Coercive and supportive teacher behaviour: Within- and across-lesson associations with the classroom social climate

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Abstract

The present study investigated whether the classroom social climate varies between lessons. Specifically, the within- and across-lesson associations of coercive and supportive teacher behaviour incidents with the classroom social climate were studied. Participants in the study were 48 Dutch secondary school teachers and their classes, that is, 1208 students. Multilevel process analyses showed that supportive behaviour incidents correlated with a positive social climate during the current lesson and the lesson a week later in terms of teacher interpersonal proximity. Supportive behaviour incidents did not, however, correlate with social climate in terms of teacher interpersonal influence. Coercive behaviour incidents correlated with disrupted teacher proximity during the current lesson and the lesson a week later, but did not virtually correlate to increased levels of a teacher’s influence in the classroom.

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1. Introduction

How students perceive the social climate of their classroom, and especially the way students perceive their teachers interpersonally, is strongly related to student academic achievement and well-being (Brophy, 1998; Davis, 2003; Wubbels, Brekelmans, den Brok, & van Tartwijk, 2006), and to the psycho-social development of students (Pianta, 2006; Wentzel, 2002). The more warm and supportive a teacher is, the more students report a sense of belonging in the class and being engaged (Freeman, Anderman, & Jensen, 2007; Woolfolk Hoy & Weinstein, 2006). On the other hand, if teachers are acting offensive and coercive (Lewis, 2001) learning is negatively affected (Banfield, Richmond, & McCroskey, 2006), and students report more psychological and somatic complaints (Sava, 2002).

The present study investigated the classroom social climate in terms of students’ generalized interpersonal perceptions of a teacher. The present study adds to the existing body of knowledge on classroom social climates by investigating associations between coercive and supportive teacher behaviour incidents and the social climate within (i.e., during a lesson) and across lessons; specifically, what is the association of coercive and supportive behaviour of a teacher with the classroom social climate one or two weeks later?

1.1. Classroom social climate

The relation between students’ outcomes and students’ perceptions of the classroom environment in general (Brophy, 1998; Fraser, 1991, 1998), and of the social climate in particular (den Brok, Brekelmans, & Wubbels, 2004; Church, Elliot, & Gable, 2001), have received quite some attention in research. In the present study the social climate is conceived as the social aspect of the classroom environment; that is, the social climate refers to the quality of social relations in classrooms. These relations can be conceptualized in terms of interpersonal
perceptions students and teachers have of each other (e.g., students’ perceptions of their classroom peers, teachers’ perceptions of their students, students’ perceptions of their teacher). Both individual and collective perceptions are used. Specifically, the collective or consensual part of students’ interpersonal perceptions of a teacher may be more indicative of the teacher as a person and his or her behaviour towards the students as a group. On the other hand, individual students’ interpersonal perceptions of a teacher (i.e., the distance from the classroom average score for this student) may be more indicative for the personal ideas of this student and the specific relationship of this student with the teacher (cf. Kenny, 2004). In the present study the collective students’ perceptions of their teacher are utilized as an indicator of the classroom social climate. Building on a phenomenological point of view, students are considered as the most appropriate informants of their learning environment (cf. den Brok, Brekelmans, & Wubbels, 2006; Lüdtke, Robitzsch, Trautwein, & Kunter, 2009).

The focus of the present study was on student perceptions of a teacher’s “dominance versus submission” and “hostility versus affection” dimensions to describe students’ collective interpersonal perceptions of their teacher. According to interpersonal theory (Fiske, Cuddy, & Glick, 2007; Judd, James-Hawkins, Yzerbyt, & Kashima, 2005) these two dimensions are primary to all interpersonal perceptions.

Psychologists have investigated the two dimensions extensively during the last half of the century giving many different names to them (Abele & Wojciszke, 2007; Kiesler, 1983). Circumplex models are one way to combine these two dimensions in an orthogonal framework (see, e.g., Leary, 1957; Wiggins, 1991). These models provided rather thorough and complete descriptions of interpersonal constructs. When Wubbels, Créton, and Hooymans (1985) adapted the Leary circumplex model to the educational context, they spoke of a teacher’s interpersonal influence and proximity (Wubbels et al., 2006). The Influence dimension describes the amount of control a teacher has in class (i.e., dominance vs. submission) and the Proximity dimension the amount of affiliation (i.e., hostility vs. affection).

The Questionnaire on Teacher Interaction (QTI; Wubbels et al., 1985, 2006) measures generalized levels of influence and proximity in students’ perceptions of their teacher. Several studies have shown that students who attend classes with relatively high average levels of teacher influence and proximity show greater cognitive achievement and more positive subject-related attitudes than classes that perceive the teacher low on these dimensions (Brekelmans, Sleegers, & Fraser, 2000; den Brok et al., 2004).

Also in other educational studies, equivalents of influence (Allen, Witt, & Wheelas, 2006; Cornelius-White, 2007) and proximity (Goodenow, 1993) have been highlighted as valuable concepts. Recently, Woolfolk Hoy and Weinstein (2006) underscored the importance of the Authority and Care dimensions in the description of good teachers.

Studies which have investigated changes of social aspects of learning environments (Evertson & Veldman, 1981; Mainhard, Brekelmans, Wubbels, & den Brok, 2008; Patrick, Anderman, Ryan, Edelin, & Midgley, 2001) have largely done so over rather extended periods of time (e.g., several months), thereby ignoring lesson-to-lesson variability. Specific incidents of teacher behaviour may be a cause of such variability. Not all teacher behaviours may have the same impact on the social climate, some salient behaviour, such as incidents of teacher coercion and conflict, and on the other hand supportive teacher behaviour may change classroom social climate temporarily or permanently. In what follows, the relative importance of these two kinds of teacher behaviour for students’ perceptions of the classroom social climate, as well as for students’ outcomes, is discussed.

1.2. Coercive teacher behaviour

As Lewis (2001) points out, a sufficient degree of classroom discipline is needed to maintain an atmosphere conducive to student learning. Good intentions of the teacher and well-planned lessons may not have the desired impact if students are not responsive or misbehave in class. However, as Kunter, Baumert, and Köller (2007) point out, how a teacher maintains a constructive classroom climate matters. Continuous supervision and support may function as a structural framework to students and enable them to self-regulate their activities appropriately, because outcomes of behaviour alternatives are predictable. On the other hand, actions to gain control that students perceive as coercive negatively affect the social climate and student learning. Coercive discipline includes sarcasm, yelling in anger, embarrassing students, and punishment (Lewis, 2001). In other studies by Lewis and colleagues students reported that they felt distracted by disciplinary behaviour they perceived as coercive, that they were feeling negative towards the teacher, and were, in general, adversely affected if the teacher handled misbehaviour by applying strategies they evaluated as coercive (Lewis, Romi, Katz, & Qui, 2008; Lewis, Romi, Qui, & Katz, 2005). In a similar vein, Frenzel, Pekrun, and Goetz (2007) showed that if teachers are perceived to convey a high negative value of failure (e.g., by punishment), students reported more anxiety and anger.

Banfield et al. (2006) also highlighted the negative effects of coercive teacher behaviour in educational processes. According to these authors, inadequate teacher behaviour (i.e., incompetence, indolence, offensiveness) interferes negatively with instruction and student learning (cf. Kearney, Piax, Hays, & Ivey 1991), with offensiveness being the most damaging to student affect, and to perceptions of teacher credibility and care. In addition, teachers themselves think that, for example, yelling at students ruins the classroom atmosphere (van Tartwijk, den Brok, Veldman, & Wubbels, 2009).

1.3. Supportive teacher behaviour

While coercive teacher behaviour may have deteriorating implications for students’ perceptions of their teacher, teacher behaviour that students perceive as warm and caring is regarded essential for creating an effective context for learning (Wentzel, 1998; Woolfolk Hoy & Weinstein, 2006). Using appropriate and non-offensive humour perceived as such by the students (Torok, McMorris, & Wen-Chi, 2004), encouraging positive student behaviour (Akin-Little, Eckert, Lovett, & Little, 2004; Lewis et al., 2008), providing emotional and
academic support to students (Patrick, Ryan, & Kaplan, 2007), and undertaking activities students think are fun (Créton, Wubbels, & Hooyman, 1989; van Tartwijk et al., 2009) are factors that support a positive classroom social climate (Woolfolk Hoy & Weinstein, 2006; Wubbels et al., 2006) and constitute a motivational factor for students (Goodenow, 1993; Patrick et al., 2007; Ryan, 1995; Solomon, Battistich, Kim, & Watson, 1997). For example, Frenzel et al. (2007) showed that teachers’ support of students in terms of providing clear and structured instruction, and keeping track of students’ comprehension, positively affect student perceptions. Appropriate humour is positively related to teacher immediacy (i.e., students’ perception of emotional closeness to the teacher, Gorham & Christophel, 1990), students’ reports of learning (Torok et al., 2004; Wanzer & Frymier, 1999), and lowering student anxiety. Abel (1998) showed the buffering and moderating effect of humour in mitigating stress and promoting psychological well-being. In general, teacher behaviour that supports positive affect in students is considered to enhance academic interest in students and, thus, learning (Hidi, 2006).

1.4. The present study

The present study examined the associations of teacher coercive and supportive behaviour with variability in the classroom social climate in terms of teacher influence and proximity. While coercive and supportive teacher behaviour refers to behaviour incidents in class, influence and proximity refer to a more aggregated level of students’ interpersonal perceptions of a teacher. Thus, the question addressed in this study is how lesson-to-lesson variability in students’ collective, generalized interpersonal perceptions of a teacher is associated to specific teacher behaviour incidents.

In classrooms with more incidents of coercive teacher behaviour students were expected to perceive less proximity, although teachers in these classrooms might gain influence because students comply with the teacher’s display of power (Hypothesis 1). Also, incidents of supportive behaviour, in terms of a teacher’s proximity, were expected to positively correlate with students’ perceptions of the social climate, but also to be beneficial to the teacher’s influence (Hypothesis 2).

For the study of the lesson-to-lesson variability of the classroom social climate the association of teacher behaviour as observed by students during a classroom lesson with the social climate during the concurrent lesson was examined. Further, it was studied how coercive and supportive teacher behaviour in a lesson one or two weeks earlier affects the classroom social climate in the current classroom lesson.

2. Method

2.1. Design – procedure

The research period lasted from September to December. Teachers were asked to administer to their students two questionnaires, namely the Questionnaire on Teacher Interaction (QTI; see Section 2.3.1) in two versions and the Teacher Behaviour Observation Checklist (TBOC; see Section 2.3.2). In this way, students recorded their perceptions of the social climate and teacher’s coercive and supportive behaviour, respectively, once a week. Because the intention was to use multilevel analyses teachers had a certain degree of freedom with regard to their time schedule of the administration of the questionnaires. One of the strengths of multilevel growth models is that they can handle varying measurement occasions across individuals (i.e., teachers). The treatment of multiple observations allows one to proceed without facing difficulties when number and spacing of time points vary across teachers (Hox, 2002; Snijders & Bosker, 1999).

As a general guideline, teachers were asked to administer the questionnaires on 10 occasions during the research period. To make students feel as free as possible to express themselves, teachers were instructed to appoint a student of the class to take in completed questionnaires and put them into a sealed envelope. On average, questionnaires were completed 9.31 (SD = 2.35) times per class, and in total 447 classroom lessons had been rated by students. Per class and measurement occasion one third of the students in a class completed the QTI-version A, one third the QTI-version B, and one third completed the TBOC. Thus, each time, a student focused on either teacher behaviour incidents or teacher influence and proximity. This procedure was opted to define the classroom social climate by perceptions of students different from those who rated the teacher behaviour incidents, and, thus, yielded some independence in the applied measures of climate and teacher behaviour. An individual student responded to the three questionnaires in alternating order, thus completing QTI-version A on the first measurement occasion, QTI-version B on the second, and TBOC (C) on the third occasion and so on. One third of the students in each class answered the questionnaires according to the sequence, one third according to sequence B-C-A, and one third according to sequence C-A-B. In case of 10 measurement occasions this means that each student completed each of the questionnaires three or four times. No student responded to the same set of items within two weeks. This A-B-C rotation employed minimized testing effects. Versions A and B of the QTI were each completed by one third of the students of a classroom group per measurement occasion, and the data of both versions was aggregated into one composite class score for the Influence dimension and one score for the Proximity dimension (see Section 2.3).

2.2. Participants

Participants in the study were 48 Dutch secondary school teachers. Teachers were contacted via online teacher communities to which all Dutch teachers have free access. Teachers (26 females) had, on average, 10.44 (SD = 8.60) years of teaching experience. This is somewhat lower than the Dutch average, possibly because overall younger teachers participated in the online communities. Of the participating teachers, 18 taught mathematics and science and 30 taught languages and social
studies. On average, there were 25.17 (SD = 3.74) students in a class with a slightly smaller number of girls than boys (M = 46.12%, SD = 15.00%). This may be due to two participating (science) classes that comprised boys only. In total, 1,208 students participated and their mean age was 14.09 years (SD = 1.47; range from 12 to 17 years). The vast majority of the students did not have an ethnic minority background.

2.3. Instruments

2.3.1. Classroom social climate

For the assessment of the classroom social climate the collective students’ perceptions of teacher influence and proximity were used. A selection of items the QTI (Wubbels et al., 1985, 2006) for the assessment of teacher influence and proximity was used. To prevent overlap between measures of Influence and Proximity dimensions and teacher behaviour as measured with TBOC, QTI items worded in terms of teacher behaviour were not included. The instructions printed on the form were “What do you think of your teacher?”, and examples of items included are “This teacher is friendly” or “This teacher is strict”. Responses were on a 5-point Likert-type scale, ranging from 1 (never) to 5 (always). Because of frequent administrations, two shortened parallel versions of the QTI (QTI-version A and QTI-version B) were used. To construct these versions a representative sample of approximately 3,000 Dutch students from secondary education, who previously had completed the QTI, was randomly divided into two subsamples. Based on one of these subsamples two 32-item versions were created by splitting the original Dutch QTI (77 items) in a way that maximized the correlation of Influence dimension measured by version A and Influence measured by version B as well as the Proximity dimension of the two versions. Then the equivalence of the two versions on the other half of the student sample was re-analyzed. Correlations between versions A and B for this second half of the sample were .92 for the Influence dimension and .89 for the Proximity dimension.1

For the present sample Cronbach’s alpha for the Influence and Proximity dimensions on student level were .79 and .93 for version A, and .80 and .93 for version B. The equivalence of the supposed two-factor structure of the two versions for the present sample was tested in a multi-group confirmatory factor analysis (Mplus; Muthén & Muthén, 1999) at the student level. Results of the analysis suggested that a model with two independent dimensions (i.e., Influence and Proximity, r = .09, p = .08) and a circular structure, fitted the data reasonably well, χ²(441, N = 1208) = 423.67; p < .01, CFI = .96, TLI = .95. Although the RMSEA (.09) and the SRMR (.09) indicated some distance between data and theoretical model the correlations between the factor scores based on the confirmatory factor analyses and factor scores based on the theoretically assumed circumplex structure were .96 and .99 for the Influence and Proximity dimensions, suggesting that the deviations from the theoretical model had only a minimal effect on reported dimension scores.

«Studies of scale homogeneity or scale intercorrelation should be carried out with the classroom group as unit of analysis» (Cronbach, 1976, p. 122, as cited in Lüdtke et al., 2009).

To check the psychometric quality of aggregated constructs, and before individual ratings are aggregated, the intraclass correlations (ICC) need to be calculated (Miller & Murdock, 2007; Raudenbush & Bryk, 2002). For the study of classroom environments, there are two relevant versions of the ICC; the ICC1, which indicates the reliability of an individual rating (.30 is regarded as high), and the ICC2, an estimate of the reliability of aggregated ratings (.70 is regarded as a sufficient level).2 As a complement to the ICC the Average Deviation index (AD) provides information on the agreement of students within a classroom (Burke & Dunlop, 2002; LeBreton & Senter, 2008). This index indicates the average deviation of a student from the class mean of Influence and Proximity. Calculation of the AD index is also possible for single Likert-type items or for proportion data. Usually the upper limit cut-off score for the AD index applied to proportion data is .20, which reflects a minimum average correlation of .70 between raters.

For the Influence and Proximity dimensions ICC1 was .44 and .52, respectively, and ICC2 (i.e., reliability of class-mean ratings) .93 and .95 respectively. For the assessment of students’ agreement within a class student’s dimension scores were transformed into proportions and AD indexes were calculated per classroom and week. Overall, the AD index for Influence and Proximity dimensions was .06 (SD = .02) and .09 (SD = .03) respectively. Consequently, it was acceptable to regard (aggregated) student ratings as reliable indicators of teacher Influence and Proximity.

2.3.2. Coercive and supportive teacher behaviour

Coercive and supportive teacher behaviour incidents were measured with a self-developed instrument, namely the Teacher Behaviour Observation Checklist (TBOC) containing eight items, each referring to the occurrence of coercive or supportive teacher behaviour during a lesson. A variety of sources (Frymier, Wanzer, & Wojtaszczyk, 2008; Lewis et al., 2005; Solomon et al., 1997; Weinstein, Marshall, Brattesani, & Middlestadt, 1982) provided the basis for the formulation of the items. The instructions were “Indicate whether the teacher engaged in the following behaviours”; an example of a coercive incident item is “In this lesson the teacher yelled at us”, an example of a supportive incident is “In this lesson the teacher said we were doing well”. Responses were given on a 3-point Likert-type scale running from 1 (not at all) to 3 (often), and items were

1 In scales based on circumplex models, the order of the items is expected to have a circular structure and to represent two, uncorrelated dimensions (Tracey, 1994); here they are called Influence and Proximity dimensions. To reflect the position of an item within the circumplex model weights are applied to the items (i.e., theoretical factor loadings; for a comprehensive discussion of the model used here please refer to den Brok et al., 2006). As a result, scores of the model used here please refer to den Brok et al., 2006). As a result, scores of

2 For details on the calculation of ICC1 and ICC2 see Lüdtke et al. (2009) or Snijders and Bosker (1999).
combined into composite scores per measurement occasion and classroom. Student observations of teacher behaviour incidents were very reliable and showed sufficient agreement between students of the same class, that is, for coercive behaviour, Cronbach’s alpha (student level) = .81, ICC1 = .58, ICC2 = .92, AD = .10, (SD = .08); for supportive behaviour, Cronbach’s alpha = .71, ICC1 = .53, ICC2 = .91; AD = .15 (SD = .05). The correlation between the composite supportive and coercive behaviour incident scores was −.44 (p < .01).

3. Results

Descriptives are summarised in Table 1. Although teachers participated on a voluntary basis, the resulting sample was rather heterogeneous in terms of the dependent variables Influence and Proximity, and the average ratings on both dimensions were comparable to larger scale studies including non-convenience samples (cf. den Brok et al., 2004; Fisher, den Brok, & Rickards, 2006; Levy, den Brok, Wubbels, & Brekelmans, 2003).

3.1. Coercive teacher behaviour

As preliminary analysis, Pearson correlations between coercive behaviour incidents and students’ perceptions of teacher influence and proximity, averaged over the research period, were calculated. Confirming Hypothesis 1, with more frequent coercive behaviour, students perceived significantly less proximity (r = −.68, p < .01). However, students also perceived less influence (r = −.14, p < .01).

3.1.1. Within- and across-lesson associations of coercive teacher behaviour and classroom social climate

Because of the nested nature of the data (i.e., measurement occasions within classes), multilevel analyses were conducted (Level 1 was the week or occasion level, Level 2 was the class-level). Teachers participated each with one class and every participating teacher taught at a different school.

To examine the within- and across-lesson associations between coercive teacher behaviour incidents and the classroom social climate, a special type of multilevel modelling, namely process analyses, was used (van Doorn, Branje, Hox, & Meeus, 2009; Papp, 2004). Rather than fitting a general trend across time in order to explain variability in the dependent variable (e.g., modelling a decline or increase in perceptions of the Influence or Proximity dimensions), this analysis examines whether factors other than time can account for variability in the dependent variable. All explanatory variables used in the analyses were Level 1 variables, namely collective perceptions of Influence and Proximity, and the perceived amount of coercive teacher behaviour in a specific lesson. Inspection of Level 1 and Level 2 residuals of the multilevel models showed a satisfactory conformity to normality and no extreme outliers.

In first place, the Coercive × Supportive Behaviour interaction was also included in the analyses, but the two types of behaviour were not conditional on each other in any of the models tested. For the sake of parsimony, the interaction term was not included in the reported analyses.

Analyses of the associations of coercive behaviour with the social climate within the current lesson were controlled for perceived influence and proximity a week prior to the classroom lesson of interest and for supportive behaviour within the current lesson (see Appendix A for the model equations). Separate analyses for each of the two dimensions were run; and all independent variables were centred on the grand mean for a better interpretation of the resulting models.

Perceived teacher influence in a lesson was significantly related to perceptions of influence one week earlier, and likewise, proximity was significantly related to perceptions of proximity one week before (see within-lesson model, upper panel in Table 2). Allowing the relation between the classroom social climate of two consecutive weeks to differ between classes (i.e., random slopes) did not improve the Proximity and Influence models, restricted iterated generalized least squares (RIGLS) estimation, Δχ²(2) = .00, p = .99, and Δχ²(2) = .03, p = .99, respectively.

Further, the within-lesson model shows that perceptions of influence were not related to coercive teacher behaviour incidents. On the other hand, coercive teacher behaviour was significantly negatively related to perceived teacher proximity. It was also examined whether the effects of coercive behaviour differed per classroom, this was however not the case.

To find out whether coercive teacher behaviour in a lesson one week earlier affected the social climate, coercive behaviour in the week before was entered into the models for proximity and influence. As Seidman, Green, Rafaeli, Shrout, and Bolger (2004), and Shrout, Seidman, Green, and Bolger (in preparation) have recommended, perceived proximity and influence one week earlier, as well as concurrent coercive behaviour, were left in the model (see Appendix A). This approach minimises floor effects and makes the interpretation of the resulting models more straightforward.

The across-lesson model for the Proximity and Influence dimensions is summarised in Table 2 (lower panel). Notably different from the within-lesson model, coercive teacher behaviour incidents in the current lesson were positively related to influence. If a teacher had engaged in coercive behaviour only a lesson a week earlier, perceived influence in the current lesson was somewhat lower. Because the across-lesson association of coercive teacher behaviour was somewhat larger than the association of concurrent coercive behaviour and Influence, engaging in coercive behaviour in lessons in two successive weeks was associated to a marginally lower influence. It was also tested whether the interaction between concurrent coercive behaviour and coercive
Coercive teacher behaviour a week earlier could further clarify these associations. This interaction was, however, not statistically significant ($B = -12.32, p = .07$). None of the within lesson associations differed per classroom, and there were no associations across more than two consecutive weeks.

In sum, these results are in line with Hypothesis 1 that coercive teacher behaviour would be negatively associated to a teacher’s interpersonal proximity in class. Associations between coercive behaviour incidents and influence were, however, less straightforward. In the analyses, two lessons in consecutive weeks had to be taken into account in order to uncover associations with influence.

### 3.2. Supportive teacher behaviour

Confirming Hypothesis 2, Pearson correlations of supportive teacher behaviour incidents and perceptions of teacher Influence and Proximity, averaged over the research period, showed that in classes where more supportive behaviour was perceived, students also tend to perceive more influence ($r = .18, p = .08$) and significantly more proximity ($r = .64, p < .01$).

#### 3.2.1. Within- and across-lesson associations of supportive teacher behaviour and classroom social climate

The within-lesson model shows that perceptions of influence were marginally positively associated with supportive teacher behaviour incidents, while controlling for effects of coercive behaviour. Proximity was according to students higher in lessons where teachers showed more supportive behaviour (see Table 2, upper panel). These findings are in line with Hypothesis 2. As was the case for coercive behaviour, associations between supportive behaviour and proximity and influence did not differ between classrooms.

Proximity during a lesson was perceived higher when the teacher had engaged in supportive behaviour the week before. Supportive behaviour a week earlier, however, was not associated to concurrent perceptions of influence (see Table 2, lower panel). Again, across-lesson associations did not differ per classroom and there were no associations for lessons two weeks earlier. A sum, supportive teacher behaviour was clearly related with lesson-to-lesson variability in proximity. However, no significant relation between supportive behaviour and influence was found.

### 4. Discussion

The aim of the present study was to examine how incidents of coercive and supportive teacher behaviour are associated with the variability of the classroom social climate teachers create. Teacher behaviour incidents were measured by observation checklists students used to indicate frequencies of specific teacher behaviours (e.g., yelling in class). Collective student perceptions of general levels of a teacher’s interpersonal proximity and influence in class were utilized to tap the social climate.

The present study provides a better understanding of the association between teacher behaviour and the social climate by utilizing multiple measurements across time within classrooms, and by contrasting relations within classroom lessons with associations of coercive and supportive teacher behaviour and the social climate across lessons. To do so multilevel process analysis was employed (van Doorn et al., 2009; Papp, 2004), which relates two or more simultaneously assessed concepts across time. This type of analysis is similar to multilevel modelling employing time varying covariates but without including a designated time variable as a predictor (cf. Hox, 2002). This approach proved to be very valuable. For example, it showed that especially for the interpretation of associations between coercive behaviour and teacher influence two lessons in consecutive weeks had to be taken into account.

#### 4.1. Coercive and supportive teacher behaviour and the classroom social climate

Confirming Hypothesis 1, frequently using sarcasm, yelling at students, or punishing students during a classroom lesson was associated with significantly lower teacher proximity. It appears that using coercive behaviour immediately disrupts the relation between teacher and class, and is associated with less proximity a week later. Thus, acting coercively does not “disappear” in the ongoing stream of teacher behaviour and is not associated to mere temporal disruptions of the classroom social climate. Although relations between coercive behaviour and teacher influence were not straightforward, it seems that coercive strategies were not associated with greater influence. The use of
coercive behaviour was associated with somewhat more influence in class, but acting coercively in two lessons in consecutive weeks occurred to counterbalance these associations. This finding is in contrast to more general theories on interpersonal power (French & Raven, 1959; Schrödt et al., 2008) which assume that coercive behaviour enhances interpersonal influence. It is, however, in line with some studies which show that coercive strategies are associated with more student misbehaviour (Lewis et al., 2005; Miller, Ferguson, & Byrne, 2000).

Finally, more frequent supportive behaviour towards students was found to be associated with more perceived proximity of the teacher during the current lesson. Supportive behaviour in a lesson one week earlier was also associated to concurrent proximity, but to a lesser extent. More frequent supportive behaviour however was hardly associated with teacher influence.

Taking the results together, previous and concurrent coercive and supportive teacher behaviour were more strongly related to collective student perceptions of teacher’s proximity than to perceptions of influence. That teacher behaviour was less associated with teacher’s influence cannot be explained, as far as we know, by earlier findings. However, there are some indications that differences between classrooms of the same teacher are greater regarding a teacher’s proximity than influence (Wubbels et al., 2006). This may indicate that the Proximity dimension is subject to more situational (i.e., classroom) influences than the Influence dimension. An alternative explanation might be that the behaviour observation list we constructed does include teacher behaviour that simply does not relate as much to a teacher’s influence as to proximity. It may also be the case that additional situational factors have to be taken into account. For example, yelling at students may be associated with more influence if students agree that they misbehaved, whereas if students think that a teacher is wrong in his or her judgement, yelling might have the opposite effect on a teacher’s influence.

The fact that there were no differences found between classrooms in the associations between teacher behaviour and the social climate (i.e., random slopes), suggests that the processes described here are fairly comparable across classrooms. Nonetheless, it has to be taken into account that the analyses were based on a convenience sample.

4.2. Limitations and future directions

From a phenomenological point of view student perceptions are very suitable for the study of the classroom social climate (Lüdtke et al., 2009; Wubbels et al., 2006). After all, the teacher’s intentions or behaviour scored by external observers may not be related to students’ interpretation of what happened in class. For example, if a teacher does not react to a question posed by a student, students may conclude that the teacher is busy with something else, thinks the student is too stupid to understand, or considers the question impertinent. Nonetheless, an alternative explanation for the associations between the classroom social climate and teacher behaviour found in this study may be that both were measure by means of student perceptions. However, we tried to introduce some independence to the data by letting students complete either a questionnaire on the social climate or a teacher’s behaviour.

A related issue is the conceptualization of the social climate as a class-level construct. We explicitly chose to address the association between teacher behaviour and the classroom social climate, rather than studying associations with individual student perceptions. An advantage of this approach was that, as we already indicated we were able to collect data that is less biased, because students completed either a questionnaire on the classroom social climate or on the teacher’s behaviour. A drawback of this strategy is however that processes relating to individual as opposed to collective aspects of student perceptions could not be studied (i.e., within-classroom effects could not be disentangled from between-classroom effects). This concerns especially the within-lesson models. Because the data on concurrent lessons was collected “cross-sectionally” (two thirds of the class responded to the QTI and one third to the TBOC), no models linking individual student data regarding teacher behaviour and the teacher influence and proximity could be fitted. Especially when studying effects on student learning outcomes, individual aspects of student perceptions, in addition to collective aspects, may be essential.

Although teachers were instructed to appoint a student to collect the completed questionnaires, students might still have felt free to give their opinion on the teacher’s behaviour. Moreover, it is unclear whether all teachers indeed followed these instructions. Especially in classes where trust between teacher and students was small data may have been biased towards less coercive teacher behaviour scores. Although data might have been biased in some classes, the descriptives show (see Table 1) that, at least in some classes, this was not the case.

Some other remarks on the study’s set-up are in order. We want to emphasise that causality in the within-lesson model cannot be implied. It is possible that a greater proximity between teacher and class makes it more likely that the teacher does display supportive behaviour, and similarly, that uncooperative or hostile student behaviour causes the teacher to act more coercively.

Although unanswered questions remain, we have provided insights into the dynamics of teacher behaviour and the social climate teachers provide to their students. Using measurements over ten consecutive weeks allowed for an investigation of the within lesson as well as across lesson associations between teacher behaviour and social climate. Future research might investigate moderators in this process. For instance, recurring classroom management issues or conflicts between teacher and students that repeatedly involved the same issue might have a more long-term impact on classroom social climate than the same amount of incidents concerning diverse matters.

4.3. Practical implications

One of the major messages of the present study is that coercive teacher behaviour is very unlikely to go together with greater influence in the classroom. Further, as was expected, coercive behaviour is associated with disruptions of the proximity between teacher and class. Teachers who engage in coercive behaviour may understand that this is not beneficial to their proximity.
However, these teachers may more or less deliberately sacrifice proximity because they believe they will re-establish or consolidate their influence in the classroom by engaging in these behaviours. The present study shows that this assumption is not justified. Disciplinary actions may sometimes be necessary, but at the same time may ruin the classroom atmosphere. The findings of the current study support the guidelines that teachers should use small rather than intense corrections, behave as unaggressive as possible (Evertson & Weinstein, 2006), and should apply increased intensity of disciplinary actions only for intensified disruptive student behaviour (Creton et al., 1989).

Regarding supportive behaviour, although the effects we found were not substantial, we have shown that supportive behaviour pays off immediately and is an investment for the near future as well.

4.4. Concluding remarks

The present study provides further insight into the social climate in classrooms and the way lesson-to-lesson variability in classroom social climate is produced. Several studies (e.g., Lewis, 2001; Sava, 2002) have already shown the destructive effects of coercive teacher discipline. A new aspect the present study highlights is the way in which coercive and supportive behaviour associates with the concurrent classroom social climate and how these associations work across time.

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Appendix A. Multilevel model equations

1. Within-lesson model for the Proximity dimension (Prox) with abbreviated variable names:

Prox_{ij} = \gamma_{00} + \gamma_{10}\text{Proximity previous week}_{ij} + \gamma_{20}\text{coercive}_{ij} + \gamma_{30}\text{supportive}_{ij} + u_{0j} + e_{ij}

Where \gamma_{00} represents the classes’ average level of perceived Proximity (e.g., the intercept of Proximity) when level of perceived proximity a week earlier, coercive, and supportive behaviour equal zero (these independent variables are centred on the grand mean): \gamma_{10}, \gamma_{20}, and \gamma_{30} represent average linear association between changes in perceived proximity and perceived proximity a week earlier, coercive behaviour in the current lesson, and supportive behaviour in the current lesson; \text{u}_{0j} and \text{e}_{ij} represent residual error terms.

2. Across-lesson model for the Proximity dimension (Prox) with abbreviated variable names:

Prox_{ij} = \gamma_{00} + \gamma_{10}\text{Proximity previous week}_{ij} + \gamma_{20}\text{coercive}_{ij} + \gamma_{30}\text{supportive}_{ij} + \gamma_{40}\text{coercive previous week} + \gamma_{50}\text{supportive previous week} + u_{0j} + e_{ij}

The across-lesson model largely resembles the within-lesson model, but is extended by coercive behaviour a week earlier and supportive behaviour a week earlier. Analogous to the within-lesson model \gamma_{40}, and \gamma_{50} represent average linear association between changes in proximity and these two additional independent variables.

References

