, yielding 300 different classes. Two classes from each

school were randomly assigned to a treatment or control condition, with different PTR being the treatment condition. In intervention classes, an additional teacher was present 8 lessons per week during the first school year, and each lesson lasted for 45 min. The control classes received no extra teaching resources. Additionally, the Two Teachers project included interventions related to teachers' professional development. The Norwegian Social Science Data Service approved the project, and the project followed the Ethical guidelines developed by the National Committee for Research Ethics in the Social Sciences and Humanities. More information about the Two Teachers project can be found in Solheim et al. (2017).

3.2. Sample

One of the objectives of the current study was to investigate the moderating effect of the intervention related to an extra teacher resource on the association between CEC and turnover intention. However, as noted previously, the Two Teachers project also includes interventions related to professional development of teachers (for a more detailed description of the various interventions, see Solheim et al., 2017). Prior to conducting the main analyses presented in the result section, it was therefore considered necessary to run a preliminary SEM model where the additional interventions were included as controls variables. However, results revealed that the additional interventions were not found to have significant associations with the variables included in the present study. Conclusively, it was considered expedient to incorporate all 300 classes in further analyses.

The student sample included first graders who started school in August 2016. Six thousand fourteen students were enrolled in the study. Overall, 95.2% of the parents gave consent to take part in the study, yielding a sample of 5830 students (47.8% girls). At the time of the data collection, the mean age of the students was seven years old. The teacher sample comprised 300 class teachers (97.6% females) for the 300 classes participating in the Two Teachers study. The response rate for the teacher sample was 100%, and they had been teaching for 14 years on average. A more detailed description of the teacher and student characteristics can be found in Table 1. The teachers who were used as additional teaching resources and were part of the intervention were not included in the sample.

3.3. Procedure and timeline

The intervention was introduced at the beginning of the school year, in August 2016. In May 2017, nearly one school year after the intervention had been introduced, disciplinary problems, CEC and turnover intention was assessed in both intervention and control classes. To measure the CEC, students were assessed individually.

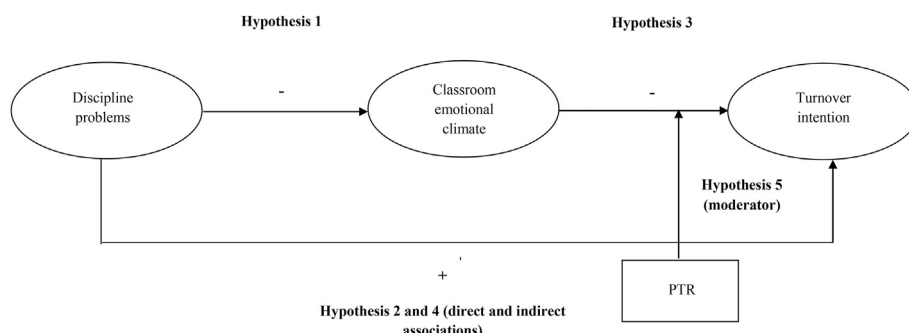


Fig. 1. Theoretical model of the study. PTR = pupil-teacher ratio.

Table 1
Characteristics of participating teachers and students.

	Students	Teachers
N	5830	300
Male (%)	52.2	2.4
Female	47.8	97.6
Mean Age	7	—
25 years old (%)	—	2
25–29 years old (%)	—	11
30–39 years old (%)	—	24.1
40–49 years old (%)	—	34.4
50–59 years old (%)	—	21.4
60 years old or more (%)	—	7
Mean years of teaching	—	14

The assessment took place in their respective schools and was conducted by a trained research assistant outside the classroom. The students answered the questions on tablet computers. The teachers participating in the study received self-report questionnaires containing questions assessing disciplinary problems in the class and turnover intention. Both students' and teachers' identities were coded. The identity codes rendered it possible to match class teachers with their respective classes.

3.4. Measures

Disciplinary problems were assessed as teacher's perceptions related to discipline in the classroom. The scale comprises three items measured on a Likert-type scale ranging from 1 = totally disagree to 5 = totally agree. Sample items are: *My teaching is often disrupted by students who lack discipline. Controlling students' behavior takes a lot of time and effort.* (Skaalvik & Skaalvik, 2011, 2016). Higher scores indicated more disciplinary problems.

The CEC included seven items, adapted from the Social Integration Classroom Climate and Self Concept of School Readiness, measuring the emotional climate in the classroom (Rauer & Schuck, 2003). As noted previously, it has been stated that individual student's ratings are the most appropriate and reliable sources of data when measuring classroom emotional climate (Lüdtke et al., 2009), and the current questions intend to capture students' experiences of the social and emotional climate in the class. In the original version (Rauer & Schuck, 2003), the items are phrased as statements. However, in the current study, we changed the items from statements to questions to reduce cognitive response bias (Bentler et al., 1971). The items have been validated in previous studies on first graders in a Norwegian context (Author, 2019; Holen et al., 2013). Moreover, in a study by Author, 2019, discrepancies of teacher responses and student response of CEC was examined. Results revealed that there were hardly any discrepancies between teacher ratings and student ratings of CEC, indicating that student measures were just as valid as teacher responses of CEC, in spite of the students' young age. Sample questions are: *Do you stick together and look after each other in the class? Are all the children in class allowed to play along?* Before conducting the assessment, the research assistant informed the students that their responses were anonymous. The research assistant read questions aloud, and the students responded to each question by choosing one out of the four smileys depicted on the tablet computer. The various smileys were coded on a Likert type scale from 1 to 4, where 1 = many don't look after each other/many are not allowed to play along, 2 = some don't look after each other/some are not allowed to play along 3 = most look after each other/most can play along, 4 = everybody looks after each other/everybody can play along. On all questions the saddest smiley corresponded to 1, and the happiest smiley corresponded to 4.

In order to grasp teachers' cognition and attitudes towards quitting their job, a scale developed by Bentin et al. (2005) was applied. The scale consists of two items which was utilized in the current study. The items were: *I often think about quitting this organization. I intend to search for a position with another employer in the next year.* Higher scores indicated stronger intentions to leave the job.

3.5. Statistical analysis

First, the intraclass correlation (ICC) for the CEC was calculated to evaluate whether the construct could be applied at the class level. According to Lüdtke and colleagues (Lüdtke et al., 2009), *ICC(1)* refers to the extent to which student's ratings of the perceived classroom climate influence class belongingness. The *ICC(2)* refers to the estimate of the reliability of the class-mean ratings (Lüdtke et al., 2009), and values between .70 and .85 are considered acceptable (LeBreton & Senter, 2008). Second, to validate the study model shown in Fig. 1, confirmatory factor analysis (CFA) with maximum likelihood estimation using AMOS version 25 (Arbuckle, 2017) was applied. Third, criteria related to the validity and reliability of constructs were estimated. To determine the reliability of constructs, Composite reliability and Cronbach's alpha was utilized, the values of which should be > .70 (Hair et al., 2010). Convergent validity was estimated using Average Variance Explained (AVE > .50). Fourth, structural equation modeling (SEM) was used to estimate the causal associations between discipline problems, CEC, and turnover intention. Fifth, a multi-group path analysis was conducted to investigate whether classes with one teacher and classes with two teachers differed in model parameters. To determine whether the variation between classes was significant, the critical ratio difference test was applied. According to Arbuckle (2017), the critical ratio that exceeds 1.96 in magnitude is significant at the 0.05 level. Finally, SPSS version 25 was utilized to calculate the means, standard deviations, and correlations of measures.

Several fit indices can be applied to determine the model fit to the data when conducting CFA and SEM analyses. Specifically, the comparative fit index (CFI), the root mean square error of approximation (RMSEA), normative fit index (NFI), incremental fit index (IFI), and Tucker Lewis Index (TLI) was evaluated. A CFI value greater than .90 and RMSEA value smaller than .06 suggest acceptable model fit (Hu & Bentler, 1999). For NFI and IFI, recommended values are .90 or above (Bentler & Bonett, 1980).

4. Results

4.1. Intraclass correlation (ICC), reliability and validity of constructs

The *ICC(1)* value for CEC was .15, indicating that class belongingness could explain 15% of the variance in student reported CEC. Further, the *ICC(2)* value was .78, indicating acceptable reliability (LeBreton & Senter, 2008). Conclusively, applying the variable CEC at the aggregated class level was considered appropriate. To validate the measurement concepts, the composite reliability and Cronbach's alpha were calculated and found to be satisfactory. As shown in Table 2Sample, all values were above .70, indicating acceptable reliability. Finally, the discriminant validities of the concepts calculated by AVE were also satisfactory, with all values being equal to or above .50 (see Table 2). Means, standard deviations, reliability, and validity of constructs are shown in Table 2. The means and standard deviations for discipline problems, CEC, and turnover intentions in the control and intervention classes were also calculated. Teachers in the intervention classes tended to report fewer disciplinary problems and turnover intentions,

Table 2
Means (M), standard deviations (SD), correlations and reliability (Cronbach's α on the diagonal) for the study variables.

Variable	n	M	SD	CR	AVE	1.	2.	3.	4.
1.DP	293	3.48	1.19	.911	.774	(.91)			
2.CEC	300	3.37	0.20	.871	.50	-.418**	(.87)		
3.TI	291	1.74	1.01	.818	.695	.248**	-.12*	(.81)	

** $p < .01$, * $p < .05$ CR = Composite Reliability, AVE = Average variance explained, DP = Discipline problems, CEC = Classroom emotional climate, TI = Turnover intention.

whereas students reported slightly higher CEC. Still, as displayed in Table 3, the mean differences between groups were marginal and non-significant.

4.2. Confirmatory factor analysis

The confirmatory factor analysis was conducted to determine whether the data fit the hypothesized model, and fit indices were evaluated. The concepts in the model were considered to be latent factors, accounting for the variance in their respective manifest variables. Prior to modeling, the student scores of CEC were aggregated to the classroom level. Modification indices refer to a χ^2 statistics with one degree of freedom, and they can be applied as evidence of misfit (Jøreskog & Sörbom, 1988). Based on high modification indices, it was decided to include a correlation between two error terms in the CEC factor to improve the fit of the measurement model (Mm). Considering that the two error terms with the highest modification indices were within the same factor, correlating these was acceptable (Hooper et al., 2008). Further, a chi-square difference test was conducted, which revealed that correlating the two error terms significantly improved the fit of the measurement model (χ^2 difference = 61.2, $df = 1$, $p < .001$). The fit indices for the measurement model after modifications were satisfactory, and they are shown in Table 4.

4.3. Structural relationships and group differences

Next, a structural model (Sm) was developed, to explore the relationships between the studied variables. The fit indices, shown in Table 4, confirmed that the structural model fit the data well, and the results are also shown in Fig. 2. As expected, a significant and negative association was found between teacher-reported discipline problems and student-reported CEC ($\beta = -0.49$ $p < .001$). Thus, Hypothesis 1 was supported. Moreover, a significantly positive relationship was found between discipline problems and

Table 3
Means (M) and standard deviations (SD) on discipline problems, negative classroom climate and turnover intentions between control and intervention classes with one and two teachers.

Variable	n	M	SD
1.DP 1 T	145	3.59	1.13
2.DP 2 T	148	3.36	1.23
3.CEC 1 T	150	3.35	0.21
4.CEC 2 T	150	3.39	0.19
5.TI 1 T	145	1.80	1.03
6.TI 2 T	146	1.69	0.98

DP 1 T = Teacher reported discipline problems in classes with one teacher, DP 2 T = Teacher reported discipline problems in classes with two teachers, CEC 1 T: Student reported classroom emotional climate in classes with one teacher, CEC 2 T: Student reported classroom emotional climate in classes with two teachers, TI 1 T: Teacher reported turnover intention in classes with one teacher, TI 2 T: Teacher reported turnover intention in classes with two teachers. The differences between groups are not significant.

turnover intentions ($\beta = .19$ $p < .01$), supporting Hypothesis 2. It was also expected to see a negative association between student reported CEC and teachers' turnover intentions for the sample overall. However, the results revealed no significant associations between the two variables; thus, Hypothesis 3 was not supported. Consequently, due to the lack of significance between CEC and turnover intention, the hypothesized indirect association between teacher's perceived disciplinary problems in the classroom and their intention to quit through classroom emotional climate was not significant. Hence, Hypothesis 4 was not supported.

Multi-group moderation path analysis was conducted to evaluate whether the structural path coefficients for CEC and turnover intention varied between the one and two teacher classes. However, before investigating differences in this path coefficient, the factor structure of the model was tested across classes to determine whether the model fit both intervention and control classes. As shown in Table 4, the fit indices indicated a good fit of the multi-group measurement model (Mgm), supporting the appropriateness of dividing the data into two groups. Thus, the next step was to examine whether structural associations between CEC, and turnover intention differed significantly in classes with both one and two teachers. First, all paths in the model were constrained to be equal across interventions and control classes, referred to as the constrained multi-group structural model (Cmgs) in Table 4. Second, the Cmgs was compared with an alternative model where the path between CEC and turnover intention was allowed to vary, holding all the remaining paths to be equal. This model was referred to as the unconstrained multi-group structural model (Umgs) and is shown in Table 4. Finally, the χ^2 difference test was applied to determine whether the difference in fit between the two models was significant. The results of the χ^2 difference test confirmed that the Umgs provided a significantly better fit to the data compared to the Cmgs (χ^2 difference = 4.027, $df = 1$, $p < .05$). Moreover, as can be seen in Table 4, the standardized estimates for the association between CEC and turnover intention was -0.22 for the one-teacher classes ($p < .05$) and $.08$ for the two-teacher classes (non-significant). However, to determine whether the standardized estimates were significantly different between groups, the critical ratio (CR) difference test was applied. The results revealed that the path between CEC and turnover intention was significantly different for classes with one teacher versus classes with two teachers (CR = 2.342). This means that the relation between CEC and turnover intention was significantly and negatively related in classes with one teacher, whereas the same relation was not present in classes with two teachers. A final ad hoc analysis was conducted to control for class size. However, including class size did not change the initial results. Conclusively, Hypothesis 4 was partly supported.

5. Discussion

The core aim of the current study was to investigate both direct and indirect associations between teacher's perceptions of disciplinary problems in the classroom, student-reported CEC, and teachers' turnover intention. In addition, it was investigated whether the association between CEC and turnover intentions varied between classes with one and two teachers. In line with expectations and previous studies on associations between disciplinary problems and climate (Barnes et al., 2006; Reyes et al., 2012), a strong and negative association between disciplinary problems and CEC was found. This finding suggests that when teachers perceive disciplinary problems as high, students report lower quality of social and emotional interactions between their classmates. One explanation for this finding could be that students who misbehave are less able to interact with classmates, thereby

Table 4
Fit statistics for the different models (n = 300).

Model	Model description	χ^2	df	CFI	NFI	TLI	IFI	RMSEA	DP→CEC	CEC→TI	DP→TI	CR
Mm	Measurement model	126.146	50	.959	.935	.936	.960	.071				
Sm	Structural model	126.146	50	.959	.935	.936	.960	.071	-.49***	.08	.19**	
Mgm	Multi-group measurement model	179.215	100	.957	.910	.933	.958	.052				
Cmgs	Constrained multi-group structural model	184.994	103	.955	.907	.933	.957	.052				
Umgs	Unconstrained multi-group structural model	180.967	102	.957	.909	.934	.958	.051		1 T: -.22** 2 T: .08		2.342*

DP = Discipline problems, CEC = Classroom emotional climate, TI = Turnover intention, **p < .05; ***p < .001, CR = Critical ratio *CR > ±1.96 based on an alpha level of .05.

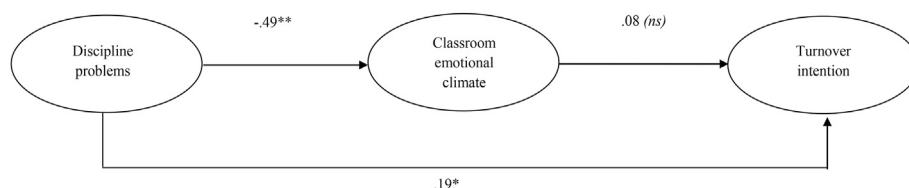


Fig. 2. Structural model. $\chi^2 = 126.146$, $df = 50$, CFI = 0.959, NFI = 0.935, TLI = 0.936, IFI = 0.960, RMSEA = 0.071. n = 300 ns = non-significant *p < .01; **p < .001.

creating a less functional climate overall. Teachers' attitudes and actions toward disciplinary problems could also explain this finding. For instance, previous studies found that students' misbehaviors triggered higher levels of anger in teachers (Lewis et al., 2005), suggesting that such reactive disciplinary strategies could affect students' perceptions of the classroom environment negatively (Mitchell & Bradshaw, 2013). As mentioned previously, one shortcoming of former studies measuring discipline problems and student misbehavior is that they have relied primarily on teacher self-reports (Aldrup et al., 2018). Consequently, knowledge of whether teachers' perceptions of behavior problems in the classroom also reflect objective behavior problems is lacking (Pas & Bradshaw, 2014). Based on the strong association found between teacher-reported disciplinary problems and student reported CEC, the current study supports the assumption that students in the classroom are aware of and affected by teacher-reported behavior problems. Still, it must be noted that the scale applied to measure the classroom emotional climate in the current study was primarily concerned with the quality of the social and emotional interaction between students in the class. In this sense, it differs from the teachers' scale that measured student misbehavior. However, the negative association between teacher-reported disciplinary problems and student reported CEC largely confirms that teacher reports of disciplinary problems also reflects the quality of interactions between classmates.

Further, the results demonstrated a direct and positive association between disciplinary problems in the classroom and teachers' turnover intention. This implies that teachers who struggle with student misbehavior are more likely to quit their job. This finding is consistent with previous research (Skaalvik & Skaalvik, 2011). Generally, these findings support the stressor-strain and the hindrance – stressor challenge stressor framework (Podsakoff et al., 2007) and former studies on associations between work stress and turnover intention (Rubenstein et al., 2018) based on which it was proposed that disciplinary problems act as a form of hindrance stressor associated with turnover intentions.

5.1. PTR as a moderator

It was further hypothesized that students' reports of CEC would relate to teachers' reports of turnover intentions. Specifically, it was expected to see that lower scores on CEC would relate to higher

scores on turnover intentions. However, for the sample overall, this proved not to be the case, and consequently, the hypothesized indirect association between teacher's perceived disciplinary problems in the classroom and their intention to quit through classroom emotional climate was not significant. Although CEC was not found to be associated with turnover intentions for the classes overall, the results turned out to be more nuanced when PTR was included as a moderator in the model. Whereas the CEC was significantly related to teachers' intention to quit in classes with only one teacher, the same relation proved to be non-significant in classes with two teachers. The significant association between CEC and turnover intention in the one-teacher classes tells us that when the CEC is low, teachers have stronger intentions to leave their job. This finding is in line with previous research, suggesting that the climate to which individuals are exposed in the work setting relates to turnover intention (Rubenstein et al., 2018).

An interesting question is why the relation between CEC and turnover intentions turned out to be non-significant in classrooms with two teachers. Based on the theoretical framework and assumptions, the most evident explanation might relate to the fact that when teachers can rely on another teacher in the class, this might again neutralize the negative effects of a dysfunctional CEC. This line of thought is consistent with the buffering hypothesis (Karasek & Theorell, 1990), implying that social support may diminish the effects of negative events (Leithwood et al., 1996; van Dick & Wagner, 2001). Moreover, concerning turnover, social support has proven to interact with stress factors at work when predicting intention to quit (Kim & Stoner, 2008; Pomaki et al., 2010), which is in line with the results of the current study.

Finally, it was also interesting to see that disciplinary problems and turnover intentions were slightly lower, whereas the CEC was slightly higher in classes with an additional teacher. Although differences were not significant at this time point, these differences might increase over time. At the time when the current study was conducted, the intervention related to an extra teacher resource had only been present for approximately one school year. However, perhaps the differences between the one and two teacher classes would have been larger and reached significance with a longer time-interval. Future studies with a longitudinal design might serve to clarify this further.

5.2. Conclusion and practical implications

To conclude, the results of the current study suggest that when teachers perceive disciplinary problems in the classroom, students view the CEC more negatively. Teachers who experience disciplinary problems also report higher turnover intentions. Finally, the significant relation between CEC and turnover intention seems to disappear when another teacher is present in the class. The current study may have several practical implications. First, school management should be aware that teachers' perceptions of discipline problems might affect teachers' attitudes toward their job negatively and increase their intentions to quit. Considering that teacher turnover is associated negatively with student achievement (Ronfeldt et al., 2013), school management should focus on means that encourage teachers to stay in the profession. It has been stated that the teachers' perceived competence to maintain order in the classroom is an important aspect of a healthy classroom environment (Marzano et al., 2003). Thus, one way to reduce discipline problems could be to increase teachers' competence concerning handling discipline issues in the classroom. Second, according to the Norwegian Directorate for Education and Training, schools in Norway must ensure that a school environment supports the well-being of all children and is conducive to learning. It is well established in research that a healthy CEC is a significant antecedent of both students' well-being and academic achievements (Mashburn et al., 2008). However, discipline problems might threaten these obligations, considering that students perceive the CEC more negatively when discipline problems are present. Thus, schools must monitor both teachers' perceptions of misbehavior in addition to students' perceptions of CEC to identify problems and take action early enough. Finally, both policy makers and school managers should be aware that including another teacher in the classroom might be an efficient way to neutralize the negative relation between CEC and teachers' turnover intentions.

5.3. Limitations, strengths, and future research

The current study has some limitations. First, the study was based primarily on self-reports, which are susceptible to common method variance. Still, an apparent strength of the study was that the studied variables were from different sources, which might reduce problems related to common method variance (Podsakoff, 1986). Additionally, the PTR was measured based on an objective intervention and a randomized control design. A second limitation relates to the study design, which prevents us from drawing any conclusions about causal relationships. Accordingly, the hypothesized relations might also be reversed or reciprocal. For instance, the turnover intention of teachers might create a negative atmosphere in the classroom, which again could lead to a negative CEC. A negative CEC might again be associated with more discipline problems. Moreover, previous studies found that employees who intended to quit their jobs but stayed showed lower performance (Burton et al., 2010). Lower performance among teachers might also contribute to a more negative CEC and more discipline problems. Thus, it is recommended that future studies apply a cross-lagged design to make more substantial conclusions about the studied associations. A final limitation of the current study was that the quality of social interactions between the teachers in the two-teacher classes was not assessed. Obviously, the quality of these interactions is likely to vary between the two-teacher classes, which again might have implications for collaboration and sense of social support. In future studies it would be interesting to examine these differences further, to establish more knowledge regarding how the quality of teacher interactions might influence the association between the CEC and teachers' turnover intentions.

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