

ESL teaching and students' reading comprehension

Perry den Brok¹
Mieke Brekelmans¹
Theo Wubbels²
Gerard Westhoff¹

¹IVLOS Institute of Education, Utrecht University

²Institute of Educational Sciences, Utrecht University

Paper voor ICO conferentie 'Interventies ter bevordering van domeinspecifieke vaardigheden', 29
oktober 2003

Corresponding author:

Dr. P. J. den Brok

IVLOS Institute of Education

Utrecht University

P. O. Box 80127

3508 TC Utrecht, the Netherlands

tel. +31.30.2532231

fax. +31.30.2532741

email: p.j.denbrok@ivlos.uu.nl

Abstract

This paper investigates the effects of ESL (English as a Second Language) teaching on third-year secondary education students' reading comprehension. Teaching was studied in terms of an interpersonal and a learning activities perspective. The interpersonal perspective describes teaching in terms of the teacher-student relationship, which is structured in terms of two dimensions: influence (teacher control over communication) and proximity (teacher-student cooperation or opposition). The learning activities perspective describes teaching in terms of the cognitive, affective and regulative learning activities teachers elicit with their students and is structured in terms of three dimensions: person orientation, process orientation and control orientation.

Multilevel analyses were used to investigate questionnaire data from 27 ESL teachers (54 classes) and their students. Effects of teaching were corrected for characteristics of students, classes and teachers. Results indicated that teachers' elicitation of learning activities had an effect on students' level of reading comprehension. The effect of teachers' elicitation of learning activities partially overlapped with teaching in terms of the teacher-student interpersonal relationship. A learning process orientation in teaching was positively related to reading comprehension, while a control orientation was negatively related.

ESL teaching and students' reading comprehension

1. Rationale

Currently, most scholars acknowledge that learning 'is not a passive, knowledge consuming and externally directed process, but an active, constructive and self-directed process in which learners build up internal knowledge representations that are personal interpretations of their learning experiences' (Vermunt & Verloop, 1999: 258, following Bednar, Cunningham, Duffy & Perry, 1991). Learning is regarded as a knowledge-construction process and will be conceptualized here as 'the performance of mental activities by students that result in (relatively) stable changes in their mental or overt behaviour or behavioural dispositions' (den Brok, 2001; Shuell, 1993, 1996; Vermunt, 1995). The mental activities undertaken to achieve these changes in behaviours and dispositions have been labelled as *learning activities* (Shuell, 1996). While learning activities are always performed by students, teachers can engage in a wide range of behaviours to regulate students' behaviours while completing their learning activities (Vermunt & Verloop, 1999). However, whether students will start on and perform the activities teachers expect in part depends on the students' perceptions of the teaching displayed (e.g. den Brok, Bergen & Stahl, in press). We assume that students' perceptions of teacher behaviour do act as one set of important mediators between the actual regulating behaviours of teachers and the actual performance of learning activities by each student (den Brok, 2001; Shuell, 1996). An important variable that is assumed to determine the quality of teachers' elicitation of students' learning activities is the teacher-student interpersonal relationship (Brekelmans, Slegers & Fraser, 2000; den Brok, 2001). For instance, when teachers send vague nonverbal messages to students while giving instructions, are perceived as lacking sufficient authority or respect in the classroom, or provide unclear assignments or lesson structure; students are not likely to engage in or much less successfully complete the intended learning activities. The teacher-student interpersonal relationship therefore has a conditional effect on the elicitation of learning activities (e.g. den Brok, et al., in press) and, consequently, on the learning outcomes of students. With these current views of learning and teaching in mind this study examines (a) the effect of teachers' elicitation of students' learning activities on students' reading comprehension levels at the end of the third year in Dutch secondary education, and (b) the effect of teaching in terms of the teacher-student interpersonal relationship in combination with the elicitation of students' learning activities on students' reading comprehension levels. By unravelling these associations the study tries to contribute to various research domains, such as teaching of English (as a second language), reading (strategy) research, educational effectiveness research and learning environments research.

Since the last few decades researchers have expressed interest in the effects of teaching on students' reading comprehension. During the last 25 years, a multitude of research projects has been conducted investigating the effects of *reading strategy instruction* (as provided by the teacher) on

reading comprehension scores of students. According to Bimmel (2001), who reviewed many studies in this domain, successful reading strategy programmes include three elements: orientation (on the reading process and text), practice and application, and awareness raising. Also, they incorporate three important groups of reading strategies: using prior knowledge, using text elements with high information value and using structure-marking elements in the text (Westhoff, 1991). These findings suggest that if teachers regularly elicit learning activities such as orientation on performance of learning (reading) activities, applying, structuring and selecting, they will likely have high(er) achieving classes with respect to reading comprehension.

However, as Bimmel (2001) points out, research in reading comprehension instruction has mostly concentrated on children in primary education and weak or learning-disabled readers. Relatively little interest appears to exist in mainstream students in regular secondary education. Second, many of the studies that actually have been conducted in secondary education hardly investigated the effects of teaching on reading comprehension; they usually concentrated on students' knowledge (memorisation) of text content. Third, almost all studies investigated the effects of teaching by means of intervention research. Usually, studies investigated two groups of students or classes – one being a group that received an intervention (reading strategy instruction programme) - tested before and after treatment. Hardly any studies in the domain of reading strategy research have investigated the effects of “everyday teaching” on reading comprehension scores. Fourth, studies have been criticised for flaws with respect to internal and external validity (Ridgeway, Dunston, & Qian, 1993, in Bimmel, 2001).

Educational effectiveness researchers have also investigated the effects of English teachers on their students' reading comprehension scores (e.g. Fitz-Gibbon, 1992; Hill & Rowe, 1996; Luyten, 1994; Mandeville & Anderson, 1987; van der Werf, van der Tuin, & Driessen, 1995; Willms & Raudenbush, 1989). These studies show that direct teaching practices – emphasis on daily review, presentation of new content, guided and individual practice, and evaluation and feedback (e.g. de Jager, Reezigt, & Creemers, 2002) - may be beneficial for students' language test scores. An important advantage of effectiveness studies was their methodology: they employed multilevel analyses to establish the effects of teaching, meaning that they corrected the effect of teacher behaviour for several student, class and teacher characteristics as well as for the fact that students were not randomly sampled (e.g. Hox, 1995; Levy, den Brok, Wubbels, & Brekelmans, 2003). Also, these studies investigated the effects of “everyday teaching” on reading comprehension. However, in several studies English was the first, rather than the second language. Also, effectiveness research has been criticised for its narrow conceptualisation of teaching and its lack of using students' perceptions (Creemers & Scheerens, 1994; Lowyck, 1994; Reynolds & Packer, 1992; Scheerens, 1993). In most cases, researchers employed general frameworks to study teaching, rather than actually focussing on particular subject-specific strategies.

Both research on reading strategy instruction as well as educational effectiveness research has largely ignored affective strategies in the reading process, such as concentrating, motivating or dealing with feelings and emotions. Also, they hardly concentrated on the role of the relationship between teacher and students, but mainly focused on rather technical and organisational features of instruction, such as grouping procedures (van Damme, de Fraine, van Landeghem, Opdenakker, & Onghena, 2002).

The effects of teaching on students' reading comprehension have also been studied within the domain of *classroom environment research* (e.g. Fraser, 1998). Research in this domain has compensated for some of the weaknesses of (educational) effectiveness research by focusing on a diversity of teacher behaviours (see Fraser, 1998, for an overview) and by largely using student perceptions to study teaching. Within the domain of learning environments research, a particular line of research has evolved around order and classroom atmosphere, studying teaching in terms of the interpersonal relationship between teacher and students (Wubbels & Brekelmans, 1998; Wubbels & Levy, 1991; 1993). Within this specific field, researchers have demonstrated a consistent relationship between teacher dominance and cooperativeness and student outcomes (Brekelmans, Wubbels, & den Brok, 2002; den Brok, 2001; Evans, 1998; Goh, 1994; Henderson, 1995; Levy, Wubbels, & Brekelmans, 1992; Wubbels & Levy, 1993). However, learning environments research has also been criticised for the methodology used to study teaching: it hardly included (student, class and teacher) covariates or employed multilevel analysis (Fraser, 1998), resulting in overestimation of teaching effects.

The present study tries to address some of the limitations mentioned above by combining insights and methodology from all of the domains described before. First, we assume that teaching is *multidimensional*, and that multiple perspectives are needed to study teaching acts (Brekelmans, et al., 2000; den Brok, 2001). While teachers elicit and maintain certain learning activities with their students, they simultaneously communicate a relationship to their students (maintain order), deliver certain content, values and norms. In this study, we study teaching with two important dimensions in mind: a learning activities perspective (describing the learning activities teachers elicit with their students) and an interpersonal perspective (describing the relationship between teacher and students). Second, our learning activities perspective not only includes cognitive and regulative¹ (or metacognitive) activities, but also affective activities (e.g. Vermunt & Verloop, 1999). Third, teaching is studied by means of questionnaires that map "everyday teaching" over a longer period of time. Fourth, in establishing the effect of teaching on reading comprehension, multilevel analysis is being employed. Fifth, the effects of teaching are corrected for various student, class and teacher characteristics, as well as for prior motivation and prior reading comprehension of students.

¹ The term regulation thus has two conceptualisations (e.g. Vermunt & Verloop, 1999): as one type (e.g. metacognitive) of learning activity (the others being cognitive and affective) and in the more general sense of control over learning activities.

This paper starts with an outline of the two perspectives to study teaching. After presentation of the research questions, we describe our method of analysis and instrumentation. We report on the effects of teaching on students' reading comprehension for a sample of 27 ESL teachers (54 classes). Finally, the outcomes of the study are discussed, including its limitations, and implications for practice are described.

2. Teaching in terms of the elicitation of students' learning activities.

In the previous section we described teaching in terms of the elicitation of learning activities to be performed by students. Here, we will more elaborately describe this elicitation of learning activities by teachers in terms of three characteristics: control, explicitness and type of learning activity.

Control can be described as the degree to which students take over the elicitation of learning activities from the teacher. Our definition of learning implicates that it is always the student who performs learning activities. However, several methods exist to elicit learning activities: a method in which the teacher intends to control elicitation (taking over, or teacher-controlled elicitation), in which teacher and student co-operate in the elicitation (shared control of elicitation) and one in which the teacher leaves the elicitation of learning activities to the student (stimulating or student-controlled elicitation). The three methods resemble similar distinctions made in the literature (Brekelmans, et. al., 2000; den Brok, et al., in press; Simons & de Jong, 1992; Vermunt & Verloop, 1999). The first method, *taking over*, is a method in which the teacher takes over or models the elicitation of the learning activities from the students. This is usually done by means of explanation or demonstration. *Shared control* is a method in which teachers elicit learning activities in co-operation and deliberation with the students. Concrete forms are teacher-student learning conversations, discussions and guided individual or group assignments. *Stimulating* is a method in which teachers leave the elicitation of learning activities to students. In this method students elicit learning activities by themselves as much as possible, with teachers only as observers or coaches rather than directors of the learning process. Concrete forms of this method of intervention are individual and group work assignments, self-study assignments and project-oriented education.

Explicitness refers to the degree to which it is clear to the students which learning activities they have to perform and how. As such it relates to the concept of clarity (Cruikshank, & Kennedy, 1986), often defined as those behaviours of teachers that are aimed at student understanding of lesson content. Several aspects are important in explicitness of elicitation: (a) the type of learning activity to be elicited, (b) the time available for performance, (c) the materials or aids one is allowed to use, (d) the organisation and possibility to co-operate with others, (e) the context or environment in terms of limitations, possibilities and safety, (f) the desired quality of performance (accuracy, minimal outcome, etc.), and (g) the order of activities if more than one activity has to be undertaken (den Brok,

Brekelmans & Wubbels, 1997). Explicitness is determined by verbal remarks made by the teacher, but also by non-verbal cues, materials and unspoken agreements or rituals between teachers and students.

In the literature several typologies can be found that distinguish between different *types of learning activities* (e.g. Oxford, 1990; Purpura, 1997; Weinstein & Mayer, 1986; Wenden, 1991; among many others). The typology by Vermunt and Verloop (1999) is one of the most comprehensive typologies, as it is based on various other typologies and represents an attempt to reduce the overlap between types of learning activities as much as possible, but at the same time maintains sufficient variation in learning activities. Vermunt and Verloop distinguished between three types of learning activities: cognitive, affective and regulative (or metacognitive processing) activities (see Table 1). *Cognitive activities* are aimed at processing of information, *affective activities* are directed at processing and regulation of emotions that occur during learning, whereas *regulative activities* are aimed at planning, monitoring, adjustment and evaluation of cognitive and affective activities.

Table 1
Learning activities according to Vermunt & Verloop (1999).

Category	Learning activity	Description
Cognitive	Relating / structuring	Bringing parts of information to an organised whole, trying to impose structure and integrating with already acquired knowledge.
	Analysing	Breaking down larger wholes of information into the parts of which it consists.
	Concretising / applying	Trying to form concrete images from abstract information, applying knowledge to new situations and contexts.
	Memorizing / rehearsing	Imprinting specific information. Learn elements of information by heart.
	Processing critically	Thinking along with authors, teachers and students, drawing personal conclusions.
	Selecting	Distinguishing between main and minor points, reducing large amounts of information.
Affective	Motivating / expecting	Building up and maintaining willingness to learn, forming expectations about a task.
	Concentrating / exerting effort	Directing attention to task-relevant aspects and coping with action-distraction.
	Attributing / judging oneself	Ascribing learning outcomes to causal factors.
	Appraising	Attaching subjective values to learning tasks resulting in the willingness to invest energy.
	Dealing with emotions	Generating, maintaining and restoring positive feelings of well being, self-confidence and commitment and coping with negative emotions.
Regulative	Orienting / planning	Preparing a learning process.
	Monitoring / testing / diagnosing	Observing during task performance, whether the learning process proceeds according to plan.
	Adjusting	Introducing changes to the original learning plan.
	Evaluating / reflecting	Judging the extent to which the final learning outcomes are in agreement with the goals that were planned.

Typologies of learning activities are usually based upon or strongly relate to the phases and components of information processing models and schema theory. Research has confirmed that

learning activities relate to parts and elements of the information-processing model (Purpura, 1997). At the same time, research has shown that some of the distinctions made by Vermunt and Verloop (1999) are rather subtle and may not always be recognized in students' and/or teachers' perceptions (e.g. den Brok, 2001; Purpura, 1997; Vermetten, 1999). The typology used in the present study starts from the typology by Vermunt and Verloop (1999), but that has been simplified after interviews with students, teachers and researchers (see den Brok, 2001). This typology is presented in Table 2, and differs slightly from the one by Vermunt and Verloop (1999).

Table 2
Learning activities distinguished in the present study.

Cognitive	Affective	Regulative
Memorising	Concentrating	On-line regulation
Processing	Motivating	Evaluation
Using	Processing emotions	

Processing is a category that combines various learning activities: relating/structuring, analysing, critical processing and selecting. All of these activities involve some kind of processing of original information into new information, either by making smaller units of information or by taking various units of information together. For the affective learning activities, a similar category is used, namely that of *processing emotions*. Within this category, attributing and appraising are seen as different ways to process emotions. Finally, for the regulative activities a distinction is made between those activities that occur just before or during (e.g. *on-line*) the performance of a task (orienting/planning, monitoring/testing/diagnosing and adjusting) and those after a task (*evaluation*).

3. Teaching in terms of the teacher-student relationship.

In our conceptualisation of the teacher-student relationship (e.g. interpersonal perspective on teaching) some notions of the so-called systems approach to communication (Watzlawick, Beavin & Jackson, 1967) are important. In the systems approach to communication the focus is on the effect of communication on the persons involved (pragmatic aspect). This pragmatic orientation is characterised by means of focus on the perception of students of the behaviour of their teacher. To be able to describe the perceptions students have of the behaviour of their teacher, Wubbels, Créton and Hooymayers (1985, see Wubbels & Levy, 1993) developed a model. They applied a general model for interpersonal relationships designed by Leary (1957) to the context of education. The Leary model has been extensively investigated in clinical psychology and psychotherapeutic settings (Strack, 1996). It has proven to be a rather complete model to describe interpersonal relationships (see e.g. Foa, 1961; Lonner 1980). In the Leary model, two dimensions are important. Leary called them the Dominance-Submission axis and the Hostility-Affection axis.

Adapting the Leary Model to the context of education, Wubbels et al. (1985) used the two dimensions, which they called *Influence* (Dominance-Submission) and *Proximity* (Opposition-

Cooperation) to structure the perception of eight behaviour segments: leadership, helpful/friendly behaviour, understanding behaviour, giving students freedom, uncertain, dissatisfied, admonishing and strict behaviour. Figure 1 is a graphic representation of the model of Wubbels et al. (1985), the *Model for Interpersonal Teacher Behaviour*.

The model for interpersonal teacher behaviour (see Figure 1), as well as the Leary model, are special models because of their statistical properties and are theoretically linked to a particular branch of models called *circumplex models* (e.g. Blackburn & Renwick, 1996; Fabrigar, Visser, & Browne, 1997; Gaines, Panter, Lyde, Steers, Rusbult, Cox, & Wexler, 1997; Gurtman & Pincus, 2000). Circumplex models assume that the interpersonal sectors can be represented by two, independent dimensions (Influence and Proximity), are ordered with equal distances to each other on a circular structure and maintain equal distances to the middle of the circle.

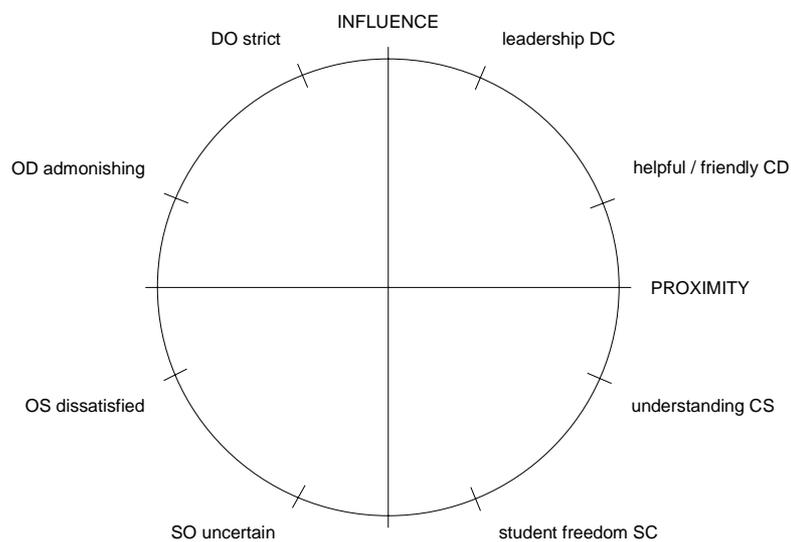


Figure 1.

The Model for Interpersonal Teacher Behaviour.

The sections are labelled DC, CD, etc. according to their position in the co-ordinate system. For example, the two sectors Leadership and Helpful/friendly are both characterised by Dominance and Cooperation. In the DC sector, the Dominance aspect prevails over the Cooperation aspect. A teacher displaying DC behaviour might be seen by students as enthusiastic, a good leader, and the like. The adjacent CD sector, however, includes behaviours of a more cooperative and less dominant type; the teacher might be seen as helpful, friendly, and considerate.

4. Research questions

In this study, teaching is analysed in terms of two perspectives – an interpersonal and a learning activities perspective – and related to students' reading comprehension scores. It is expected that the elicitation of learning activities has a direct effect on reading comprehension, while the teacher-student interpersonal relationship has a conditional effect on the elicitation of learning activities and student outcomes. Because many factors may influence the relationship between teaching (in terms of student perceptions) and student outcomes (Vermetten, Vermunt, & Lodewijks, 2002; Vermunt, 1998), effects of teaching are corrected for various student, teacher and class characteristics. This means that an answer is sought to following research questions:

1. *To what degree are students' reading comprehension scores in ESL affected by their teachers' elicitation of learning activities (after correction for student, class and teacher covariates)?*
2. *To what degree are students' reading comprehension scores in ESL affected by teaching, both in terms of the teacher-student interpersonal relationship as well as teaching in terms of teachers' elicitation of students' learning activities (after correction for student, class and teacher covariates)?*

5. Methodology

5.1 Sample

Data were collected from 963 students from 54 classes of 27 teachers (21 schools). Teachers and their classes participated on a voluntary basis. Most of the students were located in pre-university education (53.8 percent), followed by intermediate general education (27.7 percent) and lower general education (18.5 percent)². The sample was equally distributed in terms of student gender (47.1 percent male, 52.9 percent female). The majority of the students were born in the Netherlands (91.5 percent). Of the non-Dutch students, most were born in Morocco and Turkey. Most students reported their mothers and fathers to have lower vocational education and higher vocational education as the highest educational degree.

The sample contained more female (15 teachers, 56 percent) than male teachers (12 teachers, 44 percent). Most teachers had a first degree³ in teaching (14 teachers), two teachers had no degree. Average experience was 16 years and most teachers had full appointments (28 hours per week) at their schools. ESL was taught between 80 and 200 minutes per week, with an average of 150 minutes per week⁴. The majority of the schools were public schools (43 percent), followed by Catholic (26 percent) and Protestant (19 percent) schools.

² These types are referred to as MAVO, HAVO and VWO, which represent their abbreviations in Dutch language and represent different levels of student aptitude.

³ Teachers with a second degree are only allowed to teach in the first 3 years of secondary education, teachers with a first degree can teach all years, including the upper half of secondary education.

⁴ In general, students received 3 lessons of 50 minutes of ESL per week.

A comparison with the Dutch population of ESL teachers showed that the sample represented the population on most of the above mentioned teacher characteristics. However, in terms of type of education, our sample was slightly over-represented in terms of pre-university (e.g. VWO) students and under-represented in terms of lower general education (e.g. MAVO/VMBO) students.

5.2 Instrumentation

5.2.1 Teaching from a learning activities perspective

In order to measure teachers' role in eliciting students' learning activities the *Questionnaire on Lesson Activities (QLA)* was developed (e.g. den Brok, 2001). The questionnaire consisted of 71 statements about types of learning activities (cognitive, affective and regulative) that are elicited in class, methods of control (i.e. taking over, shared control and stimulation) and explicitness. For each of the statements students have to indicate the perceived frequency on a five-point Likert-type scale, running from 'almost never' to 'very often'. The items referring to the types of activities are not explicitly stated in terms of teaching activities, but assume teachers' roles (by means of taking over, shared control or stimulating more or less explicitly assigned) via formulation in terms of student, class or group activities, for example 'in our English class we often talk about the feelings we experience with certain topics'. Reliability (Cronbach's alpha), across-class consistency (lambda, Snijders & Bosker, 1999) and intra-class correlations were determined for the scales (see Table 3).

Table 3
QLA scales, reliability coefficients (Cronbach's alpha and lambda), and intra-class correlation coefficients (ICC).

Scale	Items	Typical item In our English class....	α	λ	ICC
Searching for information	5	...we think about where we can find more information about a subject.	.81	.78	.16
Processing of information	7	...we search for the main theme of a text.	.89	.89	.30
Memorisation	8	...we repeat the meaning of difficult words.	.84	.86	.26
Regulating emotions and feelings	5	...we talk about what we can do when we are nervous.	.91	.84	.22
Motivating	4	...we do pleasant things when we have finished a task.	.90	.89	.31
Concentrating	4	...we make sure it is quiet when we start with our work.	.86	.83	.21
On-line regulation	7	...we talk about strategies for solving a problem.	.92	.86	.26
Evaluation	5	...we check how many correct answers we have given.	.83	.84	.23
Explicitness	7	.... we know the sequence in which we have to do things.	.88	.83	.21
Taking over	2	...our teacher directly gives us the right answer if we ask a question.	.45	.82	.20
Shared control	5	.... our teacher activates us to think along with him/her.	.81	.82	.20
Stimulating	3	.... we work independently.	.87	.86	.26

As can be seen, apart from the scale 'taking over', all scales are reliable, consistent and have intra-class correlations of about .20. This means that items within each scale evoke consistent answers

within classes, that items within a scale group together, and that scales are able to discriminate between teachers and their classes. Confirmatory and exploratory (multilevel) factor analyses were conducted to replace QLA scales by a number of higher-order variables in order to reduce complexity in subsequent multilevel analyses (e.g. den Brok, 2001). From these (MPlus) analyses, it appeared that a model with three higher-order variables represented the scales best (Chi-squared=141.75 with $df=120$ and $p=.09$; CFI=.96; TLI=.90; RMSEA=.06). Factor loadings are displayed in table 4.

Table 4

Factor loadings (maximum likelihood) of the class-level factors for scales of the QLA.

	F1	F2	F3
Using information		.82	
Processing information	.86		
Memorising	.46	.40	
Regulating emotions and feelings		.92	
Motivating		.73	.56
Concentrating	.63		.49
Regulating on-line	.66	.60	
Evaluating	.82		
Explicitness			.86
Taking over	.56		.61
Shared control	.56	.56	.49
Stimulating			.83

Note: only factor loadings > .40 are displayed.

The three higher-order factors were labelled as learning process orientation, student orientation and control orientation. *Learning process orientation* is characterised by high amounts of processing information, concentrating, regulating on-line and evaluating. This factor thus has a strong emphasis on the elicitation of regulative activities, added with concentration and some emphasis on the elicitation of cognitive activities, especially processing of information. *Person orientation* emphasises using information, regulating emotions and feelings, motivating, and regulating on-line. All of these scales more than the other scales focus on awareness and use of personal feelings and experiences in the learning process. Using information seems somewhat strange in this factor at first, but because this activity includes concretising information, for example by searching for examples or relating it to personal experiences, there is an argument that even this activity represents some orientation towards the learner as a person. *Control orientation* is characterised by high amounts of explicitness and various degrees of control: taking over and stimulating. These scales represent the more technical aspects of elicitation, both in terms of explicitness as well as control.

5.2.2 Teaching from an interpersonal perspective

Data about the perceptions of students on the teacher-student relationship have been gathered by means of the *Questionnaire on Teacher Interaction (QTI)*. The QTI consists of 77 items, which are

answered on a five-point Likert-type scale. These items are divided into 8 scales, which conform to the 8 sectors of the model. Table 5 presents a typical item and the number of items for each scale.

Table 5
Number of items and a typical item for the QTI-scales

Scale	Items	Typical item
DC Leadership	10	S/he is a good leader
CD Helpful/friendly	10	S/he is someone we can depend on
CS Understanding	10	If we have something to say s/he will listen
SC Student freedom	9	S/he gives us a lot of free time in class
SO Uncertain	9	S/he seems uncertain
OS Dissatisfied	11	S/he is suspicious
OD Admonishing	9	S/he gets angry
DO Strict	9	S/he is strict

Several studies have been conducted on the reliability and validity of the QTI. They have included Dutch (e.g. Brekelmans, Wubbels & Créton, 1990; den Brok, 2001; Wubbels, et al., 1985), American (Wubbels & Levy, 1991) and Australian (Fisher, Fraser, & Wubbels, 1992) samples. Internal consistencies (Cronbach's α) of the scales at the class level are generally above .80. Factor analyses on class means and LISREL analyses (den Brok, 2001; den Brok, et al., 2003; Wubbels & Levy, 1991) determined that a two-dimensional structure of *influence* and *proximity* did indeed support the 8 scales. Brekelmans, Wubbels and Créton (1990) demonstrated that both dimensions explain 80 per cent of the variance on all the scales of the Dutch QTI. Similar results were obtained for the American version (Wubbels & Levy, 1991).

Each completed questionnaire yields a set of 8 scale scores. Scale scores of students from the same class are combined to a class mean. In the study presented in this chapter we analyse the teacher-student relationship on the basis of dimension scores. To summarize the scale scores by means of dimension scores we use linear combinations of the scale scores⁵. We designate the two linear combinations of the 8 scores as an Influence (DS)-score and a Proximity (CO)-score. The higher these scores are, the more dominance (DS) or cooperation (CO) is perceived in the behaviour of a teacher.

Because previous research on the reliability and validity of the QTI mainly included Science and Mathematics classes, it was decided to determine reliability and validity of the QTI also for the present (ESL) sample. The results of these analyses are presented in Table 6.

⁵To this end the eight scores are represented as vectors in a two dimensional space, each dividing a section of the model of interpersonal behaviour in two and with a length corresponding to the height of the scale score. We then compute the two coordinates of the resultant of these eight vectors.

Table 6
Reliability (Cronbach's alpha), consistency (lambda), and intra-class correlations (ICC) of the scales of the QTI

Scale	α	λ	ICC
DC	.94	.95	.46
CD	.97	.94	.55
CS	.98	.93	.47
SC	.91	.90	.41
SO	.93	.94	.41
OS	.92	.92	.40
OD	.94	.93	.42
DO	.92	.94	.41

Note. See Figure 1 for the meaning of the scales.

Reliability coefficients (both λ and α) are very high (around .90). The reliability of the scales Student Responsibility/Freedom (SC) and Strict (DO) are somewhat lower, while the reliability of the scale Understanding (CS) is somewhat higher. The percentages of variance at the teacher-class level (ICC) are between 40 and 55. These percentages are rather high compared to other instruments that measure perceptions of people or objects in clustered or interdependent situations (see also Wubbels & Levy, 1993).

Construct validity of the QTI was investigated by subjecting the scale scores to a multilevel factor analysis using Mplus. From these analyses, it appeared that an unequally-spaced circumplex - a model assuming the eight sectors to be ordered in a circle and to be represented by two, independent dimensions, but not to be equally distributed over the circle or equally distanced to the circle centre – fitted the data well (Chi-squared=72.15 with $df=13$ and $p<.01$; CFI=.99; TLI=.94; RMSEA=.06 and SRMR=.04). These outcomes suggest that two dimensions underlie students' perceptions and that the interpersonal sectors are ordered in a circular structure, though minor dislocations exist in the positions of sectors on the circle. Therefore, two dimension scores are used in establishing the effect of the teacher-student interpersonal relationship on reading comprehension.

5.2.3 Reading comprehension

Students' reading comprehension was measured by means of a multiple-choice test consisting of 20 items. The test consisted of two parts, one part containing a longer text of about 400 words and 10 items, another part dealing with 10 communicative items (small announcements, adds and other small texts). Figure 2 is an example of one communicative item presented to the students.

17. Wat krijgen alle buspassagiers van London Plus volgens de onderstaande advertentie?

- A Een aantal aanbiedingen op algemeentijd.
- B Een gratis dienstregeling.
- C Een informatieboekje over goedkope busritten.
- D Een kortingskaart voor de London Plus bus.

London Coaches
LONDON PLUS
Leisure Passport

Every passenger who rides LONDON PLUS will receive a unique and exclusive LEISURE PASSPORT.

This book contains vouchers entitling the holder to discounts and special offers from major London attractions, catering and entertainment venues. These may vary from time to time. LEISURE PASSPORTS are obtained on the bus.

For more information, please contact
IN & AROUND PUBLICATIONS LIMITED
8 Temple Square, Aylesbury, Bucks, HP20 2DN
Telephone (0296) 25423 or Fax (0296) 2666

The question above the text reads: “17. What will all bus passengers from London Plus receive according to the text of the add below? Answers: (a) discount vouchers for a number of tourist attractions; (b) a free time-table; (c) information on cheap bus trips; (d) a discounts card for London Plus bus.”

Figure 2

Example of a communicative item from the reading comprehension test.

In order to prevent memory effects – since the test was administered twice, once at the beginning and once at the end of the school year – and to prevent students from cheating, two versions of the test were constructed. Both tests were equally difficult (average p-values were .75 and .72 respectively) and reliable (α -values were .82 and .81 respectively).

5.2.4 other variables

Several respondent and background characteristics – emerging as relevant from, in particular, effectiveness studies (e.g. Luyten, 1994; Hill & Rowe, 1996; Mandeville & Anderson, 1987; Willms & Raudenbush, 1989; Fitz-Gibbon, 1992; van der Werf, et al., 1995) - were included in estimating the effects of teaching on reading comprehension. Student motivation was measured in terms of students’ subject-specific motivation (Clément, Dörnyei & Noels, 1994; Gardner & MacIntyre, 1993; Gardner & Lambert, 1972) with the Attitude Scale for English (Kuhlemeier, van den Berg & Teunisse, 1990). This questionnaire consisted of 32 items and measured four motivation aspects: pleasure ($\alpha = .87$),

relevance ($\alpha = .77$), confidence ($\alpha = .86$) and effort ($\alpha = .69$). In the multilevel analyses, the four motivation aspects were combined into one motivation variable.

The following student covariates were taken along:

- prior reading comprehension (see section 5.2.3) and motivation
- report card grades for English at the end of the second school year;
- intelligence: word knowledge (Kooreman & Luteijn, 1987; $\alpha=.73$);
- socio-economic status (SES): sum of the educational level of the father and educational level of the mother (measured in terms of 5 categories: no education, primary education, lower vocational education, higher vocational education, university); and
- gender.

Variables related to prior reading comprehension, subject-specific motivation and intelligence were decomposed into two variables: one variable representing the *class aggregate* of that variable (for example average prior reading comprehension of the class), and one variable representing the *student's difference from the class mean*. This was done to model the influence of both group influences as well as students unique, personal position in the classroom.

Apart from these (aggregated) student covariates several class and teacher covariates were added to the analyses:

- teacher gender;
- teacher experience;
- school type (lower general education, intermediate general education and pre-university education).

5.3 Analyses

To investigate the effects of teaching on reading comprehension multilevel regression analyses were performed with MLN for Windows (e.g. Rasbash, Browne, Goldstein & Yang, 2000). In the analyses, two levels were distinguished: a student level and a teacher-class combination level. Because of the small number of units at the teacher-class level, the RIGLS estimation method (Goldstein, 1995) was used to estimate regression coefficients⁶.

Several models were tested. First, an empty model (no variables entered) was formulated to estimate amounts of variance in reading comprehension at the student and teacher-class level. Second, two models were formulated to obtain answers with respect to the research questions: one model with learning activity perspective variables only and one model with both interpersonal and learning activity perspective variables. For teaching in terms of the teacher-student interpersonal relationship two variables were used in the analyses: influence and proximity. For teaching in terms of the learning

⁶ Standard estimation procedures in multilevel analyses programs, such as Iterative Generalized Least Squares (IGLS), often produce biased estimates of coefficients and variance distribution, especially when small numbers of units are available at the higher levels (Luyten & De Jong, 1998).

activities perspective three variables were included in the analyses: learning process orientation, person orientation and control orientation. Because variables were measured at the same time, coefficients represent associations between variables and should not be considered as strict causal mechanisms. In the models, we also included all student, class and teacher covariates. Apart from regression coefficients and in order to compare the effects of variables (since they were measured on different intervals) we also determined effect sizes⁷.

6. Results

6.1 Variance distribution in reading comprehension

Outcomes of the empty model (see Table 7) indicate that about half of the variance (46.7 percent) in students' reading comprehension scores is located at the teacher-class level. This finding suggests that considerable differences exist between classes in their level of reading comprehension at the end of the third year in secondary education. Though our analyses do not distinguish between classes and teachers, other studies indicate that most of the variance is located at the class level, rather than the teacher or school level (Luyten & de Jong, 1998; den Brok, 2001). As can be seen in Table 9, the amount of unexplained variance dramatically drops after covariates have been entered in the models, both at the student and at the class level. Table 9 provides estimates for the covariates only (no teaching variables are entered).

Table 7
Estimates for the empty model.

		Estimate
Variables		
Variance	Class	46.7 %
	Student	53.3 %
-2*log(like)		5003.36

6.2 Effects of teaching in terms of the learning activities perspective (research question 1)

Table 8 summarizes the outcomes on both research questions investigated in the present study. With respect to the first research question, it can be concluded that two of the three higher-order variables representing teaching in terms of the learning activities perspective exert a statistically significant effect on students' reading comprehension scores. Process orientation is positively related to reading comprehension. This means that regular elicitation of activities such as processing information, concentrating, on-line regulation of learning activities and evaluating by teachers is beneficial for students' reading comprehension test scores. Control orientation is negatively related to reading comprehension. A teacher focus on the more technical aspects of eliciting learning activities,

⁷ The effect size is reported in terms of the standardized regression coefficient, which can be obtained with the formula (Cohen, 1969): standardized coefficient=coefficient * (standard deviation independent variable/standard deviation dependent variable).

e.g. explicitness and (variety in) control, in itself may thus be counterproductive in enhancing reading comprehension. Person orientation is not statistically related to reading comprehension. A comparison of Tables 8 and 9 learns that teaching in terms of the learning activities perspective explains an extra 0.6 percent to the 63.3 percent of variance already explained by all covariates. However, at the class level the learning activities perspective explains 20 percent of the (unexplained) variance.

6.3 Effects of teaching in terms of the learning activities and interpersonal perspectives combined (research question 2)

When both interpersonal and learning activities perspective variables are joined in one analysis, the interpersonal variables show no statistically significant associations with reading comprehension. Thus, taking into account the effect of teaching in terms of the learning activities perspective, teaching in terms of the teacher-student interpersonal relationship hardly has any additive effect. This conclusion is also supported by the small increase in explained variance (0.3 percent) – which parallels 10 percent of the variance at the class level – and effect sizes that are roughly half the magnitude of those of the learning activities perspective.

Interestingly, the effect of process orientation reduces and becomes statistically non-significant when combined in one analysis with the interpersonal teaching variables. This means that teacher dominance and co-operation may overlap with process orientation in its effect on reading comprehension (also shown by a decrease in effect size). This provides some support for the claim that healthy teacher-student interpersonal relationships may be conditional to the quality and effect of teachers' elicitation of learning activities with their students.

Table 8
Estimates for the teaching models (with correction for covariates).

		Learning activity model		Interpersonal and learning activity model	
		Estimate (standard error)	Effect size	Estimate (standard error)	Effect size
Variables	Influence			-.14 (.24)	-.015 *
	Proximity			.25 (.16)	.092 *
	Process orientation	.45 (.22)	.162	.35 (.23)	.128 *
	Person orientation	-.02 (.04)	-.005 *	-.03 (.15)	-.006 *
	Control orientation	-.46 (.22)	-.200	-.45 (.20)	-.193
Variance	Explained	63.9 %		64.2 %	
	Unexplained at				
	- Class	2.4 %		2.2 %	
	- Student	33.7 %		33.6 %	
-2*log(like)		4444.45		4441.79	

Note: * = non-significant at .025 (two-sided).

6.4 Effects of student, class and teacher covariates

Of the covariates, prior reading comprehension, both in terms of individual as well as class performance, has the largest effect on reading comprehension at the end of the third year in secondary education. Its effect is three times larger than the effect of school type, four times larger than the effect

of report card grade for English at the end of the second year, and eight times larger than the effect of intelligence (word knowledge). All of the variables mentioned have a positive relationship to reading comprehension. Interestingly, subject-specific motivation, socio-economic status, teacher gender and experience, and student gender display non-significant relationships to reading comprehension.

Table 9
Estimates for the covariate model (without teaching variables).

		Estimate (standard error)	Effect size
Covariates	Student gender	N. S.	
	Report card grade	.39 (.09)	.101
	SES	N. S.	
	Prior comprehension-dev	.52 (.03)	.401
	Intelligence-dev	.10 (.04)	.049
	Motivation-dev	N. S.	
	MAVO-HAVO (1=HAVO)	1.30 (.41)	.153
	MAVO-VWO (1=VWO)	1.12 (.58)	.141
	Prior comprehension-class	.67 (.07)	.441
	Intelligence-class	N. S.	
	Motivation-class	N. S.	
	Teacher gender	N. S.	
	Experience	N. S.	
	Variance	Explained	63.3 %
Unexplained			
- Class		3.0 %	
	- Student	33.7 %	
-2*log(like)		4452.04	

Note : N.S.=non-significant; dev=individual deviation of a student from class; class=average class score.

7. Discussion

This study investigated the effects of teaching, conceptualised in terms of a learning activities and an interpersonal perspective, on ESL students' reading comprehension scores at the end of the third year of secondary education. After correction for prior achievement and student, teacher and class characteristics, a learning process orientation was positively related to reading comprehension. A learning process orientation is characterised by a focus on processing (e.g. relating, summarising, selecting, etc.) information, concentrating, evaluation and on-line regulation (monitoring and feedback). This finding is in line with elements of successful interventions in reading strategy instruction research (Bimmel, 2001; Westhoff, 1991) and the direct teaching approach found to be successful in educational effectiveness research (de Jager, et al., 2002). A person orientation was not related to reading comprehension, while a control orientation was negatively related to reading comprehension. The importance of a learning process orientation seems logical: transfer between these activities and strategies tested in reading comprehension seem most direct (e.g. Bimmel, 2001). Moreover, effectiveness research has shown that a direct teaching approach is particularly effective for rather traditional, cognitive oriented tests (Lowyck, 1994; Scheerens, 1993).

Interpersonal teaching variables, when combined in one model with learning activities variables, were not statistically related to reading comprehension. However, by adding this perspective to the model, the effect of process orientation was reduced and became statistically non-significant. It

thus seems that, in ESL, the effect of the teacher-student interpersonal relationship may partially overlap with the elicitation of some learning activities. As such, the effect of the interpersonal perspective is probably subtler. The effects of the interpersonal perspective on teaching are probably also mediated by students' initial motivation and reading comprehension level. This means that teachers may have different interpersonal relationships with their students depending on characteristics of their students (such as gender, intelligence, etc.), the composition of the class (in terms of student characteristics), class size and initial levels of achievement and motivation of the class. Evidence for such mediation processes can be found in research that has shown relationships between students' perceptions of the teacher-student interpersonal relationship and various teacher and student characteristics, such as gender, experience, motivation and achievement (e.g. den Brok, Levy, Rodriguez, & Wubbels, 2002; den Brok, Levy, Wubbels, & Rodriguez, 2003; Levy, et al., 2003).

The absence of a direct relationship between teaching in terms of the interpersonal relationship and cognitive student outcomes is contradictory to findings for other school subjects, such as Math, Biology, Physics and Chemistry (Brekelmans, et al., 2002; Evans, 1998; Goh, 1994; Henderson, 1995; Levy, et al., 1992; Wubbels & Levy, 1993). Of course, the nature of the school subject may help to explain these findings. It seems likely that the effects of interpersonal behaviour (or teacher behaviour in general) are smaller for ESL, because after school (Dutch) students are exposed to English (reading and listening) to a large degree via television, radio, the Internet, newspapers and other sources. Despite the limited direct influence of the interpersonal perspective on teaching, it may still be very useful for ESL teachers (and researchers) because of its conditional nature for teachers' process orientation. For example, in order to make sure that students will process information, or evaluate the effects of their learning activities, teachers have to make sure that students' perceive them as co-operative and dominant. If they are not co-operative enough, chances are that students perceive the learning environment as unsafe, which makes it less likely for them to engage in (difficult) activities. If they are not dominant enough, students may take this as an opportunity to pursue their own goals rather than those of the teacher. Therefore, having knowledge and information on the interpersonal relationship may be helpful in gauging the effect of teachers' elicitation by both teachers themselves as well as researchers.

Unfortunately, the study suffered from some limitations. First, the sample was not representative to the population of ESL students in the Netherlands in terms of school type (our sample consisted of mainly pre-university students). This may have led to lower amounts of variance than actually present in the population. Since pre-university students are also relatively intelligent and independent, it may also have downplayed the role of teaching. Second, the sample was relatively small. As a consequence, we were only able to distinguish between two levels in the multilevel analyses. Results on larger samples may help in establishing the stability of our findings, and in distinguishing between variance at various levels, such as the class, teacher and school level.

The instruments and findings of this study may be helpful for teachers and trainers in a number of ways. First, student perceptions may be valuable for self-evaluation and professional development, especially when they are compared with self-perceptions. They may provide teachers with an insight in how accurate their own perceptions are, how they are different and which processes are causing these perceptual differences. From there, teachers can decide how to overcome these differences, which changes in attitude or behaviour may be necessary. Also, if student perceptions are mapped over time or together with data from colleagues, they may provide teachers with insight in their own professional development and teaching career (Brekelmans, et al., 2002). Second, attention for the interpersonal relationship with students during reading (comprehension) activities is important, given its conditional nature on the learning processes involved (and the elicitation of these processes). Third, some of the (qualitative) distinctions made as well as concepts used may be helpful in providing (student) teachers with tools and language to discuss their own behaviour and its effect on learning.

References

- Bednar, A. K., Cunningham, D., Duffy, T. M., & Perry, J. D. (1991). Theory into practice: how do we link. In G. J. Anglin (Ed.), *Instructional technology: past, present and future* (pp.88-101). Englewood, CO: Libraries Unlimited.
- Bimmel, P. (2001). Effects of reading strategy instruction in secondary education: a review of intervention studies. *Educational Studies in Language and Literature, 1*, 273-298.
- Blackburn, R., & Renwick, S. J. (1996). Rating scales for measuring the interpersonal circle in forensic psychiatric patients. *Psychological Assessment, 8* (1), 76-84.
- Brekelmans, M., Sleegers, P., & Fraser, B. J. (2000). Teaching for active learning. In P. R. J. Simons, J. L. van der Linden, & T. Duffy (eds.), *New learning* (pp.227-242). Dordrecht: Kluwer Academic Publishers.
- Brekelmans, M., Wubbels, Th. and Créton, H.A. (1990) A study of student perceptions of physics teacher behavior, *Journal of Research in Science Teaching, 27*, 335-350.
- Brekelmans, M., Wubbels, Th., & Brok, P. den (2002). Teacher experience and the teacher-student relationship in the classroom environment. In S. C. Goh & M. S. Khine (Eds.), *Studies in educational learning environments: an international perspective* (pp.73-100). Singapore: New World Scientific.
- Brok, P. den (2001). *Teaching and student outcomes*. Utrecht: W. C. C.
- Brok, P. den, Bergen, T., & Stahl, R. J. (in press). Students' perceptions of teacher control behaviours. Manuscript accepted for publication in *Learning and Instruction*.
- Brok, P. den, Levy, J., Rodriguez, R., & Wubbels, T. (2002). Perceptions of Asian-American and Hispanic-American teachers and their students on interpersonal communication style. *Teaching and Teacher Education, 18*, 447-467.

- Brok, P. den, Levy, J., Wubbels, T., & Rodriguez, M. (2003). Cultural influences on students' perceptions of videotaped lessons. *International Journal of Intercultural Relations*, 27, 355-374.
- Brok, P. den, Wubbels, Th., & Brekelmans, M. (1997, august). *Studying teacher behaviour from multiple viewpoints*. Paper presented at the conference of the European Association of Research on Learning and Instruction, Athens, Greece.
- Clement, R., Dornyei, Z., & Noels, K. A. (1994). Motivation, self-confidence, and group cohesion in the foreign language classroom. *Language Learning*, 44, 417-448.
- Cohen, J. (1969). *Statistical power analysis for the behavioural sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Creemers, B. P. M., & Scheerens, J. (1994). Developments in the educational effectiveness research programme. *International Journal of Educational Research*, 21, 125-140.
- Cruickshank, D. R., & Kennedy, J. J. (1986). Teacher clarity. *Teaching and Teacher Education*, 2, 1, 43-67.
- Damme, J. van, Fraine, B. de, Landeghem, G. van, Opdenakker, M. C., & Onghena, P. (2002). A new study on educational effectiveness in Secondary schools in Flanders: an introduction. *School Effectiveness and School Improvement*, 13, (4), 383-398.
- Evans, H.M. (1998). *A study of students' cultural background and teacher-student interpersonal behavior in secondary Science classrooms in Australia*. Unpublished doctoral dissertation. Perth: Curtin University, Science and Mathematics Education Centre.
- Fabrigar, L. R., Visser, P. S., & Browne, M. W. (1997). Conceptual and methodological issues in testing the circumplex structure of data in personality and social psychology. *Personality and Social Psychology Review*, 1, 184-203.
- Fisher, D.L., Fraser, B.J. and Wubbels, Th. (1992) *Teacher communication style and school environment*, Paper presented at the 1992 ECER conference, Enschede.
- Fitz-Gibbon, C. T. (1992). School effects at A level: genesis of an information system. In D. Reynolds & P. Cuttance (Eds.), *School effectiveness: research, policy and practice*. London: Cassell.
- Foa, U.G. (1961). Convergence in the analysis of the structure of interpersonal behavior. *Psychological Review*, 68, 341-353.
- Fraser, B. J. (1998). Science learning environments: assessment, effects and determinants. In B.J. Fraser & K. G. Tobin (Eds.), *International handbook of science education (part one)*. London: Kluwer Academic Publishers, 527-564.
- Gaines, S. O., Panter, A. T., Lyde, M. D., Steers, W. N., Rusbult, C. E., Cox, C. L., & Wexler, M. O. (1997). Evaluating the circumplexity of interpersonal traits and the manifestation of interpersonal traits in interpersonal trust. *Journal of Personality and Social Psychology*, 73, 610-623.

- Gardner, R. C., & Macintyre, P. D. (1993). On the measurement of affective variables in second language learning. *Language Learning*, 43, 157-194.
- Gardner, R. C., & Lambert, W. E. (1972). *Attitudes and motivation in second language learning*. Rowley, MA: Newbury House.
- Goh, S. C. (1994). *Interpersonal teacher behavior, classroom climate and student outcomes in primary Mathematics classes in Singapore*. Unpublished doctoral dissertation. Perth: Curtin University of Technology, Science and Mathematics Education Centre.
- Goldstein, H. (1995). *Multilevel statistical models*. London: Edward Arnold.
- Gurtman, M. B., & Pincus, A. L. (2000). Interpersonal adjective scales: confirmation of circumplex structure from multiple perspectives. *Personality and Social Psychology Bulletin*, 26, 374-384.
- Henderson, D.G. (1995). *A study of the classroom and laboratory environments and student attitude and achievement in senior secondary Biology classes*. Unpublished doctoral dissertation. Perth: Curtin University, Science and Mathematics Education Centre.
- Hill, P. W., & Rowe, K. J. (1996). Multilevel modelling in school effectiveness research. *School Effectiveness and School Improvement*, 7, 1-34.
- Hox, J. J. (1995). *Applied multilevel analysis*. Amsterdam: TT Publicaties.
- Jager, B. de, Reezigt, G. J., & Creemers, B. P. M. (2002). The effect of teacher training on new instructional behaviour in reading comprehension. *Teaching and Teacher Education*, 18, 831-842.
- Kooreman, A., & Luteijn, F. (1987). *Guidelines for using the Groninger Intelligence Test, written, shortened form*. [in Dutch] Lisse: Swets & Zeitlinger.
- Kuhlemeier, H., Van den Bergh, H., & Teunisse, F. (1990). Internal structure and construct validity of the Attitude Scales towards Mathematics and English [In Dutch]. *Tijdschrift voor Onderwijsresearch*, 15, 110-122.
- Leary, T. (1957). *An interpersonal diagnosis of personality*. New York: Ronald Press Company.
- Levy, J., Brok, P. den, Wubbels, t., & Brekelmans, M. (2003). Students' perceptions of interpersonal aspects of the learning environment. *Learning Environments Research*, 6 (1), 5-36.
- Levy, J., Wubbels, Th., & Brekelmans, M. (1992). Student and teacher characteristics and perceptions of teacher communication style. *Journal of Classroom Interaction*, 27, 23-29.
- Lonner, W.J. (1980). The search for psychological universals. In H.C. Triandis & W.W. Lambert (Eds.), *Handbook of cross cultural psychology* (vol.1) (pp. 143-204). Boston: Allyn and Bacon.
- Lowyck, J. (1994). Teaching effectiveness: an overview of studies. *Tijdschrift voor Onderwijsresearch*, 19, 17-25.
- Luyten, H. (1994). Stability of school effects in Dutch secondary education: the impact of variance across subjects and years. *International Journal of Educational Research*, 21, 197-216.

- Luyten, H., & De Jong, R. (1998). Parallel classes: Differences and similarities, teacher effects and school effects in secondary schools. *School Effectiveness and School Improvement*, 9, 437–473.
- Mandeville, G. K., & Anderson, L. W. (1987). The stability of school effectiveness indices across grade levels and subject area. *Journal of Educational Measurement*, 24, 203-216.
- Oxford, R. L. (1990). *Language learning strategies: what every teacher should know*. New York: Harper Collins Publishers Inc.
- Purpura, D. (1997). An analysis of the relationship between test takers' cognitive and metacognitive strategy use and second language test performance. *Language Learning*, 47, 289-325.
- Rasbash, J., Browne, W., Goldstein, H., Yang, M., et al. (2000). *A user's guide to MLwiN* (Second Edition). London, Institute of Education.
- Reynolds, D., & Packer, A. (1992). School effectiveness and school improvement in the 1990s. In D. Reynolds & P. Cuttance (Eds.), *School effectiveness: research, policy and practice* (pp.171-187). London: Cassell.
- Ridgeway, V. G., Dunston, P. J., & Qian, G. (1993). A methodological analysis of teaching and learning strategy research at the secondary school level. *Reading Research Quarterly*, 28 (4), 334-349.
- Scheerens, J. (1993). Basic school effectiveness research: items for a research agenda. *School Effectiveness and School Improvement*, 4, 17-36.
- Shuell, T. J. (1996). Teaching and learning in a classroom context. In D. C. Berliner, & R. C. Calfee (Eds.), *Handbook of Educational Psychology* (pp. 726-764). New York: Macmillan.
- Shuell, T. J. (1993). Toward an intergrated theory of teaching and learning. *Educational Psychologist*, 28, 291-311.
- Simons, P. R. J., & de Jong, F. P. C. M. (1992). Self-regulation and computer-aided instruction. *Applied Psychology: an International Review*, 41, 333-346.
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: an introduction to basic and advanced multilevel modelling*. London: Sage Publications.
- Strack, S. (1996). Special series: Interpersonal theory and the interpersonal circumplex: Timothy Leary's Legacy. *Journal of Personality Assessment*, 66, 211-307.
- Vermetten, Y. J. (1999). *Consistency and variability of learning strategies in different university courses*. Unpublished doctoral dissertation. Tilburg: Tilburg University.
- Vermetten, Y. J., Vermunt, J. D., & Lodewijks, H. G. (2002). Powerful learning environments? How university students differ in their response to instructional measures. *Learning and Instruction*, 12, 263-284.
- Vermunt, J. D. (1998). The regulation of constructive learning processes. *British Journal of Educational Psychology*, 68, 149-171.
- Vermunt, J. D. H. M. (1995). Process-oriented instruction in learning and thinking strategies. *European Journal of Psychology of Education*, 10, 325-349.

- Vermunt, J. D., & Verloop, N. (1999). Congruence and friction between learning and teaching. *Learning and Instruction, 9*, 257-280.
- Watzlawick, P., Beavin, J.H. and Jackson, D. (1967). *The pragmatics of human communication*. New York, Norton.
- Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.) (pp. 315-327). New York: Macmillan.
- Wenden, A. (1991). *Learner strategies for learner autonomy*. London: Prentice Hall.
- Werf, M. P. C. van der, Tuin, A. C. van der, & Driessen, G. (1995). *The functioning of secondary education, characteristics of schools and teachers in the third grade*. [in Dutch] Groningen: GION.
- Westhoff, G. (1991). Increasing the effectiveness of foreign language reading instruction (part 1). *ADFL-Bulletin, 22* (2), 29-36.
- Willms, J. D., & Raudenbush, S. W. (1989). A longitudinal hierarchical linear model for estimating school effects and their stability. *Journal of Educational Measurement, 26*, 209-231.
- Wubbels, T., & Brekelmans, M. (1998). The teacher factor in the social climate of the classroom. In B.J. Fraser & K. G. Tobin (Eds.). *International handbook of Science education, part one* (pp.565-580). London: Kluwer Academic Publishers.
- Wubbels, Th., Créton, H.A. & Hooymayers, H.P. (1985). *Discipline problems of beginning teachers, interactional teacher behavior mapped out*. Paper presented at the AERA Annual meeting, Chicago. Abstracted in *Resources in Education, 20*, 12, p. 153. ERIC document ED260040.
- Wubbels, Th., & Levy, J. (1993). *Do you know what you look like?* London: Falmer Press.
- Wubbels, T., & Levy, J. (1991). A comparison of interpersonal behavior of Dutch and American teachers. *International Journal of Intercultural Relations, 15*, 1-18.