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Chapter 1

Two decades of research on teacher–student relationships in class

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Abstract

This paper reports on results of research from a 25-year program of studies investigating teacher–student relationships in secondary classrooms. The authors review the research that examines teaching from an interpersonal perspective using a communicative systems approach and propose a model to describe teacher–student relationships in terms of teacher behavior. The studies used the Questionnaire on Teacher Interaction (QTI) to collect data on students' and teachers' perceptions of the teacher–student relationship. The authors review studies showing that teacher–student relationships appropriate for high student outcomes are characterized by a rather high degree of teacher influence and proximity towards students. Studies on non-verbal behavior and the spatial position of the teacher in the class support the need for beginning teachers to portray the image of an experienced teacher whenever they address the class as a group. The paper concludes that the QTI is a useful research tool, but research on the QTI as a feedback instrument for teachers is insufficient to prove its usefulness.

Keywords: Teacher–student relationship; Student outcomes; Non-verbal behaviour

1. Introduction

This paper reports on results of research from a 25-year program of studies investigating teacher–student relationships in secondary classrooms (Wubbels, Brekelmans, den Brok, & Tartwijk, 2006). Starting in the Netherlands, this line of research now has developed to

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many other countries such as Australia, Canada, Israel, Slovenia, Turkey, Korea, Taiwan, Singapore and the US. In our research we analyze teaching from an interpersonal perspective; that means in terms of the relationship between teacher and students. Two elements are central to this perspective: the communicative systems approach and a model to describe teacher–student relationships in terms of teacher behavior. We will discuss these two elements before turning to measurement instruments developed to map teacher–student relationships. The remainder of the paper reviews studies on diverse issues covering teacher–student relations and student outcomes, non-verbal behavior and the spatial position of the teacher in the class, differences between teacher and student perceptions of the relationship, and finally interventions to improve relationships in class.

2. The communicative systems approach

Our conceptualization of teaching considers teaching as a form of communication. Following Watzlawick, Beavin, and Jackson (1967), we assume that every behavior that someone displays in the presence of someone else is communication. This choice is an element of the so-called 'systems approach', that assumes that one cannot *not communicate* when in the presence of someone else, whatever a person's intentions are, others will infer meaning from this behavior. For example, if teachers ignore students' questions because they do not hear them, students might make a variety of inferences (i.e., that the teacher is too busy, the teacher thinks the students are too dull to understand, or that the teacher considers the questions impertinent).

The systems approach focuses on the *pragmatic* aspects of communication; that is the effects on the other involved. According to the systems approach, every form of communication has a *content* and a relation aspect (Watzlawick et al., 1967). We distinguished two levels of communication. The lowest level consists of one single unit of behavior, the *message* level having a content and a relation aspect. For instance, the words, 'I want to help you to learn,' (content aspect) can be combined with either a smile or a frown (relation aspect). In the latter case, the relation may be perceived as: 'I think you are too stupid to learn' (Marshall & Weinstein, 1986). When the students and the teacher have interacted for some time their mutual perceptions are confirmed and reconfirmed, and thus form a stable basis for reactions. Typical relational patterns then evolve and these relations form the second level, the *pattern* level.

The pragmatic orientation of the communicative systems approach (i.e., what is the effect of communication on someone else) has evolved in our conceptualization of the interpersonal perspective as we focused on the *perceptions of students* of the behavior of their teachers. We have focused not so much on the stated intentions of the teacher, but on the students' perceptions evoked by what occurs in the classroom, what students think about their teacher, and what they learn and do. Of course, intentions are important variables; they may influence the teacher's way of teaching, and thus they, for example, may help explain differences in relationships of teachers with different classes, or with different students in one class.

3. The model for interpersonal teacher behavior

The perceptions of students about their relationships with their teacher have been mapped and studied in the research in this issue with the *Model for Interpersonal Teacher*

Behavior (*MITB*). This model is based on Timothy Leary's research on the interpersonal diagnosis of personality (1957) and its application to teaching (Wubbels, Créton, & Hooymayers, 1985). The Leary model has been investigated extensively in clinical psychology and psychotherapeutic settings and has proven effective in describing human interaction (Lonner, 1980). While not conclusive, there is evidence that the Leary model is cross-culturally generalizable (Brown, 1965; Dunkin & Biddle, 1974; Lonner, 1980; Segall, Dasen, Berry, & Poortinga, 1990). In the MITB the two dimensions are Influence (Dominance—Submission) and Proximity (Opposition—Cooperation). These dimensions can be represented in an orthogonal coordinate system (see Fig. 1). The two dimensions, represented as two axes, underlie eight types of teacher behavior: leading, helpful/friendly, understanding, student responsibility and freedom, uncertain, dissatisfied, admonishing and strict (see Fig. 2).

The sectors are labeled DC, CD, etc. according to their position in the coordinate system (much like the directions in a compass). For example, the two sectors 'leading' and 'helpful/friendly' are both characterized by Dominance and Cooperation. In the DC-sector, the Dominance aspect prevails over the Cooperation aspect covering teacher enthusiasm, motivating, and the like. The adjacent CD-sector includes more cooperative and less dominant perceptions; the teacher shows helpful, friendly, and considerate behavior. Fig. 2 provides an overview of typical teacher behaviors that relate to each of the eight sectors of the Model.

4. Measurement of perceptions of teacher–student relationships

For the measurement of students' perceptions of teacher–student relationships in terms of teacher behavior, different instruments are needed, for the message and for the pattern level.

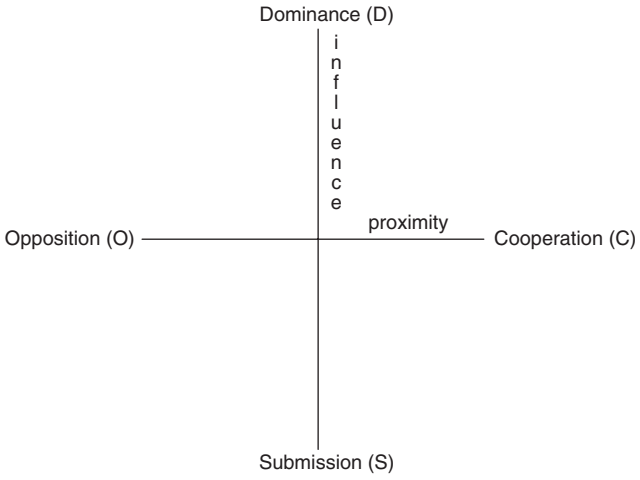


Fig. 1. Two-dimensional coordinate system of the model for interpersonal teacher behavior.

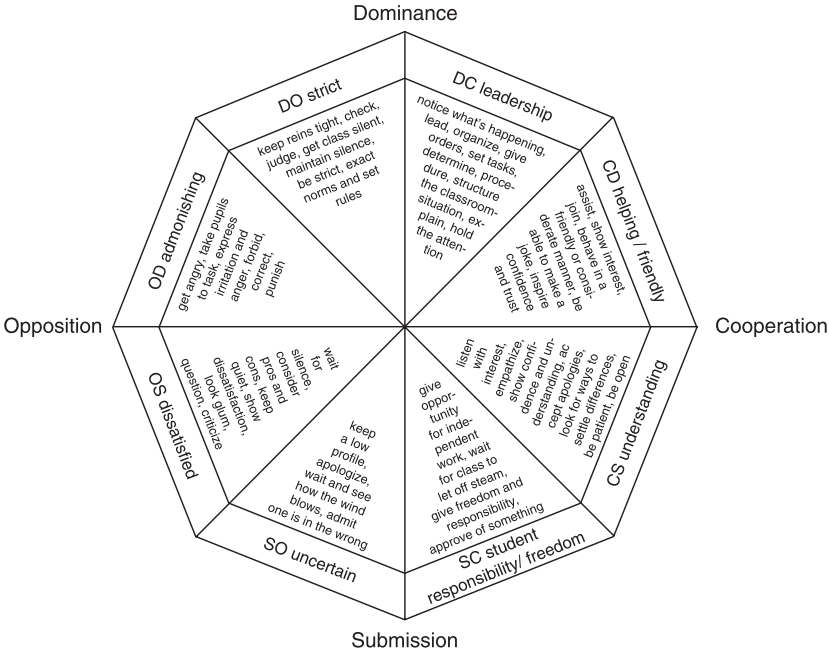


Fig. 2. Model for interpersonal teacher behavior.

Dominance (D)		**Submission (S)**
The teacher determines the students' activities.	5--4--3--2--1	The students can determine their own activities.
Cooperation (C)		**Opposition (O)**
The teacher shows approval of the students and their behavior.	5--4--3--2--1	The teacher shows disapproval of the students and their behavior.

Fig. 3. Rating scales for observation of students' perceptions at the message and interaction level.

4.1. Message level

At the message level, not much research on student perceptions has been carried out. Van Tartwijk (1993) and van Tartwijk, Brekelmans, Wubbels, Fisher, and Fraser (1998) report studies using an instrument to measure students' perceptions of interpersonal messages. These studies used two rating scales corresponding to the two dimensions of the Model (see Fig. 3).

Table 1
Number of items and typical item for each of the eight scales of the Dutch and US version of the QTI

		No. of items		Typical item
		Dutch	US	
DC	Leading	10	7	S/He is a good leader
CD	Helpful/friendly	10	8	S/He is someone we can depend on
CS	Understanding	10	8	If we have something to say s/he will listen
SC	Student responsibility/freedom	9	8	S/he gives us a lot of free time in class
SO	Uncertain	9	7	S/He seems uncertain
OS	Dissatisfied	11	9	S/He is suspicious
OD	Admonishing	9	8	S/He gets angry
DO	Strict	9	9	S/He is strict

4.2. Pattern level

The perceptions of teachers and students at the pattern level can be measured with the *Questionnaire on Teacher Interaction* (*QTI*). The QTI was designed according to the two-dimensional Leary model and the eight sectors to map teacher–student relationships, (Wubbels et al., 1985). It was originally developed in the Netherlands, and a 64-item American version was also constructed in 1988 (Wubbels & Levy, 1991). The Dutch items were formulated, based on large numbers of interviews with both teachers and students (Wubbels & Levy, 1993). The original Dutch version consists of 77 items to be rated on a five-point Likert scale ranging from 'Never/Not at all' to 'Always/Very'. The items are divided into eight scales corresponding with the eight behavior types. The instrument has been translated into the following languages: English, French, German, Hebrew, Russian, Slovenian, Swedish, Norwegian, Finnish, Spanish, Mandarin Chinese, Singapore Chinese and Indonesian.[1] In Table 1 typical items are provided for each of the eight sectors of the QTI.

Students can rate their current teacher on the QTI, and teachers can also record their perceptions about their own behavior (their self-perceptions). Teachers may also record their responses from the perspective of how they would like to be (their ideal perceptions). Each completed questionnaire yields a set of eight *scale scores*, the sum of all item scores rescaled to range between 0 and 1. When the QTI has been administered to students, scale scores of students from the same class can be aggregated to a class mean.

In some studies reviewed for this paper, teacher–student relationships were analyzed on the basis of *dimension scores* (i.e., the scale scores are converted linearly to dimension scores[2]). The closer sectors are to the Dominance/Submission dimension (strict, leading,

[1]The QTI was intended for use in Secondary Education and formed the basis of several new versions such as for Primary Education (e.g. Goh, & Fraser, 1996) and for Higher Education teachers (e.g. Soerjaningsih, Fraser & Aldridge, 2002), for supervisors of student teachers (Kremer-Hayon & Wubbels, 1993a), and one for teachers about school managers (the Questionnaire on Principal Interaction, e.g. Kremer-Hayon & Wubbels, 1993b; Fisher & Cresswell, 1998). The instrument also formed the starting point for adaptations that are being used in post-compulsory education (Hockley & Harkin, 2000).

[2]To this end the eight scores are represented as vectors in a two-dimensional space, each dividing a section of the model of interpersonal behavior in two and with a length corresponding to the height of the scale score. We

uncertain and student responsibility/freedom) the more they contribute to this dimension, and similarly helpful/friendly, understanding, dissatisfied and admonishing contribute most to the Cooperation/Opposition dimension. Graphic representations of the eight scale scores ('interpersonal profiles') also can be used to report on the teacher–student relationship (see Fig. 5 for examples).[3]

Several studies have been conducted on the reliability and validity of the QTI. These have included among others Dutch (e.g. Brekelmans, Wubbels, & Créton, 1990; den Brok, 2001; Wubbels et al., 1985), American (Wubbels & Levy, 1991) and Australian (Fisher, Fraser, & Wubbels, 1992; Fisher, Henderson, & Fraser, 1995). Recently, a cross-national validity study was completed comparing students' responses to the questionnaire in Singapore, Brunei, US, The Netherlands, Slovakia and Australia (den Brok et al., 2003). In all these studies, both reliability and validity were satisfactory. The agreement between the scores of students in a single class usually meets the general requirements for observer agreement. The internal consistencies (Cronbach's α) usually are above 0.90 (Brekelmans, et al., 1990). Internal consistencies for teacher self-perceptions and teacher ideals are usually a bit lower, but hardly ever below 0.65. The variance in students' ratings at the class level is much higher than for most other learning environments questionnaires indicating that the QTI discriminates well between classes. Although most of the variance in students' ratings is at the teacher level, there is an interaction between teacher level and the class level indicating that students perceive their teachers as varying in their relationships across classes (den Brok, 2001; Levy, den Brok, Wubbels, & Brekelmans, 2003). This effect is, however, not very large. From a generalizability study (Shavelson, Webb, & Burstein, 1986) on students' ratings, it was concluded (Brekelmans 1989) that the QTI should be administered to at least ten students in a class for the data to be reliable. The QTI does not need to be administered more than once per year, since interpersonal style remains relatively stable. At least two classes of students should complete the questionnaire for each teacher for a reliable measure of overall style.

With respect to validity, for example, factor analyses on class means and LISREL analyses (den Brok, 2001; den Brok, Levy, Wubbels, & Rodriguez, 2003; Wubbels & Levy, 1991) determined that the two-factor structure did indeed support the eight scales. For both students' ratings and teacher self- and ideal perceptions, scales appear to be ordered in a circumplex structure, meaning that two, independent factors are found, with a circular ordering of the scales (Wiggins, Philips, & Trapnell, 1989).

4.3. Interpersonal profiles

To describe research results for interpersonal profiles, we first turn to the profiles that have been found with the help of the *Model for Interpersonal Teacher Behavior* and the QTI. A profile is the particular combination of eight scale scores resulting from the

(*footnote continued*)
then compute the two coordinates of the resultant of these eight vectors. Dimension scores are computed as follows: Influence = (.92∗DC) + (.38∗CD)−(.38∗CS)−(.92∗SC)−(.92∗SO)−(.38∗OS) + (.38∗OD) + (.92∗DO); Proximity = (.38∗DC) + (.92∗CD) + (.92∗CS) + (.38∗SC)−(.38∗SO)−(.92∗OS)−(.92∗OD)−(.38∗DO).

[3]These graphic representations are achieved by shading in each sector of the model of interpersonal teacher behavior. The ratio of the length of the perpendicular bisector of the shaded part and the length of the perpendicular bisector of the total sector equals the ratio of the observed score and the maximum score for that sector.

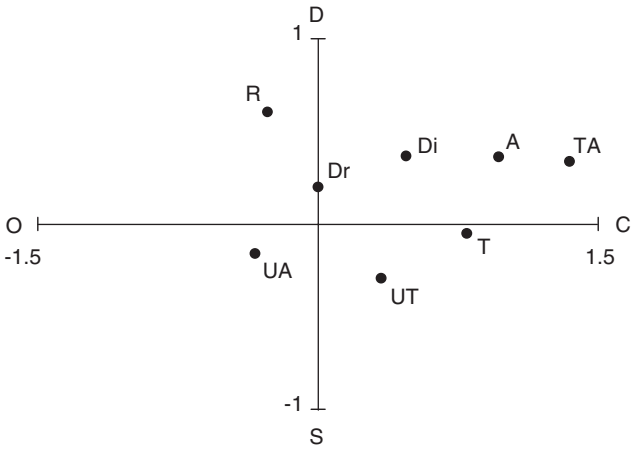


Fig. 4. Main points of the eight types of patterns of interpersonal relationships. A = Authoritative, Di = Directive, Dr = Drudging, T = Tolerant, R = Repressive, TA = Tolerant/Authoritative, UA = Uncertain/Aggressive, UT = Uncertain/Tolerant.

administration of the QTI. When describing patterns of teacher–student relationships in classrooms using cluster analyses of students' ratings, eight different types of profiles could be distinguished in Dutch and American classes (Brekelmans, 1989; Brekelmans, Levy, & Rodriguez, 1993).

These profiles have been named Directive, Authoritative, Tolerant/Authoritative, Tolerant, Uncertain/Tolerant, Uncertain/Aggressive, Drudging and Repressive. In Fig. 4, we summarize each of the eight types on the basis of the two dimension scores of the profile by means of a main point in the coordinate system. Although we characterize these profiles in terms of the teacher's style, it is important to remember that these are descriptions of a single teacher in one particular class.

The Authoritative, the Tolerant/Authoritative and the Tolerant type are patterns wherein students perceive their teachers as relatively high on the Proximity Dimension, with the Tolerant type lowest on the Influence Dimension. Less cooperative than the three previous types are the Directive, the Uncertain/Tolerant and the Drudging type, with the Uncertain/Tolerant type lowest on the Dominance Dimension. The least cooperative patterns of teacher–student relationships have been indicated as Repressive and Uncertain/Aggressive. In Repressive type classes, teachers are the most dominant of all eight types.

5. Teacher–student relationships and cognitive and affective outcomes

Classroom environment studies that have included the interpersonal perspective on teaching usually indicate a strong and positive relationship between perceptions of Influence and Proximity or their related subscales and cognitive and affective student outcomes.

5.1. Profiles

The Brekelmans (1989) study with physics teachers investigated the relationship between student outcomes and students' perceptions of teacher–student relationships. In terms of the interpersonal profiles results showed that, on average, the teacher with a Repressive profile has the highest achievement outcomes. Teachers with disorderly classrooms, the Uncertain/Tolerant, Uncertain/Aggressive, and Drudging profiles reflect relatively low student achievement, whereas Directive, Authoritative and Tolerant teachers have relatively high outcomes. The Authoritative and Directive teachers have the highest student attitude scores. Students of the Drudging, Uncertain/Aggressive and Repressive teachers have the worst attitudes toward physics.

5.2. Scales, dimensions and cognitive outcomes

In terms of dimensions, Brekelmans' (1989) study showed that students' perceptions of teacher Influence were related to cognitive outcomes. The higher a teacher was perceived on the Influence dimension, the higher the outcomes of students on a Physics test. In her study, teacher influence was the most important variable at the class level. Other studies found positive correlations or regression coefficients for the scale Leading and cognitive student outcomes (Goh & Fraser, 2000; Henderson, 1995).

Similar relationships have also been found for the Proximity dimension and Proximity related scales such as helpful/friendly and understanding, and to a lesser degree student responsibility/freedom (Goh & Fraser, 2000; Henderson, 1995; Evans, 1998). The more teachers were perceived as cooperative, the higher students' scores on cognitive tests. However, relationships between proximity and cognitive outcomes are not always straightforward. In some studies, it could only be shown that opposition, or dissatisfied and admonishing behavior were related to lower performance, but not that friendly and understanding behavior were related to higher performance (Rawnsley, 1997). In other studies, the relationship between proximity and cognitive outcomes is not linear, but curvilinear (i.e., lower perceptions of proximity go with low outcomes, but intermediate and higher values with higher performance until a certain ceiling of optimal proximity has been reached; den Brok, 2001; den Brok, Brekelmans, & Wubbels, 2004). Fig. 5 shows a

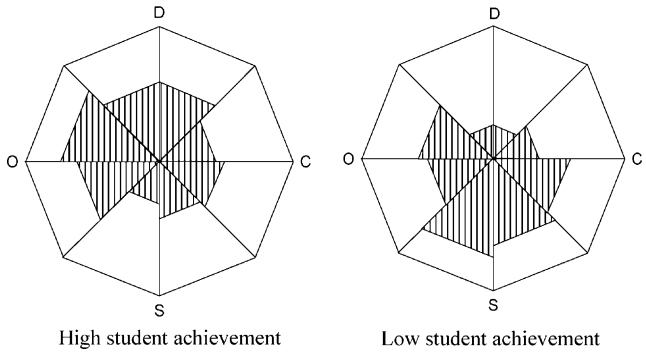


Fig. 5. Interpersonal profiles of teachers with relatively high and low student outcomes.

graphical profile of two Physics teachers (from the Brekelmans study), one with relatively high and one with relatively low student achievement.

5.3. Scales, dimensions and affective outcomes

Studies investigating associations between the teacher–student relationships and affective outcomes display a much more consistent pattern than studies investigating the relationship with cognitive outcomes. All studies find a positive relationship of both influence and proximity with affective outcome measures, usually measured in terms of subject-specific motivation. Generally, effects of proximity are somewhat stronger than effects of influence. In a study with Physics teachers and their students, Brekelmans (1989) found a clear relationship between proximity and student motivation for Physics. In Fig. 6 graphical profiles are presented for two Physics teachers, one with relatively low and one with relatively high student attitudes.

The higher the perception of proximity, the higher the motivation of the students is. With more specific measures of students' subject-specific motivation, other studies found positive relationships for helpful/friendly and understanding behavior with pleasure, confidence, effort and relevance of students (Derksen, 1994; Setz, Bergen, van Amelsvoort, & Lamberigts, 1993; van Amelsvoort, 1999). Strong and positive associations have also been demonstrated between several interpersonal scales, such as leading and helpful/friendly, and affective outcomes, while negative relationships have been found with admonishing, dissatisfied, and, in most cases, the strict scale (Goh & Fraser, 2000; Henderson, 1995; Rawnsley, 1997; Evans, 1998; Setz, et al., 1993; van Amelsvoort, 1999). The weakest associations have been found between teacher–student relationships and confidence (Derksen, 1994; Setz, et al., 1993; van Amelsvoort, 1999). Van Amelsvoort (1999) demonstrated that the effect of teacher–student relationships on students' subject-specific motivation is both direct as well as indirect via student motivation and regulation processes. In his study, he tested a causal model that linked students' perceptions on the QTI (dimension scores) to students' pleasure, confidence, and effort. He found two (statistically) significant causal paths leading from proximity to students' pleasure: one path linked the two variables directly, the other path linked proximity to student regulation of emotions, which in turn affected effort, with effort affecting pleasure.

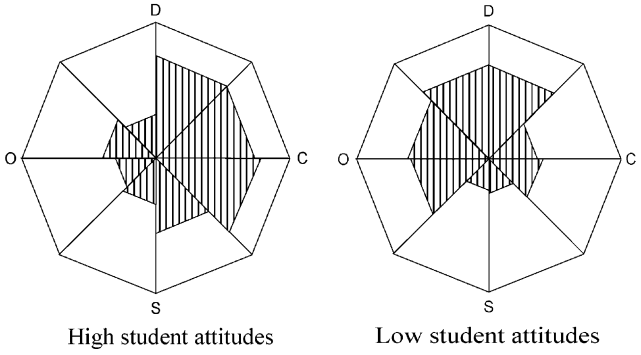


Fig. 6. Interpersonal profiles of teachers with relatively high and low student attitudes.

Teacher proximity as perceived by students may thus both directly affect students' state-of-mind, but also indirectly via learning activities performed by students.

In a recent study on English as Foreign Language (EFL) teachers, den Brok (2001) found that the teacher–student relationship was mainly related to affective student outcomes, whereas other environment characteristics were more relevant for cognitive outcomes. For all of the affective student outcome variables—pleasure, relevance, confidence and effort—a positive and strong effect was found for teacher proximity. For some of the affective variables—pleasure, relevance and effort—influence also had a positive effect.

5.4. Students' learning activities

Some of the most important mediating factors between students' perceptions of teacher student relationships and student outcomes are students' learning activities (Shuell, 1996; den Brok, Bergen, & Stahl, 2002). These learning activities are, in turn, very likely to originate from students' perceptions of their teachers' regulation of learning activities and teacher–student relationships. Brekelmans, Sleegers, and Fraser (2001) investigated relations between students' perceptions of teacher–student relationships and students' perceptions of teacher elicitation and regulation of learning activities, in particular the degree to which teachers activated students to perform and initiate learning activities by themselves (teaching for active learning). Somewhat surprisingly, increasing perceptions of teacher activation seemed to be helped by stronger perceptions of influence. A similar result was found in another study on EFL teachers (den Brok, 2001). This may be understood from the result reported by van Tartwijk et al. (1998) that teaching at central moments in lessons (e.g. when the teacher is lecturing in front of the class) is crucial for the kind of relationship that develops. From their study, to be discussed in more detail in the next section, it appeared that central moments in lessons ask for leadership, whereas the responsibility given to students comes more to the fore during group and independent work. The latter lesson segments contribute less to the general perceived teacher–student relationship. To give students appropriate freedom and responsibility during group and independent work, it appeared to be important for a teacher to be a strong leader in central lesson segments. The learning environment they create in central moments extends to individual work.

5.5. Conclusion

In general, we conclude from the studies reviewed that with respect to student outcomes appropriate teacher–student relationships are characterized by a rather high degree of teacher influence and proximity towards students. Interestingly and more reassuring, results of studies with students' and teachers' preferred teacher–student relationships (e.g. Créton & Wubbels, 1984) support the appropriateness of high amounts of influence and proximity.

6. Teacher position in class and non-verbal behavior

This section reports on studies on the position of the teacher in class and teacher non-verbal behavior. According to the systems approach, non-verbal behavior is particularly important for the perception of the relationship aspect of communication. Differences

between beginning and experienced teachers in non-verbal behavior in relation to the position in class may help explain problems of beginning teachers in creating positive teacher–student relationships.

6.1. *Position*

In a joint Dutch and Australian study, the relationship between the students' perceptions of their teacher's interpersonal style and judges' ratings of the interpersonal aspect of these teachers' messages was investigated (van Tartwijk, et al., 1998). Strong and strong to medium significant correlations were found between students' perceptions and judges' ratings during whole-class teaching, whereas no significant correlations were found between students' perceptions and judges' ratings during individual seatwork. These findings suggest that teachers who present themselves as teachers with a specific interpersonal style when they have a central position in the classroom (when they are "on stage"), will probably create a working climate that will last for the whole lesson and beyond. Whole-class teaching seems important for establishing the 'image' the students have of their teacher. Subsequently, this image will also guide the students' communication with their teacher during seatwork (cf. Weber & Mitchell, 1995).

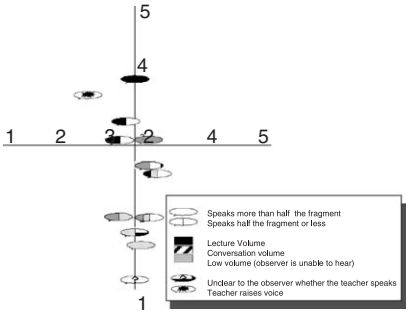
6.2. *Non-verbal behavior*

Van Tartwijk (1993) studied the contribution of non-verbal behaviors to the perception of the relationship at the message level using five channels of behavior (cf., Harper, Wiens, & Matarazzo, 1978): space (the teacher's use of classroom space); body (position and movement of the trunk, arms and head), face (various expressions), visual behavior (duration of the teacher looking at the students), and voice (the non-content aspects of speech). Raters were shown about one thousand 8-second video fragments selected from the videotaped lessons of 53 teachers at work in their classrooms. The raters estimated the students' perception of the teacher–student relationship in these fragments on rating scales corresponding to the Influence and Proximity dimensions (Fig. 3). Subsequently the non-verbal behavior in the fragments was scored with a specially designed observation instrument for non-verbal teacher behavior.

All channels could be used to explain variance in the Influence ratings, with voice being by far the most important. In Fig. 7 showing this relationship for voice non-verbal behaviors were plotted on a vertical axis according to the mean DS rating. The mean CO ratings of non-verbal behaviors were plotted on the horizontal axis. Only the Face and Voice channels were important for explaining variance in the CO ratings, with the facial expression having the strongest relationship (see Fig. 8).

Fig. 9 summarizes these dimensions across channels.[4] The figure to the left shows that behaviors such as looking at the students continuously and speaking loud and emphatically were often observed together. On average, this combination of behaviors was rated as highly dominant. In the figure to the right, we see that the behaviors such as

[4]This figure is based on the results of a Homals analysis, a technique for optimal scaling. In this analysis fragments are quantified in such a way that fragments that resemble each other get a similar value on a dimension, whereas fragments which do not resemble get a more different value. This analysis was used to identify the combinations of non-verbal behaviors from the various channels that occurred relatively often together.

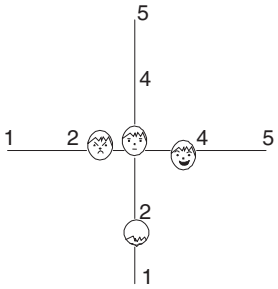


Voice

The relation between the Voice channel and the DS ratings shows that the longer teachers speak using a lecturing volume, the more they are perceived as dominant and the longer teachers speak in such a way that they cannot be heard by the observer, the more the teachers' behaviour is perceived as submissive.

For the CO ratings, whether teachers raise their Voice is the most important distinctive feature.

Fig. 7. Dimension scores and the use of voice.



Face

For the DS ratings, the visibility of the face for the students was the most important factor. Not surprising if compared with the importance of an upright head position for a rating as relatively dominant.

The most important facial expression for the CO ratings were laughing, neutral or angry facial expressions.

Fig. 8. Dimension scores and facial expression.

not being heard, being close to the students, and bending toward the students often go together and yield a low influence score.

6.3. Beginning teachers' problems

In Kounin's (1970) landmark study on discipline problems it was found that the management success of teachers, in terms of freedom from deviancy, correlated with

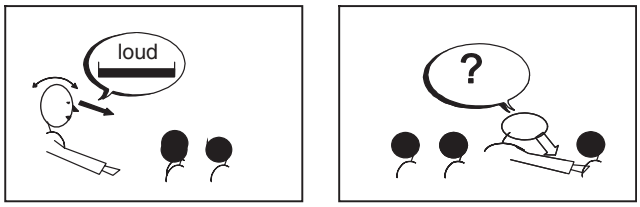


Fig. 9. Combinations of behavior with a relatively high (left) and low (right) influence perception. In the left position the teacher is relatively far from the student, with his or her head in upright position, scanning and talking long in a rather low voice. In the right position the teacher is close to the students with his or her head down so that his or her facial expression cannot be seen.

"with-it-ness" (the teacher demonstrates that he or she knows what is going on) and "overlapping" (the teacher's ability to attend to two issues simultaneously). The major relationship in the study by Van Tartwijk (1993) between non-verbal behaviors and interpersonal perception can be interpreted using Kounin's concepts: the more the teacher facilitates visual contact with the class, the more his or her behavior is perceived as dominant. When non-verbal behaviors such as visual contact with class and emphatic verbal presence (speaking continuously with a loud voice) are combined, the teacher's messages were rated most dominant.

However, there appeared a distinct difference between beginning and experienced teachers' non-verbal behavior that may be an important factor in the unsatisfying relationships of some beginning teachers with their students. Behaviors that facilitated visual contact (looking at students) and signaling with-it-ness and overlapping were demonstrated by experienced teachers almost twice as much as by student teachers. These behaviors are typical for experienced teachers during whole-class teaching. No differences were found between beginning and more experienced teachers for the non-verbal behaviors that are typical for a teacher interacting with individual students, such as speaking in a low volume, head and trunk bent forward, and a non-frontal body orientation toward the majority of students in the class (to the right of Fig. 10). This indicates that the non-verbal behaviors of beginning and experienced teachers differ, not so much when they interact with individual students during individual seatwork, but foremost during whole-class teaching.

The results above support the need for beginning teachers to portray the image of an experienced teacher whenever they address the class as a group. However, they probably should avoid whole class teaching for a longer period. Staying on-stage too long often increases the risk of not being able to sustain one's part.

7. Relations between teachers' and students' perceptions

Although a small number of studies reported non-significant differences between students' and teachers' perceptions (Ben-Chaim & Zoller, 2001; Wubbels & Levy, 1991) most studies show rather distinct differences in scale scores as well as on the dimensions Influence and Proximity (Brekelmans & Wubbels, 1991; den Brok, Levy, Rodriguez, & Wubbels, 2002; Fisher, Fraser, Wubbels, & Brekelmans, 1993; Levy, Wubbels, & Brekelmans, 1992; Wubbels & Brekelmans, 1997). On average, teachers reported higher ratings of their own leading, helpful/friendly and understanding behavior than did their

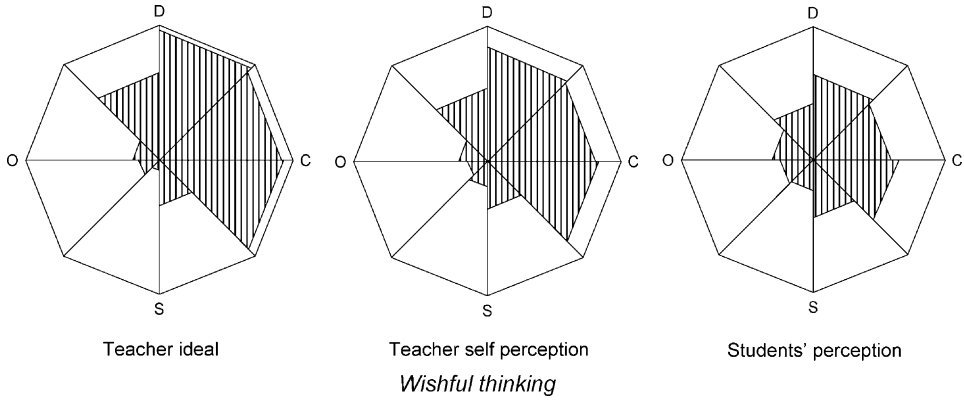


Fig. 10. Teacher ideal, self-report and students' perceptions of one teacher. The self-report occupies a position between students' perceptions and ideal.

students, whereas they reported lower perceptions of their own uncertain, dissatisfied and admonishing behavior on their students (e.g. den Brok, Levy, et al., 2002; Fisher & Rickards, 1999; Harkin & Turner, 1997; Rickards & Fisher, 2000; Wubbels, Brekelmans, & Hermans, 1987; Wubbels, Brekelmans, & Hooymayers, 1992; Yuen, 1999). Some studies also reported higher teacher than student perceptions of strict and lower teacher than student perceptions of student freedom and responsibility (Fisher & Rickards, 1999; Rickards & Fisher, 2000).

Behaviors for which teachers reported higher perceptions than their students—leading, helpful/friendly and understanding—have found to be positively related to student achievement and motivation, whereas behaviors for which lower teacher than student perceptions were reported were negatively associated with student achievement and motivation. This means that many teachers made a more favorable judgment about the learning environment than did their students.

In a study by Wubbels et al. (1992) on the differences between teacher self-, ideal, and students' perceptions, the mean of the eight differences on the scales of the QTI was used as a general difference measure for a profile. This mean difference between self- and students' perception as well as between ideal and self-perception was for 92 percent of the teachers far larger than the measurement errors. The differences are most distinct for the ideal and students' perceptions of the behavior. So according to the students' views, most teachers do not attain their ideal. From the difference between self-report and ideal, we see that also teachers think that they do not reach their ideal.

It appears that the more the teacher and his or her students disagree in their perceptions of the teacher–student relationship, the more students perceive the teacher as uncertain, dissatisfied and admonishing. These types of behavior have been shown to be counter-productive with respect to the promotion of cognitive and affective student outcomes. Studies indicate that if student perceptions of influence and proximity were higher, the difference between students' and teachers' perceptions was smaller (Brekelmans & Wubbels, 1991; Wubbels, et al., 1987, 1992).

Wubbels et al. (1992) showed that for about two third of the teachers sampled the teacher's perception of his or her own behavior occupies a position between the teacher's ideal about the teacher–student relationship and the students' perceptions. An example is

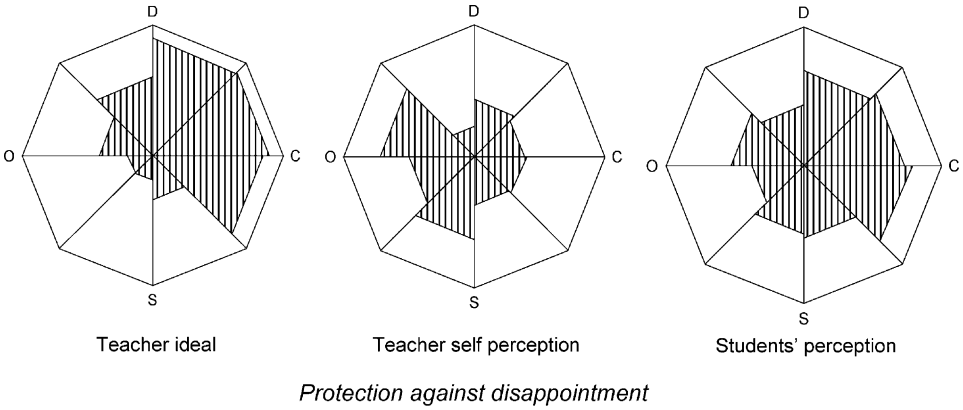


Fig. 11. Teacher ideal, self-report and students' perceptions of one teacher. The self-report is further away from the ideal than the students' perceptions.

shown in Fig. 10. These teachers see their behavior more like their ideal than their students. Thus, the difference between students' and the teacher's perceptions could be caused by the teacher's wishful thinking, that may function to reduce cognitive dissonance (Festinger, 1957).

For another group of teachers (about one third), the self-report is lower than the students' perceptions of the actual behavior, whereas the ideal is higher than both actual behavior and self-report. An example of this pattern is found in Fig. 11. The teachers in this group view their behavior more negatively (in the light of their ideal) than perceived by students. This arrangement of profiles can function to protect the teacher against potential disappointment resulting from confrontation with more negative students' perceptions. Evidence for the influence of such thought processes was found in teachers' explanations of their own ratings (Wubbels, Brekelmans, & Hooymayers, 1993).

8. Improving relationships

The QTI can be used as a feedback instrument for teachers. It can be useful to compare student and teacher self and ideal perceptions, e.g. in the light of the two possible different positions of these three perceptions to each other. Further, it is important for teachers when they interpret their profiles to be aware of their career stage because of the changes found in relationships during the teaching career (see Brekelmans, Wubbels, & van Tartwijk, 2006). For a single teacher administering the questionnaire several years in a row, may help to monitor and influence the development of relationships during the career. For professional development purposes, comparison of the students and teacher perceptions in different classes may be helpful: teachers might learn from their perceptions of good classes and for classes where relationships with student are not positive. For this purpose, we have good experiences with interviews of the teacher with their students based on the data gathered with the questionnaire. In these interviews one can try to find out what is going on in the minds of the students. The most important function of these interviews is however to engage in meta-communication: communication about how

teacher and students communicate with each other. According to Watzlawick et al. (1967) this kind of communication by itself helps to improve relationships.

Although we have some informal evidence the number of intervention studies that can corroborate the ideas presented above about the use of the QTI as a feedback instrument, unfortunately is scarce. In a program in Brunei, aimed at stimulating teachers' science teaching (by reducing their teacher-centered role and their inclination to rote learning) teachers' behavior was assessed with the QTI (Scott, Fisher, & den Brok, 2003). Analyses of variance showed that teachers in the program were perceived as more helpful/friendly than non-project teachers at the same schools. However, this study used only a post-treatment measurement (no pre-test).

As part of a Dutch professional development program focusing on teaching for active learning, teachers were also coached with respect to their interpersonal competence (Derksen, 1995). This 18-week program consisted of coaching on the job, university and school-based meetings and assessment by means of questionnaires, one of these being the QTI. Because interpersonal competence was regarded an important prerequisite to teaching for active learning, the first 3–5 weeks of the program teachers were mainly coached with respect to the teacher–student relationship. (For a few teachers, teacher–student relationships covered the whole program.) The QTI was administered three times: before and directly after the professional development program, as well as 4 months after the program (retention measurement). Analyses showed some changes in teacher–student relationships (Derksen, 1995). Directly after the training, teachers, on average, were perceived as more uncertain by their students. After 4 months, however, teachers were perceived as more friendly, as providing more student responsibility/freedom and as less dissatisfied, admonishing and strict. Moreover, uncertainty had decreased again and was on the level as just before the program.

9. Concluding remarks

The studies reviewed in this paper showed that the QTI is a useful research tool, but research on the QTI as a feedback instrument for teachers is insufficient to prove its usefulness. The QTI meets the standards of the American Evaluation Association (1999) for accuracy, reliability and validity. The use of the QTI is practical in the light of time and money involved in administering the questionnaire and calculating the results and the intrusiveness of the process.

Throughout this paper we have considered student and teacher perception data as having a value of its own: the teacher and his or her students have perceptions of their relationship and both are significant for research and for professional development. At the end of this paper, it might be useful to mention that in secondary education students' perceptions usually have a high quality (e.g. d'Apollonia & Abrami, 1996): they bare stronger resemblance to observer data than teacher's self-perceptions do (Marsh, 1982). Nevertheless we want to emphasize that for feedback or evaluation purposes the QTI needs to be used in a respectful way and embedded in appropriate, open and fair procedures and taking the differences in teachers careers, and differences across classes into account. The students' perceptions are only one of the possible inputs and certainly not the last or only word.

The research program is to be continued both in the Netherlands and in other parts of the world. Recent and ongoing studies on teacher–student relationships include the

teacher–student relationships in multicultural classrooms. Much needed and on its way are intervention evaluations, e.g., in teacher training programs for teacher–student relationships. For input in such programs, a recently started study on the development of relationships in the first 10 lessons in a class will be significant.

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