Student emotions in class: The relative importance of teachers and their interpersonal relations with students

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1. Introduction

Emotions are an important student outcome but they also affect motivation for learning, self-regulation, lifelong learning skills and academic achievement (Mega, Ronconi, & De Beni, 2014; Pekrun, Goetz, Titz, & Perry, 2002). Studies consider the social environment a major source of emotions in everyday life (Baumeister & Leary, 1995; Keltner, Van Kleef, Chen, & Kraus, 2008) and in academic settings (Martin & Dowson, 2009; Pekrun & Perry, 2014; Pekrun, Elliot, & Maier, 2006). In classrooms, teachers are the focal point of many social exchanges, and they are the professionals whose task is to organize the (social) classroom environment. This study used two ways to gauge the importance of teachers and their interpersonal relations with students for student emotions in class.

First, in line with the conceptual and empirical work of Kenny and colleagues (Kenny, 1994; Kenny, Kashy, & Cook, 2006), we argue that in addition to the teacher and the student themselves, the specific relationship that evolves between them drives students’ emotional experiences. Thus, beyond the trait-like or stable influences of teacher and student characteristics, the specific adjustment between a teacher and a student may cause students to report, for example, more or less enjoyment or anxiety. We examined the relative importance of these so-called relationship effects for student emotions. To do so, we extended current modelling of classroom (social) environments (e.g., Becker, Goetz, Morger, & Ranellucci, 2014; Goetz, Lüdtke, Nett, Keller, & Lipnevich, 2013; Marsh, Martin, & Cheng, 2008) with cross-classified multilevel modelling (Fielding & Goldstein, 2006).

Second, because interpersonal processes and emotions are intertwined (Fischer & Van Kleef, 2010; Keltner et al., 2008), we applied interpersonal theory (Horowitz & Strack, 2010) and its adaptation to the educational context (Wubbels, Creton, & Hooymers, 1985; Wubbels et al., 2014). We estimated the extent to which students’ emotional variability can be explained by...
how students perceive their teachers’ interpersonal agency (i.e., power or social influence) and communion (i.e., affection or warmth). Teacher behaviours that support agency include generally taking the lead in class, talking with a relatively loud voice and an up-right posture while lecturing. In contrast, behaving in an uncertain way or exhibiting weak discipline in class reduce teacher interpersonal agency. Behaviour that support communion include being generally friendly and responsive to student needs, whereas punishing students or using sarcasm and making fun of students decrease teacher communion (Wubbels, Brekelmans, den Brok, & van Tartwijk, 2006).

Thus, based on a more fine-grained modelling approach (i.e., decomposition of variance), we aimed to gain a clearer understanding of the relative importance of teachers for student emotions. We aimed at explaining variability in students’ emotions through students’ interpersonal perceptions of their teachers.

### 1.1. Facets of the classroom social environment and student emotions

Multiple studies have reported the relative importance of facets of the classroom environment, such as students, teachers and classes, for teachers sampled. Ahmed et al. (2010; Ahmed, Wehr, Minaeert, & Koppen, 2010; Becker et al., 2014; den Brok, Levy, Brekelmans, & Wubbels, 2005; Frenzel, Pekrun, & Goetz, 2007; Goetz et al., 2013; Goetz, Frenzel, Luedtke, & Hall, 2011; Marsh et al., 2008). In line with the conceptual and empirical work of Kenny and colleagues (e.g., Kenny, 1994; Kenny et al., 2006), we argue that in addition to these frequently examined facets or levels of the classroom environment, additional facets should be considered to fully understand the teacher’s role in student emotions. Because people (teachers and students) develop an interaction history, behaviour and perceptions become increasingly interdependent and unique to the persons involved (Kenny et al., 2006), representing specific adjustment between interaction partners. Kenny showed that pairings of specific people, or so-called relationship effects, are potent sources of variability in constructs reflecting social and interpersonal processes. For example, a teacher may be able to elicit enjoyment from certain classes and particularly from certain students but not from all classes or from all students alike. Therefore, we expected that the role of the teacher in student emotions could be further clarified by studying these pairings or relationship effects. To date, the study of these effects and, in particular, teacher-class and teacher-student pairings is rather uncommon in educational research (cf. Fielding & Goldstein, 2006). Thinking along these lines, however, has become quite common in other social science research. For example, Cook (2001) showed that parental control is not only a function of parenting style or child temperament, but also of the specific adjustment of parent and child. Quick and Lakey’s study (2017) indicated that sensation seeking in social situations is to a large degree dependent on the specific adjustment of people, next to more stable personality traits.

### 1.1.1. Modelling the classroom social environment

When determining the relative importance of facets of the classroom environment for students’ emotional variability, most studies (e.g., Becker et al., 2014; den Brok et al., 2005; Frenzel et al., 2007) have applied a “classical” multilevel structure with students purely nested in classes and classes purely nested in teachers. Such a structure is depicted in the upper panel of Fig. 1. When just one class per teacher is sampled, the teacher and class levels are completely confounded or identical, and class contributions to student emotions cannot be distinguished from teacher contributions. In this situation, only two levels of the classroom social environment are modelled (the student and a combined teacher-class level). Confounded levels may lead to incorrect variance estimates (Fielding & Goldstein, 2006) and, consequently, to inaccurate estimations of the relative importance of teachers for students’ emotional experiences in class.

It can be argued that in many samples, more than just the teacher and class levels are confounded. The pairing of specific teachers with specific classes and the pairing of teachers with specific students also represent levels or facets of the classroom environment that may contribute to variability in student emotions.

The lower panel of Fig. 1 depicts a sample structure that includes these additional pairing levels. Teachers teach multiple classes, and students are taught by multiple teachers. As Fig. 1 shows, students attend different classes for different subjects, and the class level cannot be distinguished from the teacher-class level. Further, because each teacher-class pairing belongs to only one teacher, teacher-class pairings are purely nested within teachers. Thus, as depicted in the lower panel of Fig. 1, student perceptions (e.g., questionnaires or the teacher-student pairings) are nested within one higher-level unit. This is called a cross-classification (Fielding & Goldstein, 2006; Raudenbush & Bryk, 2002). The teacher-class level represents the average rating of all students from a specific class for a specific teacher, and the teacher-student level represents a rating of a student for a specific teacher. Likewise, the teacher level represents the average of all students who rated a teacher; the class level represents the average rating of all students from a specific class for all teachers the class rated, and the student level represents the average of all ratings of one student for several teachers.

Technically, a teacher-student pairing (or teacher-class pairing) resembles an interaction term (Raudenbush & Bryk, 2002). Thus, for students and teachers a cross-classification can be conceptualised as a table in which the rows are teachers and the columns are students. A random interaction effect (e.g., the teacher-student level) is “the deviation of the cell mean from that predicted by the grand mean and the two main effects” (Raudenbush & Bryk, 2002, p. 377). The main effects in our example are the student and the teacher, and the deviation of the cell mean represents the specific adjustment between a teacher and a student (reminiscent of a so-called relationship effect; Kenny, 1994; Kenny et al., 2006). In a situation where students have several subjects in the same classroom group (note that this situation is not depicted in Fig. 1), also the teacher-class level is cross-classified by teacher and class.

### 1.1.2. Variance decomposition of student emotions

The available studies on student emotions (sections 1.1 and 1.1.1) vary in terms of the applied measures and in terms of what levels were considered. Hence, broad ranges of variability at the different levels of the classroom environment have been found. For example, between 13% and 86% of the variance in enjoyment and between 8% and 71% of the variance in anxiety have been ascribed to the student level. Between teachers, student emotions vary to a lesser extent: approximately 10% for enjoyment and below 5% for anxiety (Ahmed et al., 2010; Becker et al., 2014; den Brok et al., 2005; Goetz et al., 2013; Marsh et al., 2008). There is also some evidence that classes contribute to students’ emotional variability. For example, Frenzel et al. (2007) showed that students in classes with more boys reported relatively less enjoyment and more anxiety. Overall, however, less than 5% of the variability in student emotions has been ascribed to the class level (den Brok et al., 2005; Marsh et al., 2008).

To obtain a clearer estimate of the relative importance of teachers for student emotions, the present investigation examined relationship effects involving the teacher. These effects highlight the adjustment of a teacher with a specific class or student and are
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