How Teacher, Student, and Observer Perceptions of Teacher Behavior Influence

Learning Engagement

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Abstract

Perceptions of teachers, students, and external observers of interpersonal teacher behavior give insight into what occurs in the classroom. Previous research shows that these perceptions of interpersonal teacher behavior do not always match with each other. This study measures and compares relationships between teachers' self-, student-, and observers' perceptions of interpersonal teacher behavior. In this study, 80 teachers and 1762 students filled in questionnaires about interpersonal teacher behavior. Observers analyzed 80 videos of those teachers and students in the secondary school classroom context. This research uses the Interpersonal Circle for Teachers (IPC-T, Wubbels et al., 2012) to measure different types of interpersonal teacher behavior. A correlational research design examines which parts of the IPC-T of teachers' self-perceptions, students' perceptions, and observers' perceptions relate to each other. Furthermore, this study examines which parts of the IPC-T predict student learning engagement. This prediction of student learning engagement is also examined between teacher, student, and observers' perceptions of interpersonal teacher behavior. Results of this study show that student perceptions correlate strong with observer perceptions and weak with teacher perceptions. Teachers and observers do not perceive interpersonal teacher behavior the same way. Furthermore, learning engagement is only predicted by student perceptions of helpful and uncertain interpersonal teacher behavior.

Keywords: interpersonal teacher behavior, teacher perceptions, student perceptions, observer perceptions, learning engagement

There is a relationship between interpersonal teacher behavior; i.e. behavior that occurs when the teacher and students interact, and learning engagement (Khine & Atputhasamy, 2005). Positive and helpful teacher-student relationships are linked to social and responsible student behavior and student learning engagement (Wentzel, 1998). Also, a good teacher-student relationship enhances teachers' classroom management and can avoid negative classroom interruptions (Bear, 2015). The teacher organizes and produces the right learning conditions for his or her students. This must be acknowledged by the students with the accomplishment and the efficiency relying upon both groups (Fend, 2002). However, there is a noticeable dissimilarity between the manner teachers and students perceive the teacher's behavior in the classroom context (Wubbels & Levy, 1993). Because of their different positions, teacher and students have different experiences, preferences, and views of classroom processes. "Fully understanding their perspectives should allow us to create better learning environments for both students and teachers" (Woolfolk Hoy & Weinstein 2006, p. 181). Researchers often reveal that classroom analyses should contain different perspectives; i.e. teacher, student, and observer perceptions, and aim attention at discrepancies between these perceptions to enhance teaching and learning (den Brok, Bergen, & Brekelmans, 2006; Helmke & Lenske 2013). First, this current study examines the relationship between - teacher self-perception, student perception, and observer perception of teacher behavior. Second, it is examined to what extent these perceptions predict learning engagement of students.

Interpersonal Teacher Behavior

Teacher behavior can be described according to the *Model for Interpersonal Teacher Behavior* by Wubbels, Créton, Levy, and Hooymayers (1993). This general model for interpersonal relationships between students and teachers is derived from a

model designed by Leary (1957). The Leary model (1957) has proved to be quite

exhaustive to specify interpersonal relationships and was later transferred to the

educational context. In the Model of Interpersonal Teacher Behavior, the two dimensions

of Leary's model were labeled as Agency (Dominance – Submission), and Communion

(Cooperation – Opposition). The Agency dimension points out who is authoritative or

commanding in communication. The Communion dimension shows the degree of

collaboration or nearness between the persons communicating. This structure of

perceptions results in four behavior sections: Directive/Helpful,

Understanding/Compliant, Uncertain/Dissatisfied, Confrontational/Imposing. This

structure is illustrated in the *Interpersonal Circle for Teachers* (IPC-T; Figure 1; Wubbels
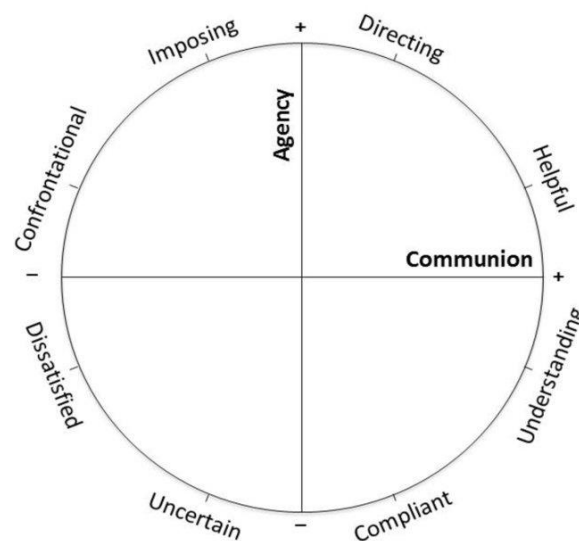
et al., 2012).

Figure 1. The Interpersonal Circle for Teachers (IPC-T; Wubbels et al., 2012)

In this present study, the IPC-T is used to determine self-, student-, and observer-

perceptions of teachers' interpersonal behavior via the *Questionnaire of Teacher*

Interaction (QTI; Wubbels, Créton, & Hooymayers, 1985). Previous studies have shown

that teacher behavior with high levels of Agency and Communion (behavior that is helpful and directing) is favored by both students and teachers (Mainhard, Oudman, Hornstra, Bosker, & Goetz, 2018). Also, research into teacher behavior shows that a combination of high levels of Agency and Communion may lead to higher levels of students' learning engagement (Mainhard, Pennings, Wubbels, & Brekelmans, 2012).

Teacher Self-, Student-, and Observers-Perception of Teacher Behavior

According to Bem (1972), self-perception is all about how "individuals come to 'know' their own attitudes, emotions, and other internal states partially by inferring them from observations of their own overt behavior and/or the circumstances in which this behavior occurs" (p.1). Self-perception is about when individuals' internal states, which only the individual himself has access to, become explicit (Bem, 1972). According to Wubbels and Levy (1993), teacher self-perceptions emerge more from their ideals than from their real demonstrated behavior in the classroom. In practice teachers are not always capable to match their behavior to their ideals because of restricting factors as, for example, the teaching context like dealing with students, instructional issues, or other unforeseen circumstances (Wubbels, Brekelmans, & Hooymayers, 1992).

How students perceive interpersonal behavior of a teacher is regarded as an important element of the social climate in the classroom context (Mainhard, Wubbels, & Brekelmans, 2014). According to Kenny (1994), interpersonal perceptions are views that persons have about other persons. These perceptions are assumptions about traits or characteristics of the observed person, observations of behavior, which are matched to personal beliefs of the perceiver. Furthermore, students who are well acquainted with their teacher presumably define new experienced circumstances on the foundation of what they already know about their teacher (Sherman & Klein, 1994). The impact on the student's perception of what the teacher does, quickly decreases with better acquaintance

(Kenny, 2004). The better the acquaintance, the less importance is assigned to the teacher's observed behavior. After a while, only the teacher's traits and characteristics predominate. The more behavioral information experienced by students, the less probable new information influences confirmed impressions (Mainhard et al., 2014). The teacher's perception about the students evenly addresses the stable perceptions of the students about the teacher's behavior (Blumenfeld & Meece, 1985). Once these perceptions have stabilized, it is difficult to adjust these ideas.

There are several arguments that substantiate the use of student perceptions to measure teacher behavior. First, psychological research shows that the impact teachers have on students is mainly defined by students' psychological reactions to how the teacher behaves (Doyle, 1979; Shuell, 1996; Shulman, 1986). The manner in which students perceive and process information (containing content and social processes) in the classroom context is critical in what the students will learn (Shuell, 1996). Second, the experiences students have with certain teachers' behavior is frequently founded on a vast quantity of lessons (Den Brok, 2001; Fraser, 1998). For that reason, student perceptions may explain the past aspects of the classroom situation (Doyle, 1986; Shuell, 1996). Third, student perceptions frequently exist of the combined judgement of multiple students in one class. So, the average student perception of a class is resistant to mood swings and other individual or situational factors (Den Brok, 2001). Fourth, Van Tartwijk, Brekelmans, Wubbels, Fisher and Fraser (1998) state that it is beneficial to use student perceptions to judge classroom contexts and teacher behavior. Students encounter a lot of different classroom situations which may improve describing a diverse picture. Above all, research has shown that students are capable of providing scores of teacher behavior that are adequately reliable, valid, stable, and are predictive for evaluation of

teachers and research objectives (Driscoll, Peterson, Crow, & Larson, 1985; Peterson & Stevens, 1988; Taba, Tylor, & Smith, 1998).

Teacher and student perceptions of interpersonal teacher behavior can be supplemented by the perception of an external observer. External observers can compare various classes and draw explicit conclusions guided by clear procedures (Lawrenz, Huffman, & Robey, 2003). Observations in the classroom are, in comparison with student and teacher perceptions, regarded as one of the most objective methods of measuring interpersonal teacher behavior (Worthen, Sanders, & Fitzpatrick, 1997). Judgements of external observers are assumed to not be affected by the student-teacher relationship in the classroom context (Lawrenz et al., 2003). Observers do not participate in the interaction between teachers and students and can therefore take a more 'objective' perspective on interpersonal teacher behavior (Praetorius, Helmke, & Lenske, 2012). As stated earlier, because routine class behavior practically cannot be changed, it can be considered that observer perceptions add valuable information about interpersonal teacher behavior. In addition, in the procedure of perceiving teacher behavior and processing this behavior, misinterpretation may occur by students (Wubbels et al., 1992). This misinterpretation may be caused by, for example, selective perception by students (i.e. the process by which persons perceive what they want to perceive). Selective perception by students may occur when the acquaintance with the teacher becomes more stable; the less importance is assigned to the teacher's observed behavior (Kenny, 2004). For this reason, there might be inconsistency between teachers' self-perception and student perception. Therefore, next to teacher self-perceptions and student perceptions, observer perceptions are taken into account. Observers may have a more objective perception of teacher behavior, because they are not acquainted with the teachers involved.

According to Wubbels and Levy (1993), student perceptions of teacher behavior agree more with observational data; i.e. observers' perception of teacher behavior, than teacher perceptions. In addition, Mayer (1999) discovered a 0.85 correlation between student survey data and classroom observations. Furthermore, Scherzinger and Wettstein (2019) found a weak correlation between teacher and student perceptions of the teacher-student relationship. Teachers' perceptions of their teaching styles are largely based on their ideals rather than their real behavior in the classroom (Wubbels & Levy, 1993).

Learning Engagement

The condition of teacher-student relationships, in terms of caring, supportive collaboration, is an essential predictor of learning engagement (Skinner, Furrer, Marchand, & Kindermann, 2008). Learning engagement concerns engagement to goal-directed, constructive, flexible, persistent, active, focused interaction with learning activities (Skinner et al., 2008). High levels of learning engagement emerge from behaviors and emotions that demonstrate motivation to understand learning material (Skinner et al., 2008). The behavioral dimension of learning engagement refers to students' attention, persistence and effort during the performance of learning tasks. The emotional dimension concerns students' emotional states in the course of learning activities, for example enthusiasm and enjoyment (Meyer & Turner, 2002). So, learning engagement consists of a behavioral and an emotional dimension, but also of negative engagement known as disaffection with learning (Connell & Wellborn, 1991; Skinner, Kindermann, & Furrer, 2009; Wellborn, 1991). Because this study focuses on interpersonal teacher behavior, only the behavioral dimension (behavior of students) of learning engagement is taken into account. According to Deci and Ryan (1985), engaged emotions encourage engaged behavior and vice versa. For example, if students become frustrated about their learning activities, this probably weakens their behavioral

participation in these learning activities and leads to active behavioral disaffection in the classroom. As well as boredom, a more passive emotion, might result in less behavioral engagement. Furthermore, Skinner et al. (2008) state that a more supportive classroom context stimulates positive student perceptions, and positive student perceptions in turn promotes student learning engagement. Vice versa, a lower supportive classroom context weakens positive student perceptions, which then fuels disaffection with learning. Furthermore, disaffection with learning has a behavioral element which comprises passivity and retraction from participating in learning tasks. It has been found that disaffection with learning is a predictor of low performance scores, low student grades, and possible student drop-out (Connell, Halpen-Felsher, Clifford, Crichlow, & Usinger, 1995).

This study tries to discover whether there is a relationship between interpersonal teacher behavior perceived by teachers, students, and observers, and student learning engagement. Previous studies showed significant relations between teacher interpersonal behavior and students' learning engagement (Bergin & Bergin, 2009; Davis, 2003). These analyses unveiled positive relations between positive (Directing/Helpful, Understanding/Compliant) interpersonal teacher behavior and student engagement, and negative relationships between negative (Uncertain/Dissatisfied, Confrontational/Imposing) behavior and learning engagement (Birch & Ladd, 1997).

Research Questions

This study gives an answer to two research questions. The first research question is: 'To what extent do teacher self-perceptions, student perceptions, and observer perceptions of teacher behavior relate to each other?' Hypotheses are derived from the statement that student perceptions of teacher behavior agree more with observational data than teacher perceptions (Wubbels & Levy 1993). However, weak correlations between

student and teacher perceptions of the teacher-student relationship were found in a study

of Scherzinger and Wettstein (2019). The first hypothesis states that student and observer

perceptions relate to each other. The second hypothesis states that student perceptions and

teacher self-perceptions have a weak relationship with each other, and the third

hypothesis states that observer perceptions and teacher self-perceptions do not relate.

The second research question is: 'To what extent are teacher self-perceptions,

student perceptions, and observer perceptions of teacher behavior, derived from

interpersonal circle for teachers, predictors of student learning engagement?' It is

examined whether the parts of the IPC-T are predictors of student learning engagement

for all three perceptions. Student perception regarding Directing/Helpful and

Understanding/Compliant behavior is expected to be a predictor of student learning

engagement. Insecure/Dissatisfied and Confrontational/Imposing teacher behavior is

expected to predict student learning disengagement for every perception (Bergin &

Bergin, 2009; Davis, 2003).

Method

Research Design

This study has a descriptive quantitative survey research-design: patterns and

relationships of teacher, student, and observer perception, and student learning

engagement has been analyzed. Teachers and students filled in the QTI (Wubbels &

Levy, 1993). Students also filled in a learning engagement questionnaire (Skinner et al.,

2008). Also, this study has a quantitative observational research design: non-verbal and

verbal interpersonal teacher behavior has been analyzed. Four observers watched a total

of 80 videos of teachers and students of secondary schools in a classroom context. Every

video was watched twice; every observer separately watched 40 videos. After every video

the observers also filled in the QTI (Wubbels & Levy, 1993). Interpersonal teacher

behavior has been coded by filling in the perception questionnaire. A reliability-analysis was conducted after the questionnaire has been filled in.

Participants

In this study 80 teachers and 1762 students participated from multiple classrooms of different secondary schools in the Netherlands. The teachers-sample existed of 41 female and 39 male teachers. The teachers were all between 24 years and 63 years old (M_{age} = 43.71, SD = 11.50). Teachers taught across four educational levels; four teachers educated at the VMBO-bk level, 15 at the VMBO-tl level, 39 at the HAVO level, and 22 at the VWO/Gymnasium level. The students-sample existed of 842 male and 852 female students; 68 students' gender data was missing. The students were all between 13 years and 18 years old (M_{age} = 15.18, SD = 1.14).

Instruments

To measure teacher self-perception, student perception, and observer perception, this study made use of the Teacher Self-Perception and Student-Perception questionnaire derived from the QTI (Wubbels & Levy, 1993). The perception questionnaires are both the same and existed of 24 questions to measure interpersonal teacher behavior. All the questions of the Teacher Self-Perception-questionnaire begin with 'What do you think as yourself as a teacher?'. The questions of the Student-Perception-questionnaire begin with 'What do you think of this teacher?'. Asked questions are for example; This teacher '…threatens with punishment', '… has authority', or '… has a sense of humor'. A 5-point Likert scale was used, where 1 means (almost) never, and 5 means (almost) always. Also, a reliability analyses were conducted.

Teacher perception. The Teacher Self-Perception-questionnaire is a reliable questionnaire. For this questionnaire a reliability analysis with Cronbach's alpha was

conducted for every part of the IPC-T. As shown in Table 1, every part of the IPC-T has a

level higher than .70, except for the Confrontational/Imposing part.

Student perception. The Student-Perception questionnaire turned out to be even

a more reliable questionnaire. A reliability analysis with Cronbach's alpha was conducted

for every part of the IPC-T, as shown in Table 1. Every part of the IPC-T has a level of

.80 or higher, except for the Confrontational/Imposing part.

Observer perception. The observers who analyzed teacher behavior to measure

observer perceptions were four master-students from the study program Educational

Sciences of Utrecht University in the Netherlands. The observers' perception of teacher

behavior was also measured with the QTI (Wubbels & Levy, 1993), in combination with

analyzing 80 educational videos. After watching 40 videos twice by the observers, the

QTI (Wubbels & Levy, 1993) was filled in. For each video an Intraclass-Correlation-

Coefficient (ICC) was computed. Every video with an ICC below .60 was deleted, which

resulted in 68 videos with a minimum ICC of .60 and a maximum of .97. Also, a

reliability analysis with Cronbach's alpha was conducted for every part of the IPC-T, as

shown in Table 1. The Directing/Helpful and Uncertain/Dissatisfied parts of the IPC-T

have levels higher than .90.

Table 1

Reliability Analyses with Cronbach's Alpha of the QTI for Teacher, Student and Observer Perceptions

IPC-T / Perceptions	Teacher	Student	Observer
Directing / Helpful	$\alpha = .80$	$\alpha = .84$	$\alpha = .91$
Understanding / Compliant	$\alpha = .71$	$\alpha = .81$	$\alpha = .79$
Uncertain / Dissatisfied	$\alpha = .75$	$\alpha = .80$	$\alpha = .93$
Confrontational / Imposing	$\alpha = .55$	$\alpha = .72$	$\alpha = .64$

Note. Student perception is aggregated to class-level.

Student learning engagement was measured by the Engagement versus Disaffection with Learning-questionnaire (Skinner et al., 2008) which measured behavioral engagement and disaffection with learning. The questionnaire consisted of 10 items. All the questions begin with 'The next questions ask how you experienced the past lesson. During this lesson…'. Asked questions are for example; '… I listened very carefully', '… I just acted like I'm working', and '… I paid attention'. A 5-point Likert scale was used where 1 means disagree, and 5 means agree. Because five items measured 'disaffection with learning', these items were recoded. After the recoding was done, a reliability analysis was conducted. The Engagement versus Disaffection with Learning-questionnaire turned out to be quite a reliable questionnaire (α= .87).

Procedure

Information about procedures, participation-risks, explanations about how to acquire the research results, voluntary participation, and researchers' contact information, and the purpose of the study were all provided in informed consent forms to both students and teachers. During the lessons, the videos were recorded for observer analysis. After the lessons, the teachers' Self-Perception questionnaire and the Student-Perception questionnaire were administered. Also, the students' 'Engagement versus Disaffection with Learning'-questionnaire was administered. The Ethics Committee of the Faculty of Social and Behavioral Sciences of Utrecht University (FETC16-074) accepted the design of this study. All the teachers and students participating in this study administered written active informed consent. Questionnaire data of students that did not agree to participate in this study were not used in the analyses.

Data Analysis

To run the data-analysis, the software program SPSS version 26.0.0.1 was used. The first aim of this study was to determine to what extent teacher self-perceptions,

student perceptions and observer perceptions relate to each other. To reach this aim, this study made use of a *descriptive correlational research design*. These relations have been measured with *Pearson's correlation coefficient*. The second aim of this study was to determine to what extent these three kinds of perceptions using the interpersonal circle for teachers, are predictors for students' learning engagement. To reach this aim, this study made use of a *multiple regression analysis*. Per perception (teacher self-, student-, and observer-perception), predictor variables of interpersonal behavior (Directive/Helpful, Understanding/Compliant, Uncertain/Dissatisfied, Confrontational/Imposing behavior) on outcome variable learning engagement were analyzed.

Results

The first step in the analysis consisted of computing means, standard deviations, and score ranges for every perception combined with every kind of interpersonal teacher behavior. Student learning engagement is also included. The results of this first exploration are displayed in Table 2. As can be seen, Directing/Helpful teacher behavior scored high in contrast to Uncertain/Dissatisfied teacher behavior. Understanding/Compliant and Confrontational/Imposing teacher behavior have more averaged scores. This applies to both teachers, students, and observers. Furthermore, teachers have higher scores for all kinds of interpersonal teacher behavior than both students and observers. In addition, observers have the highest deviations in scores, where students have the lowest deviations. Students scored relatively high on learning engagement.

Research Question 1

The second step in the analysis consisted of computing correlations between teacher, student and observer perceptions of every kind of interpersonal teacher behavior.

Table 2

Means and Standard Deviations of the QTI of Teacher, Student, and Observer
Perceptions, and Student Learning Engagement.

Perception / IPC-T	*M*	*SD*	Min.	Max.	*n*
Teacher					
Directing / Helpful	3.90	.50	2.17	5.00	80
Understanding / Compliant	3.40	.46	2.17	4.33	80
Uncertain / Dissatisfied	1.99	.56	1.00	3.50	80
Confrontational / Imposing	2.62	.48	1.67	3.83	80
Student					
Directing / Helpful	3.72	.48	2.66	4.60	80
Understanding / Compliant	3.34	.45	1.91	4.07	80
Uncertain / Dissatisfied	1.91	.43	1.18	3.17	80
Confrontational / Imposing	2.76	.48	1.66	4.12	80
Learning Engagement	3.29	.37	2.39	4.21	80
Observer					
Directing / Helpful	3.95	.73	1.25	4.83	68
Understanding / Compliant	3.21	.53	2.17	4.50	68
Uncertain / Dissatisfied	1.86	.70	1.00	4.83	68
Confrontational / Imposing	2.52	.52	2.39	4.21	68

Note. Student Perception is aggregated to class-level, Observer Perception has 68 cases
due to lack of reliability and complications with video-material.

Table 3 displays correlations between teacher, student, and observer perception of

interpersonal teacher behavior.

Comparing student and observer perceptions. As shown in Table 3, every part

of the IPC-T of student perception correlates significant with the same parts of the IPC-T

of observer perception. Furthermore, every part of the IPC-T of student perception has a

negative significant correlation with their counterparts, for example Directing/Helpful vs.

Uncertain/Dissatisfied -and- Understanding/Compliant vs. Confrontational/Imposing,

even in relation to the observer perception.

Comparing teacher and student perceptions. Table 3 also displays the same significant correlations between teacher and student perception as between observer and student perceptions. Every part of the IPC-T correlates significantly between teacher and student perception, and negative correlations were found between their counterparts. However, many of these significant correlations between teacher and student perceptions are weaker than between student and observer perceptions. This indicates that the relation between student and observer perceptions is stronger than the relation between the perceptions of teachers and students.

Comparing teacher and observer perceptions. In contrast with the results reported above, teacher and observer perceptions rarely correlate with each other. Significant results were only found between the Understanding/Compliant part of the IPC-T and the Confrontational/Imposing part of the IPC-T. Directing/Helpful and Uncertain/Dissatisfied teacher behavior was not perceived in the same way.

Research Question 2

Table 4 displays four separate multiple regression analyses measuring the predictive value of student learning engagement from interpersonal teacher behavior of teacher, student, and observer perceptions. First, an analysis of assumptions of multiple regression was conducted. The assumption of linear relationship between the IPC-T parts per perception, and learning engagement was met. No outliers were detected. Because the IPC-T is a circular model, not all variables were normally distributed. As shown in Table 3, multicollinearity values were unavoidable. The assumption of homoscedasticity was met; the residual variation of the predictor variables is roughly similar.

As shown in Table 4, the first regression model analyzes Directing/Helpful teacher behavior, which explains a lot of variance predicting student learning engagement ($R^2 = .50$). This regression analysis shows that only the student perception of

Directing/Helpful teacher behavior is a significant predictor of student learning engagement. In contrast, teacher perceptions of their own behavior and observer perceptions of Directing/Helpful teacher behavior do not explain variance to the model, and therefore do not predict student learning engagement.

The Understanding/Compliant part of the IPC-T explains little variance predicting student learning engagement ($R^2 = .13$). The regression analysis shows again that only student perception is a significant predictor of student learning engagement. On the other hand, observer perceptions and teacher perceptions of Understanding/Compliant teacher behavior do not explain variance to the model. Hence, they do not predict student learning engagement.

The Uncertain/Dissatisfied part of the IPC-T explains a lot of variance predicting student learning engagement ($R^2 = .51$). The regression analysis shows that students perceive Uncertain/Dissatisfied teacher behavior as significantly negative for their learning. engagement. In other words; student perceptions of Uncertain/Dissatisfied behavior predict learning disengagement. In contrast, observer perceptions and teacher perceptions of Uncertain/Dissatisfied teacher behavior do not explain variance to the regression model.

Finally, Confrontational/Imposing teacher behavior is not a predictor for student learning engagement from the perspective of teacher, student and observer perceptions ($R^2 = .03$). The regression analysis shows that neither of the three perceptions of Confrontational/Imposing teacher behavior predict student learning engagement.

Table 3

Correlations of Teacher, Student, and Observer Perceptions of Interpersonal Teacher Behavior

	Teacher Directing / Helpful	Teacher Understanding / Compliant	Teacher Uncertain / Dissatisfied	Teacher Confrontational / Imposing	Student Directing / Helpful	Student Understanding / Compliant	Student Uncertain / Dissatisfied	Student Confrontational / Imposing	Observer Directing / Helpful	Observer Understanding / Compliant	Observer Uncertain / Dissatisfied	Observer Confrontational / Imposing
Teacher Directing / Helpful	1											
Teacher Understanding / Compliant	.10	1										
Teacher Uncertain / Dissatisfied	-.55**	-.15	1									
Teacher Confrontational / Imposing	.00	-.48**	.30**	1								
Student Directing / Helpful	.31**	.06	-.55**	-.27*	1							
Student Understanding / Compliant	.00	.48**	-.26*	-.55**	.54**	1						
Student Uncertain / Dissatisfied	-.37**	. 01	.56**	.22	-.93**	-.41**	1					
Student Confrontational / Imposing	-.06	-.54**	.20	.55**	-.43**	-.84**	.36**	1				
Observer Directing / Helpful	.21	-.04	-.15	-.08	.52**	.14	-.60**	-.16	1			
Observer Understanding / Compliant	-.13	.20	.08	-.18	-.14	.34**	.16	-.33**	-.32**	1		
Observer Uncertain / Dissatisfied	-.22	-.04	.17	.11	-.49**	-.16	.59**	.19	-.94**	.32**	1	
Observer Confrontational / Imposing	.02	-.36**	.00	.33**	-.14	-.56**	.08	.56**	.09	-.77**	-.08	1

Note. *p < .05, **p < .01

Table 4

Multiple Regression Analyses Predicting Student Learning Engagement from Interpersonal Teacher Behavior Using the IPC-T, of Teacher, Student, and Observer Perceptions.

Predictors	R^2	F	β	t	p
Directing / Helpful	.50	21.14**			.00
Teacher			.00	0.03	.97
Student			.62**	5.92	.00
Observer			.14	1.37	.18
Understanding / Compliant	.13	3.26*			.03
Teacher			-.16	-1.20	.24
Student			.41**	2.99	.00
Observer			-.21	-1.71	.09
Uncertain / Dissatisfied	.51	21.97**			.00
Teacher			.08	0.79	.43
Student			-.72**	-5.67	.00
Observer			-.05	-0.45	.65
Confrontational / Imposing	.03	.62			.61
Teacher			-.10	-0.66	.51
Student			-.11	-0.63	.53
Observer			.01	0.10	.92

Note. * $p < .05$, ** $p < .01$, Regression analyses are done separately per behavior section of the IPC-T.

Discussion

This study aimed its attention at teachers' self-perception, students' perception, and observers' perception of interpersonal teacher behavior and their influence on students' learning engagement. Teacher, student, and observer perceptions give insight into what occurs in the classroom learning environment. To enhance learning environments for teachers as well as students, it is important to understand their perceptions of interpersonal teacher behavior (Woolfolk Hoy & Weinstein, 2006). In this study, three hypotheses regarding (dis)similarities between teacher, student, and observer perceptions of interpersonal teacher behavior were examined. Also, it was examined if these perceptions of interpersonal teacher behavior are predictors of student learning engagement.

According to the first hypothesis, student perception and observer perception of interpersonal teacher behavior relate to each other. This hypothesis is confirmed; student perception agreed on all parts of the IPC-T with observer perception of interpersonal teacher behavior. This result corroborates the findings of the previous work of Scherzinger and Wettstein (2019) and Mayer (1999). In these studies, external observers' ratings of classroom disruptions correspond largely with students' perception ratings. Also, the result found in this study is in line with a study of Wubbels and Levy (1993), who found that student perceptions concur with observational data of teacher behavior.

According to the second hypothesis, student perceptions and teacher self-perceptions have a weak relationship to each other. The findings of the current study support the outcomes of previous research of Scherzinger and Wettstein (2019). Many studies have paid attention to the dissimilarities between teachers' and student' perception pertaining to interpersonal teacher behavior (den Brok, Levy, Rodriguez, & Wubbels, 2002). The most often, important dissimilarities were found between teacher and student perception. Generally, teachers gave higher grades to their own Directing/Helpful and Understanding/Compliant behavior than student perception did. At the same time, teachers noted lower ratings of their own Uncertain/Dissatisfied and Confrontational/Imposing behavior (den Brok et al., 2002). In contrast, few studies show higher ratings of teacher perception than student perception of Confrontational/Imposing behavior and lower ratings of Understanding/Compliant behavior (Fisher & Rickards, 1999). In the current study, correlations between teacher and student perceptions of interpersonal teacher behavior showed significant agreement on all parts of the IPC-T (Directing/Helpful, Understanding/Compliant, Uncertain/Dissatisfied, Confrontational/Imposing). These findings are not in line with previous research where correlations show no agreement between the teacher-student relationship where teachers and students scored very contrasting (den Brok et

al., 2006; Fauth, Decristan, Rieser, Klieme, & Büttner, 2014). Reason for this discrepancy could be the use of the QTI, where observable behavior is measured. Many studies measure teacher behavior focused on complex aspects requiring interpretation, like 'rule clarity' and 'overview of the happenings in the class'; these complex aspects could be interpretable in several ways. This study focused on observable behavior like 'this teacher threatens with punishment' and 'this teacher gives students their way'; the QTI measures pure observable behavior which could be interpreted less unambiguously. A fundamental goal of the QTI is to measure perceptions that represent the four parts (Directing/Helpful, Understanding/Compliant, Uncertain/Dissatisfied, Confrontational/Imposing) of interpersonal teacher behavior validly (Sun, Mainhard, & Wubbels, 2018). One of the latest versions of the QTI has been used in several Dutch studies (e.g. Mainhard, 2015; Pennings et al., 2014). The items of this version were reworded based on several criteria; describe teacher behavior, focus on interpersonal actions rather than pedagogical concerns, and concentrating on teacher behavior rather than student behavior.

According to the third hypothesis, teacher perception and observer perception do not relate to each other. The results of the current study showed that this hypothesis is true for most parts of the IPC-T. Correlations between teacher perception and observer perception of interpersonal teacher behavior showed differences on all parts of the IPC-T, except for the Confrontational/Imposing part. There are several possible explanations for this result. The dissimilarity found in the data could be assigned to the factor that observers and students have an observational benefit, rather than the teacher; the teacher acts "under pressure to make numerous decisions while staying on top of the classroom's complex happenings" (Scherzinger & Wettstein, 2019, p.113). Another explanation for this result could be that observers and teachers have different roles in the classroom context. According to Watson (1982), teachers consider their behavior as more affected by environmental situations, while

observers focus more on comparatively stable personal traits or characteristics. Both teachers and observer may aim attention at different aspects in their observations, resulting in different perceptions of interpersonal teacher behavior. This discrepancy of perceptions between teachers (actors) and observers is also known as 'actor-observer asymmetry' (Jones & Nisbett, 1971). Actor-observer asymmetry clarifies the inaccuracy when making attributions about behavior of others. When individuals examine their own behavior (they are also the actor), they are expected to assign their actions to specific situations than to their personality. Because the actor (teacher) is better acquainted with the circumstantial factors influencing their own decisions, they see the social situation as an important influence of their behavior. In contrast, when observers make attributions about the teacher's behavior, they tend to assign their behavior to the teacher's overall personality rather than to circumstantial factors. These circumstantial effects of the teacher's behavior are less available to the observer; they assign the teacher's behavior to their personality (Miller & Norman, 1975). Furthermore, the lack of relationship between teacher and observer perception is discovered by other researchers in the past. According to Hook and Rosenshine (1979), teacher self-reports in comparison to observations in the classroom show significant differences. Also, Logan (1996) discovered differences between teachers' self-reports and observational data. In US classrooms, contrasting patterns were discovered by observers from self-reports of teachers in mathematics classes (Spillane & Zeuli, 1999).

Thus, teacher perceptions of their own behavior put emphasis on situational factors; how teachers perceive the classroom and why they show certain behaviors in specific situations. Student perceptions of interpersonal teacher behavior are based on everyday experiences during lessons with different teachers. This gives a stable and reliable overview of the teachers' interpersonal behavior according to students, but this view is very rigid; the better the acquaintance, the less importance is assigned to the teacher's observed behavior

(Kenny, 2004). Observer perceptions of teacher behavior emphasize teachers' personal characteristics in the way teachers behave in the classroom context.

Concerning the relationship with student learning engagement in the current study, student perceptions of interpersonal teacher behavior were far more significant than teacher perceptions and observer perceptions. This result agrees with several past studies with predicting aspects of student perceptions on student learning engagement (Kunter & Baumert 2006; Maulana, 2012). These studies demonstrate that agreement between interpersonal teacher behavior and student learning engagement is stronger when teacher behavior and learning engagement are measured from the same perspective. However, one of the main causes of common method bias (bias that is assigned to the method of measurement rather than to the variables of interest), is acquiring both predictor and outcome variables from the same rater (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Thus, common method bias could partially explain the correlation between the two measures. One manner to control common method bias is to obtain measures of variables from different sources (Podsakoff et al., 2003).

As shown in Table 4, Directing/Helpful and Uncertain/Dissatisfied interpersonal teacher behavior are far more predicting students' learning engagement than Understanding/Compliant and Confrontational/Imposing teacher behavior. This result is in line with a study of Birch and Ladd (1997), who found the same results. Thus, students who have positive impressions of their teacher perform better and have hardly any problems in the classroom (Crosnoe, Kirkpatrick, Johnson, & Elder, 2004). In addition, Roorda, Koomen, Spilt, and Oort (2011) found that Uncertain/Dissatisfied interpersonal teacher behavior has a stronger effect on student learning (dis)engagement than Directing/Helpful behavior in primary education. On the other hand, Directing/Helpful interpersonal teacher behavior has more effect on student learning engagement in secondary education. Also, Wubbels, Den

Brok, Veldman, and van Tartwijk (2006) found that desirable teacher-student relationships are represented by a high intensity of teacher Agency and Communion, which contains Directing/Helpful teacher behavior. Generally speaking, a positive relationship between teachers and students correlates with students' engagement in academic activities (Wentzel, Battle, Russell, & Looney, 2010).

Research about the relation between student learning engagement and interpersonal teacher behavior have been usually undertaken using teacher and student perception questionnaires. Specially in secondary education, the use of external observers to analyze the relation between teacher behavior and student learning engagement is relatively rare (Virtanen, Lerkkanen, Poikkeus, & Kuorelahti, 2015). In contrast to student perceptions, the current study found that observer perceptions of interpersonal teacher behavior do not significantly predict student learning engagement. This result is not in line with a previous study of Cornelius-White (2007). This study demonstrated that both observer and student perceptions are adequate methods to measure teacher behavior in relation to student learning engagement. They suggest that the addition of observer perceptions is quite useful for examining interpersonal teacher behavior. Furthermore, studies of Allen et al. (2013), and Roorda et al. (2011) show that observed teacher behavior predicts student learning engagement as well. However, according to Lüdtke, Robitzsch, Trautwein, and Kunter (2009), using observer ratings have some disadvantages. For example, in video-based classroom studies, normally one or a few lessons are video recorded. This may endanger the validity of video recorded observer ratings. However, the interclass-correlation coefficient (ICC) was used to guarantee that only reliable observer ratings were used in the analyses.

Strengths and Limitations

This study made use of teacher, student, and observer perceptions of interpersonal teacher behavior. This variety of perceptions provides a comprehensive picture of the

differences and similarities between perceptions, and how interpersonal teacher behavior influences students' learning engagement. However, the perceptions of teachers, students and observers could be biased in several ways. In this study teachers volunteered to participate, which could indicate that it is likely that teachers who supply less supportive classroom contexts to students were underrepresented. Another concern is that student perceptions were aggregated to class level, which is acceptable. Although, some of the richness of the data could be lost. While the variability of the student level may be seen as deceiving on processes on class-level, it could support a more accurate picture of interpersonal teacher behavior in the classroom context. Another issue could be that students do not have enough knowledge and skills concerning teaching, which makes it difficult to identify the value of more complex teaching behavior. Furthermore, the presence of external observers may affect the teachers' behavior in the classroom context. This study made use of 80 videos to observe interpersonal teacher behavior which may affect the behavior of the teacher in the classroom context. Nevertheless, videos can be viewed multiple times which is a great advantage of this study. At the same time, observer perceptions of interpersonal teacher behavior are commonly restrained to a limited number of lessons, which may provide a one-sided image of a certain teacher. Also, it could be interesting to place more emphasis on perceptions across different school years, and to investigate how these perceptions about different teachers evolve over time concerning student learning engagement. Perceptions of interpersonal teacher behavior are rather constant during the schoolyear, and hard for teachers to change when they are teaching the same students (Mainhard, 2009).

Conclusion

        This study tried to strengthen the increasing body of research on investigation of how interpersonal teacher behavior influences student learning engagement from a teacher, student, and observer perception. The first aim of this study was to examine to what extent

teacher, student, and observer perceptions relate to each other. The study showed that students shared the same perception about interpersonal teacher behavior with observers. This result could be assigned to the factor that observers and students have an observational benefit rather than the teacher, who has to make many decisions while acting in the classroom context. In the same way, the results of this study indicate that students share the same perception with their teachers. Reason for this result could be that the QTI measures pure observable behavior which teachers and students perceive in the same way. However, these correlations are less strong than between student and observer perception. The discrepancy between teacher and observer perceptions could be assigned to the fact that observers relate teacher behavior to teachers' personal characteristics, where teachers assign their behavior more to situational factors. In sum, from a student perspective this study shows unambiguous results in relation to teacher and observer perceptions. In addition, this study demonstrated that the perceptions of an external observer complement better with student than teacher perceptions of interpersonal teacher behavior. Furthermore, educational research is greatly typified by the creation and utilization of instruments from teachers' and students' point of view (Cavanagh and Romanoski, 2006). Little is known about the extent how to interpret differences in perceptions of interpersonal teacher behavior measured by teacher and student questionnaires, and external observations. Future research could emphasize this deficiency of interpretations of different perceptions.

The second aim of this study was to determine if teacher, student, and observer perceptions, using the interpersonal circle for teachers, separately predict students' learning engagement. The results of this study indicate that student perceptions of interpersonal teacher behavior predict student learning engagement in contrast to teacher and observer perceptions. These results support the ideas of Kunter & Baumert (2006) and Maulana (2012), that agreement between interpersonal teacher behavior and student learning

engagement is stronger when behavior and engagement are measured from the same perspective. Finally, for improving student learning engagement some recommendations are suggested based on the findings of this study. From a teachers' perspective it is very important to invest in developing their interpersonal teacher behavior. When teachers are aware of showing more directing and helpful interpersonal behavior and less uncertain and dissatisfied behavior, students could perceive them as more directing or helpful. This is according to this study, a significant predictor of learning engagement. Also, learning about the effect of interpersonal teacher behavior could be an excellent addition to teacher education. Student-teachers should develop into teachers who are aware of their interpersonal behavior and how this behavior is perceived by their students. In essence, if teachers would like to foster students' learning engagement, they should invest in more directing and helpful interpersonal teacher behavior.

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Appendices

A. Questionnaire of Teacher Interaction – Teacher Perception

What do you think of yourself as a teacher? This teacher …

Item	Stelling	Score
ZVIL 1	… threatens with punishment.	
ZVIL 2	… has a sense of humor.	
ZVIL 3	… has authority.	
ZVIL 4	… occurs hesitantly.	
ZVIL 5	… lets students go ahead .	
ZVIL 6	… is unsatisfied.	
ZVIL 7	… makes an uncertain impression.	
ZVIL 8	… is easy on students.	
ZVIL 9	… acts weak.	
ZVIL 10	… has empathy for his/her students.	
ZVIL 11	… is out of his/her mood.	
ZVIL 12	… determines if students can say something.	
ZVIL 13	… makes a gloomy impression.	
ZVIL 14	… is heated.	
ZVIL 15	… is someone you can trust.	
ZVIL 16	… gives students their way.	
ZVIL 17	… has a strict classroom management.	
ZVIL 18	… can get angry.	
ZVIL 19	… acts confident.	
ZVIL 20	… allows a lot.	
ZVIL 21	… has a nice classroom atmosphere.	
ZVIL 22	… is patient.	
ZVIL 23	… is a good leader.	
ZVIL 24	With this teacher it has to be silent in the classroom.	

Subscales:
Directing: ZVIL 3, ZVIL 19 and ZVIL 23
Helpful: ZVIL 2, ZVIL 15 and ZVIL 21
Understanding: ZVIL 8, ZVIL 10 and ZVIL 22
Compliant: ZVIL 5, ZVIL 16 and ZVIL 20
Uncertain: ZVIL 4, ZVIL 7 and ZVIL 9
Dissatisfied: ZVIL 6, ZVIL 11 and ZVIL 13
Confrontational: ZVIL 1, ZVIL 14 and ZVIL 18
Compelling: ZVIL 12, ZVIL 17 and ZVIL 24

B. Questionnaire of Teacher Interaction – Student Perception

What do you think of this teacher? This teacher …

Item	Stelling	Score
SVIL 1	… threatens with punishment.	
SVIL 2	… has a sense of humor.	
SVIL 3	… has authority.	
SVIL 4	… occurs hesitantly.	
SVIL 5	… lets students go ahead .	
SVIL 6	… is unsatisfied.	
SVIL 7	… makes an uncertain impression.	
SVIL 8	… is easy on students.	
SVIL 9	… acts weak.	
SVIL 10	… has empathy for his/her students.	
SVIL 11	… is out of his/her mood.	
SVIL 12	… determines if students can say something.	
SVIL 13	… makes a gloomy impression.	
SVIL 14	… is heated.	
SVIL 15	… is someone you can trust.	
SVIL 16	… gives students their way.	
SVIL 17	… has a strict classroom management.	
SVIL 18	… can get angry.	
SVIL 19	… acts confident.	
SVIL 20	… allows a lot.	
SVIL 21	… has a nice classroom atmosphere.	
SVIL 22	… is patient.	
SVIL 23	… is a good leader.	
SVIL 24	With this teacher it has to be silent in the classroom.	

Subscales:
Directing: SVIL 3, SVIL 19 and SVIL 23
Helpful: SVIL 2, SVIL 15 and SVIL 21
Understanding: SVIL 8, SVIL 10 and SVIL 22
Compliant: SVIL 5, SVIL 16 and SVIL 20
Uncertain: SVIL 4, SVIL 7 and SVIL 9
Dissatisfied: SVIL 6, SVIL 11 and SVIL 13
Confrontational: SVIL 1, SVIL 14 and SVIL 18
Compelling: SVIL 12, SVIL 17 and SVIL 24

C. Questionnaire of Teacher Interaction – Observer Perception

https://survey.uu.nl/jfe/form/SV_cCIO03c9zTk4lNP

D. Engagement Versus Disaffection with Learning Questionnaire

The next questions ask how you experienced the past lesson. During this lesson ...

Item	Stelling	Score
SEng 1	… I listened very carefully	
SEng 2	… I worked as hard as I could	
SEng 3	… I think about other things	
SEng 4	… I did just enough to get by	
SEng 5	… I did not try very hard	
SEng 6	… I acted like I'm working	
SEng 7	… my thoughts drifted away	
SEng 8	… I tried hard to do well	
SEng 9	… I paid attention.	
SEng 10	… I actively participated in the lesson (for example by asking questions and giving answers)	

Subscales:
Behavioral Engagement: SEng1, SEng2, SEng8, SEng9, SEng10
Behavioral Disaffection: SEng3, SEng4, SEng5, SEng6, SEng7

E. FETC-Form

Section 1: Basic Study Information

1. Name student:

Robbert van Uum

2. Name(s) of the supervisor(s):

Monika Donker

3. Title of the thesis (plan):

How Teacher, Student, and Observer Perception Influence Learning Engagement

4. Does the study concern a multi-center project, e.g. a collaboration with other organizations, universities, a GGZ mental health care institution, or a university medical center?

No.

5. Where will the study (data collection) be conducted? If this is abroad, please note that you have to be sure of the local ethical codes of conducts and permissions.

In this study, the data is already collected by Monika Donker. The only data that will be collected is the observers'-perception. The observers are master students from the UU. The observers will watch videos of teachers in a classroom context. After watching the videos, the observers will fill in a perception-questionnaire.

Section 2: Study Details I

6. Will you collect data?

> Yes and No. Existing data is available, and this will be supplemented with data that I
> will collect (the observers' perception).
> Yes → Continue to question 11
> No → Continue to question 7

7. Where is the data stored?

The data is stored on YODA.

8. Is the data publicly available?

No.

9. Can participants be identified by the student? (e.g., does the data contain (indirectly
   retrievable) personal information, video, or audio data?)

> Yes. The Ethics Committee of the Faculty of Social and Behavioral Sciences of Utrecht
> University (FETC16-074) accepted the design of this study (The same data collected by
> Monika Donker will be used in this study). All the teachers and student participating in
> this study administered their written active informed consent. Questionnaire data of
> students that did not agree to participate in this study was not used in the analyses.

10. If the data is pseudonymized, who has the key to permit re-identification?

Monika Donker.

Section 3: Participants

11. What age group is included in your study?

Teachers (adults) and students in secondary school (12 to 18 years old).

12. Will be participants that are recruited be > 16 years?   Yes
13. Will participants be mentally competent (wilsbekwam in Dutch)?   Yes
14. Does the participant population contain vulnerable persons?
    (e.g., incapacitated, children, mentally challenged, traumatized,   No
    pregnant)
15. If you answered 'Yes' to any of the three questions above: Please provide reasons to justify why this particular group of participants is included in your study.

The thesis is about perception of secondary school students and secondary school teachers. 80 videos of teachers and students in the classroom context will be analyzed by observers.

16. What possible risk could participating hold for your participants?

No possible risks. All data is only available for the observers via YODA. The study is about interpersonal teacher behavior, so the behavior of teachers will be emphasized, and the students are only used to indicate their perception about the behavior.

17. What measures are implemented to minimize risks (or burden) for the participants?

All measures have already been done. The participants all filled in an informed consent form.

18. What time investment and effort will be requested from participants?

None. The data is already available via the videos on YODA.

19. Will be participants be reimbursed for their efforts? If yes, how? (financial reimbursement, travelling expenses, otherwise). What is the amount? Will this compensation depend on certain conditions, such as the completion of the study?

No.

20. How does the burden on the participants compare to the study's potential scientific or practical contribution?

> In this observational study, only real existing behavior is analyzed. The participants don't carry any burden.

21. What is the number of participants? Provide a power analysis and/or motivation for the number of participants. The current convention is a power of 0.80. If the study deviates from this convention, the FERB would like you to justify why this is necessary.
(Note, you want to include enough participants to be able to answer your research questions adequately, but you do not want to include too many participants and unnecessarily burden participants.)

> 80 teachers and 1762 students.

22. How will the participants be recruited? Explain and attach the information letter to this document.

> The participants have already been recruited. Only video data will be analyzed.

23. How much time will prospective participants have to decide as to whether they will indeed participate in the study?

> The participants have already been recruited. Only video data will be analyzed.

24. Please explain the consent procedures. Note, active consent of participants (or their parents) is in principle mandatory. Enclose the consent letters as attachments. You can use the consent forms on Blackboard.

> Information about procedures, participation-risks, explanations about how to acquire the research results, voluntary participation, and researchers' contact information, and the purpose of the study were all provided in informed consent forms.

25. Are the participants fully free to participate and terminate their participation whenever they want and without stating their grounds for doing so? Explain.

> Questionnaire data of students that did not agree to participate in this study was not used in the analyses.

26. Will the participants be in a dependent relationship with the researcher?

No.

27. Is there an independent contact person or a general email address of a complaint
    officer whom the participant can contact?

Yes. I don't know the mail-address. The data of the study of Monika Donker will be
analyzed. Questionnaire data of students that did not agree to participate in this study was
not used in the analyses.

28. Is there an independent contact person or a general email address of a complaint
    officer whom the participant can contact in case of complaints?

Yes. I don't know the mail-address. The data of the study of Monika Donker will be
analyzed. Questionnaire data of students that did not agree to participate in this study was
not used in the analyses.

Section 4: Data management

29. Who has access to the data and who will be responsible for managing (access to) the data?

The observers have access to the data. Monika Donker provides access to the data via YODA.

30. What type of data will you collect or create? Please provide a description of the instruments.

Videos of teachers and students of secondary school in classroom contexts. Also, the students and teachers filled in perception-questionnaires and learning engagement-questionnaires.

31. Will you be exchanging (personal) data with organizations/research partners outside the UU?

No.

32. If so, will a data processing agreement be made up?

No.

33. Where will the data be stored and for how long?

The data is already stored in YODA. The data will be available throughout the process of writing the master thesis (June/July 2020).

34. Will the data potentially be used for other purposes than the master's thesis? (e.g., publication, reporting back to participants, etc.)

Yes. There has already been published scientific literature with the same dataset: Donker, M. H., van Gog, T., & Mainhard, M. T. (2018). A Quantitative Exploration of Two Teachers with Contrasting Emotions: Intra-Individual Process Analyses of Physiology and Interpersonal Behavior. Frontline Learning Research, 6(3), 162-184.