Teacher-Student Interpersonal Relationships in Chinese Secondary Education Classrooms

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Teacher-Student Interpersonal Relationships in Chinese Secondary Education Classrooms

Interpersoonlijke leraar-leerlingrelaties in Chinese klassen in het voortgezet onderwijs
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GENERAL INTRODUCTION

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Teacher-student interpersonal relationships play an essential role in students' life in school (Cornelius-White, 2007; Den Brok, Brekelmans, & Wubbels, 2004; Den Brok, Levy, Brekelmans, & Wubbels, 2005; Goh & Fraser, 2000; Spilt, Koomen, Stoel, Thijs, & Van der Leij, 2011). Positive interpersonal relationships between teacher and students contribute to students' affective school experiences and outcomes, such as emotions (Mainhard, Oudman, Hornstra, Bosker, & Goetz, 2018), goals (Mainhard, 2015) and attitudes towards school work (Wubbels, Brekelmans, Den Brok, & van Tartwijk, 2006). Such productive relationships are created through teacher moment-to-moment interpersonal behaviour in class, and these relationships in turn shape moment-to-moment interactions (Granic, 2005; Hollenstein, 2007; Pennings et al., 2014).

Previous studies on teacher-student interpersonal relationships, especially concerning teacher moment-to-moment interpersonal behaviour, have mainly been carried out in Western educational contexts. However, the cultural patterns of a society are reflected in social relations, such as relationships and interactions between teacher and students (Den Brok, Fisher, Wubbels, Brekelmans, & Rickards, 2006; Fisher & Rickards, 1998; Hofstede, 1986; Hofstede, Hofstede, & Minkov, 2010). Therefore, it is important to study the characteristics of teacher-student interpersonal relationships also in other cultural contexts. The current PhD thesis focuses on the East Asian context, more specifically, secondary classrooms in the Chinese context.

This thesis, titled *Teacher-Student Interpersonal Relationships in Chinese Secondary Education Classrooms*, is a compilation of four studies and in this general introduction an overview is provided of the theoretical basis of these studies. First, the most prominently used theory in this thesis is introduced: the interpersonal theory and its application in education. All four studies included here investigated the relationship between teachers and students from an interpersonal perspective. Then, a brief review of previous literature is given on the associations between teacher-student interpersonal relationships and student outcome variables, on which we based our assumptions for the current work. Finally, we discuss literature on the characteristics of East Asian and Western classroom cultural contexts, which contributed not only to the development of expectations, but also provided a context for the discussion of our findings.

After this theoretical introduction, a brief summary is provided of the samples and methods applied in the thesis; a more specific description is included in the chapters per study. Finally, an introduction to each chapter of this dissertation is provided.

Interpersonal theory in education

This thesis applied interpersonal theory to conceptualize teacher-student relationships and teacher moment-to-moment behaviour. Interpersonal theory offers a systematic and integrative perspective to study human behaviour and relationships (Horowitz & Strack, 2011). Relationships from an interpersonal perspective describe behaviours of people within a social space or a social system, such as a classroom (Wubbels, Brekelmans, Mainhard, Den Brok, & van Tartwijk, 2016). The interpersonal theory conceptualizes behaviours and interpersonal perceptions with an interpersonal circumplex (IPC; Horowitz & Strack, 2010) in terms of two orthogonal dimensions: *agency* and *communion* (see Figure 1). The *agency* (vertical) dimension reflects interpersonal control and dominance, describing the degree to which a person strives for social influence, ranging from submissive to dominant. The *communion* (horizontal) dimension refers to interpersonal affiliation and connection, describing the level of emotional togetherness a person conveys, ranging from hostility and separation to friendliness or connecting with others. The IPC reflects all possible combinations of levels of agency and communion (Wiggins, 1991). Wubbels and colleagues (Wubbels, Créton, & Hooymayers, 1985) adapted interpersonal theory to the educational context into the *Interpersonal Circle for the Teacher* (IPC-T, Pennings et al., 2014; Pennings & Mainhard, 2016), which in the past has also been referred to as the Model for Interpersonal Teacher Behaviour (Wubbels et al., 1985). The IPC-T consists of eight octants, representing eight prototypical interpersonal teacher behaviours: Directing, Helpful, Understanding, Compliant, Uncertain, Dissatisfied, Confrontational and Imposing (Mainhard, 2015; see Figure 1). Interpersonal theory postulates that each behaviour someone shows in the vicinity of others can be described by a combination of both dimensions. The two interpersonal dimensions Agency and Communion are theoretically uncorrelated (Fabrigar, Wegener, MacCallum, & Strahan,1999), and this has been empirically shown in the educational setting too (Den Brok et al., 2004; Den Brok et al., 2005; Wubbels et al., 2006). For instance, teachers who notice that students are off-task may guide students towards productive behaviour in a considerate and friendly manner (i.e., helpful), or may get angry and use punishment to threaten students (i.e., confrontational). These two strategies represent similar levels of teacher agency yet opposite levels of teacher communion.

Since the development of a social system is nested in time hierarchically (Granic, 2005; Hollenstein, 2007), moment-to-moment teacher behaviour (i.e., the micro level) can be conceived as being nested in general teacher-student interpersonal relationships (i.e., the macro level) (Pennings et al., 2018), and teacher behaviour can be viewed as the building blocks for teacher-student relationships (Pennings et al., 2014; Hollenstein, 2007). Using the IPC-T, researchers can not only assess general teacher-student interpersonal relationships by mapping students' perceptions of their teacher's behaviour (Wubbels et al., 2006; Wubbels et al., 2014), but also by describing observed teacher behaviour from moment-to-moment in class (Pennings et al., 2017; Pennings et al., 2014; Pennings & Mainhard, 2016).

Figure 1. The Teacher Interpersonal Circle.
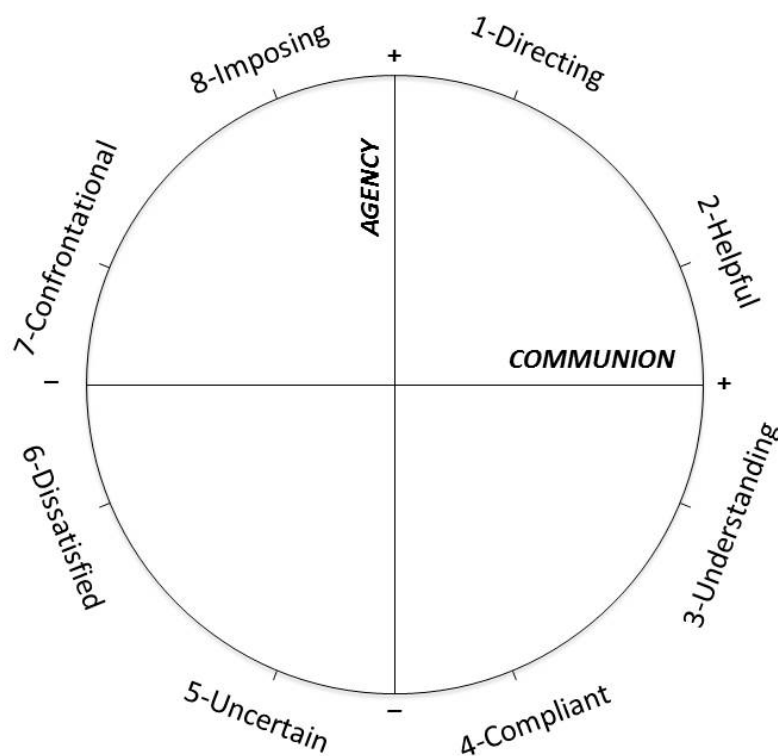
Based on the IPC-T, the Questionnaire on Teacher Interaction (QTI) was designed to measure student perceptions of teacher agency and communion. Corresponding to the eight IPC-T octants, the QTI items are divided into eight scales and each item loads on both underlying dimensions. The QTI has been translated to several other languages and sometimes adapted to other cultural contexts, for example, American English (Wubbels & Levy, 1991), Australian English (Wubbels, 1993), Indonesian (Maulana, Opdenakker, Den Brok, & Bosker, 2012) and Turkish

(Telli, Den Brok, & Cakiroglu, 2007) versions have been presented (for an overview see Wubbels et al., 2014). The most common and also preferred teacher-student interpersonal relationship in both East Asian and Western classrooms has been characterized by a combination of high teacher communion and moderately high teacher agency, i.e. as 'helpful' (Brekelmans, Wubbels & Den Brok, 2002; Wei, Den Brok, & Zhou, 2009; Wei, Zhou, Barber, & Den Brok, 2015).

Teacher-student interpersonal relationships and affective aspects of student learning

Affective aspects of classroom life, such as motivation, emotion and engagement, are important for student learning and well-being in school (e.g., Elliot & McGregor, 2001; Martin & Dowson, 2009; Pekrun, Goetz, Titz, & Perry, 2002; Roorda, Koomen, Spilt, & Oort, 2011). A number of studies have shown that positive interpersonal relationships between teachers and students, i.e. when teachers combine supportive and mildly dominant behaviour, contribute evidently to the development of effective learning environments for students (Brekelmans, Wubbels, & Den Brok, 2002; Hoy & Weinstein, 2006; Ross, Bondy, Bondy, & Hambacher, 2008) which benefit students (Mainhard, 2015; Mainhard et al., 2018; Roorda et al., 2011; Skinner & Belmont, 1993). In this thesis, we mainly focus on three affective variables: students' academic emotions, achievement goals and their behavioural engagement.

Teacher-student interpersonal relationships and students' academic emotion

Academic emotions are emotions that are experienced by students in academic settings on a daily basis (Pekrun, 2006). These emotions are directly linked to the students' achievement activities and outcomes. Prototypical academic emotions include enjoyment (pleasant, activating), relief (pleasant, deactivating), anxiety (unpleasant, activating), and boredom (unpleasant, deactivating). Emotions have a strong social aspect (Van Kleef, 2009) and emerge directly from firming or damaging of interpersonal relationships (Baumeister & Leary, 1995). Studies have clearly indicated a strong connection between teacher communion related concepts and student emotions. Students tend to experience pleasant emotions (e.g., enjoyment) when they perceive their teachers as being supportive and enthusiastic (i.e., high communion) (Goetz, Lüdtke, Nett, Keller, & Lipnevich, 2013; Mainhard et al., 2018). Conversely, students tend to experience unpleasant emotions (e.g., anxiety and boredom) when they perceive their teachers to be cold or excessively demanding (i.e., low communion) (Goetz et al., 2013). The association between teacher agency and student emotions is more ambiguous. Some studies found that providing structure and subject control (i.e., high agency) promote pleasant emotions such as

enjoyment (Goetz et al., 2013; Mainhard et al., 2018) and reduce unpleasant emotions such as anxiety and boredom (Goetz et al., 2013), whereas other research found that high teacher agency can enhance student anxiety (Mainhard et al., 2018) which may be due to a feeling of control loss in students (Pekrun, 2006).

Teacher-student interpersonal relationships and student achievement goals

Achievement goals refer to students' personal goal orientations which reflect students' reasons for engaging in learning activities (Anderman & Partrik, 2012). Elliot and McGregor (2001) used two fundamental dimensions to classify achievement goals: mastery/performance and approach/avoidance. Students' achievement goals are influenced by social contexts (Martin & Dowson, 2009). Teacher warmth and support directly affect students' pursuit of goals (Urdan & Schoenfelder, 2006). A supportive teacher (i.e., high communion) promotes students' strong adoption of mastery-goals (Mainhard, 2015; Turner, Gray, Anderman, Dawson, & Anderman, 2013); in contrast, an unsupportive, sarcastic and impatient teacher (i.e., low communion) is more likely to enhance students' adoption of avoidance goals (Turner et al., 2002). Autonomy and choice are also key elements for students' pursuit of goals (Ames, 1992). A teacher sharing authority with students, for example, giving students enough autonomy or involve them in decisions making, provide students a feeling of ownership (Urdan & Schoenfelder, 2006) and thus promotes high mastery goals (Ames, 1992; Urdan & Schoenfelder, 2006; Patrick et al., 2011). When a teacher exercises excessive control (i.e., high agency), students tend to become overly concerned about failing and adopt low mastery goals (Patrick et al., 2011), and to report strong performance goals (Mainhard, 2015; Patrick et al., 2011) and avoidance goals (Mainhard, 2015; Turner et al., 2002).

As achievement goals are also one of the antecedents of academic emotions (Goetz, et al., 2016; Pekrun, 2006), part of the association between teacher-student relationships and student emotion may be achieved indirectly through student goals.

Teacher-student interpersonal relationships and student behavioural engagement

Students' behavioural engagement refers to participation and involvement in academic and social activities (Skinner, Kindermann, & Furrer, 2009). Researchers claim that the concept of behavioural engagement also requires its opposite conceptualization, termed as disaffection (i.e., disengagement or absence of engagement).

Positive relationships between teacher and students are considered to promote student engagement, since these relationships contribute to students' positive attitude in school in general (White, 2013). From the interpersonal perspective,

teachers as warm demanders whose behaviour is characterized by high communion and moderately high agency usually show a healthy interpersonal relationship with their students and can affect students' attitude towards school work (Wubbels et al., 2006). Teacher support and involvement (i.e., high communion) are considered to be important predictors of student behavioural engagement in learning activities (Pianta, 1999; Roorda et al., 2011; Skinner & Belmont, 1993). Conflict (i.e., low communion) is considered to hamper students' behavioural engagement (Roorda et al., 2011). The number of studies related to the concept of teacher agency is rather limited. Teachers showing a moderately high dominance in class, such as setting clear rules and high expectations on academic performance, enhance students' behavioural engagement in class (Roorda et al., 2011; Ross et al., 2008; Skinner & Belmont, 1993). Specifically, a certain level of teacher dominance may be necessary to strengthen the positive effect of teacher supportive behaviour on students (Den Brok et al., 2005; Hoy & Weinstein, 2006; Mainhard, 2015; Pennings et al., 2018).

Teaching in East Asian classrooms

The cultural characteristics of a society are usually reflected in typical social relations such as relationships between teacher and students in school (Wubbels et al., 2006; Fisher & Rickards, 1998; Hofstede, 1986; Hofstede et al., 2010). An important element to describe cultural context is *power distance* (Hofstede et al., 2010) which is clearly connected to the concept of interpersonal Agency, because it emphasises the acceptance of inequality in power distribution. East Asian classrooms are usually characterized by a large power distance (i.e., high acceptance of unequal power distribution). Teachers in the East Asian cultural context are expected to be an authority and expert (Zhu, Valcke, & Schellens, 2010) and to show strictness (i.e., high agency) (Wei et al., 2009; Wei et al., 2015). Western cultures are often characterized by a relatively small power distance (i.e., low acceptance of inequality in power distribution). Teachers in Western classrooms are expected to give students freedom in class (i.e., low teacher agency) (Hofstede et al., 2010). Therefore, highly agentic teacher behaviour may be valued in the East Asian classroom context more than in the Western classroom.

Another important element to describe culture is *collectivism versus individualism* (Hofstede et al., 2010; Triandis, 2004) which may be reflected in interpersonal communion. In East Asian classroom contexts, which are characterized by collectivist ideas (i.e., emphasis on shared interest and group harmony), teachers are expected to build group harmony, being a moral example and caring for students (i.e., high Communion) (Jin & Cortazzi, 1998). In Western classrooms that are characterized by individualist thinking (i.e., emphasis on individual importance and

interest) (Hofstede et al., 2010), having good social communication skills and being sympathetic (i.e., high Communion) are highly valued in teachers (Jin & Cortazzi, 1998). Therefore, in positive teacher-student interpersonal relationships relatively high teacher communion may be expected in both East Asian and Western classrooms. Considering the characteristics of East Asian and Western societies and classroom contexts, it is clear that previous findings that are based on samples drawn from Western contexts may not always be applicable in the East Asian contexts.

The current thesis project and outline of the thesis

The aim of the studies in this PhD thesis was to investigate if the interpersonal framework of teacher-student relationships can be used in Chinese classroom contexts including assessing the relevance of teacher interpersonal behaviour for students' affective variables in school. To reach this aim, we conducted four studies: first, to measure how students perceive their teacher interpersonally, we developed a contextualized adaption of the instrument, i.e., the Chinese version of the QTI (study 1); second, to further understand teacher-student interpersonal relationships in the Chinese context, we assessed how it is related to student goals, emotions (study 2) and behavioural engagement (study 3); and finally, to get insight into teacher moment-to-moment behaviours in the East Asian classroom contexts, we used case-studies consisting of video observations of five classrooms to look at how Chinese teachers behave interpersonally in class from moment to moment (study 4).

Chapter 2 describes the first study that aimed to develop an improved Chinese version of the QTI which was conceptual parallel with the Dutch and American English versions and well represented the circumplex nature of the IPC-T. The research question of the first study was: to what extent is the newly developed Chinese version of the QTI a reliable and valid instrument for measuring students' interpersonal perceptions of their teachers in Chinese secondary classrooms? The sample was questionnaire data including 2000 grade-7 to -9 students rating 80 teachers from 40 classrooms in 4 public junior secondary schools in China. The process of development of the Chinese QTI contained several steps, including expert panels and semi-structured interviews with teachers and students. New items were also created based on the Chinese secondary classroom context, rather than only using translations of English items. In this study, we applied CircE analyses (Grassi, Luccio, & Blas, 2010) in R which was specifically used for testing the structural validity of items underlying a circumplex structure. The overall fit of the items was tested in both unconstrained and strictly constrained models.

Chapter 3 gives an explanation of the second study. The second study aimed to investigate how students' perceptions of their teacher's interpersonal agency and

communion and students' achievement goals jointly function as antecedents of students' academic emotions. The research questions guiding this study were: 1) to what degree do students' interpersonal perceptions of their teacher and their achievement goals predict students' academic emotions, and 2) to what degree is the association between students' interpersonal perceptions of their teacher and their academic emotions mediated by students' achievement goals? The participants are the same as in study 1. In this study, in addition to the Chinese QTI developed in study 1, we also used a Chinese version of the Achievement Goal Questionnaire (AGQ) (Xiao, Bai, Wang, & Cui, 2013) to measure students' achievement goals, and a Chinese version of the Academic Emotion Questionnaire (AEQ) (Frenzel, Thrash, Pekrun & Goetz, 2007) to measure students' academic emotions. In study 2, we used structural equation modelling (Kaplan, 2008) with Mplus to test the direct and indirect associations between the variables. A two-level model was built with individual students' personal perception at the lower and classroom shared perception about the same teacher at the higher level. As the variance of achievement goals largely resided at the student level, we focused specifically on the student level in this study.

Chapter 4 describes the third study, which aimed to explore how teachers as warm demanders may affect Chinese students' behavioural engagement by investigating the synergetic effect of communal and agentic teacher behaviour, especially how teacher agency might contribute to the effect of teacher communion. The research question of this study was: How are teachers' communion and agency independently and jointly associated with students' behavioral engagement and disaffection? The sample consisted of questionnaire data of 800 grade 7-9 students rating 40 teachers from a public junior secondary school in China. Students completed questionnaires on their perception of teacher interpersonal behaviour and their behavioural engagement in class. In this study, we applied the Chinese QTI developed in Study 1, and a ten-item student self-report questionnaire of their behavioural engagement and disaffection (Skinner, Furrer, Marchand, & Kindermann, 2008), with five items for each scale. In study 3, we conducted multi-level regression analyses in SPSS with student behavioural engagement and disaffection as the dependent variables in two separate models. Agency was tested as a moderator of the association between communion and behavioural engagement at the teacher and the student level.

Chapter 5 discusses the fourth study. The goal of the fourth study was to investigate what interpersonal teacher behaviour in the context of positive teacher-student relationships looked like in Chinese classrooms. The research question was: How do Chinese teachers with a positive interpersonal relationship as

judged by their students on a macro level (i.e. high in Communion and moderately high in Agency) behave interpersonally when judged on a micro level? The sample in this study included five Chinese teachers selected from the 40 teachers of study 3. Five Dutch teachers, selected from 37 teachers of a previous Dutch study (Pennings et al., 2018), with matched general teacher-student relationships served as a context for the findings in the Chinese classrooms. In this study, we used the Continuous Assessment of Interpersonal Dynamics (CAID) to code teacher moment-to-moment behaviour. CAID is a joystick based observation procedure developed by Sadler, Ethier, Gunn, Duong, and Woody (2009). Movement of the joystick over the interpersonal circle is recorded in real time by the computer program Joymon.exe (Lizdek, Sadler, Woody, Ethier, & Malet, 2012).

Chapter 6 summarizes and discusses the major findings of the studies into a general conclusion, and furthermore, discusses the studies' limitations and possible future research directions.

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CHAPTER 2

DEVELOPMENT AND EVALUATION OF A CHINESE VERSION OF THE QUESTIONNAIRE ON TEACHER INTERACTION (QTI)[1,2]

Abstract

Teacher-student interpersonal relationships play an important role in education. The Questionnaire on Teacher Interaction (QTI) was designed to measure students' interpersonal perceptions of their teachers. There are two Chinese versions of the QTI for student use, which inherited the weaknesses of the previous English versions. These versions include, for example, items that focus on class behaviour, instead of teacher behaviour, or they include conditionals and negations. The present study aimed to develop an improved Chinese version of the QTI which is conceptually parallel with the original QTI and with the use of optimal item wording. The process contained several steps, including expert panels and student and teacher interviews. New items were also created based on the Chinese secondary classroom context, rather than only using translations of English items. The final version of the Chinese version of the QTI presented in this paper was evaluated with a sample of 2000 students from 4 secondary schools in mainland China, rating a total of 80 teachers. The resulting version of the Chinese QTI had adequate validity and reliability, and it distinguished clearly between teachers. The predictive validity was supported by the relation between the students' perceptions of their teachers and their academic emotions in class. Although further improvement of the instrument is recommended, the instrument can be used to study interpersonal teacher behaviour in China and to help improve Chinese teachers' teaching practices.

CHAPTER 2

Introduction

Teacher-student relationships have been studied extensively in education (e.g. Maulana, Opdenakker, Den Brok, & Bosker, 2012; Telli, Den Brok, & Cakiroglu, 2007; Passini, Molinari, & Speltini, 2015; Wubbels, et al., 2014). The importance of interpersonal relationships in education has been appreciated for years because positive relationships between teachers and students contribute to student learning and wellbeing (Den Brok, Brekelmans, & Wubbels, 2004; Den Brok, Levy, Brekelmans, & Wubbels, 2005; Goh & Fraser, 2000). To conceptualize teacher-student interpersonal relationships, Wubbels, Créton and Hooymayers (1985) adapted Leary's interpersonal circle (Leary, 1957) to the educational context into the Model for Interpersonal Teacher Behaviour (Wubbels et al, 1985), which more recently, and in line with research in interpersonal psychology, is also referred to as the *Teacher Interpersonal Circle* or the IPC-T (Pennings et al., 2014; Pennings & Mainhard, 2016). The IPC-T is a circumplex model representing prototypical teacher behaviours. Based on this model the *Questionnaire on Teacher Interaction* (QTI) was created to measure teacher-student interpersonal relationships by capturing students' interpersonal perceptions of their teachers. The QTI was originally developed in Dutch (Wubbels et al., 1985), and has been adapted to and translated into several other languages, for example, American English (Wubbels & Levy, 1991), Australian English (Wubbels, 1993), Turkish (Telli et al., 2007) and Indonesian versions (Maulana et al., 2012) (see Wubbels et al., 2014 for an overview). However, some QTI adaptations have involved straightforward, literal translations, thus heightening the risk of misunderstanding caused by variation in the interpretation of seemingly similar interpersonal meanings of words in different languages (Wubbels et al., 2012). According to Wubbels et al. (2012), a further step in the adaptation of the QTI is crafting conceptually parallel versions rather than direct translations, considering language and cultural embeddedness. This means besides high alpha reliabilities, it is also important for the adapted versions to have their items structured into a pattern that represents the circumplex nature of the model, and the items represent equivalent positions on the interpersonal circle across versions.

Among the adaptations of the QTI are also Chinese versions. A simplified Chinese version was developed and applied in south-west China to measure the perceptions of Chinese students (Wei, Den Brok, & Zhou 2009). A traditional Chinese version was created later in Hong Kong (Sivan, Dennis, Chan, & Kwan, 2014). Earlier, a version specifically adapted to measure teachers' self-perceptions, was published in a Chinese journal (Xin & Lin, 2000). Considering that the educational system and cultural context in China are very different from that in the western countries, the

goal of the present study was to further improve the current Chinese versions of the QTI in terms of reliability and validity, by crafting a Chinese version of the QTI which is conceptually parallel to the original QTI.

The Teacher Interpersonal Circle (IPC-T)

The interpersonal theory was applied to conceptualize interaction and interpersonal perceptions in terms of the meta-labels *agency* and *communion*, which are combined in an interpersonal circumplex (IPC; Horowitz & Strack, 2010). The *agency* (vertical) dimension refers to interpersonal influence and control, describing the level to which someone strives for dominance and control, and ranging from yielding to influencing. The *communion* (horizontal) dimension refers to interpersonal proximity, affiliation or connection, describing the degree of emotional togetherness someone conveys and ranging from keeping separate to connecting with others. The IPC is a weighted combination of levels of both dimensions, reflecting all of the possible combinations of agency and communion (Wiggins, 1991). In the educational context, the IPC for the teacher (IPC-T) is the latest version of the Model for Interpersonal Teacher Behaviour (Wubbels et al, 1985). As Wubbels et al. (2012) describe, during the last decades, a change in labels for these dimensions has occurred (Brekelmans, Mainhard, den Brok, & Wubbels, 2011; Wubbels et al, 1985; Wubbels et al., 2014), which reflects a process of compliance with the use of labels in interpersonal psychology (Horowitz & Strack, 2010). At first, Influence and Proximity were used, later also control and affiliation, and finally, agency and communion were used as labels of the underlying dimensions of the IPC-T and thus the QTI. Note that this is merely a question of labels and not concerning the essence of the underlying construct which remained the same. The IPC-T describes a teacher's general behavioural tendencies in interpersonal terms, and it can be used to describe students' interpersonal perceptions of how a teacher generally behaves in class (Wubbels et al., 2014). The IPC-T is divided into eight octants, describing eight prototypical types of teacher interpersonal behaviour as 1-Directing, 2-Helpful, 3-Understanding, 4-Compliant, 5-Uncertain, 6-Dissatisfied, 7-Confrontational and 8-Imposing (Mainhard, 2015; Wubbels et al., 2014; see Figure 1, numbers refer to octants in the model). Just as was the case with the underlying dimensions, also the labels for these eight specific positions on the IPC-T have changed somewhat over time with the aim of improving the clarity of what specific underlying blend of agency and communion is referred to (Wubbels et al., 2014). Thus the original labels (Leadership, Helpful, Understanding, Student Freedom, Uncertain, Dissatisfied, Admonishing and Strict, in Wubbels et al.,

1985) conceptually were meant to convey the same interpersonal meaning of teacher behaviour in class as the labels used more lately.

Figure 1. The Teacher Interpersonal Circle.
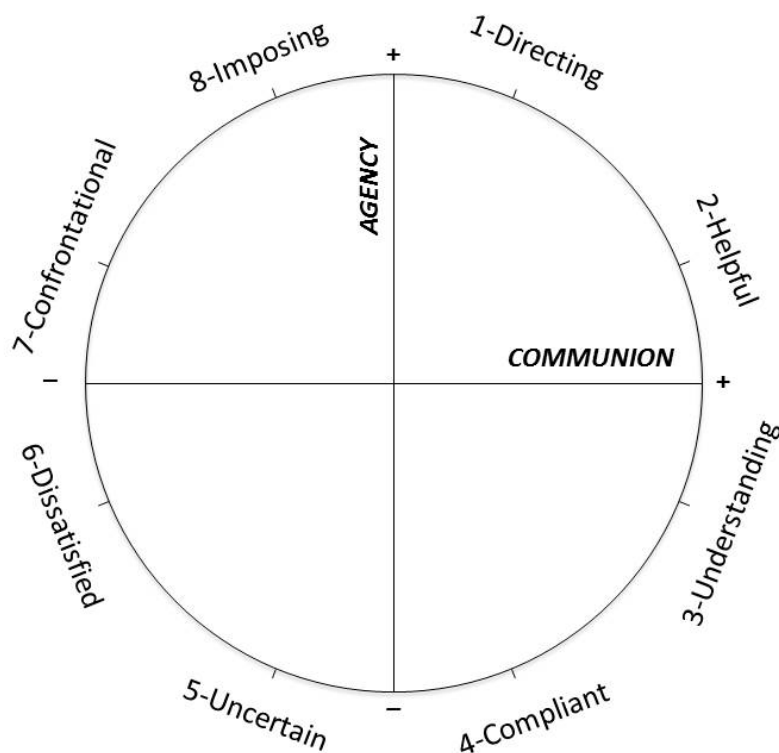
On the IPC-T, neighbouring octants are highly positively correlated (e.g., 8-Imposing and 1-Directing overlap substantially in their interpersonal meaning), whereas octants opposite to each other are highly negatively correlated (e.g., 1-Directing and 4-Uncertain). Theoretically and empirically, the two interpersonal dimensions are uncorrelated in heterogeneous samples, and the octants are equally distributed (i.e., equidistant), occupying specific positions on the circle. Each octant reflects a specific blend of the independent dimensions - agency and communion. Knowing the level of agency that a teacher conveys in class does not allow for inferring how communion is enacted, and vice versa. For example, teacher behaviour representing moderately high agency might either be confrontational behaviour (when combined with relative low communion) or helpful behaviour (when combined with relative high communion).

The Questionnaire on Teacher Interaction (QTI)

QTI was originally designed in Dutch, and it consists of 77 items (Wubbels et al., 1985) measuring student perceptions (and teachers' self-perceptions) of the level of agency and communion that teachers convey in class. The items of the QTI are divided into eight scales corresponding with the eight octants of the IPC-T. As each item corresponds to one of the octants, unlike in questionnaires with simplex structures, therefore, it loads on both underlying dimensions instead of only one. For example, the item " this teacher changes his/her mind in response to student feedback", belonging to the 4-Compliant scale, reflects both, rather low levels of agency and moderate levels of communion, whereas the item "this teacher gets angry quickly", belonging to the 7-Confrontational scale, reflects low teacher communion combined with moderately high agency. Items are rated on a 5-point Likert-type scale, bounded by "Never" and "Always".

The first translation of the QTI was an American English version, consisting of 64 items after adding, deleting and adjusting items based on several rounds of testing (Wubbels & Levy, 1991). This first translation was a conceptually parallel version, with the items representing equivalent positions on the interpersonal circle as the original Dutch version. This version was initially also applied in Australia and was then revised into a 48-item selection for the Australian context (Wubbels, 1993). This Australian version of the QTI was then translated into several languages and applied in various countries such as Singapore (Goh & Fraser, 1998), Brunei (Scott & Fisher, 2004), Turkey (Telli et al., 2007), Indonesia (Maulana et al., 2012), and Italy (Passini et al., 2015). Although these later translations may have had the goal of achieving to the original QTI parallel measures, most of them used translation procedures only.

Next to the issue of conceptually parallel measures, Wubbels et al. (2012) noted that the original Dutch, and therefore the American and Australian versions and later translations had some conceptual weaknesses. Most translators were not aware of these weaknesses which were published only in Dutch (Créton & Wubbels, 1984). For instance, the correlations between octants (i.e., the position of octants on the circle) deviated from the position of octants on the theoretical circumplex, that is some scales showed higher or lower correlations than a model with equidistant octant scores would exhibit. Another problem was related to the wording of items. According to Wubbels et al. (2012), the items should describe general, unconditional situations rather than specific instances of classroom situations (e.g. 'this teacher is uncertain' - 5-Uncertain), focus on the teacher rather than students (e.g. 'this teacher has a sense of humour' - 2-Helpful), concentrate on interpersonal processes rather than more didactic issues (e.g. 'this teacher is strict' - 8-Imposing), and avoid using negative forms. However, for example the Australian

48-item version contained 5 items using conditional formulations (e.g. 'if we don't agree with this teacher, we can talk about it'), 6 items describing student behaviour instead of teacher behaviour (e.g. 'we can decide some things in this teacher's class'), 3 items focussing on pedagogical or didactical rather than interpersonal issues (e.g. 'this teacher is severe when marking papers'), and 6 items used negative formulations (e.g. 'This teacher is not sure what to do when we fool around'). Versions adapted from the Australian adaptation have risked repeating these problems. Furthermore, Wubbels et al. (2012) claimed that the goal of making an adaptation is to produce a conceptually parallel instrument with not only high alpha reliabilities for each scale, but also a pattern of scale correlations that represents the circumplex nature of the IPC-T. Therefore, the items need to be structured to measure each blend of agency and communion on the circle equally across all versions. Making parallel items by only translation and back-translation procedures may not be adequate to represent parallel circumplex structures across versions, as participants from different cultural contexts may interpret seemingly parallel translations as differing in the specific blend of agency and communion (i.e., the specific position of an item on the interpersonal circle). As noted by Telli et al. (2007), if only translation and back-translation procedures would be applied, scale reliability might appear good, but it is questionable whether such a translation would be conceptually comparable to the original Dutch and English versions. Hence, when adapting the QTI to another language, it is essential to adapt to the local context by considering the position of the items on the circle, and thus to create a version conceptually parallel with the IPC-T.

With the essential goal of creating a questionnaire including items that are able to measure perceptions representing the eight octants of the IPC-T validly, conceptual parallel adaptations have been made in Turkey (Telli et al., 2007) and Indonesia (Maulana, 2012). For both versions interviews with local teachers and students were performed, and different meanings of items of the original American English version as compared to the Turkish and Indonesian context were identified. New items were created based on interviews and some items were moved to other scales. About 70% of the original American English items were directly translated and used in the Indonesian version and about 40% were used in the Turkish version. More recently, a 24-item selection of the Dutch version was developed from the original 77 items after several rounds of item selecting process. This latest 24-item version has increasingly been used in most Dutch studies (e.g. Mainhard, 2015; Pennings et al., 2014). These 24 Dutch items were selected and reworded based on the following criteria: describing general teacher behaviour, focusing on interpersonal process rather than pedagogical issues, concentrating on the teacher

rather than the behaviour of students, and avoid using negative forms. Thus, in terms of wording a more homogeneous set of items appeared. Also, the crafting of the Chinese version of the QTI described in the current paper was informed by these criteria.

Applications of the QTI in China

Until now, three Chinese versions of the QTI have been published, all of them using the 48-item Australian version as their starting point for translation and adaptation. Xin and Lin (2000) translated the Australian QTI into Mandarin and modified it into a teacher version with the specific aim of measuring teachers' self-perceptions only. A student version published by Wei et al. (2009) was applied in classrooms in the south-west part of China where English as a foreign language was taught. This was the first time to apply the QTI in the Chinese context by accepted translation procedures with students assessing the behaviour of their teachers. Their sample consisted of 160 grade-8 students from four secondary education classrooms. For their version single-level confirmatory factor analysis using MPlus (Muthén & Muthén, 1999) was conducted to test the model fit at the scale level. A model that allowed scales to shift freely over the circle showed a rather satisfying fit, whereas for a stricter model applying the theoretical, equidistant positions of octant scores on the circumplex, the model fit was less satisfactory. For example, compared to the theoretical model, the 4-Compliant scale had a higher factor loading on Agency, and the 5-Uncertain scale had a higher factor loading on the Communion dimension than expected, that is, these scales were shifted over the IPC-T. Additionally, the internal reliabilities of some of the scales were not satisfactory and the authors concluded that additional improvement was needed. For example, more qualitative data sources were suggested to improve the quality of the questionnaire, such as interviews with students and teachers for generating new items and in order to assess whether translated items reflect actual teacher behaviour in the Chinese classroom context.

A different Chinese QTI adaptation translated from the 48-item Australian version was developed and tested by Sivan and Chan (2013), based on a convenience sample consisting of 612 grade-9 students from 16 classrooms in six secondary schools in Hong Kong. The validity was tested by calculating inter-scale correlations at both the individual student level and the class level. Although the correlations generally reflected the circumplex nature of the IPC-T, some problems were observed. For instance, the 1-Directing scale was positively correlated with all seven of the other scales at the individual level, indicating that a problem with measuring more submissive teacher behaviours existed. In sum, in terms of the circumplex structure,

the correlations between scales indicated a deviant spacing and ordering of octants. More recently, Sivan et al. (2014) improved the instrument with a sample of 739 grade-5 and -6 primary school students in Hong Kong. Principal component analysis with oblique rotation and maximum likelihood confirmatory factor analysis were performed on two sub-samples separately and one-, three-, and eight-factor models were examined. Although the eight-factor model showed a satisfying fit, it indicated many correlated factors rather than two orthogonal factors (i.e. agency and communion) underlying the IPC-T. Both student versions of the Chinese QTI adaptations inherited the item formulation problems of the original Dutch and Australian version.

The current study's goal was to develop an improved Chinese version, a conceptual parallel version which well represents the circumplex nature of the IPC-T and with the use of optimal item wording. The process included, first, to follow the process of item formulation and selection as applied to the improvement of the most recent Dutch version (e.g., focusing on general, in-class behaviours of teachers and avoiding the use of negative forms); and second, to ensure face validity of items in the Chinese classroom setting, by conducting interviews with students and teachers to test whether the translated items, octant and dimension labels were able to represent the intended combination of agency and communion in the actual classroom context; and finally, to apply a stricter, confirmatory test of the circular structure of items and scales, and to improve the validity of the questionnaire.

Therefore, in the current study, a Chinese version of the QTI was developed based on the previous versions by reformulating existing items but also by crafting new items. This version was tested with a large data set. The research question was:

To what extent is the newly developed Chinese version of the QTI a reliable and valid instrument for measuring students' interpersonal perceptions of their teachers in Chinese secondary classrooms?

Methods

Item crafting and face validity

As a first step, informed by the previous Chinese versions and on the basis of the Australian version and the Dutch 24-item selection, and following the item crafting criteria as described above, 37 Chinese items were crafted by the first author. Two other Chinese educational researchers were involved in ensuring the face validity for the Chinese context.

To test whether the wording of items represented the intended blend of agency and communion in the classroom context well, and to receive additional practical suggestions for item wording, semi-structured interviews, based on the existing 37

items, were conducted with 10 teachers and 10 students from two regular high schools and two vocational secondary schools in Jining city, Shandong Province, which is located in the eastern part of China. Nine female students and one male student participated in the interviews, with their age ranging from 15 to 18. The participating teachers included nine female teachers and one male teacher, and their teaching experience varied from 3 to 30 years. All interviewees participated on a voluntary basis and the data were treated anonymously. The interviews were audio recorded with the oral agreement of every interviewee. To assess how items were interpreted, the participants were asked to think-out loud while completing the questionnaire. Teachers were asked to think of how they perceived themselves in class, while students were asked to think of how they perceived their favourite and least favourite teachers while discussing the items offered and while thinking of new or alternative item formulations. For example, favourable teacher behaviours described by students are as follows:

"This teacher is very responsible in class. Every time when we had questions, she would explain it clearly and figure out why we had these questions."

"She treats all students equally. No matter a student has good grades or bad grades, she shows no partiality."

"He is very strict on our study, but he cares about us in daily life, he is like a friend to us."

Examples of unfavourable teacher behaviours described by students are as follows:

"She is always late for class, and never apologises for it. Also, she doesn't care whether we understand what she teaches in class, which is not very responsible."

"She says offensive words to students. She wants us to respect her, but she doesn't respect us."

"She punishes us to clean the classroom for a week if we are late for school, or if we are found to use our cellphone in class. Also, she will take away our cellphone."

Based on these interviews, most of the items were considered understandable, but also several problems appeared. For example, according to the interviewees, some 4-Compliant and 5-Uncertain items were problematic as the behaviours described in these items almost never occurred in their classrooms. This was in line with the low reliabilities of these two scales in earlier Chinese versions of the QTI (Sivan et al., 2014; Wei et al., 2009). To solve this problem, the participants were asked to think of situations in which a teacher might be compliant or uncertain in the participants' eyes and several items were reworded. Starting with this round of interviews and with the goal to create a larger item base for quantitative testing and selection of items, an item pool consisting of 80 items was created.

CHAPTER 2

Main test

Sample and procedure

The 80 Chinese QTI items were administered to 2000 grade-7 to -9 students from 40 classrooms in 4 public junior secondary schools in Weihai city, Shandong Province in May 2015. First, approval was provided by the principals to conduct the survey. Further, it was made clear to teachers and students that participation was voluntary and that the data would be treated anonymously. An administrative teacher went into each classroom to distribute paper questionnaires and answer sheets to students during self-study classes.

In order to assess the predictive validity of the QTI, additionally to the QTI items, eight academic emotion items were administered to measure emotions experienced by students during class. Academic emotions are the emotions experienced by students in academic settings on a daily basis, and these emotions are connected with teacher behaviour in classrooms (Pekrun, 2006). In the present study, two academic emotions were used: enjoyment and anxiety. Four items were selected for each emotion from a Chinese version of the Academic Emotions Questionnaire (AEQ) (Pekrun, Goetz, Frenzel & Perry, 2005). Items were answered on a 5-point Likert-type scale. Finally, 1995 usable questionnaires were collected. The students were, on average, 13.49 years old, ranging from 11 to 17 years. Of the students, 50.6% were females; 1427 students (71.5%) were in grade 7, 231 (11.6%) were in grade 8, 196 (9.8%) were in grade 9, and 141 students (7.1%) failed to report the grade level. As is common in China, each class contained about 50 students; approximately half of the students in each class (22 to 26 students) completed the questionnaire for a specific teacher, resulting in ratings of 80 teachers. Each school received a short report summarising the results on a general level.

Item selection

To develop a shorter, less time-consuming, reliable and valid instrument, item selection was performed from the 80 items in the pool. For this selection, the sample was split into two subsamples by sorting the data by teacher, labelling the even and odd numbered questionnaires per teacher to samples A and B, respectively. Item selection, based on internal validity analysis and reliability analysis, was performed on sample A (n=1029), and internal validity and reliability were then re-evaluated with sample B (n=964).

To select items, the first step was to assess the quality of each item using item descriptive statistics, including the mean, range, standard deviation, skewness and kurtosis. Intra-class correlations (ICC) were calculated, aiming to examine the consensus between students and thus whether an item could distinguish between

teachers adequately. Items with a relatively low ICC (less than 0.10) or extreme descriptive coefficients (e.g., skewness greater than 2.0, kurtosis greater than 3.0) were nominated for exclusion. On the QTI, items are viewed as repeated measures of an octant; therefore, internal reliabilities and item-rest correlations per octant were also considered.

CircE (Grassi, Luccio, & Blas, 2010) was used in the R statistical environment, version 3.2.2, to select items based on how the items and scales were projected on the IPC-T and to test the overall model fit. CircE was specifically developed to test the structural validity of items with an underlying circumplex structure. Model fit was checked with four goodness-of-fit indices after each round of trimming: the standardised root mean square residual (SRMR), the root mean square error of approximation (RMSEA), the comparative fit index (CFI) and the Tucker-Lewis index (TLI). As the RMSEA levies a harsher penalty for complexity in relatively small models containing only a few variables (Kline, 2011), we used the RMSEA at the item level but emphasised it less when evaluating models based on scales.

Both unconstrained and stricter constrained models were tested. The unconstrained model represented a free circumplex, hypothesising two independent dimensions yet allowing scales to shift over the circle. In the stricter model, the items were constrained to be situated within a specific octant, and the octants were set to be spaced equally around the circle (Grassi et al., 2010). After each round of item trimming, the unconstrained and constrained models were also tested at the scale/octant level for the purpose of checking the order and spacing of the scale scores. Additionally, the internal reliabilities of the involved scales were checked. In some cases, items with less than favourable descriptive coefficients or relatively low ICC values had to be retained to maintain acceptable validity and scale reliability. For instance, the items "this teacher let students boss him/her around" (skewness=3.38), and "this teacher tolerates a lot of student behaviour" (ICC=0.08) were included in the final item selection.

Some items were projected in a different octant than originally intended, with their loadings indicating a more favourable fit in a different octant. In this case, when face validity allowed, these items were moved from the original to the other octant. For instance, the original 7-Confrontational item "this teacher is easily offended" was projected in the 6-Dissatisfied octant on the circle and better represented as measuring dissatisfied behaviour. So we moved it into the 6-Dissatisfied scale in the questionnaire. The item "this teacher can take a joke" originally belonged to the 2-Helpful scale in the Dutch, American and Australian versions, whereas in the current Chinese sample it loaded on the 4-Compliant octant. Items were removed when they loaded in a different octant than intended but face validity didn't allow to

move it. In the end, 12 items were moved between octants.

This process of trimming was repeated until no further improvement of the model with as few items as possible could be reached. Of the 40 items included in the final selection of the Chinese QTI, 13 were newly created items (see Appendix A for a list of all included items). The validity and reliability of this selection of items were then re-evaluated on subsample B.

Finally, the scale and dimension scores were correlated with students' academic emotions to evaluate the predictive validity of the current QTI version. The Cronbach's alpha of enjoyment and anxiety emotions were 0.86 and 0.57 respectively. As stated by Pekrun, Elliot and Maier (2006), enjoyment emotions tend to be experienced when an activity is valued as positive and warm, while anxiety is usually experienced when an activity is perceived to be negative and cold. Therefore, it could be expected that the Enjoyment scales would be correlated positively with the four QTI scales representing positive communion - 1-Directing, 2-Helpful, 3-Understanding and 4-Compliant - and negatively with the other four scales representing negative communion, while the Anxiety scale was expected to be correlated with the QTI scales reversely. Both Enjoyment and Anxiety were expected to have stronger correlations with the octants representing the most and least communion, that is 2-Helpful, 3-Understanding, 6-Dissatisfied and 7-Confrontational.

Results

The validity was tested with the CircE application in R in both unconstrained and constrained conditions on item and scale levels for samples A and B. The values of the four fit indices of the Chinese QTI are listed in Table 1.

Table 1. Goodness-of-Fit indices for CircE models of the Chinese QTI

Model	RMSEA	SRMR	TLI	CFI
Sample A				
Item (unconstrained)	0.04	0.06	0.90	0.91
Item (constrained)	0.05	0.08	0.89	0.90
Scale (unconstrained)	0.10	0.04	0.92	0.97
Scale (constrained)	0.10	0.04	0.92	0.97
Sample B				
Item (unconstrained)	0.05	0.06	0.89	0.90
Item (constrained)	0.05	0.09	0.88	0.89
Scale (unconstrained)	0.13	0.05	0.89	0.96
Scale (constrained)	0.14	0.08	0.85	0.95

Note. As the RMSEA levies a harsher penalty for complexity in relatively small models containing only a few variables (Kline, 2011), the RMSEA should be less emphasised when evaluating the models based on scales.

From Table 1, it can be seen that in the unconstrained model for items in sample A, all the indices suggested adequate fit. When all of the items were constrained to fall within octants, only the TLI had a slightly lower value. Also for scale scores, except for the RMSEA, all indices showed supportive values for good model fit in both the unconstrained and constrained conditions. Note that we deemed the RMSEA less informative for models including scale scores (see section *Item selection*). Overall, the indices showed that the questionnaire adequately represented the IPC-T in sample A. As might be expected, because the model fit was maximized for sample A, the fit indices were somewhat less supportive in sample B. The model fit was, however, still deemed acceptable.

Figure 2 provides a visual representation of how the QTI items projected on the IPC-T in both the constrained and unconstrained situations. The items and scale scores situated on the left side of the IPC-T (representing negative communion) fell within their octants as expected. However, the spacing was not perfect. Further, a few items of the 1-Directing, 3-Understanding, 4-Compliant and 8-Imposing scales fell on the octant boundaries. At the scale level, the score for 3-Understanding also located on the upper border of the respective octant, indicating that it was correlated too strongly with the 2-Helpful scale. Apparently, the 3-Understanding items were slightly more agentic than they should be theoretically, which however was consistent with the versions in other countries, such as Singapore and Australia (Den Brok, Fisher, Wubbels, Brekelmans, & Rickards, 2006). Furthermore, the spacing between the 1-Directing and 8-Imposing scales was greater than expected. From Figure 2, we can see that there was a lack of items representing sufficiently high agency situated in the upper middle space of the circle, indicating larger than on a theoretical basis desirable communion differences between these two scales.

Amongst the eight scales, the 1-Directing, 4-Compliant, 5-Uncertain and 8-Imposing scale scores spaced slightly closer to the centre of the circle, indicating that, in this sample, the items did reflect somewhat small variance. Amongst them, the 4-Compliant scale was located closest to the centre of the circle due to lower variances of its items on both agency and communion, demonstrating a problem similar to one in previous studies in China and other countries, such as Singapore, Brunei, Australia (Den Brok et al., 2006), Turkey (Telli et al., 2007), Indonesia (Maulana et al., 2012) and Italy (Passini et al., 2015).

Figure 2. The circular models of the 40-item Chinese QTI as displayed by CircE (Grassi et al., 2010) of sample A.

Item level, unconstrained Item level, constrained

Scale level, unconstrained Scale level, constrained

Attended Circular Order

+ 1-Directing   o 2-Helpful   ◇ 3-Understanding   ● 4-Compliant

▲ 5-Uncertain   ▽ 6-Dissatisfied   ▲ 7-Confrontational   ✳ 8-Imposing
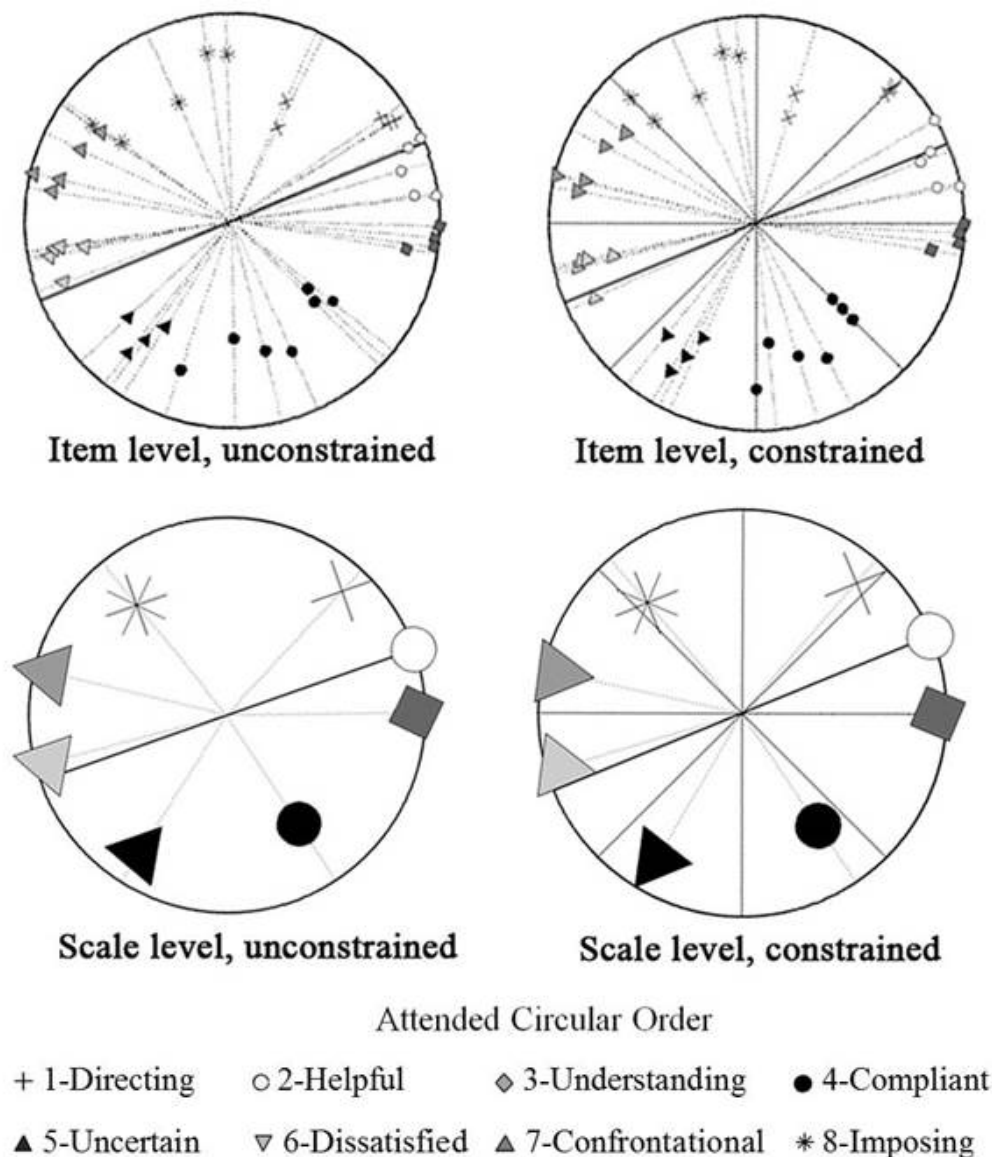
Figure 2 shows the order and spacing of items and scales in a circumplex under two different conditions: constrained and unconstrained (see labels). The two models on the right side (the constrained models) contain the eight boundaries representing the theoretical borders of the octants. The Cronbach's alpha values ranged between 0.60 and 0.84 for the eight scales, showing acceptable reliabilities in both sample A and sample B (for an overview see Table 2). In sample A, the ICC at the octant level ranged from 0.13 to 0.31, indicating that the questionnaire could distinguish rather well between teachers. Besides the ICC, which refers to the average correlation between individual students' ratings of the same teacher, the ICC2 was also calculated, providing an estimate of the reliability of class-mean ratings (Lüdtke,

Robitzsch, Trautwein, & Kunter, 2009). The ICC2 indicated that the classroom aggregates of the scales were rather reliable (values greater than 0.70 indicate sufficient reliability, Lüdtke et al., 2009), ranging from 0.79 to 0.92 for an average class size of n=25, and between 0.74 and 0.82 for n=10 except for the 4-Compliant scale (0.60). The reliabilities of both the agency and communion dimensions were adequate, and the correlation between the two dimensions was statistically non-significant with a value of 0.03 (*p*=0.28). See Table 2 for an overview.

Table 2. Mean, standard deviation, ICC and reliability of the Chinese QTI scales and dimensions

	Number of items	M	SD	ICC	ICC2 (n=10)	ICC2 (n=25)	Cronbach's alpha Sample A	Sample B
1-Directing	5	0.72	0.21	0.23	0.75	0.88	0.68	0.64
2-Helpful	5	0.84	0.21	0.31	0.82	0.92	0.84	0.84
3-Understanding	4	0.71	0.28	0.25	0.77	0.89	0.83	0.81
4-Compliant	7	0.31	0.17	0.13	0.60	0.79	0.61	0.60
5-Uncertain	4	0.10	0.16	0.25	0.77	0.89	0.61	0.60
6-Dissatisfied	5	0.11	0.18	0.22	0.74	0.88	0.78	0.81
7-Confrontational	5	0.21	0.23	0.26	0.78	0.90	0.80	0.81
8-Imposing	5	0.47	0.21	0.21	0.73	0.87	0.63	0.62
Agency	-	0.20	0.12	0.30	0.81	0.91	0.70	0.66
Communion	-	0.33	0.20	0.31	0.82	0.92	0.91	0.92

Note. The Cronbach's alpha was calculated at student level. The mean scores of the dimensions were scaled to range between -1 and 1. As is customary, dimensions were calculated by applying to each scale the theoretical weight (a=0.923880, b=0.382683) of the theoretically assumed circumplex: Agency=(a*1-Directing) + (b*2-Helpful) - (b*3-Understanding) - (a*4-Compliant) - (a*5-Uncertain) - (b*6-Dissatisfied) + (b*7-Confrontational) + (a*8-Imposing); Communion=(b*1-Directing) + (a*2-Helpful) + (a*3-Understanding) + (b*4-Compliant) - (b*5-Uncertain) - (a*6-Dissatisfied) - (a*7-Confrontational) - (b*8-Imposing) (see Wubbels & Brekelmans, 2005).

To check the predictive validity of the current QTI version, the correlations between the QTI and AEQ scales were inspected. As expected, the 1-Directing, 2-Helpful, 3-Understanding and 4-Compliant scales were positively correlated with Enjoyment, and negatively correlated with Anxiety; while the 5-Uncertain, 6-Dissatisfied, 7-Confrontational and 8-Imposing scales were correlated with the two emotions reversely. The scales representing the highest communion (2-Helpful, 3-Understanding) had the strongest positive correlations with Enjoyment and negative correlations with Anxiety, while the scales representing the lowest

communion (6-Dissatisfied, 7-Confrontational) had the strongest negative correlations with Enjoyment and positive correlations with Anxiety. Hence, predictive validity also supported the adequacy of the instrument (see Table 3).

Table 3. Correlations of academic emotions scales with QTI scales and dimensions

	Enjoyment	Anxiety
1-Directing	0.39*	-0.18*
2-Helpful	0.59*	-0.34*
3-Understanding	0.61*	-0.34*
4-Compliant	0.21*	-0.12*
5-Uncertain	-0.30*	0.22*
6-Dissatisfied	-0.42*	0.32*
7-Confrontational	-0.51*	0.42*
8-Imposing	-0.14*	0.21*
Agency	0.06	0.04
Communion	0.64*	-0.42*

*$p < 0.05$.

Discussion

The purpose of this study was to craft an improved instrument to measure teacher agency and communion and their eight underlying related octants in the Chinese context. Overall, the reliability and validity of this 40-item Chinese QTI were supported by the data analyses. The strengths of this newly developed questionnaire are as follows. First, more stringent criteria for item wording were followed from the very start of the development of the current version, that is: the items describe general, unconditional situations rather than specific instances of classroom situations, focus on the teacher rather than students, concentrate on interpersonal processes rather than more didactic issues, and avoid using negative formulations (Wubbels et al.; 2012). Second, by performing interviews with students and teachers, the current version was explicitly grounded in the Chinese classroom context; new items were formulated based on these interviews. Third, the present study was the first to apply a strict, constrained model-fit testing approach, specialised in assessing the circular fit of items and scales, suited to test the specific assumptions of this specific questionnaire. Nevertheless, there is still room for improvement.

For future orientation, more work should be undertaken to improve the properties of some items. In general, the correlations (i.e., spacing) between the scales could still be improved, especially between the 8-Imposing and 1-Directing scales and between the 4-Compliant and 5-Uncertain scales. In terms of the

underlying dimensions, it proved difficult to formulate a sufficient number of items reflecting very high/low agency with moderate communion (situating at the very top/bottom of the circle). Future studies should attempt to find more agentic items for both 1-Directing and 8-Imposing, such as the good fitting items "this teacher is strict" and "this teacher's standards are very high" in the current version, as well as find more submissive items for both 4-Compliant and 5-Uncertain, for example, like the item "this teacher let students do what they want". This challenge was also reflected in the relatively lower reliability of the agency dimension as compared to the communion dimension in the current version.

The 1-Directing, 4-Compliant, 5-Uncertain and 8-Imposing items did show relatively small variance in the current sample. A possible reason might be the involved teachers' homogeneousness in terms of agency in the current sample, which may also relate to the relatively high power-distance in the Chinese school culture (Hofstede, Hofstede, & Minkov, 2010). Also, as became evident in the interviews, almost all of the teachers seemed to show similarly high agency while describing their classroom behaviours, and several teachers mentioned that high agency was a property that a qualified teacher always had. It is possible that agency is a more important selection criterion for teachers in China than in western countries. Thus, for further testing of the Chinese QTI, trying to contract a more heterogeneous sample in terms of teacher agency is an important next step.

Special attention should be paid to the most problematic scale: 4-Compliant. Already in the interviews, it became apparent that it was difficult for students and teachers to think of a compliant Chinese teacher, as they stated that compliant teacher behaviours were rarely experienced in the classroom. In the end, the 4-Compliant scale had more items than other scales but nevertheless had the lowest reliability. All seven of the items had a relatively low variance, and four of them were situated on the octant border. In addition, a few 4-Compliant items still contained wording problems regarding the item crafting criteria, because the most fitting Chinese wording tended to describe what students did in such a teacher's class rather than describing the teacher. For example, the item "this teacher lets students get away with a lot" in Chinese translation says "in this teacher's class, students' mistakes can be let go". This translation was attributed to the same corresponding translation of the word "let" and "ask someone to do something" in the Chinese language, which is more active than the compliant behaviour the item aimed to describe. Future research should therefore pay additional attention to the formulation and selection of the 4-Compliant items.

As stated by Wubbels et al. (2012), for research purpose, 16 well-chosen items might already be sufficient to measure students' interpersonal perceptions of

teacher agency and communion. From this point of view, the current Chinese version is still rather time-consuming. Future studies might further attempt to make a more efficient measure with fewer items. Moreover, to further validate this instrument, studies could also be carried out on how students' perceptions measured with the questionnaire are aligned with actual teacher-student interactions in class (Pennings et al., 2014; Pennings & Mainhard, 2016).

Notwithstanding the limitations and challenges discussed, we think that the current version of the questionnaire is already an improvement and suitable to obtain students perceptions of their teachers' agency and communion in Chinese secondary classrooms for research and to provide Chinese secondary school teachers with feedback about their teaching. The approach applied in this study might also be informative for future adaptations of other instruments. Ultimately, after studies on relationships between student outcomes and their perceptions of teacher agency and communion in China have been conducted, it might be possible to design specific measures for creating positive teacher-student relationships with favourable student outcomes specifically for the Chinese context, thus providing some guidance to secondary school educators for the improvement of teaching and learning in China.

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CHAPTER 3

CHAPTER 3

THE CLASSROOM SOCIAL ENVIRONMENT AS AN ANTECEDENT OF STUDENT EMOTIONS: THE MEDIATING ROLE OF ACHIEVEMENT GOALS[3,4]

Abstract

In line with assumptions made by the control-value theory of academic emotions, it was hypothesized that the association between the classroom social environment, in terms of students' perceptions of their teachers' interpersonal behaviour, and students' academic emotions was partially mediated by students' achievement goals. The present study applied multilevel structural equation modelling on questionnaire data from a sample of 2000 Chinese secondary school students. As assumed, achievement goals partially mediated the association between the classroom social environment and student emotions. Further, results indicated that the classroom social environment was more closely associated with student emotions than student goals were. The findings of this study add to the understanding of the antecedents of students' emotions in class.

Introduction

Academic emotions are a key factor in students' learning and well-being (Martin & Dowson, 2009; Pekrun, 2006). Control-value theory (CVT; Pekrun, 2006) views social aspects of the classroom environment, such as the interpersonal behaviours of teachers (Mainhard, Oudman, Hornstra, Bosker, & Goetz, 2018), as important antecedents of academic emotions. Numerous emotions have a strong social component and emerge directly from affirming or damaging interpersonal relationships (Baumeister & Leary, 1995; Van Kleef, 2009). Next to the classroom social environment, students' achievement goals have been shown to be an antecedent of academic emotions, by regulating the academic-related thoughts and actions which shape student emotions (Goetz, Sticca, Pekrun, Murayama, & Elliot, 2016; Pekrun, Elliot, & Maier, 2006). According to CVT, the effect of social aspects of the classroom environment, including teacher interpersonal behaviours, may in part affect student emotions via their goal orientations (Pekrun, 2006). Indeed, some studies have hypothesized and shown that interpersonal teacher behaviour affects students' goals (Ames, 1992; Mainhard, 2015), for example through self-esteem in learning (Elliot & McGregor, 2001). The current study therefore aimed to explore the associations among these three factors in an integrated way. More specifically, we examined whether and to what degree the association between the social environment of the classroom in terms of teacher interpersonal behaviour and individual student's academic emotions is mediated by students' achievement goals.

Interpersonal teacher behaviour as an antecedent of students' academic emotions

Academic emotions are emotions that tie directly to students' academic activities and outcomes (Pekrun, 2006). Pekrun (2006) grouped academic emotions into four prototypical categories: pleasant-activating (e.g., enjoyment), pleasant-deactivating (e.g., relief), unpleasant-activating (e.g., anxiety), and unpleasant-deactivating emotions (e.g., boredom). Emotions are viewed as having a strong social aspect (Van Kleef, 2009). According to Baumeister and Leary (1995), pleasant emotions emerge from building and affirming social bonds and threatened, refused or broken social bonds go together with unpleasant emotions. In line with this, CVT views the social environment of the classroom as a basic antecedent of student emotions (Pekrun, 2006).

The present study applied interpersonal theory (Horowitz & Strack, 2010) to describe the social environment of the classroom in terms of students' interpersonal perceptions of their teachers. Interpersonal theory and its adoption to the educational context (Wubbels, Brekelmans, Den Brok, & Van Tartwijk, 2006) describes interpersonal perceptions in terms of two underlying orthogonal

dimensions, *agency* (dominance or power) and *communion* (warmth or friendliness). These two dimensions are theoretically and empirically uncorrelated. A premise of interpersonal theory is that all behaviour that is exhibited in the vicinity of others conveys a certain degree of both agency and communion.

Indeed, students' pleasant emotions (enjoyment) are strongly associated with perceived teacher support and enthusiasm (i.e., high communion) (Goetz, Lüdtke, Nett, Keller, & Lipnevich, 2013). In contrast, research clearly indicated that students experience unpleasant emotions (anxiety and boredom) when a teacher is perceived as cold or excessively demanding (i.e., low communion) (Goetz et al., 2013). Teacher agency is associated with student emotion in a more ambiguous way. For example, high levels of structure and control (i.e., high agency) go together with student enjoyment and reduce unpleasant emotions (anxiety and boredom) (Goetz et al., 2013), but high agency has also been found to go together with anxiety (Mainhard et al., 2018) as high teacher control may result in a feeling of reduced control in students (Pekrun, 2006).

Achievement goals as antecedents of emotions

In CVT, achievement goals are considered as core antecedents of academic emotions. Achievement goals reflect students' reasons for engaging in learning tasks (Anderman & Partrik, 2012). In Elliot and McGregor's (2001) 2 x 2 achievement goal framework, goals are identified by two fundamental dimensions: mastery/performance and approach/avoidance. Mastery-approach goals refer to the intention of understanding and mastering tasks, whereas mastery-avoidance goals represent the desire of avoiding failure in development of mastery; performance-approach goals refer to the aim of outperforming others, whereas performance-avoidance goals represent the desire of avoiding poorer performance than others.

CVT views achievement goals as antecedents of emotions by affecting the control and value appraisals underlying emotions. Approach goals focus on the positive value of learning activities and outcomes, controllability of such activities and outcomes and available competency, which are thus expected and also have been found to foster pleasant emotions, e.g., enjoyment (Goetz et al., 2016) and reduce unpleasant emotions, e.g., boredom and anger (Daniels et al., 2009). Avoidance goals concentrate on the negative value of learning, loss of controllability and possibility of failure, which therefore are assumed and have been found to foster unpleasant emotions, e.g., anxiety (Elliot & McGregor, 2001). However, as the associations between goals and emotions are not substantial (the smallest effects are typically found for performance-avoidance goals on anxiety) (Pekrun et al., 2006),

emotions are likely to be affected by a number of other factors besides achievement goals.

Interpersonal Teacher behaviour and Students' achievement goals

Social contexts influence students' achievement goals (Martin & Dowson, 2009) and teacher care and support have a direct effect on students' pursuit of their goals (Urdan & Schoenfelder, 2006). Students care about their relationship with their teacher and thus, they tend to respond with greater effort and engagement in learning when relationships are positive. Students of a supportive teacher, for example, being encouraging, humorous and enthusiastic (i.e., high communion), report relatively strong mastery goals (Mainhard, 2015; Turner, Gray, Anderman, Dawson, & Anderman, 2013). Conversely, when a teacher is perceived as unsupportive, sarcastic or impatient (i.e., low communion), students may lack confidence and become overly concerned with failure and thus are likely to adopt avoidance goals (Turner et al., 2002).

Ames (1992) suggested that autonomy and choice are key elements for students to focus on mastery goals. Teachers sharing authority with students (i.e., relative low agency), such as giving them autonomy in tasks, or involve them in rules and decision making, provide students a sense of ownership over their learning process (Urdan & Schoenfelder, 2006) and thus promote positive student motivation like high mastery goals (Ames, 1992; Urdan & Schoenfelder, 2006; Patrick, Kaplan, & Ryan, 2011). When teachers are more controlling by emphasizing rules, grades and ability differences amongst students, students tend to emphasize performance and avoidance goals (Mainhard, 2015; Patrick et al., 2011; Turner et al., 2002) and may also become overly concerned about failing, which may undermine student mastery orientation (Patrick et al., 2011).

In line with these findings, CVT views the classroom social environment, including teacher interpersonal behaviour, as an antecedent of student goals, which may mediate at least in part the effect of teacher behaviour on students' academic emotions (Pekrun, 2006).

The present study

In line with CVT, the present study investigated to what degree teacher's interpersonal behaviour has a direct versus an indirect association with academic emotions via achievement goals. Based on Pekrun's (2006) taxonomy, we selected three prototypical in-class academic emotions: enjoyment (pleasant/activating), anxiety (unpleasant/activating) and boredom (unpleasant/deactivating). These emotions are most frequently experienced by students and are of primary

importance in academic settings (Pekrun, Goetz, Titz, & Perry, 2002). We did not integrate positive-deactivating emotions (e.g. relief, relaxation) because these emotions tend to occur after as opposed to during academic situations (see Pekrun et al., 2002).

We expected teacher communion to have positive associations with student's approach goals and enjoyment, and negative associations with avoidance goals, anxiety, and boredom. We also expected teacher agency to have positive associations with performance-approach goals, the two avoidance goals and enjoyment, and negative associations with mastery-approach goals and boredom. We did not have specific expectation for the association between agency and anxiety due to mixed previous findings.

Further, we expected approach goals to be positively connected with enjoyment and negatively with boredom and anxiety, whereas avoidance goals would be connected with these three emotions in a reverse way. Finally, we expected that indirect associations would exist between teacher agency and communion and student emotions via goals. However, considering the strong social nature of emotions (Baumeister & Leary, 1995; Van Kleef, 2009), we deemed it likely that teacher interpersonal behaviour would also have a direct association with student emotions. We had no specific expectations regarding the degree to which the association between teacher agency and communion with emotions would be direct or indirect via goals.

Method

Sample and procedure

The study included 2000 students in grades 7 to 9 from 40 classrooms in four public junior secondary schools in Weihai city, Shandong Province, China. Classes are typically large in China with approximately 50 students per class. In each class half of the students rated a different teacher, resulting in 80 teachers being rated (41 female). 1997 questionnaires were returned. Students were on average 13.49 years old (range: 11-17), 51% were females. Twelve questionnaires (0.6%) were excluded because it was unclear to which teacher they referred.

Chinese was the first language of all participants. The schools were selected for convenience. Students were clearly notified about the voluntariness of their participation and data confidentiality. Each school received a summary of the results on a general level without identifying specific participants. The ethical guidelines of the Association of Universities in the Netherlands and the Netherlands Educational Research Association were followed.

Instruments

Academic Emotions

We used four items from a Chinese version of the Academic Emotions Questionnaire (AEQ; Frenzel, Thrash, Pekrun & Goetz, 2007) to assess each emotion, and these were answered on a 5-point Likert-type scale ranging from totally disagree (1) to totally agree (5). A confirmatory factor analysis (CFA) revealed satisfactory fit, χ^2(114) =590.28, p < .001; RMSEA = .05; SRMR = .05; CFI = .94; TLI = .93. Reliability (Cronbach's alpha) was satisfactory for both enjoyment (.87) and boredom (.84), but not for anxiety (.58) (cf. Goetz et al., 2013; Goetz et al., 2016). We suggest some caution when interpreting the results for anxiety. Intraclass correlation (ICC1) indicated a considerable amount of variation at the teacher level (enjoyment: .19, anxiety: .10, boredom: .18) and ICC2 (N=50) showed sufficient reliability for a typical Chinese classroom of 50 students (enjoyment: .92, anxiety: .84, boredom: .92).

Achievement Goals

A Chinese version of the Achievement Goal Questionnaire (AGQ; Xiao, Bai, Wang, & Cui, 2013) was used, consisting of 12 items that evaluated four types of goals. Items were answered on a 5-point Likert-type scale, ranging from totally disagree (1) to totally agree (5). The measure was focused on a particular subject and teacher, χ^2(105) = 339.87, p < .001; RMSEA = .03; SRMR = .03; CFI = .96; TLI = .95. Cronbach's alphas at the student level ranged between .73 to .88. ICC1s for the goals were: mastery-approach: .11, mastery-avoidance: .06, performance-approach: .12, performance-avoidance: .05. For a typical classroom of 50 students ICC2s were: mastery-approach: .86, mastery-avoidance: 0.76, performance-approach: .87, performance-avoidance: .71.

Teacher interpersonal agency and communion

Student perceptions of teacher agency and communion were measured using a Chinese version of the Questionnaire on Teacher Interaction (QTI; Sun, Mainhard, & Wubbels, 2018, see Chapter 2), which follows a circumplex structure and consists of 40 items. Example items are "This teacher threatens students with punishment" (i.e., low communion and high agency) or "This teacher is compliant" (i.e., high communion and low agency). Responses were based on a 5-point Likert-type scale bounded from *never* (1) to *always* (5). As is customary for circumplex measures, perceived teacher agency and communion levels were calculated based on the scores of all items (see Wubbels & Brekelmans, 2005). The reliability was .91 for communion and .70 for agency. The model fit was supported in a CFA for circumplex measures (Grassi, Luccio, & Di Blas, 2010), RMSEA = .05, SRMR = .08, CFI = .89, TLI

= .90. ICC1 was .31 for agency and .31 for communion and ICC2 (N=50) was .96 and .96 respectively.

Analyses

We applied structural equation modelling (Kaplan, 2008) to examine the associations among students' achievement goals and academic emotions and their perceptions of teachers' interpersonal behaviours (Mplus Editor 7.3.1; Muthén & Muthén, 2010). A two-level model was fitted with students' individual perception at the lower level and classroom shared perception at the second level. As the variance in achievement goal variables resided for a large part at the student level and because our main interest was in student-level associations, we focused especially on this level (see Appendix B for the complete model results).

Due to the complexity of the model and to avoid over-fitting it, each emotion was tested separately. The analyses included a CFA of the latent structure and a test of the two-level structural equation model based on manifest variables. Student's individual perceptions were entered class-mean centred.

In the three emotion models, we first tested the interaction effect between agency and communion. Analyses showed that the interaction effect was insignificant for all three emotions at both levels. Also, taking the interaction effect into account largely reduced the model fit (enjoyment: RMSEA = 0.10, SRMR = 0.17, CFI = 0.92, TLI = 0.23; anxiety: RMSEA = 0.10, SRMR = 0.16, CFI = 0.91, TLI = 0.15; boredom: RMSEA = 0.17, SRMR = 0.23, CFI = 0.92, TLI = 0.26). Therefore, the effect of agency was apparently not moderated by communion, and vice versa. We thus did not include the interaction effect in the model.

Then, we added student gender as a covariate and tested interactions of gender with all variables, yet encountered estimation problems especially on the teacher level (type = two level). As a next step, we used the type = complex function in Mplus. The model fit greatly reduced (enjoyment: RMSEA = 0.48, SRMR = 0.19, CFI = 0.01, TIL = -0.75; anxiety: RMSEA = 0.48, SRMR = 0.18, CFI = 0.04, TIL= -0.70; boredom: RMSEA = 0.48, SRMR = 0.19, CFI = 0.09, TIL = -0.62) with mostly non-significant interaction terms. Therefore, it was not deemed necessary to add student gender as a covariate.

Finally, we examined whether the model was similar across school subjects. We tested for model invariance using the three major subjects (Chinese, Math and English). For model identification reasons, model invariance was tested per goal and for communion and agency separately. Results showed only a small number of dissimilarities in the models for the three subjects. For example, a few effects seemed to be somewhat less strong (or non-existent) for Chinese in comparison to

the effects for English and mathematics. Earlier findings also indicated that school subjects could make a difference in the absolute values of students' goals and emotions, but that structural associations rarely change over subjects (Goetz et al., 2013). Therefore, we did not include school subject in the analyses.

In line with assumptions of interpersonal theory (Horowitz & strack, 2010), the observed correlation between agency and communion was statistically nonsignificant in the sample ($r = .03$; $p > .05$) and was therefore set to zero. Correlations among the four goals were freely estimated in accordance with previous studies. All direct effects, as well as the indirect effects through goals, were tested. The model demonstrated an excellent fit for all three emotions: $\chi^2(2) = 0.29$, $p > 0.05$, RMSEA < .001, SRMR = .002, CFI = 1.000, TLI = 1.000. Although the model was not saturated, the original TLI values of the models were for enjoyment 1.025, for anxiety 1.030 and for boredom 1.022. According to Kenny (2015), the TIL does not provide the protection of ranging between 0 to 1 and can be truncated to one when its value is greater than one.

Results

Direct effects and explained variance

Table 1 displays the path coefficients of direct effects and the explained variance.

Table 1. Standardized path coefficients of direct effects, and variance components.

Predictor variable	Enjoyment	Anxiety	Boredom	Mastery-approach goals	Mastery-avoidance goals	Performance-approach goals	Performance-avoidance goals
Communion	0.51***	-0.27***	-0.50***	0.34***	-0.13***	0.22***	-0.11***
Agency	-0.001	0.01	-0.06*	0.13***	0.04	0.05*	0.06**
Mastery-approach goals	0.17***	-0.11***	-0.20***				
Mastery-avoidance goals	-0.10***	0.35***	0.14***				
Performance-approach goals	0.16***	0.04	-0.08***				
Performance-avoidance goals	0.03	0.10***	0.08***				
Explained variance	0.44	0.28	0.46	0.13	0.02	0.05	0.02

Note. *p < .05. **p < .01. ***p < .001. In this table, we reported the standardized path coefficients between the predictors (communion, agency and four goals) in the enjoyment model, as the values of these path coefficients are very comparable in the three emotion models and only small differences were found at the second decimal place.

Overall, 44% of the total variance in enjoyment, 46% of the total variance in boredom and 28% of the total variance in anxiety was explained in the models, whereas goal variances were explained to a lesser extent. Except for mastery-approach goals (13%), little if any variance was explained (2% to 5%) in student achievement goals. Most direct effects were in line with our expectations: teacher communion was positively predicting approach goals and enjoyment, and a negative direct effect on avoidance goals, anxiety and boredom was found. As expected, teacher agency had a positive effect on performance goals and a negative direct effect on student boredom. All links between student achievement goals and academic emotions were in line with our expectations.

The results indicated a few paths that were nonsignificant or opposed our expectations. Teacher agency was not associated with students' enjoyment and anxiety. Also, links between students' performance-approach goals and anxiety, and between performance-avoidance goals and enjoyment were statistically nonsignificant. Agency was positively associated with mastery-approach goals and had no statistically significant direct association with mastery-avoidance goals, which was inconsistent with our expectations.

As compared to communion, the direct effect of agency and performance goals on emotions were rather small. A large proportion of the association between teacher communion and student emotion was direct, with 84% of the variance for enjoyment, 77% for anxiety and 82% for boredom. The direct effect between teacher agency and student boredom also took a large part of 75% in the total effect.

Goals as mediators

Table 2 presents the path coefficients of indirect effects of agency and communion on the three emotions via the four goals. The results are reported for communion and for agency separately. As expected, an indirect effect of teacher interpersonal behaviour via student achievement goals on emotions was found.

Table 2. Standardized path coefficients of indirect effects.

	Enjoyment	Anxiety	Boredom
Communion			
Total indirect	0.10***	-0.08***	-0.11***
Via Mastery-approach goals	0.06***	-0.04***	-0.07***
Via Mastery-avoidance goals	0.01**	-0.05***	-0.02***
Via Performance-approach goals	0.04***	0.01	-0.02**
Via Performance-avoidance goals	< -0.01	-0.01*	-0.01**
Agency			
Total indirect	0.03**	0.01	-0.02**
Via Mastery-approach goals	0.02***	-0.01**	-0.03***
Via Mastery-avoidance goals	< -0.01	0.02	0.01
Via Performance-approach goals	0.01*	< 0.01	< -0.01
Via Performance-avoidance goals	< 0.01	0.01*	0.01**

Note. *p < .05. **p < .01. ***p < .001.

Communion

In the *enjoyment* model, a small positive total indirect effect of communion via goals was found (b = .10, p < .00; 16% of the total effect). Except for performance-avoidance goals, all goals positively mediated associations between teacher communion and enjoyment.

In the *anxiety* model, communion indirectly predicted anxiety via all goals except for performance-approach goals, and all exhibited negative coefficients. Furthermore, a significant total indirect effect via goals was found (b = -.08, p < .001; 23% of the total effect).

With respect to *boredom*, a significant indirect effect was found via each of the four goals, and all exhibited negative coefficients (b = -.11, p < .001; 18% of the total effect).

Agency

Overall, agency seemed to be a less important predictor for goals and emotions than communion. In the *enjoyment* model, the total indirect effect of agency via goals was positive and statistically significant, though the coefficient was rather small (b = .03, p < .001).

In the *anxiety* model, the total indirect effect of teacher agency on student anxiety was nonsignificant. Nevertheless, a small but statistically significant independent indirect effect was observed via mastery-approach goals (b = -.03, p

< .001) and performance-avoidance goals with a positive coefficient (b = .01, p < .05).

Regarding *boredom*, a total indirect effect was found (b = -.02, p < .01) via mastery-approach goals and performance-avoidance goals (25% of the total, however small, effect of agency). Mastery-approach goals had a negative coefficient (b = -.03, p < .001), whereas performance-avoidance goals showed a positive coefficient (b = .01, p < .01).

Discussion

As academic emotions play an essential role in the academic lives of students (Martin & Dowson, 2009; Pekrun, 2006), it is important to understand the antecedents of these emotions. In the current study, teacher communion (i.e., warmth) appeared to be a more important predictor of student emotions than teacher agency (i.e., dominance). The direct associations of teacher interpersonal behaviours and emotions were stronger than the indirect effects via student goals. Still, achievement goals mediated a portion of the association between teacher behaviour and student emotions. Hence, student goals, at least in part, seem to play a role in the association between the two.

Direct associations

Teacher interpersonal behaviour and student emotions

Communion. A large part of the associations between students' perceptions of teacher interpersonal behaviour and student academic emotions was direct. In line with our expectation, we found that students who perceived a teacher as relatively friendly reported relatively high pleasant and low unpleasant feelings (c.f. Goetz et al., 2013; Mainhard et al., 2018; Pekrun et al., 2006). This is also in accordance with Pekrun's (2006) assumption that teacher warmth and support strengthen the social bond between teacher and students, from which pleasant feelings emerge.

Agency. In line with previous findings (Goetz et al., 2013), results indicated that teacher structure (i.e., agency) was associated with reduced student unpleasant emotions (boredom), although this association was rather weak in the current sample. In addition, inconsistent with previous findings, teacher agency was not related to student enjoyment and anxiety. This may be due to a range restriction in agency in the current Chinese sample (compare Mainhard et al., 2018), which in turn may be rooted in a large power distance in Chinese classrooms (Hofstede, Hofstede, & Minkov, 2010): Chinese students tend to expect teacher strictness (Wei, Zhou, Barber, & Den Brok, 2015), which may result in relatively homogeneous high levels of perceived agency in Chinese teachers. Nevertheless, when taking communion out of the model, teacher agency still explained 15 - 20% of the variability in student

emotions. Therefore, agency should not just be discarded as a relevant antecedent of student emotions.

Student goals and emotions

This study confirmed the predictive role of students' achievement goals for academic emotions (e.g., Daniels et al., 2009; Goetz et al., 2016): students who reported stronger approach goals (which focus on positive value and controllability of learning) were more likely to report pleasant feelings and less likely to feel unpleasant. Students with stronger avoidance goals (which focus on negative value of learning and loss of control) were more likely to feel anxious and bored. Of the four goals, mastery-approach goals showed the strongest association with students' emotions. Two nonsignificant paths (i.e., performance-approach goals and anxiety, performance-avoidance goals and enjoyment) were inconsistent with previous findings (Goetz et al., 2016). A possible explanation might be that participants had difficulties in distinguishing between performance-approach and avoidance goals (Urdan and Mestas, 2006) in real life situations through a survey instrument.

Overall, the associations between teacher interpersonal behaviour and emotions were considerably stronger than those between student goals and emotions. This is consistent with general emotion theories that specifically highlight the intertwinement between emotions and social processes (Baumeister & Leary, 1995; Van Kleef, 2009).

Teacher interpersonal behaviour and student goals

Although the direction of associations in the current findings were consistent with previous research (e.g., Mainhard, 2015; Turner et al., 2013), the interpretation of the findings should consider the low explained variance in goals. The more friendly and supportive a teacher was perceived, the more likely a student was to report approach goals and the less likely to report avoiding failure in learning, as students tend to respond to a caring teacher with greater effort and motivation in learning (Urdan & Schoenfelder, 2006). Inconsistent with Patrick et al. (2011), who found that teacher control hampers students' feelings of control and confidence and mastery motivation, but consistent with Mainhard's (2015) finding, we found that the more dominant a teacher was perceived, the more likely students were to report stronger mastery-approach goals. One possible explanation could be that a certain type of teacher dominance, such as providing structure in class by setting clear rules and conveying high expectations rather than strictly controlling behaviour, is beneficial for student learning (Roorda, 2011). It also needs to be considered that in the Chinese context teacher strictness is valued in class (Sun et al., 2018, see Chapter 2;

Wei et al., 2015).

The mediating role of goals

Communion

Students' goals mediated 16% to 23% of the association between teacher communion and student emotion. The more friendly and caring students perceived their teachers, the more likely they were to report to enjoy class and the less anxiousness and boredom were reported. This was partially mediated by their goal orientations: they were also more likely to report stronger approach goals and weaker avoidance goals with higher levels of teacher communion. Thus, in part these emotions emerge from students' learning motivation which is enhanced by teacher support.

Agency

Agency was only weakly associated with goals and emotions. Still, 25 to 100% of its weak association with emotions was through goals, mainly via mastery-approach goals. For example, although agency showed no direct association with student enjoyment, a very small indirect connection via student approach goals was observed. A possible explanation might be that despite Chinese students' rare direct reaction to teacher dominance in their pleasant emotions due to their high acceptance of teacher strictness (Wei et al., 2015), they may still experience a corresponding change in their personal approach goals which may slightly increase enjoyable feelings. This finding is consistent with previous findings that teacher agency enhances students' approach goals (Mainhard, 2015) and that approach goals foster pleasant emotions (Goetz et al., 2016).

Limitation and future directions

This study was based on cross-sectional data and a non-experimental design. Although mediation can be demonstrated in cross-sectional studies via statistical criteria (Hayes & Scharkow, 2013), we could not gauge sequential associations. Another important alternative research line might consider goal structures of the classroom instead of individual student goal orientation (Meece, Anderman, & Anderman, 2006). Including classroom goals may allow to study shared perceptions more closely.

Practical implications

To create a positive classroom social environment for students, teachers should be warm and caring (Wubbels et al., 2006). Our study indicates that teacher warmth

or communion goes together with healthy learning goals and ultimately more pleasant student emotions and less unpleasant feelings towards class. In this regard, connecting with students may be effective in part because students adopt approach goals rather than less productive avoidance goals.

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CHAPTER 4

CHAPTER 4

TEACHERS AS WARM DEMANDERS: THE SYNERGETIC EFFECT OF TEACHER WARMTH AND DOMINANCE ON STUDENTS' BEHAVIORAL ENGAGEMENT AND DISAFFECTION[5,6]

Abstract

Teachers as 'warm demanders', who combine warm and dominant behavior, create a positive learning environment that can promote students' behavioral engagement. However, most studies on behavioral engagement have focused primarily on the role of teacher warmth only, whereas the specific role of teacher dominance, especially how teacher dominance might contribute to the effect of teacher warmth, has largely been disregarded. This study investigates how teachers' warm and dominant behavior independently and jointly affects students' behavioral engagement and disaffection from an interpersonal perspective. Multilevel regression analyses were applied on a sample consisting of ratings of 40 teachers from 800 secondary school students in China. The results showed that students who perceived their teachers as warm demanders, combining both warm and dominant interpersonal behavior, reported the highest levels of behavioral engagement and the lowest levels of behavioral disaffection. Teacher warmth was a more important predictor of student behavioral engagement and disaffection, but teacher dominance clearly accelerated the effect of teacher warmth. Thus these findings suggest that teachers who combine high levels of warmth and dominance (i.e., warm demanders) in their interpersonal behavior potentially have the most engaged and least disengaged students in class.

Introduction

'*Warm demanders*' are teachers who are not only caring and supportive but also demonstrate authority, provide clear structure, show high expectations and demand respect and hard work from their students (Bondy & Ross, 2008; Ross, Bondy, Bondy, & Hambacher, 2008; Bondy, Ross, Hambacher, & Acosta, 2013). According to Ross et al. (2008), a teacher being a warm demander, combining *warm* (or friendly and supportive) and *dominant* (or demanding and structuring) behavior, creates a positive learning environment that scaffolds engagement and achievement of students. Specifically, a certain level of teacher dominance or demanding behavior, such as setting clear rules and expressing high expectations, may be necessary to realize the positive effect of teacher warmth on students (Den Brok, Levy, Brekelmans, & Wubbels, 2005; Hoy & Weinstein, 2006; Mainhard, 2015; Pennings et al., 2018). One important way to conceptualize this positive effect of teaching is student behavioral engagement and disaffection (i.e., disengagement or absence of engagement) (Skinner & Belmont, 1993), which are of great importance to student learning (Roorda, Koomen, Spilt, & Oort, 2011; Skinner & Belmont, 1998; Skinner, Wellborn, & Connell, 1990). Until now, most studies on behavioral engagement have focused primarily on the role of teacher support and warmth only (e.g., Roorda et al., 2011; Skinner & Belmont, 1993; Thijs & Koomen, 2008), disregarding teacher dominance and specifically how teacher dominance might contribute to the effect of teacher warmth. Nonetheless, there are indications, for example, that a certain level of teacher structure may strengthen student motivation and engagement by satisfying their need for competence (Skinner & Belmont, 1993; Vansteenkiste et al., 2012) and Ames hypothesized already in 1992 that teacher dominance has an important role to play for student engagement and their drive to learn. In this study, we applied the idea of the teacher as a warm demander and focused on how teachers' warm and dominant behavior are jointly associated with students' behavioral engagement and disaffection. We specifically argue that constructs that capture teacher dominance or structuring behavior may be important to include in educational studies to better understand how teachers impact student outcomes such as behavioral engagement and disaffection. To do so, the current study framed teachers' classroom behavior in terms of interpersonal theory (Horowitz & Strack, 2011), which closely fits the idea of the warm demander as it conceptualizes teacher behavior and students' generalized perceptions of teacher behavior in terms of both teachers' interpersonal demand or dominance and teacher relational support or warmth (Wubbels et al., 2014).

An interpersonal perspective on teacher behavior

The interpersonal perspective on teacher behavior provides an integrative and systematic perspective to study 'warm demanders', that is, to study warm or supportive aspects of teacher behavior in combination with teacher dominance or structuring aspects of teacher behavior. According to the interpersonal theory, a general psychological theory describing social perceptions and interactions (Horowitz & Strack, 2011), all behavior that people exhibit in the vicinity of others can be conceptualized in terms of two dimensions that describe the level of warmth and friendliness of behavior versus the level of social influence or dominance. The meta-labels used for these two aspects of interpersonal behavior are *communion* and *agency* (Horowitz & Strack, 2011; Wubbels et al., 2014). With regard to teachers' behavior shown in the classroom setting, *communion* refers to the degree of friendliness or warmth a teacher communicates, and *agency* refers to the level of dominance and structure a teacher conveys in class. At the population level, these two dimensions are orthogonal: knowing the degree of agency a teacher usually conveys in class does not infer the degree of teacher communion. However, at the individual level, teachers exhibit certain tendencies in how they combine their communion and agency (Pennings et al., 2018). For example, some teachers may be inclined to combine relatively high levels of dominance with low communal behavior (e.g., controlling student behavior and being generally strict), whereas others tend to combine high levels of agency with high levels of communion (e.g., clearly structuring classroom processes, assisting students, and inspiring students' confidence). At the same time, teacher behavior that is characterized by relatively high levels of warmth or friendliness (i.e., high communion) can have quite different interpersonal meanings depending on the level of teacher agency. For example, a relatively high level of communion combined with *low* agency represents compliant teacher behavior (e.g., being lenient and compliant with what students want) (see Figure 1, Wubbels et al., 2014). Research has indicated that teacher agency and communion, in terms of students' generalized perceptions of teachers' interpersonal behavior, are associated with an array of student outcomes and students' attitudes towards school (Wubbels, Brekelmans, den Brok, & van Tartwijk, 2006). In the current study and in line with the conceptualization of Skinner, Kindermann and Furrer (2009), we specifically examine the relevance of teacher agency and communion for students' behavioral engagement and dissatisfaction in class, because behavioral engagement is considered as one of the most important pathways to meaningful learning in school.
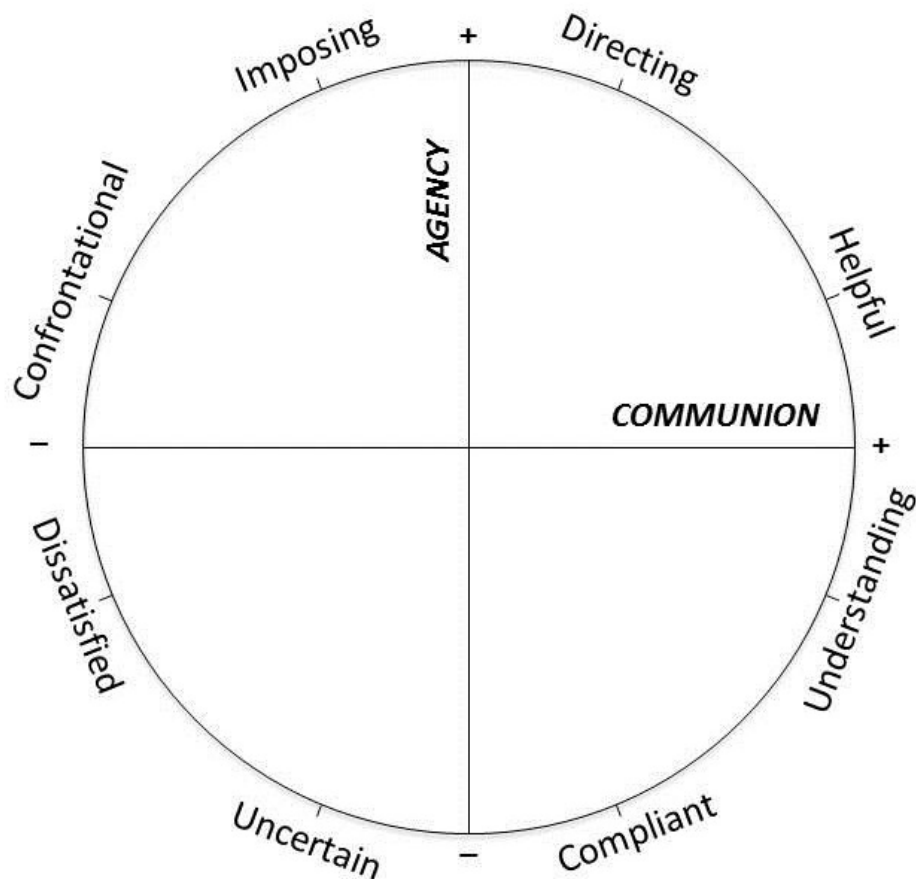
Figure 1. The two dimensions that conceptualize interpersonal behavior:
    communion and agency.

Student behavioral engagement and disaffection

The concept of student behavioral engagement refers to participation and involvement in academic and social activities (Skinner et al., 2009). Researchers claim that studying engagement also requires its opposite conceptualization, termed as disaffection (i.e., disengagement or absence of engagement) (Connell & Wellborn, 1991; Skinner, 1991; Skinner & Belmont, 1993). This conceptualization that includes disaffection is especially important in situations from which voluntary physical withdrawal is prohibited, such as school, when participation habits may develop into passive participation and mental withdrawal (Skinner et al., 2009). Accordingly, Skinner et al. (2009) conceptualized student behavioral engagement in terms of two components: behavioral engagement and behavioral disaffection. Behavioral engagement refers to students' engaged behaviors in academic tasks and class participation, such as effort exertion and persistence, as well as mental effort exertion like attention and concentration. Oppositely, behavioral disaffection is typically demonstrated as absence of effort or persistence, such as passivity, lack of

initiation and giving up. It also includes mental withdrawal, for example, lack of attention or "just going through the motions". Behavioral engaged students show sustained involvement, exert intense effort and concentration in learning activities and are more likely to achieve positive academic outcomes than students who are behavioral disaffected (De Bruyn, 2005; Roorda et al., 2011; Skinner et al., 2009; Skinner et al., 1990). In contrast, behavioral disaffected students are passive in their learning activities and withdraw easily (Archambault, Janosz, Fallu, & Pagani, 2009; Manlove, 1998). Several studies indicate a close connection between teacher warmth and students' school engagement.

Teacher behavior and student behavioral engagement and disaffection

Several meta-analyses indicated that teacher behavior influences student behavioral engagement in school (Cornelius-White, 2007; Roorda et al., 2011). Notably, concepts related to teacher communion, such as general warmth and student-centered care, friendliness, and emotional support, have received much attention in this regard and are considered to be important predictors of student engagement in school (e.g., Roorda et al., 2011; Skinner & Belmont, 1993; Thijs & Koomen, 2008). For example, a teacher who shows involvement (Deci, Vallerand, Pelletier, & Ryan, 1991; Ryan & Powelson, 1991) or closeness (Pianta, 1999; Roorda et al., 2011) serves as a secure emotional base for children, which stimulates children to deal with school demands and thus also motivates their engagement in learning activities (Pianta, 1999; Pianta, Nimetz, & Bennett, 1997; Skinner & Belmont, 1993; Thijs & Koomen, 2008). In contrast, teacher conflict, which is reflected by discordant and coercive interactions (i.e., low communion) (Pianta, 1999), represents an absence of security and is considered to hinder students' engagement in dealing with school demands (Roorda et al., 2011).

Concepts related to teacher dominance and being demanding are, however, largely lacking in the existing literature on student behavioral engagement. There is some evidence that teachers showing a certain level of dominance (e.g., providing structure in class by setting clear rules and expectations) may enhance students' engagement in learning activities (Roorda et al., 2011; Skinner & Belmont, 1993). Nevertheless, teachers showing involvement (e.g., caring and warmth) were considered to be a more important predictor of student engagement than teachers providing structure (e.g., influencing classroom processes and setting clear rules) (Skinner & Belmont, 1993; Tucker et al., 2002).

The conceptualization of teachers as '*warm demanders*' argues however that in order for students to function effectively in school, teachers not only need to be caring and supportive but also demonstrate authority, provide clear structure and

show high expectations towards their students (Bondy & Ross, 2008; Ross, Bondy et al., 2008). Katz (1999) found that it is important for teachers to combine high expectations for academic achievement with their care and warmth towards students, because "caring without high expectations can turn dangerously into paternalism in which teachers feel sorry for 'underprivileged' youth but never challenge them academically" (p. 814). Indeed, teachers who are perceived as warm demanders have been found to create safe and pleasant learning environments for students (Wubbels et al., 2006; Wubbels, Brekelmans, Mainhard, den Brok, & van Tartwijk, 2016). Teachers' agentic (i.e., structuring and dominant) behaviors also add, next to warm and communal teacher behavior, to students' pleasant emotions (Mainhard, Oudman, Hornstra, Bosker, & Goetz, 2018) and motivation to learn (Den Brok et al., 2005; Mainhard, 2015). Further, the effect of teacher warmth on students may differ when combined with teacher dominance. According to Vansteenkiste et al. (2012), rather than merely teacher support, a teacher who uses structure in addition to teacher support provides competence-supportive guidance which may best meet students' needs and wishes. Similarly, based on moment-to-moment classroom observations, Pennings and her colleagues (2018) found that teachers with a leading pattern in their behavior (i.e., moderately high communion and high agency) indicated a more favorable interpersonal relationship as perceived by students than compliant teachers (i.e., moderately high communion and low agency): this indicates that teacher agency in class may be valued or even needed by students to create a warm and friendly learning environment that is conducive to learning. Conversely, low teacher warmth combined with strong teacher dominance may result in a controlling or confrontational style which frustrates students' needs and hinder their engagement in class (Vansteenkiste et al.,2012; Haerens, Aelterman, Vansteenkiste, Soenens, & van Petegem; 2015).

Considering these findings, it is plausible to assume that both teacher communion and agency as elements of teacher interpersonal behavior are associated with student behavioral engagement and disaffection. Specifically, we argue that agentic and dominant teacher behavior and warm and communal teacher behavior may have a synergetic effect on student behavioral engagement in class. That is, we expected not only that high levels of teacher communion will go together with strong behavioral engagement and weak disaffection with classroom work, but also that positive levels of teacher agency might strengthen these effects of teacher communion.

Covariates of student behavioral engagement and disaffection

Next to teacher interpersonal behavior, other characteristics of the student and

teacher may be associated with student behavioral engagement and disaffection. Marks (2000) found that students were more engaged in mathematics than in social studies classes in elementary and high school. However, school subject was not associated with middle school students' engagement. Regarding student gender, researchers found that boys were generally less engaged in learning activities than girls (e.g., Bos, Sandfort, De Bruyn, & Hakvoort, 2008; Furrer & Skinner, 2003; Verkuyten & Thijs, 2002). When considering student gender composition in a class, Tison, Bateman, and Culver (2011) found that both boys and girls tend to be more engaged in learning when a class had a lower proportion of girls. The possible reason might be that boys are at a higher risk of school failure than girls, which may make them have more to gain or lose in their adaptation to the classroom social environment (Hamre & Pianta, 2001). Also, several studies documented a connection between student academic achievement and engagement; more engaged students often also obtain higher average grade points (De Bruyn, 2005; Roorda et al., 2011; Skinner et al., 2009; Skinner et al., 1990). Although it has often been assumed that higher engagement leads to higher grades, reciprocal relationships between engagement and academic achievement seem to be most likely (Roorda et al., 2011). Finally, regarding grade level, previous studies found that as students become older, their engagement in learning tends to decrease as other aspects of students' lives gain more importance (Marks, 2000; McDermott, Mordell, & Stoltzfus, 2001).

In the present study, the variables discussed above were taken into account as covariates of students' behavioral engagement.

Present study

The present study explores the relevance of teachers as warm demanders for students' behavioral engagement and disaffection in the classroom. As an operationalization for the warm demander, we investigated the effect of teacher interpersonal communion (warmth and friendliness) and agency (being dominant, demanding and providing structure) on student behavioral engagement and disaffection. Our research question was: How are teachers' communion and agency independently and jointly associated with students' behavioral engagement and disaffection?

We expected teacher communion and agency to be positively correlated with students' behavioral engagement and negatively correlated with their behavioral disaffection (e.g., Deci et al., 1991; Skinner & Belmont, 1993; Vansteenkiste et al., 2012). Overall, in accordance with the idea that teacher involvement seemed to be a more important predictor of student engagement than providing structure (Skinner & Belmont, 1993; Tucker et al., 2002), we expected teacher communion to be a

stronger predictor for student behavioral engagement and disaffection than teacher agency. As a directing teacher may contribute stronger to favorable student functioning than a warm but submissive teacher (Pennings et al., 2018; Vansteenkiste et al., 2012), whereas a controlling or imposing teacher may frustrate students even more than an unfriendly but submissive teacher (Vansteenkiste et al.,2012; Haerens, et al.; 2015), we expected to find a synergetic effect. That is, we expected that a certain level of teacher agency would support the positive association between teacher communion and student behavioral engagement and would strengthen the negative association between teacher communion and student disaffection with class.

Method

Sample

The data were collected in spring 2017, including 40 teachers rated by 800 grade 7-9 students from a public junior secondary school in Weihai, Shandong Province, China. A total of 799 valid questionnaires were returned. The school was selected for convenience. Eight teachers were male, and teachers taught various subjects (9 math, 7 English, 6 Chinese, 2 physics, 2 chemistry, 4 biology, 4 history, 3 geography and 3 politics). Students were between 11 and 17 years old (M = 14, SD = 1.01); 139 students (17.4%) were from grade 7, 299 (37.4%) were from grade 8, 357 (44.7%) were from grade 9, and 4 students (0.5%) failed to report their grade level. Of the participating students, 406 (50.8%) were girls and 29 (3.6%) did not report their gender. For all students participating in this study, Chinese was their first language.

Procedure

Before the survey began, approval was given by the principals to conduct the data collection. Students who participated in the survey were clearly notified that their participation was voluntary and that they had the freedom to quit at any time. It was made clear to the participants that the data would be treated anonymously and used for research purposes only. No names or other personal identifiers were recorded. An administrative teacher of the school went into each classroom during self-study classes, distributed paper questionnaires and answer sheets to students, and collected them back. Although some of the returned questionnaires were incomplete, at the item level, there were no variables with a large number of missing values. The item with the most missing values had 16 blanks out of 799 valid questionnaires (2%).

Instruments

Teacher communion and agency

Student perceptions of teacher communion and agency were mapped with a Chinese version of the Questionnaire on Teacher Interaction (QTI; Sun, Mainhard, & Wubbels, 2018; see Chapter 2). This questionnaire contains 40 items, and responses were provided on a 5-point scale bounded by *never* (1) and *always* (5). Rather than a simplex structure, communion and agency are assessed with items follow a circumplex structure. This is based on the idea that every behavior a teacher shows in class conveys both a certain degree of communion and agency. For example, the item "this teacher listens to students" represents behavior that conveys moderately low levels of teacher agency and relatively high levels of teacher communion. On the other hand, "this teacher is strict" represents high levels of teacher agency and moderately low levels of communion. Thus, each QTI item depicts teacher behavior, and for each item, communion and agency scores are calculated through a weighing of each item for each of the two underlying interpersonal dimensions (see a more elaborate discussion in Wubbels & Brekelmans, 2005). Student ratings indicated sufficient consensus perceiving the same teacher by calculating intraclass correlations (ICCs) (Agency: 0.24; Communion: 0.30) and ICC2 (N=20) (Agency: 0.86; Communion: 0.89). The validity, that is, the weighing of the items for communion and agency, was supported by a confirmatory analysis for circular measures (Grassi, Luccio, & Di Blas, 2010), RMSEA = .05, SRMR = .08, CFI = .89, TLI = .90. The reliability (i.e., Cronbach's alpha) was adequate for both teacher agency (student level: 0.71; teacher level: 0.86) and teacher communion (student level: 0.91; teacher level: 0.96).

Student behavioral engagement and disaffection

We used ten items from the Student Report of Engagement Versus Disaffection with Learning (Skinner, Furrer, Marchand, & Kindermann, 2008), including five items for behavioral engagement and five items for behavioral disaffection. Each item was answered on a 5-point Likert-type scale that ranged from totally disagree (1) to totally agree (5). Example items are "in class, I work as hard as I can" for behavioral engagement and "in class, I do just enough to get by" for behavioral disaffection. These ten items were first translated from English into Chinese by the first author, and two Chinese educational researchers checked the face validity. This translation was then back-translated by a teacher educator who was fluent in English and whose first language was Chinese. In due course, the wording of some items was modified. The resulting Chinese items (see appendix C) showed satisfactory reliability for both behavioral engagement (0.87) and behavioral disaffection (0.86). A CFA representing behavioral engagement as two correlated factors (engagement versus disaffection)

showed adequate internal validity, RMSEA = .08, SRMR = .03, CFI = .96, TLI = .94.

Covariates

Students reported their gender, grade level, the subject taught by the rated teacher and the grades they received in this subject for the final exam of the most recent semester. In the exam system of the participating school, the grades of the three major subjects (i.e., Chinese, math and English) are typically scaled from 0 to 120, whereas the grades of the other subjects are scaled from 0 to 100. The grades for Chinese, math and English were rescaled to also run from 0 to 100.

Analyses

To accommodate the nesting of students within teachers, we used multilevel regression analyses (mixed procedure in IBM SPSS 24) with student reported behavioral engagement and disaffection as the dependent variables in two separate models. Perceptions of teacher communion and agency at the student level were centered at the teacher mean, which represented the unique perception of one individual student of a teacher, while aggregated perceptions and predictors at the higher level were centered at the grand mean, representing the unique characteristic of a teacher (cf . Lüdtke, Robitzsch, Trautwein, & Kunter, 2009).

In line with Hox, Moerbeek, and van de Schoot (2017), as a first step, an empty model that only contained the dependent variable was tested (Model 0). In Model 1, we first added student level covariates (student gender as boys = 0, girls = 1; teacher-centered grades) and then the second level covariates (the percentage of girls in the group; grand-mean-centered grades; grade level; school subject categorized into 5 categories of about similar sizes: Chinese, English, math, sciences and liberal arts). Then, in Model 2, communion, agency and their interaction terms were entered to test their separate contributions and to test whether and how teacher agency might accelerate the predictive effect of teacher communion on student behavioral engagement and disaffection. This final model also included a test of random slopes in communion and agency. Furthermore, in the case of a significant interaction effect, we performed HLM 2-way interaction analyses with the online tool of Preacher, Curran, and Bauer (2003) to further explore how agency would enhance the effect of communion.

Although residuals were normally distributed at the teacher level, they were skewed at the student level because approximately one-third of students gave extreme ratings for all behavioral engagement items (i.e., 5) and/or behavioral disaffection items (i.e., 1). To gauge the possible effect of these extreme scores on the analyses, all models were run twice, for the full sample (sample A) and a

subsample (sample B, n = 507) excluding students with extreme scores (i.e., behavioral engagement mean = 5 or behavioral disaffection mean = 1). The results are presented on the full sample, and differences in the subsample are noted.

Results

Table 1 shows the descriptive statistics of the dependent variables (i.e., behavioral engagement and disaffection), predictors (i.e., centered communion and agency scores) and covariates in the study, as well as the intraclass correlations of the dependent variables.

Table 1. Descriptives and intraclass correlations of the variables in the full sample (A) and the trimmed sample (B).

Measure		M		SD		Min		Max	
		A	B	A	B	A	B	A	B
Dependent variable	Behavioral engagement	4.26	3.89	0.74	0.67	1.00	1.00	5.00	4.80
	Behavioral disaffection	1.80	2.20	0.80	0.71	1.00	1.20	5.00	5.00
Within teacher covariates	Gender[a]	0.53	0.52	0.50	0.50	0.00	0.00	1.00	1.00
	Grades[b]	<0.01	<0.01	17.43	17.79	-64.42	-59.45	47.11	38.54
Between teacher covariates	Gender_c[c]	0.53	0.52	0.12	0.15	0.30	0.00	0.80	1.00
	Grades_c[d]	<0.01	<0.01	9.44	10.32	-24.15	-31.12	18.75	21.38
	Grade level	2.27	2.39	0.74	0.65	1	1	3	3
	Chinese	0.15	0.16	0.36	0.37	0.00	0.00	1.00	1.00
	Math	0.23	0.22	0.42	0.42	0.00	0.00	1.00	1.00
	English	0.17	0.18	0.38	0.39	0.00	0.00	1.00	1.00
	Sciences	0.20	0.18	0.40	0.38	0.00	0.00	1.00	1.00
	Liberal arts	0.25	0.26	0.43	0.44	0.00	0.00	1.00	1.00
Within teacher	AGs[e]	<0.01	<0.01	0.10	0.10	-0.36	-0.36	0.31	0.32
	COMs[f]	<0.01	<0.01	0.16	0.16	-0.70	-0.60	0.44	0.36
Between teacher	AGt[g]	<0.01	<0.01	0.06	0.07	-0.13	-0.13	0.17	0.23
	COMt[h]	<0.01	<0.01	0.11	0.11	-0.34	-0.30	0.14	0.20

[a]Gender: 0 = boy, 1 = girl.

[b]Centered score of grades at the student level. Students' original grades were standardized to range between 0 and 100.

[c]Gender composition, which is equal to the percentage of girls in the group that rated the same teacher.

[d]Grades composition, which is the centered score at the teacher level.

[e]Centered agency score at the student level.

[f]Centered communion score at the student level.

[g]Centered agency score at the teacher level.

[h]Centered communion score at the teacher level.

Table 2 displays the correlation matrix of all variables in the model. Most correlations in the full sample (sample A) and in the subsample (sample B) were similar, but a few differences were observed. Students' behavioral engagement was uncorrelated with school subjects in sample A but was positively correlated with Chinese and negatively with sciences in sample B. Behavioral disaffection was negatively associated with teacher level grades and student level-centered agency in the full sample, while there was no correlation in sample B.

Table 2. Correlations of the variables in the full sample (A) and the trimmed sample (B).

A\B	Behavioural engagement	Behavioral disaffection	Gender	Grades	Gender _c	Grades _c	Grade level	Chinese	Math	English	Sciences	Liberal arts	AGs	COMs	AGt	COMt
Behavioral engagement	-	-.70**	.03	.19**	-.18**	.11*	-.13**	.13**	.02	-.06	-.12**	.03	.09*	.38**	.10*	.29**
Behavioral disaffection	-.78**	-	-.06	-.19**	.16**	-.07	.20**	-.15**	-.05	.06	.14**	.02	-.07	-.38**	-.14**	-.32**
Gender	.02	-.04	-	-.02	.29**	.01	.01	<.01	.02	-.08	.04	.01	-.06	.11*	-.11*	.01
Grades	.19**	-.19**	-.01	-	<.01	<.01	<.01	.01	<.01	-.01	-.01	-.01	.05	.06	<.01	<.01
Gender_c	-.16**	.13**	.25**	<.01	-	.04	.03	.04	.04	-.30**	.14**	.07	<.01	<.01	-.38**	.03
Grades_c	.16**	-.16**	.04	<.01	.17**	-	-.09	-.01	-.09*	-.66**	.36**	.36**	<.01	<.01	-.03	.10*
Grade level	-.21**	.23**	-.05	<.01	-.19**	-.06	-	-.07	-.08	.05	.25**	-.12**	<.01	<.01	-.02	-.02
Chinese	.06	-.07**	.02	.01	.13**	-.05	.02	-	-.23**	-.21**	-.20**	-.26**	.01	.01	.22**	.13**
Math	.02	-.05	.02	.01	.02	-.03	-.12**	-.23**	-	-.25**	-.25**	-.31**	-.01	<.01	.31**	.01
English	-.05	.07*	-.08*	-.02	-.31**	-.70**	.02	-.19**	-.25**	-	-.22**	-.28**	<.01	<.01	.02	-.17**
Science	-.02	.01	.03	-.01	.12**	.41**	.16**	-.21**	-.27**	-.23**	-	-.27**	<.01	-.01	-.12**	-.19**
Liberal Arts	<.01	.05	<.01	<.01	.03	.29**	-.06	-.24**	-.31**	-.26**	-.29**	-	.01	<.01	-.39**	.19**
AGs	.12**	-.12**	-.03	.08*	<.01	<.01	<.01	<.01	-.01	<.01	<.01	<.01	-	-.04	<.01	.01
COMs	.41**	-.42**	.13**	.11**	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	-.02	-	<.01	<.01
AGt	.10**	-.13**	-.11**	<.01	-.44**	-.04	.05	.20**	.32**	.05	-.16**	-.37**	<.01	<.01	-	-.10*
COMt	.43**	-.45**	-.02	<.01	-.07*	.22**	-.21**	.05	.02	-.15**	-.07*	.13**	.01	<.01	<.01	-

*p < .05; **p < .01.

Note. Correlations below the diagonal are from sample A (full sample, N = 799); correlations above the diagonal are from sample B (trimmed sample, N = 507).

Behavioral engagement

Table 3. Multilevel regression models for students' behavioral engagement, students' perception of teacher interpersonal behavior and covariates in the full sample (A) and the trimmed sample (B). We selected Chinese as the baseline of other subjects by recoding its dummy to 0.

	Model 0		Model 1		Model 2	
	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B
	B (SE); β	B (SE); β	B (SE); β	B (SE); β	B (SE); β	B (SE); β
Fixed effects						
Intercept	4.26 (0.06)**	3.93 (0.05)**	5.52 (0.35)**	4.62 (0.24)**	5.32 (0.22)**	4.60 (0.18)**
Within level covariates						
Gender			0.09 (0.05)*; 0.06	0.12 (0.06)*; 0.09	0.01 (0.04); <0.01	0.07 (0.05); 0.05
Grades			0.01 (<0.01)**; 0.20	0.01 (<0.01)**; 0.19	0.01 (<0.01)**; 0.15	0.01 (<0.01)**; 0.18
Between level covariates						
Gender_c			-1.33 (0.45)**; -0.22	-0.92 (0.30)**; -0.20	-1.11 (0.28)**; -0.19	-0.86 (0.23)**; -0.19
Grades_c			0.03 (0.01)**; 0.33	0.01 (0.01)*; 0.21	0.02 (<0.01)**; 0.20	0.01 (<0.01)*; 0.15
Grade level			-0.22 (0.07)**; -0.22	-0.06 (0.07); -0.06	-0.15 (0.04)**; -0.15	-0.07 (0.04); -0.07
Subject						
Chinese			-	-	-	-
Math			-0.10 (0.16); -0.06	-0.12 (0.13); -0.08	-0.12 (0.09); -0.07	-0.10 (0.10); -0.06
English			0.12 (0.19); 0.06	-0.11 (0.17); -0.06	0.03 (0.12); 0.01	-0.05 (0.12); -0.03
Sciences			-0.19 (0.18); -0.10	-0.34 (0.16)*; -0.19	-0.17 (0.11); -0.09	-0.22 (0.11); -0.12
Liberal arts			-0.25 (0.16); -0.14	-0.21 (0.13); -0.14	-0.27 (0.11)*; -0.16	-0.16 (0.10); -0.11
Within teacher						
AGs					0.97 (0.21)**; 0.13	0.73 (0.27)**; 0.11
COMs					1.83 (0.13)**; 0.39	1.46 (0.17)**; 0.34

AGs*COMs					2.88 (1.17)*	3.63 (1.47)*
Between teacher						
AGt					-0.13 (0.68); -0.01	0.38 (0.55); 0.04
COMt					2.49 (0.29)**; 0.36	1.72 (0.27)**; 0.29
AGt*COMt					-0.74 (4.08)	-0.69 (3.73)
				Random effects		
Within teacher	0.42 (0.02)**	0.39 (0.03)**	0.39 (0.02)**	0.37 (0.03)**	0.29 (0.02)**	0.30 (0.02)**
Between teacher	0.14 (0.04)**	0.06 (0.02)**	0.08 (0.03)**	0.03 (0.02)*	0.01 (0.01)	<0.01 (0.01)
Explained variance						
Within teacher	n/a	n/a	0.07	0.06	0.30	0.23
Between teacher	n/a	n/a	0.39	0.45	0.90	0.94
-2 Restricted Log Likelihood	1649.83	1003.05	1474.55	896.42	1230.63	777.31

*p < .05; **p < .01.

Note. In this study, we used a one-tail test for the effect of gender and gender composition, as we have specific expectations on these two covariates based on existing literature. Therefore, the significance was based on half of the p-value.

Table 3 displays the results of the multilevel regression models for behavioral engagement. Adding the covariates (Model 1) improved model fit and contributed to the explained variance of student behavioral engagement, especially at the teacher level. All covariates except school subject were associated with student behavioral engagement.

Adding communion and agency (Model 2) resulted in a considerable amount of explained variance in behavioral engagement (an increase from 7% to 30% at the student level and from 39% to 90% at the teacher level; sample B indicated a similar increase). In total, 30% (from 15% to 45%) of the variance in behavioral engagement was explained by teacher communion and agency. Adding communion and agency in the model resulted in a change in regression weights regarding the effects of one covariate: student gender became nonsignificant for student behavioral engagement. Student grades and class grades both positively predict behavioral engagement, whereas classroom gender composition (the proportion of girls in class) showed a negative effect. Students' grade level was also negatively related to their behavioral engagement; however, this association was not confirmed in the subsample. Regarding school subject, liberal arts indicated significant differences in the association with student behavioral engagement from that of the Chinese subject, but this was not confirmed in the subsample. In line with our expectations, teacher communion and agency indicated consistent positive associations with student behavioral engagement, except for agency at the teacher level, which had no significant association. As expected, at both the student and the teacher level, the standardized coefficients indicated that communion had a stronger effect on student behavioral engagement than agency.

Furthermore, at the student level, a significant positive interaction between student-level-centered communion and agency indicated an enhanced effect of agency on the association between communion and behavioral engagement. Probing this interaction with the online tool of Preacher et al. (2003) showed that at very low levels of communion (-0.3 and lower), agency further reduced student engagement. The lowest behavioral engagement scores were predicted for students who perceived their teacher to convey low levels of communion in combination with a high level of agency (e.g., when teachers were perceived as relatively imposing or strict, see the dotted line in Figure 2). Agency also enhanced the positive effect of communion at higher values of communion. For example, already at relatively low levels of communion (approximately -0.1, see Figure 2), very high agency (dotted line) resulted in a prediction reflecting maximum behavioral engagement. Thus, if agency was perceived as higher, the slope relating communion to engagement became more strongly positive (see Figure 2). At low levels of agency (solid line in Figure 2), rather

high levels of teacher communion needed to be perceived to reach high levels of engagement. All three simple slopes included in this figure (at low, average and high values of agency) were statistically significant. More specifically, areas of significance indicated that agency enhanced the effect of communion at almost every level. For example, at very low levels of communion, the predicted difference in engagement for the highest and lowest level of agency was close to one SD in behavioral engagement (0.74), reflecting a medium-sized effect.
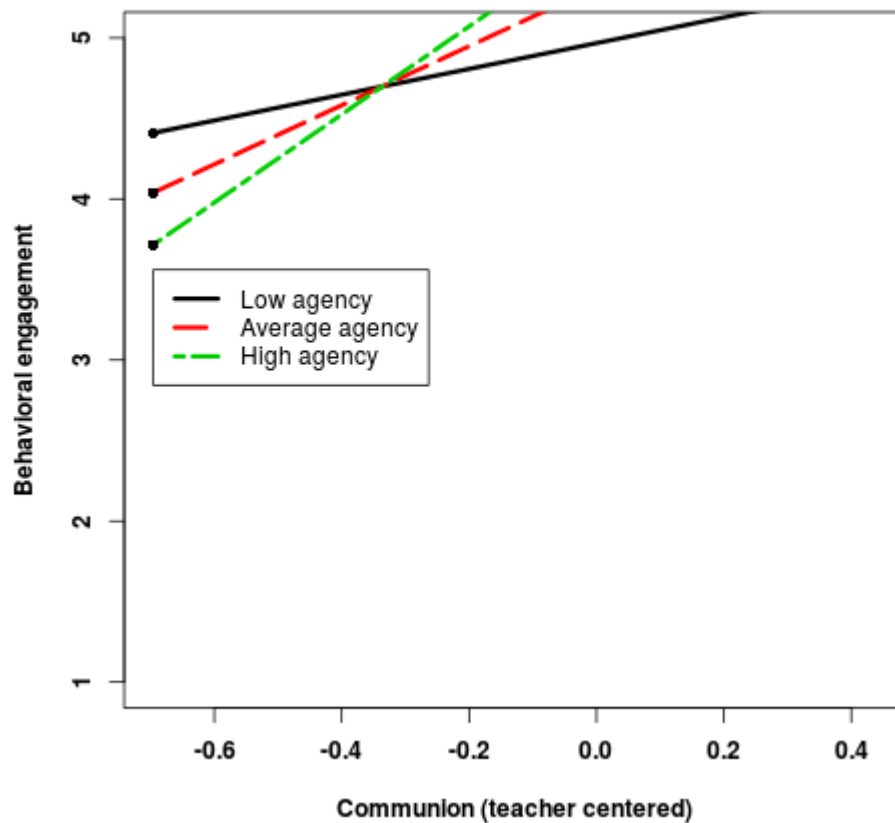
Figure 2. 2-way interaction: teacher agency as a moderator of teacher communion's association with student behavioral engagement. This test was performed on the full sample with communion and agency scores at the student level that were centered at the teacher mean.

Behavioral disaffection

Table 4. Multilevel regression models for students' behavioral disaffection, students' perception of teacher interpersonal behavior and covariates. We selected Chinese as the baseline in subjects. We selected Chinese as the baseline of other subjects by recoding its dummy to 0.

	Model 0		Model 1		Model 2	
	Sample A	Sample B	Sample A	Sample B	Sample A	Sample B
	B (SE); β	B (SE); β	B (SE); β	B (SE); β	B (SE); β	B (SE); β
			Fixed effects			
Intercept	1.80 (0.07)**	2.15 (0.06)**	0.33 (0.39)	1.13 (0.26)**	0.68 (0.24)**	1.22 (0.18)**
Within level covariates						
Gender			-0.11 (0.05)*; -0.07	-0.16 (0.06)*; -0.11	-0.02 (0.04); -0.01	-0.11 (0.06)*; -0.07
Grades			-0.01 (<0.01)**; -0.19	-0.01 (<0.01)**; -0.20	-0.01 (<0.01)**; -0.14	-0.01 (<0.01)**; -0.18
Between level covariates						
Gender_c			1.42 (0.50)**; 0.22	0.93 (0.32)**; 0.19	1.04 (0.31)**; 0.16	0.79 (0.23)**; 0.16
Grades_c			-0.02 (0.01)*; -0.29	-0.01 (0.01); -0.12	-0.01 (<0.01)*; -0.15	<0.01 (<0.01); -0.05
Grade level			0.26 (0.08)**; 0.24	0.17 (0.07)*; 0.18	0.18 (0.04)**; 0.17	0.19 (0.05)**; 0.19
Subject						
Chinese			0	0	0	0
Math			0.17 (0.17); 0.09	0.21 (0.15); 0.12	0.14 (0.10); 0.07	0.17 (0.10); 0.10
English			0.06 (0.21); 0.03	0.28 (0.18); 0.15	0.10 (0.13); 0.05	0.17 (0.12); 0.09
Sciences			0.22 (0.20); 0.11	0.36 (0.17)*; 0.19	0.14 (0.12); 0.07	0.19 (0.12); 0.10
Liberal arts			0.41 (0.18)*; 0.22	0.33 (0.15)*; 0.20	0.37 (0.11)**; 0.20	0.25 (0.10)*; 0.15
Within teacher						
AGs					-1.19 (0.23)**; -0.15	-0.75 (0.28)**; -0.11

COMs					-2.00 (0.14)**; -0.39	-1.50 (0.18)**; -0.33
AGs*COMs					-3.86 (1.23)**	-4.80 (1.54)**
Between teacher						
AGt					-0.24 (0.74)*; -0.02	-0.85 (0.56)**; -0.08
COMt					-2.87 (0.31)**; -0.39	-2.08 (0.28)**; -0.33
AGt*COMt					1.38 (4.44)	2.08 (3.76)
				Random effects		
Within teacher	0.47 (0.02)**	0.43 (0.03)**	0.44 (0.02)**	0.41 (0.03)**	0.33 (0.02)**	0.33 (0.02)**
Between teacher	0.18 (0.05)**	0.08 (0.03)**	0.11 (0.03)**	0.04 (0.02)*	0.02 (0.01)*	<0.01 (0.01)
Explained variance						
Within teacher	0	0	0.06	0.05	0.31	0.23
Between teacher	0	0	0.39	0.49	0.91	0.98
-2 Restricted Log Likelihood	1751.19	1061.62	1574.94	950.01	1308.85	820.38

*$p < .05$; **$p < .01$.

[a b c d] This parameter is set to zero because it is redundant.

Note. In this study, we used a one-tail test for the effect of gender and gender composition, as we have specific expectations on these two covariates based on existing literature. Therefore, the significance was based on half of the p-value.

Table 4 lists the results of the analyses for behavioral disaffection. As in the engagement model, adding the covariates (Model 1) contributed to model fit and explained the variance in student behavioral disaffection. All covariates showed significant effects. Liberal arts indicated a significantly different association with student behavioral disaffection than Chinese, and teacher-level-centered grades only showed a significant association with behavioral disaffection in sample A.

Adding communion and agency (Model 2) contributed a considerable additional amount of explained variance in behavioral disaffection (from 6% to 31% in sample A at the student level and 39% to 91% at the teacher level; sample B showed a similar increase). In total, 32% (from 15% to 47%) of the variance in behavioral disaffection was explained by teacher communion and agency. Again, after adding communion and agency, student gender became statistically nonsignificant. Gender class composition (proportion of girls) was positively associated with behavioral disaffection. Students' individual grades indicated a clear negative association with student behavioral disaffection, whereas class-average grades showed a significant negative effect in sample A. The grade level was positively associated with behavioral disaffection. Among the school subjects, liberal arts had a somewhat negative relation with student behavioral disaffection when taking Chinese as a baseline.

As expected, communion and agency were negatively associated with student behavioral disaffection at both the student and the teacher level. Also, in line with our expectations, at both levels, the standardized coefficients indicated that communion had a stronger association with students' behavioral disaffection than agency. A statistically significant and positive interaction between centered communion and agency at the student level indicated an enhanced effect of agency on the association between communion and disaffection. Probing this interaction for average teacher level communion and agency showed that low levels of communion (-0.1 and lower) resulted in higher disaffection and that this effect was enhanced by agency. Low communion and relatively high agency (e.g., when a student perceived a teacher as more imposing or strict compared to classroom peers) predicted the highest disaffection scores. At communion values of approximately -0.1 or higher, communion reduced disaffection, and this effect was more enhanced with higher levels of agency (dotted line, see Figure 3). Very high communion (e.g., 0.4) was predicted to not result in very low student disaffection only when agency was very low (solid line in Figure 3). At low levels of communion, the predicted difference in disaffection for very high and low agency was larger than one SD (0.80) in disaffection, reflecting a large effect (compare Figure 3). Areas of significance indicated that agency enhanced the effect of communion on behavioral disaffection across almost the entire agency range.
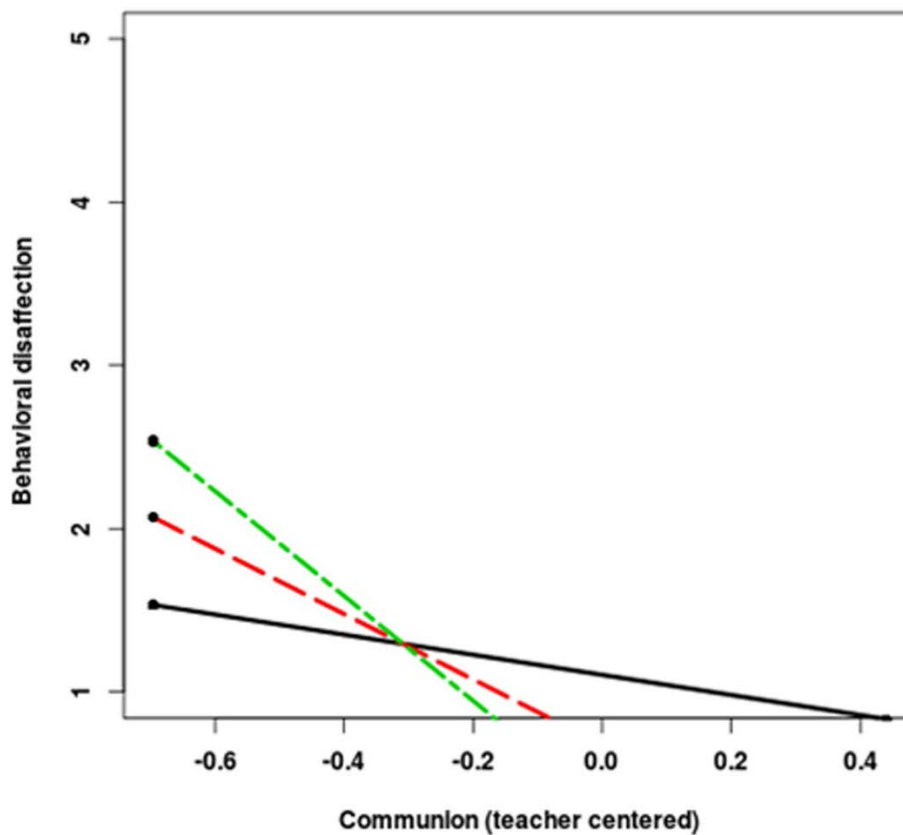
Figure 3. 2-way interaction: teacher agency as a moderator of teacher communion's association with student behavioral disaffection. This test was performed on the full sample with communion and agency scores at the student level that were centered at the teacher mean.

Discussion

Communion and agency

For teachers, being a warm demander means establishing an effective learning environment for students by combining warm and friendly behavior (i.e., communion) with a certain level of dominant or demanding behavior (i.e., agency) in class (Hoy & Weinstein, 2006; Ross et al., 2008). Our study confirmed that the more a teacher is perceived to be a warm demander, the more likely students reported to be behaviorally engaged in class. In accordance with previous research (Skinner & Belmont, 1993; Tucker et al., 2002), at both the student and teacher level, perceived teacher warmth was found to be a stronger predictor than perceived teacher dominance for student engagement and disaffection. Notably, interaction effects between individual students' perceptions of teacher communion and agency were

present. Agency enhanced the effect of communion at its entire range, whereas at the teacher level, teacher communion and agency showed separate unconditional associations with students' behavioral engagement and disaffection.

For individual students, our expectation was confirmed that a certain level of perceived teacher dominance or agency enhanced the association between perceived teacher warmth or communion and student behavioral engagement and disaffection; thus, a synergetic effect was found. Students who considered their teacher to be relatively warm compared to their peers and at the same time dominant were predicted to report the highest levels of behavioral engagement and the lowest levels of disaffection. In contrast, students who thought their teacher was rather cold and at the same time dominant reported the lowest behavioral engagement and the highest levels of disaffection in our model. This finding may explain why the effects found for variables tapping into teacher agency are not always straightforward. Not including the interaction may lead to either nonsignificant effects or, depending on the specific construct that is used, small positive or negative effects on engagement (Haerens, et al., 2015) and possibly also other student outcomes (Mainhard et al., 2018; Patrick, Kaplan, & Ryan, 2011). Our results were consistent with previous research on warm demanders (Bondy & Ross, 2008) that reported that teacher support (i.e., communion) and structure (i.e., agency) worked in a complementary way for student functioning (also compare Jang et al., 2010; Vansteenkiste et al., 2012) and that concluded that teacher dominance may add to the impact of teacher warmth or friendliness (Pennings et al., 2018).

At the teacher level, in line with our expectations, the more friendly a teacher was perceived to be by a class of students, the more likely it was that the students reported higher engagement and lower disaffection in their learning behavior. However, at the teacher level, we did not find an interaction effect, and teacher communion and agency functioned independently for student engagement and disaffection. Thus, although the shared perceptions that students have of their teacher clearly add to students' engagement, the synergetic effect between agency and communion seems to become apparent in the specific interaction history that teachers share with a specific student. This specific interpersonal adjustment (Mainhard et al., 2018) between the teacher and student may thus reflect individual differences in the teacher-student interaction.

The findings at the teacher level are generally in line with previous findings that teacher support contributed to students' engagement and reduced their disengagement in learning activities (Skinner & Belmont, 1993; Thijs & Koomen, 2008). Also in accordance with previous research that structure in a class such as setting clear rules and high expectations would enhance student engagement

(Roorda et al., 2011; Skinner & Belmont, 1993), we found that a class of students who perceived their teacher to have higher dominance also reported lower disaffection, though the impact of teacher dominance is not as strong as that of teacher warmth. However, inconsistent with our expectation, we found that perceived teacher dominance was not related to student-reported behavioral engagement. We think that this weak or nonsignificant association is likely due to the low variance of teacher-level perceived agency. In Table 1, it can be seen that the teacher-level-centered agency (i.e., deviation of the grand mean of all teachers) had a lower standard deviation (0.06) than communion, SD: 0.11. This low variability in perceived agency might be attributed to the large power distance rooted in the Chinese classroom culture (Hofstede, Hofstede, & Minkov, 2010). Chinese teachers strive to establish an image of teacher authority in order to be respected by students (Chang et al., 2011; Zhou, Lam, & Chan, 2012), and Chinese students also expect their teachers to show relatively high levels of dominance and strictness (Wei, den Brok, & Zhou, 2009; Wei, Zhou, Barber, & den Brok, 2015). This may lead to students reporting similar positive levels of agency for their teachers.

Covariates

Our findings on covariates (i.e., student and class characteristics) were mostly consistent with our expectations and earlier research on student gender (Bos et al., 2008; Furrer & Skinner, 2003; Verkuyten & Thijs, 2002), classroom gender composition (Tison et al., 2011), and academic achievement (De Bruyn, 2005; Roorda et al., 2011; Skinner et al., 2009; Skinner et al., 1990). It is notable that for student behavioral engagement and disaffection, the strength of the associations with the covariates was clearly smaller than for teacher communion. Also, the association between engagement and student gender became insignificant when taking perceived teacher behavior into account.

In this study, we also found that students from higher grade levels reported lower behavioral engagement and higher behavioral disaffection than their peers from lower grade levels. This finding is in accordance with previous studies (Marks, 2000; McDermott et al., 2001) that students' engagement in learning decreases as they grow older. In contrast with results found by Marks (2000) that show that how strongly junior secondary school students were engaged or disengaged in their learning behavior did not differ among different school subjects, in this study, we found that students were more likely to be disaffected in liberal arts subejcts (e.g., history and geography) than in other subjects. One possible explanation might be that Chinese, math and English are generally considered as the most important subjects in Chinese secondary schools, and hence, the current sample of students

may have been more engaged in these subjects.

Limitations and future directions

In the current sample, approximately one-third of students gave extreme ratings for behavioral engagement and disaffection (e.g., scoring 1 for all behavioral disaffection items). Nevertheless, the data and residuals were normally distributed at the teacher level. To gauge the effect of this apparent rater bias, we also performed the analyses in a subsample with the extreme cases filtered out (Sample B). Most of our findings were similar in the full sample and the subsample. It seems likely that social desirability affected many students' answers (Lavrakas, 2008), which might be expected in Chinese classrooms. In China, students are expected to highly value hard work (Hofstede et al., 2010), and nonconformity to generally accepted and highly valued standards may be less likely to be appreciated in Chinese culture, which is characterized, next to a high power distance, by collectivism.

The present study only investigated student engagement from the behavioral perspective. Although behavioral engagement is considered to be one of the most important avenues to learning, engagement, as such, is a complex construct that can be studied from several other perspectives as well. A well-known example is the conceptualization of Fredricks, Blumenfeld and Paris (2004) in terms of behavioral, emotional and cognitive engagement. To broaden our understanding of the association between interpersonal aspects of teaching and specifically teacher agency and student engagement, it would be valuable to involve other engagement perspectives in future studies.

Conclusion

Students who perceive their teachers as warm demanders (Bondy & Ross, 2008; Ross et al., 2008) are more likely to report adaptive behavioral engagement in class. This type of teacher combines warm behavior (i.e., communion) with dominant behavior (i.e., agency) in their teaching. At the level of personal student perceptions, teacher agency enhanced the association between teacher communion and students' engagement. This clearly adds to our understanding of the relation between teacher behavior and student engagement, which until now was predominantly focused on teacher relational support and warmth, which are specifically reflecting communion. Students tend to be engaged in learning activities if they think their teacher is friendly, but students who think that their teacher is also clearly structuring the classroom process and taking the lead are even more likely to be engaged. Thus, agency-related variables, such as teacher dominance and demanding behaviors, are potentially important factors in students' classroom experiences and should receive

due attention. This is in line with scattered evidence in other areas of educational research that shows that teacher behaviors reflecting teacher agency help to satisfy students' basic psychological needs (Deci et al., 1991; Ryan & Powelson, 1991; Vansteenkiste et al., 2012) and thereby strengthen their motivation. Especially in Confucian societies in which students have high expectations of teacher strictness (Wei et al., 2009; Wei et al., 2015) and teachers are valued to take most initiatives in class (Hofstede et al., 2010; Zhou et al., 2012), teacher agency may play an even stronger role in creating an effective learning environment for students. For teachers, specifically in China, it may therefore be advisable to strengthen their students' behavioral engagement by also showing warmth and friendliness.

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CHAPTER 4

CHAPTER 5

TEACHER INTERPERSONAL BEHAVIOR IN THE CONTEXT OF POSITIVE TEACHER-STUDENT INTERPERSONAL RELATIONSHIPS IN EAST ASIAN CLASSROOMS: EXAMINING THE APPLICABILITY OF WESTERN FINDINGS[7,8]

Abstract

We investigated teacher interpersonal behavior in the context of positive teacher-student interpersonal relationships in Chinese secondary classrooms, while using a Dutch sample as a reference group. In a quantitative case study, we matched five Chinese to five Dutch teachers based on their general teacher-student interpersonal relationships. We found that Chinese teachers' interpersonal behaviors conveyed moderately high levels of warmth or friendliness and were perceived to be rather dominant and stable over time. Our results indicate that findings of interpersonal processes from Western samples, specifically on teacher dominance, may not always be generalizable to East Asian cultures, and vice versa.

Introduction

Positive interpersonal relationships between teachers and students are conducive for student motivation, learning and well-being (Den Brok, Brekelmans, & Wubbels, 2004; Den Brok, Levy, Brekelmans, & Wubbels, 2005; Cornelius-White, 2007; Goh & Fraser, 2000; Spilt, Koomen, Stoel, Thijs, & Van der Leij, 2011). An important factor for building such relationships is teacher interpersonal behavior. Although relationships are built in and outside classrooms, the current study focusses on teacher interpersonal behavior within the classroom context, because interpersonal processes between teacher and students most intensively happen in classrooms and teacher interpersonal behaviors are closely connected to their classroom management (Pianta, 2009). Teacher interpersonal behaviors (i.e., the micro level) have been viewed as the building blocks of the overall teacher-student interpersonal relationships (i.e., the macro level) (Pennings et al., 2014; Hollenstein, 2007). While teacher-student interpersonal relationships have been studied in a number of societies (e.g., Fisher & Rickards, 1998; Maulana, Opdenakker, Den Brok, & Bosker, 2012; Telli, Den Brok, & Cakiroglu, 2007; Wei, Zhou, Barber, & Den Brok, 2015), most studies on teacher interpersonal behavior until now have been conducted predominantly in Western educational contexts (e.g., Mainhard, Pennings, Wubbels, & Brekelmans, 2012; Pennings et al., 2014; Pennings & Hollenstein, 2019). However, the cultural patterns of a society are reflected in typical social relations and interactions such as teacher-student interpersonal relationships in school (Den Brok, Wubbels, Brekelmans, & Rickards, 2006; Fisher & Rickards, 1998; Hofstede, 1986; Hofstede, Hofstede, & Minkov, 2010). Therefore, it remains unknown how the interpersonal behavior of East Asian teachers, who have similar positive interpersonal relationships with their students at the macro level as Western teachers, may be perceived at the micro level. To understand the nature of teacher interpersonal behavior occurring in positive teacher-student relationships in East Asian cultures, we conducted a case study in a Chinese sample with intensive micro-level video observations tracking teacher interpersonal behavior during a typical classroom lesson from moment to moment. In part, the current study used existing data from a Chinese (Sun, Mainhard, & Wubbels, submitted, see Chapter 4) and Dutch sample (Pennings et al., 2018). The Dutch classrooms were mainly included to contextualize our findings in the Chinese classrooms.

Cultural differences in the perception of the same social situation (e.g., a relationship) may relate to different weightings of interpersonal behavior in this situation (Holtgraves & Yang, 1992; Tsai, Sun, Wang, & Lau, 2016). East Asian cultures such as the Chinese culture traditionally are characterized by Confucian dynamism, which refers to "the acceptance of the legitimacy of hierarchy and the valuing of

perseverance and thrift" (Franke, Hofstede, & Bond, 1991, p. 167). In such a cultural context, students may expect high teacher strictness or dominance in class (Wei, Den Brok, & Zhou, 2009; Wei et al., 2015), and teachers may address students as group members instead of focusing on dyadic relationships with isolated individuals (Hofstede et al., 2010). In Western cultures, superiority over others is often considered not very acceptable and individual differences are appreciated (Hofstede et al., 2010). So, for example, it is possible that the amount of dominant teacher interpersonal behavior students in East Asian cultures perceive needs to be, from a western perspective, rather intense to arrive at similar positive teacher-student interpersonal relationships as perceived in Western contexts. Considering these potential cultural differences in the correspondence of interpersonal behavior and general interpersonal relationships, and in order to understand the possible cultural limits of the generalizability of findings concerning the connection between teacher interpersonal behavior and the general interpersonal relationship in classrooms, it is important to investigate this connection in non-western cultures, such as East Asian cultures.

An interpersonal perspective on teacher behavior and teacher-student relationships

In the present study, we applied interpersonal theory (Horowitz & Strack, 2011). Interpersonal theory is a general social psychological theory and states that both the quality of relationships (i.e., the macro level or trait level) and aspects of human behavior in interaction with other people (i.e., the micro level or state level) can be captured by means of just two dimensions: Agency, which reflects dominance, power, status, and interpersonal influence, and Communion, which implies warmth, union, and friendliness (Gurtman, 2009). Agency and Communion are used as meta-labels for the two interpersonal dimensions (Fournier, Moskowitz, & Zuroff, 2011; Horowitz, 2004; Wiggins, 1991). Each word that describes the behavior of a person (e.g., *acting* friendly or demanding) or describes interpersonal relationships at a more general level (e.g., *being generally* hostile or supportive) can be regarded as a specific combination of Agency and Communion. The interpersonal meaning of these words is represented by their angular position on a circular continuum called the Interpersonal Circle (IPC; Fabrigar, Visser, & Browne, 1997; Gurtman, 2009; Horowitz & Strack, 2011). Figure 1 presents the adaption of the IPC into educational contexts including typical descriptions of specific combinations of teacher Agency and Communion: the Interpersonal Circle for the Teacher (IPC-T; Wubbels, Créton, & Hooymayers, 1985; Mainhard, 2015; see Figure 1). In general, knowing the degree of Agency that a teacher conveys in class does not allow to infer the teacher's

Communion, and vice versa. For example, helpful and confrontational behavior reflect similar levels of moderately high teacher Agency, but opposite levels of teacher Communion (see Figure 1).
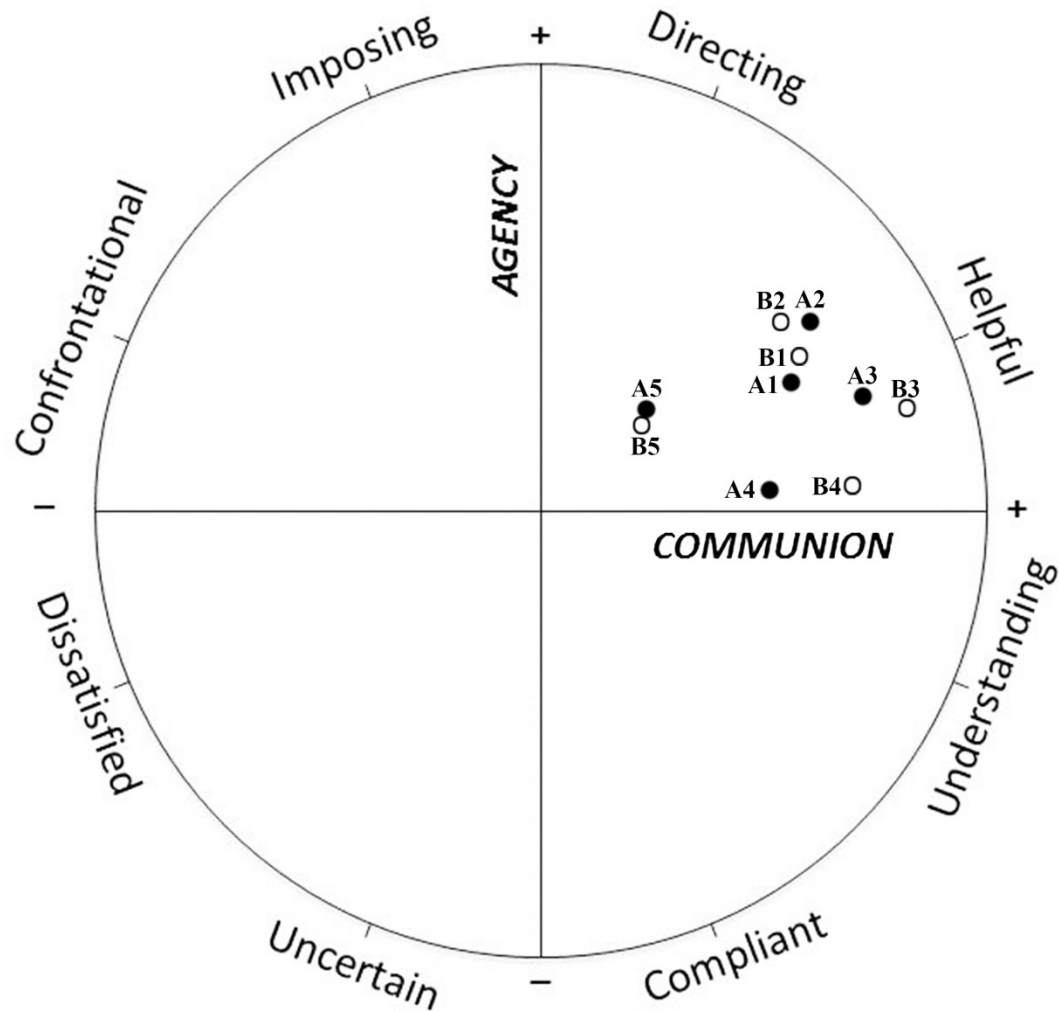
Figure 1. The Interpersonal Circle for the Teacher (IPC-T) and the location of the ten teachers' teacher-student interpersonal relationships. The Chinese teachers are labeled A1 – A5 by filled circles, the Dutch teachers are labeled B1 – B5 by hollow circles. The QTI means (Agency, Communion) of the teachers are as follows: A1 (.19, .35), B1 (.22, .36), A2 (.27, .37), B2 (.27, .34), A3 (.17, .45), B3 (.15, .51), A4 (.03, .31), B4 (.04, .44), A5 (.14, .14), B5 (.14, .13).

To further distinguish behavior and relationships, micro-level moment-to-moment interpersonal behavior can be conceived of as being nested in generalized macro-level interpersonal relationships (Granic, 2005; Hollenstein, 2007). Individuals live in each of the current moments and moment-to-moment experiences (e.g., behaviors or interactions) assemble into more general outcomes (e.g.,

relationships) (Granic, 2005). This process is considered as universal across cultural and ethnical groups (Holtgraves & Yang, 1992; Tsai, et al., 2016). Accordingly, in the classroom situation, teacher-student interpersonal relationships can be viewed as summarized perceptions of the interaction history between teachers and students, i.e., students' generalized perceptions of their teachers' interpersonal behavior in class (Pennings et al., 2014). In the current study we assumed that this is generally true in any culture, thus also in both East Asian and Western classroom contexts.

Positive teacher-student interpersonal relationships

When students' general perceptions of teacher-student interpersonal relationship are characterized by positive levels of teacher Agency and Communion (i.e., the upper right quadrant of the IPC-T), this is beneficial for students' cognitive and affective outcomes (Brekelmans, & Wubbels, 1991; Den Brok et al., 2006; Den Brok, 2001; Goh & Fraser, 2000; Levy, 1993; Telli et al., 2007). Also, when asked about their personal ideals, both teachers and students report that they prefer relationships that are characterized by positive levels of both Agency and Communion (Den Brok et al., 2006). Especially relationships that could be characterized as high Communion and moderately high Agency (see Figure 1) were preferred by both Chinese students (Wei et al., 2009; Wei et al., 2015) and Dutch students and teachers (Brekelmans, Wubbels, & Den Brok, 2002). Internationally, researchers found that this type of teacher-student interpersonal relationship is rather frequent in both East Asian and Western cultural contexts, such as Australia (Den Brok et al., 2006), Brunei (Den Brok et al., 2006), China (Wei et al., 2009; Wei et al., 2015), Indonesia (Maulana et al., 2012), Singapore (Den Brok et al., 2006), The Netherlands (Brekelmans, Mainhard, den Brok, & Wubbels, 2011), Turkey (Telli et al., 2007) and the USA (Fisher & Rickards, 1998). We therefore refer to this kind of relationships as positive teacher-student interpersonal relationships, and this pattern seems to be rather similar across cultures. The current study focusses on classroom behavior of teachers with generally positive teacher-student interpersonal relationships.

Moment-to-moment teacher interpersonal behavior

In addition to tapping into students' general perceptions of the teacher-student interpersonal relationship (i.e., their generalized perceptions of teacher Agency and Communion), the IPC-T can also be applied to track teachers' interpersonal behavior from moment to moment. For instance, when a teacher raises his or her voice to attract student attention, teacher Agency may go up, while Agency may go down later during a lesson when the teacher is, for example, hesitating or nervously

fumbling with his or her materials. Similarly, at one moment Communion may increase because the teacher is smiling and actively listening to students and may decrease again when the teacher reprimands a distracted student. Several studies, also outside the educational context, have indicated that not only how friendly or dominant people behave on average during a period of time (i.e., mean levels and most frequently occurring combinations of Agency and Communion) but also the way people move between different types of behaviors (i.e., between different levels and combinations of Agency and Communion) are predictive of the overall relationship quality (Hollenstein, 2007; Thomas, Hopwood, Woody, Ethier, & Sadler, 2014). In a Dynamic Systems (DS) theory context (Granic & Hollenstein, 2003), these two aspects of behavior are referred to as *content* and *structure*.

The interpersonal content of teacher behavior describes *which* behaviors are shown by the teacher during the lesson (Hollenstein, 2013; Hollenstein & Lewis, 2006). Researchers found in Dutch classrooms that if a teacher frequently helps students to understand explanations, then the interpersonal content of this teacher's behavior is characterized by high levels of both Agency and Communion which on its turn contributes to the development of a positive general interpersonal relationship between teacher and students (Pennings et al., 2014). It is possible that a teacher has multiple (different) typical behaviors regarding the interpersonal content (Pennings et al., 2014). For example, if the teacher not only helps students, but also reprimands students rather often during the same class; the interpersonal content then indicates two distinct interpersonal behavior characteristics: one of high levels of both Agency and Communion, and the other characterized by high levels of Agency combined with low levels of Communion.

The interpersonal structure of teacher behavior describes *how* the behaviors of a teacher change during the lesson (Hollenstein, 2013; Hollenstein & Lewis, 2006). For parent-child interaction, Granic and Hollenstein (2003) found that high variability contributes to favorable relationships between parents and children and to children's positive social-emotional development. Yet, in the Dutch classroom context, stability rather than high variability in teacher interpersonal behavior indicated positive teacher-student interpersonal relationships (i.e., overall moderately high teacher Agency and Communion) (Mainhard et al., 2012; Pennings et al., 2014). Similarly, in these studies, higher predictability of teacher interpersonal behavior was associated with more favorable teacher-student interpersonal relationships. In a recent study using a larger Dutch sample, Pennings and Hollenstein (2019) confirmed the results concerning variability but not concerning predictability.

All these findings regarding interpersonal content and structure, especially the findings regarding those of teacher behavior, are based on Western samples.

Classrooms in East Asian and Western cultures

We now discuss how East Asian and Western students may perceive and expect the amount of teacher Agency and Communion in teacher interpersonal behavior (i.e., the micro level), to view a classroom as having typically positive teacher-student interpersonal relationships (i.e., the macro level).

Power distance is a prime element that describes characteristics of cultures (Hofstede et al., 2010). This concept is clearly related to interpersonal Agency as it stresses the acceptance of inequality in the distribution of power or control. East Asian societies are traditionally characterized as Confucian Heritage cultures, which indicates large power distance (i.e., high acceptance of inequality in Agency distributions) (Hofstede et al., 2010). Classrooms in East Asian cultures are mostly represented by teacher-centered processes (Hofstede et al., 2010; Jin & Cortazzi, 1998), in which an important virtue is considered that students show respect and obedience to authority figures such as their teachers (Song, Kwan, Bian, Tai, & Wu, 2005; Zhou, Lam, & Chan, 2012). East Asian students tend to have high expectations (Wei et al., 2009; Wei et al., 2015) and a high acceptance of teacher strictness (i.e., high Agency) in class (Hofstede et al., 2010). Along similar lines, being able to strictly control classroom processes is considered a necessary property for a qualified teacher in the East Asian context (Zhu, Valcke, & Schellens, 2010; Sun, Mainhard, & Wubbels, 2018, see Chapter 1). Western societies are generally characterized by a small power distance (i.e., low acceptance of unequal Agency distribution). Western classrooms mostly are represented by student-centered processes, in which independency and autonomy are valued in student learning (Chang et al., 2011). Students tend to expect their teachers to give them freedom and choices in class (i.e., low teacher Agency) (Hofstede et al., 2010). Thus, in the East Asian classroom context with positive teacher-student interpersonal relationships, rather dominant (i.e., agentic) teacher interpersonal behavior may be valued positively (and likewise, low agentic behavior might be rather not tolerated).

Collectivism versus individualism is another major element describing cultural characteristics (Hofstede et al., 2010; Triandis, 2004) which may predominantly be related to the concept of interpersonal Communion. East Asian societies usually hold collectivist ideas which emphasize shared interests and group harmony (Hofstede et al., 2010). In East Asian classrooms, teachers are considered in-group members and in order to build group harmony, being a moral example and caring for students (i.e., high Communion) are highly valued for a teacher (Ho, 2001; Jin & Cortazzi, 1998). Western societies are usually characterized by individualist thinking, which emphasize individual interest and importance (Hofstede et al., 2010). Teachers in

Western contexts are expected to treat each student as a unique individual (Hofstede et al., 2010); being sympathetic and having good social communication (i.e., high Communion) are highly valued (Jin & Cortazzi, 1998). Thus, in both cultural contexts teacher interpersonal behavior conveying Communion is likely to be valued in classrooms with overall positive teacher-student interpersonal relationships.

Regarding the characteristics of the structure aspects of teacher interpersonal behavior in East Asian classrooms with generally positive teacher-student interpersonal relationships, it is plausible to expect the characteristics in the variability and predictability of teacher interpersonal behavior. The large power distance and collectivist thinking in an East Asian culture give an emphasis on obedience to authority figures and compliance to group interest (Chang et al., 2011). Teachers are expected to have rich knowledge and to be able to give sequential talk (Jin & Cortazzi, 1998); consistency (i.e., low variability and high predictability) in learning procedures and concepts is valued (An, Kulm, & Wu, 2004; Cai, 2005; Chang et al., 2011). In a Western culture, the low power distance and individualist thinking values autonomy, independence and individual differences (Hofstede et al., 2010; Zhou et al., 2012). Western teachers are usually expected to use various methods and activities (i.e., high variability and possibly low predictability) to encourage creativity and critical thinking among their students (Cai, 2005; Chang et al., 2011). Therefore, it is plausible to assume that the interpersonal behaviors of teachers from an East Asian culture in classrooms with generally positive teacher-student interpersonal relationships may be perceived as low on variability and rather predictable.

Present study

Previous studies on teacher interpersonal behavior have collected data predominantly from Western samples. As we have shown in the previous section, cultures may however differ in ways that might affect what kind of teacher interpersonal behavior underlies an overall positive interpersonal relationship with students. For example, students from East Asian classrooms may need to experience relatively high Agency in their teacher's interpersonal behavior due to the degree to which social hierarchy is accepted and valued. Thus, in the present study, we examined teacher interpersonal behavior in the context of overall positive teacher-student interpersonal relationships in a sample from an East Asian context and a sample from a Western context. At the macro level, we used generalized scales to map how a teacher typically behaves as assessed through student questionnaires. At the micro level, we used moment-to-moment judgments of teacher interpersonal behavior, as assessed through observer ratings. Our research question was the

following:

How do Chinese and Dutch teachers with a positive interpersonal relationship as perceived by their students on the macro level (i.e. high in Communion and moderately high in Agency) behave interpersonally when observed on the micro level?

Thus, we focused on the question, what teacher interpersonal behavior is exhibited in classrooms with favorable teacher-student interpersonal relationships within each cultural context. Based on previous studies (e.g., Hofstede et al., 2010; Zhou et al., 2012; Zhu et al., 2010), we explored (1) in terms of interpersonal content, teachers' levels of Agency and Communion in their behavior, and (2) regarding interpersonal structure, the stability and predictability of behavioral patterns.

In doing so, our primary focus was on the Chinese classrooms. We used a Dutch sample, with comparable positive teacher-student interpersonal relationships, to be better able to contextualize our findings in the Chinese classrooms, as no more general data or data from other cultural contexts is available so far.

Method

Sample and procedure

We used classroom observations to track teacher interpersonal behavior from moment to moment. From existing data sets in China (Sun et al., submitted, see Chapter 4) and The Netherlands (Pennings et al., 2018) that included questionnaire data on students' general perceptions of the teacher-student interpersonal relationship (i.e., the macro level) and in the Dutch set also video data of classroom teaching (i.e., the micro level), five teachers from each cultural context with similar positive teacher-student interpersonal relationships were sampled and their interpersonal behavior was examined based on the video data that, in the Chinese set, were collected specifically for the present study.

Based on the questionnaire data, we matched five Chinese teachers to five Dutch teachers based on the student-reported general character of the teacher-student interpersonal relationship. We focused on teachers whose general interpersonal relationships were characterized by high levels of Communion and moderately high levels of Agency. Figure 1 visualizes the locations of the 10 selected teachers on the IPC-T. The Chinese teachers were labeled A1 to A5 and the matched Dutch teachers B1 to B5. Subsequently, we mapped classroom observations of the moment to moment interpersonal behaviors of these ten teachers in terms of Agency and Communion. We used a multiple case study design (Ledford & Gast, 2009) to investigate the interpersonal content and structure of the micro-level teacher interpersonal behavior in the Chinese and Dutch classroom contexts.

The Chinese sample

The Chinese data stemmed from a study including 40 teachers which was conducted in the spring of the 2016-2017 academic year from a public junior secondary school in Weihai city, Shandong Province, China. The school was selected for convenience. After approval to collect the data was granted by the school principal, all participating teachers and students were notified a week before data collection began and asked for their consent to participate. It was made clear that the data collection was focused on the teacher and that the data would be treated as confidential and for research purposes only. The students participated in the survey were from grade 7 to 9, age ranging from 11 to 17 years. The 40 teachers (9 were male) taught various subjects and each teacher was rated by 20 students. Five of these teachers were selected based on these ratings and were invited to participate in the current study, that is to record a lesson in that class on video. The five Chinese teachers (four female and one male teaching five different subjects) were, on average, 37.0 years old (range: 26 - 46) with an average teaching experience of 15.0 years (range: 3 - 23), their students were from 12 to 16 years old. Videos were taken from the back of the classroom, with students showing only their backs most of the time. Before the data were analyzed, students' faces were blurred if they were visible in the video (e.g., when students turned backward during a group discussion, or when they were asked by the teacher to write something on the blackboard and then returned to their seats). Teachers received the video recordings after the data collection finished.

The Dutch sample

The Dutch data used in this study was selected from a study including 35 teachers from 27 secondary schools that was conducted in the spring of the 2010-2011 academic year (Pennings et al., 2018). These 35 teachers (14 were female) participated in a 3-year longitudinal classroom climate study in The Netherlands. For these teachers, video-taped lessons and survey data were available. As the Chinese teachers, the 35 Dutch teachers taught various subjects. Students who participated in the survey were from grade 7 to 12, age ranging from 12 to 18 years. Each teacher was rated by 20 to 25 students. For the current study, five Dutch teachers (one female and four male teaching four different subjects) were selected based on their general interpersonal relationships perceived by students in the survey and matched to the Chinese teachers with similar characteristics. The five Dutch teachers were on average 42.8 years old (range: 34 - 58) and had on average 13.2 years of teaching experience (range: 1-35), their students' age ranged from 12 to 17 years. Video

recordings of the teachers were made using a camera in the back of the classroom. After the data collection, teachers received the video recordings and a written report on their interpersonal relationship with students.

Instruments

Teacher-student interpersonal relationships

Teacher-student interpersonal relationships were measured using the Questionnaire on Teacher Interaction (QTI; Wubbels et al., 1985). This instrument assesses the level of teacher Agency and Communion in the teacher-student interpersonal relationships by asking students how they perceive their teacher in general (e.g., 'this teacher is patient' or 'this teacher is uncertain'). The items are answered on a 5-point Likert-type scale ranging from "Never" to "Always". Agency and Communion dimension scores are calculated by weighting each item based on its angular position on the Interpersonal Circle (a procedure thoroughly described by Locke, 2010).

The Dutch version consists of 24 items (Mainhard, 2015). The Cronbach's alpha of the Dutch version was satisfactory for both Agency (.86) and Communion (.96), and the model fit was adequate, RMSEA = .04, CFI = .99, TLI = .97 (Pennings et al., 2018). Different cultures may require different indicators to measure the same concept (Hines, 1993). Therefore, to gain conceptual equivalent versions of the instrument, the Chinese QTI items were actively grounded in the Chinese secondary classroom context with teacher and student interviews rather than only using direct translations and parallel items. This resulted in the Chinese version of the QTI including 40 items (Sun et al., 2018, see Chapter 2). For the Chinese version, reliability was adequate for both Agency (.70) and Communion (.91), and validity was supported, RMSEA = .05, CFI = .89, TLI = .90 (Sun et al., 2018, see Chapter 2). Thus, and along the lines of what Hines (1993) describes, the Chinese and Dutch version use not completely overlapping sets of items, but nonetheless can be understood as conceptually parallel instruments. Intra-class correlations (ICC) indicated consensus between students who rated the same teacher with the Chinese (0.24 for Agency, 0.30 for Communion) and the Dutch QTI (0.53 for Agency, 0.52 for Communion). The ICC2 (N=20) indicated that the aggregates in both the Chinese (0.86 for Agency, 0.89 for Communion) and the Dutch samples were reliable (0.92 for Agency, 0.91 for Communion).

Teacher moment-to-moment interpersonal behavior

To code teacher interpersonal behavior, we used Continuous Assessment of Interpersonal Dynamics (CAID), which is a joystick-based observation procedure

developed by Sadler, Ethier, Gunn, Duong, and Woody (2009). Movement of the joystick over the interpersonal circle by coders is recorded in real time by a computer program, while coders watch a video recording (Joymon.exe; Lizdek, Sadler, Woody, Ethier, & Malet, 2012). The program numerically records the location of the cursor as x- and y-coordinates in the IPC-T, ranging from -1000 (very low Agency/Communion) to +1000 (very high Agency/Communion) (Pennings et al., 2014); recordings are made twice per second (i.e., the default setting of Joymon). According to Sadler et al. (2009), a period of ten minutes is generally considered as a sufficient duration to identify the characteristic of how people behave interpersonally in typical moment-to-moment interactions (Sadler et al., 2009). A ten-minute video-recording would typically provide around 1200 behavior coordinates, i.e., 1200 data points for Agency and for Communion respectively.

In the present study, we recorded one whole lesson of each teacher and then coded the first ten minutes of each lesson. We selected the beginning of a lesson because then teachers were most likely to be equivalent with each other in their teaching process: communicating with their class as a whole by introducing or explaining the subject of the lesson or giving assignments to the class (van Tartwijk, Brekelmans, Wubbels, Fisher, & Fraser, 1998). This period is also of great importance for building an effective learning environment in class and is especially demanding for class-level dynamics (van der Want et al., 2015).

Two trained native Chinese and two trained native Dutch observers were involved in the coding of videos in the current study. All coders were trained to follow the same standard of coding as described in Sadler et al. (2009) and except for one, the coders were trained by Sadler in 2015. The observers practiced coding and discussed the inconsistencies during the process; thus, they established standards for coding frequently occurring teacher interpersonal behaviors. For instance, the joystick slightly went up on Agency when the teacher raised his or her voice to attract student attention and moved downwards on Agency when the teacher hesitated on his/her words and paused for silence. The joystick went rightward when a rise in Communion was recognized, for example, when the teacher smiled to students; and slightly went left when the teacher frowned showing a drop in Communion. Furthermore, in cases of uncertainty regarding a few behaviors, the Chinese and the Dutch coders would discuss the meaning of those behaviors in the East Asian context and in the Western context, and differences in interpretation rarely occurred in coding the English videos. An example of such a rare difference concerns sustaining direct eye contact from one person to the other during communication that is more likely to convey hostility or anger in the eyes of one from an East Asian culture, while it more often conveys immediacy or supportive signals in Western settings (McIntyre,

Mainhard, & Klassen, 2017; Akechi et al., 2013). Another example was that a direct expression of disagreement of one person on an opinion of the other is more likely to be perceived as impolite in East Asian cultures, whereas it is more acceptable in a Western context (Leech, 2007).

We tested the consistency between one Chinese and one Dutch observer based on their coded data of the behaviors of six individuals in four ten-minute English spoken videos from a Canadian non-educational context. We calculated Intra Class Correlations (ICCs), the agreement between the observers for moment-to-moment Agency and Communion (Field, 2018), and found an average ICC of 0.72 for Agency and 0.68 for Communion across six occasions. These ICCs are regarded as adequate reliability for the per teacher pooled codes (LeBreton & Senter, 2008). As in this study the aim was to investigate teacher interpersonal behavior as it is perceived within a particular cultural context (cf. Hines, 1993), we deemed it important that the observation of teacher interpersonal behavior by coders aligned with the perceptions of typical students in that class. Coders needed to fully understand the interpersonal meaning of verbal and certain non-verbal language the teachers used in class in their own cultures. Thus, in the present study, the Chinese coders coded behavior in light of their East Asian cultural beliefs and the Dutch coders coding behaviors in light of their Western cultural beliefs. By training coders in a third cultural context (the Canadian data), we aimed to establish a shared understanding of the general coding approach and by using coders from within the specific cultural context of the classroom settings, we wanted to maximize ecologically sound coding. Adequate inter-rater reliability was established between coders within each culture. When coding five teachers by the two Chinese observers, the average ICCs were .70 (range: .67 - .73) for Agency and .69 (range: .66 - .73) for Communion. For the two Dutch observers, the average ICCs were .86 (range: .78 - .95) for Agency and .75 (range: .66 - .96) for Communion. As these ICCs represented adequate inter-rater reliability (LeBreton & Senter, 2008), we procceded the analyses of content and structure with per teacher aggregated codes to dampen idiosyncratic observations, as is proposed by Sadler et al. (2009).

Analyses

To calculate the characteristics of the interpersonal content and structure of moment-to-moment teacher behavior, we used moment-to-moment Agency and Communion codes that were averaged per teacher over two coders at each time point (resulting in a single time-series per teacher) and then we applied State Space Grid (SSG) analysis with Gridware (Lamey, Hollenstein, Lewis, & Granic, 2004).

In DS theory, behaviors at the micro-level are often referred to as *states*. From an

interpersonal perspective, a state can be described as a specific combination of Agency and Communion. An SSG is a two-dimensional graphical representation of all possible behavior states as a grid of dyadic cells (Hollenstein, 2013). Figure 2 shows an example of the SSG we used in the current study. Each cell represented a categorical combination of Agency and Communion. We recoded the teacher interpersonal behavior coordinates which ranged from -1000 to 1000 (see section Analyses-Teacher moment-to-moment interpersonal behavior) into 21 categories with 100 coordinate points for each of 20 categories, ranging from -10 (very low Agency/Communion) to 10 (very high Agency/Communion), plus an additional category for the 0 value (neutral). This resulted in an SSG of 441 cells. In this study, we omitted the very beginning of the video to avoid "boxcar" artifacts (Warner, 1998), which refers to spurious codes that result from the process of quickly moving the joystick from the origin position to the first intended rating position at the beginning of the coding (Sadler et al., 2009). This procedure resulted in a total duration of 587.5 seconds for each ten minutes of coding and a total of 1176 data points per teacher, almost 12,000 data points in total in the current study.
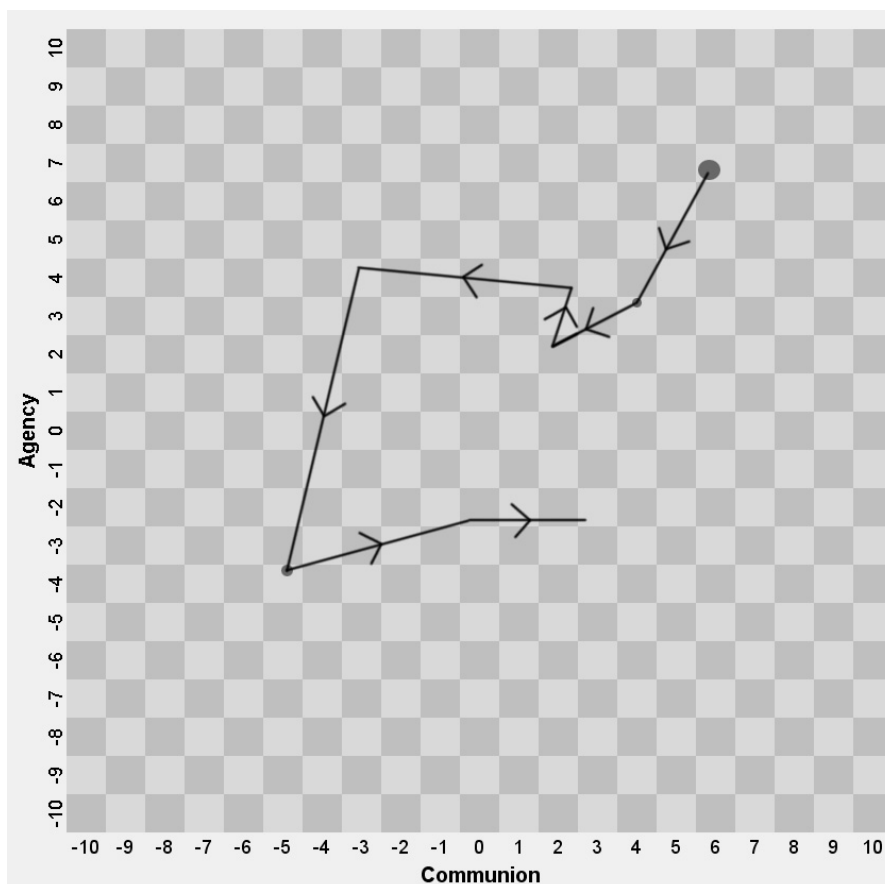
Figure 2. Example of a State Space Grid (21 x 21 categories) of teacher interpersonal behavior in terms of Agency and Communion. The horizontal axis represents the Communion level of behavior. The vertical axis indicates the Agency level of behavior. The arrowed lines represent the changes in teacher interpersonal behavior over the coded time (i.e., the interpersonal behavior trajectory). The size of the dots indicates the duration of each behavioral state. Note that the data for this SSG example are simulated and for explanatory purposes only.

Interpersonal content

In line with the DS approach (Granic & Hollenstein, 2003), we calculated two indices to map the content of teacher interpersonal behavior: (1) *the average levels* of Agency and Communion representing these behaviors, and (2) *attractors.* An attractor is used to describe a behavioral *state* (i.e., a specific combination of Agency and Communion) that occurs most frequently and stably in moment-to-moment interactions (Granic & Hollenstein, 2003). Based on criteria formulated by Pennings et al. (2014), in the current study, we identified attractors based on the longest *total duration* and the largest *number of visits* to cells or adjacent cells in the SSG (cf. Hollenstein, 2013). The *duration of visits* refers to how many seconds the behavior coordinates were in a specific cell; larger duration indicates longer time a behavior state occurred during the lesson. The *number of visits* refers to how many times the behavior coordinates moved into a specific cell from other cells, a large number represents a high frequency that a behavior state occurred during the lesson[9]. Therefore, it is possible, for example when attractors are not very strong or there are multiple attractors, that the attractors can be quite different from the overall average of Agency and Communion.

Interpersonal structure

We used four indices produced by Gridware to measure interpersonal structure (i.e., variability) (Granic & Hollenstein, 2003). The first index was the *number of transitions*, which means the number of changes between different behavior coordinates shown by the teacher during the ten minutes. The second index was the *cell range*, which refers to the numbers of unique cells that the behavior coordinates visited during the ten minutes. The third index was the *mean duration in visited cells*, which was the total duration (i.e., ten minutes in this study) divided by the cell range.

---

[9] The actual values of these indices were generated by Gridware: cells or adjacent cells were identified as attractors with a total duration longer than 33.33 seconds per 10 minutes of coding and a number of visits larger than two times of the sample mean (12.54 for the Chinese sample and 5.72 for the Dutch sample).

A larger number of transitions and cell range represents more changes in behaviors during the lesson and thus indicates higher variability, whereas larger mean duration in visited cells represents less behavior changes which indicates higher stability. Finally, we used *visit entropy* to measure the predictability of teacher interpersonal behavior. Visit entropy indicates to which extent a system is predictable by calculating the logarithm of conditional probabilities of behavioral transitions using the Shannon and Weaver entropy formula that is built into Gridware (see Hollenstein, 2013). Low visit entropy values represent a highly organized interaction pattern which indicates more predictable teacher interpersonal behavior.

The measures of interpersonal content and structure not only describe the temporal patterns among Agency and Communion that are synchronized in time, but also offer tools for exploring how behavioral processes unfold in time (Hollenstein, 2007).

Results

To study the moment-to-moment teacher interpersonal behaviors in the East Asian and Western classrooms with overall favorable teacher-student interpersonal relationships, we used SSGs to analyze the behavioral time-series in terms of interpersonal content and structure of five teachers in Chinese and five teachers in Dutch context, who were perceived by their students to have similar positive general teacher-student interpersonal relationships. We studied interpersonal content by looking at the average levels of Agency (i.e., power or dominance) and Communion (i.e., friendliness or warmth), as well as attractors (the most frequently and stably occurring behaviors). Interpersonal structure was measured by several indices of variability and predictability.

Interpersonal content

Figure 3 shows two SSGs, one in which the observations of all five teacher interpersonal behavior trajectories in the Chinese context are plotted and one in which all five behavior trajectories in the Dutch context are plotted. The interpersonal behaviors of all teachers, both the Chinese and the Dutch, were mainly perceived as being high on Agency and Communion, which was consistent with the students' perceptions of their general teacher-student interpersonal relationship. Further visual inspection of these SSGs showed that the Chinese teachers' interpersonal behaviors formed a rather clustered pattern mainly located in the upper right quadrant of the SSG (i.e., high Agency, high Communion), with some projections to the upper left quadrant of the SSG (i.e., high Agency, low Communion). The Dutch teachers' interpersonal behaviors were perceived by the Dutch coders as

somewhat loosely spread across the right half of the SSG (i.e., both high and low Agency combined with high Communion).
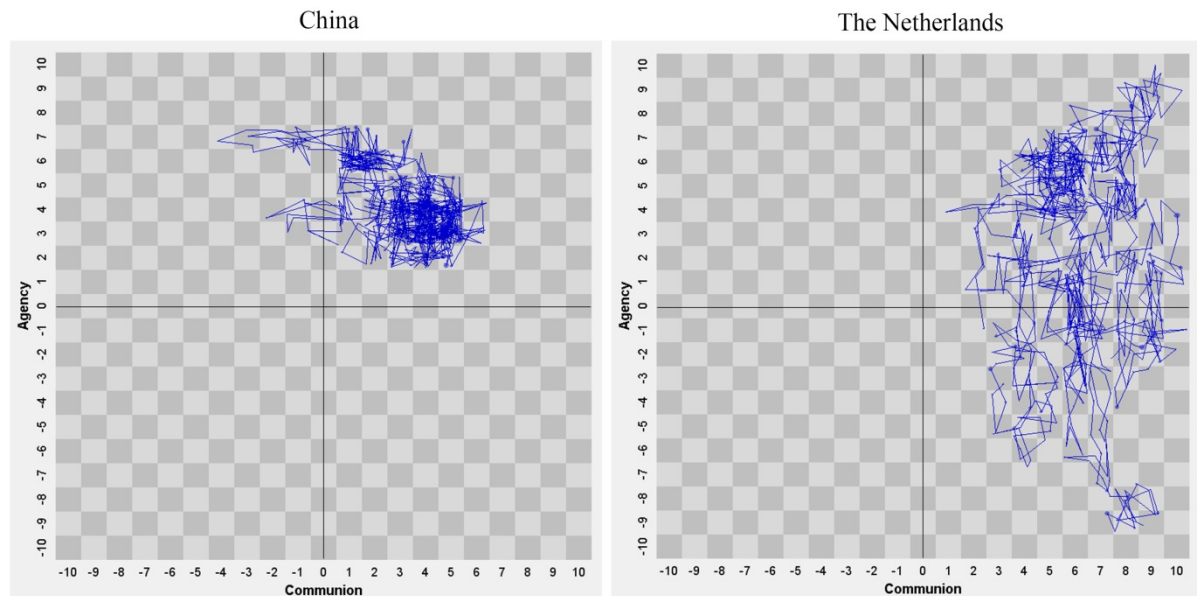
Figure 3. The five interpersonal behavior trajectories of the Chinese teachers altogether (left) and the five interpersonal behavior trajectories of the Dutch teachers altogether (right) during the ten minutes on the SSGs.

Average level of Agency and Communion

Table 1 shows the means and standard deviations for the teachers' moment-to-moment Agency and Communion during the 10-minute observations. Additionally, the average scores for both samples are provided. Regarding Agency, Chinese teachers' interpersonal behavior was perceived to show a relatively high mean level and the standard deviation was relatively small (approximately one fourth of the standard deviation in the Dutch sample). Regarding Communion, the mean level in teachers' interpersonal behavior in the Chinese context in total was approximately one half of the value of the Dutch teachers, and their standard deviation in Communion was also somewhat lower than the standard deviation in the Dutch sample.

Table 1. The interpersonal content measures of the ten teachers: means and standard deviations (SD) of observed moment-to-moment Agency and Communion levels, number of attractors, number of cells that are attractors, total duration of behavior in an attractor and number of visits to attractor cells.

	Mean (SD)		Attractors			
	Agency	Communion	Number of attractors	Number of Cells	Total Duration	Number of visits
Chinese teachers						
A1	333.65 (78.16)	318.79 (92.27)	1	1	158	26
A2	562.95 (69.14)	123.21 (89.70)	1	2	326.5	56
A3	339.49 (81.69)	283.92 (59.20)	1	4	408	69
A4	289.09 (84.97)	317.94 (140.06)	1	3	227	41
A5	266.52 (69.96)	410.73 (53.63)	1	2	261.5	48
Average	358.34 (76.78)	290.92 (86.97)	1	2.4	276.2	48
Dutch teachers						
B1	155.66 (365.79)	396.82 (98.55)	2	2	102.5	13
B2	442.39 (213.75)	478.32 (105.22)	1	4	269	68
B3	427.17 (285.98)	739.64 (131.87)	1	2	86.5	26
B4	153.75 (267.40)	709.75 (166.14)	0	0	-	-
B5	-137.28 (441.17)	577.11 (142.53)	2	2	75.5	25
Average	208.338 (314.82)	580.33 (128.86)	1.2	2	106.7	26.4

Note. Cells with a duration of visits longer than 33.33 seconds were selected as attractors, as were cells with a number of visits above 12.54 for the five Chinese teachers and above 5.72 for the five Dutch teachers, which is two times the total visits divided by the total visited cells of the teachers in the respective countries. An attractor can consist of multiple adjacent cells.

Attractors

The attractors that were identified for each teacher are presented in Figure 4. Per teacher, the SSG corresponding to their behavior is displayed and the attractors are visualized with bold-faced squares around the attractor cell(s). In the Chinese context, a clustered pattern of attractors in teacher interpersonal behavior emerged. For each Chinese teacher, we identified one single attractor. For two Dutch teachers, we identified two distinct attractors and for one Dutch teacher we could not identify a specific attractor at all.

Regarding the location of attractors, for four of the Chinese teachers, their attractors indicated high Communion and moderately high Agency, or similarly high levels of both Agency and Communion. The fifth (A2) teacher's attractor clearly showed a high level of Agency and intermediate level of Communion. Thus, almost all attractors indicated relatively high levels of both Agency and Communion with the Chinese teachers. For the Dutch teachers, two had an attractor characterized with similarly high levels of Agency and Communion, while the other attractors in the Dutch context showed high teacher Communion combined with moderate or low Agency. The attractors indicated the frequent occurrence of levels of Agency below 0 for at least two of the Dutch teachers.
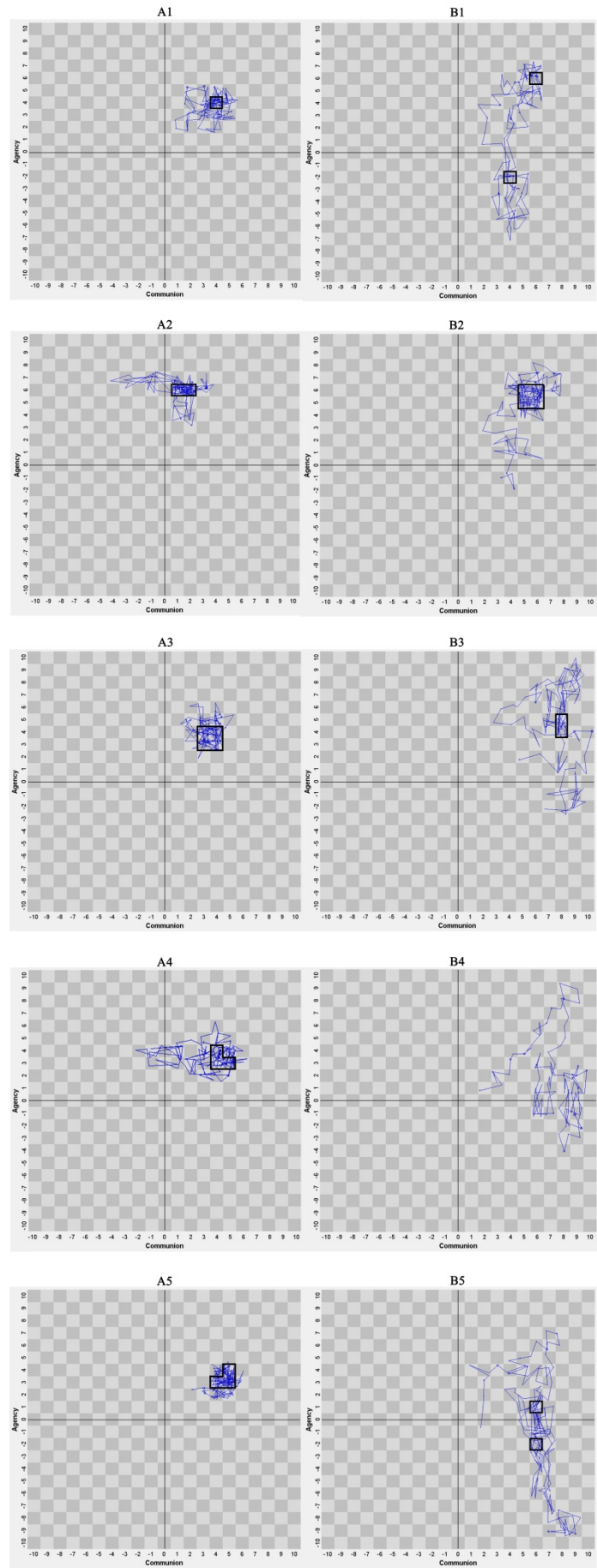
Figure 4. The behavior trajectories per teacher on the SSGs. A1 to A5 are the Chinese teachers, B1 to B5 are the matching Dutch teachers. The attractors are visualized with boldface squares around the attractor cell(s). Multiple adjacent cells can be considered as one attractor.

Table 1 lists the details of the identified attractors, including number of attractor cells, corresponding duration and number of visits for each of the teachers. These results indicate the strength of the identified attractors. The numbers of cells were rather similar in the Chinese and Dutch contexts. In total, in the Chinese context the five teachers were perceived to show rather strong attractors, based on their approximately two-times-longer duration in and more visits to the attractors than in the Dutch sample. When looking at the results for each individual teacher, it can be seen in Table 1 that the total durations in and the number of visits to the attractors of the Chinese teachers, even for the one with the lowest results, were greater than or equal to those of almost all the Dutch teachers (except B2).

Interpersonal structure

To study the interpersonal structure of teachers' interpersonal behavior, we derived four indices: number of transitions, cell range, mean duration of visits, and visit entropy. In Table 2, the teachers' individual results on these indices are presented and averaged per cultural context.

Table 2. The interpersonal structure measures of the ten teachers.

	Number of transitions	Cell range	Mean duration in visited cells	Visit entropy
	Chinese teachers			
A1	108	18	32.64	2.49
A2	113	18	32.64	2.34
A3	106	16	36.72	2.28
A4	120	25	23.50	2.90
A5	106	12	48.96	2.02
Average	110.60	17.80	34.89	2.41
	Dutch teachers			
B1	118	41	14.33	3.53
B2	135	34	17.28	2.97
B3	142	53	11.09	3.61
B4	91	46	12.77	3.67
B5	167	56	10.49	3.68
Average	130.60	46	13.14	3.49

It can be seen from Table 2 that the averaged numbers of transitions in both contexts were quite comparable. Table 2 indicates that the number of transitions in the Chinese context were rather small while the mean durations in the visited cells were rather large (more than two times the durations in the Dutch context). When looking at visit entropy, it can be seen that teachers' behavior trajectories in the Chinese context were perceived as being rather predicable (i.e., high visit entropy means low predictable behavior). Only one Chinese teacher and one Dutch teacher shared a similar level of entropy, all the other Chinese teachers' visit entropy was lower than entropy in the Dutch context. Overall, except for the number of transitions, the values of all other structure indices of the Chinese teachers indicated some disparities when referring to those of the Dutch sample.

Discussion and conclusion

To understand what teacher interpersonal behavior occurs in positive teacher-student interpersonal relationships in East Asian classrooms, we conducted intensive case-studies based on moment-to-moment observations in Chinese classrooms with overall positive teacher-student interpersonal relationships. We used a Western (Dutch) sample to provide a context for the analysis and included five teachers in each cultural context in total. We found that in the Chinese context teachers were perceived to show (1) relatively frequent agentic or dominant interpersonal behavior and (2) teacher interpersonal behavior on the Agency dimension was perceived to be rather stable in the Chinese context. At the same time, teacher interpersonal behavior was also perceived as being relatively communal or friendly.

As specifically findings for agentic or dominant teacher interpersonal behavior differed in the Dutch sub-sample, this indicates that findings in Western samples may not indiscriminately be generalizable to the East-Asian context.

Interpersonal Content – how agentic and communal is teacher interpersonal behavior?

The Chinese Confucian cultural context is characterized by a relatively large power distance (e.g., Hofstede et al., 2010; Zhou et al., 2012; Zhu et al., 2010) and in line with this it is generally expected that teachers often take initiative and are to be respected (Song et al., 2005; Zhu et al., 2010). Indeed, *regarding Agency*, all five Chinese teachers showed moderate-to-high levels of Agency in their behavior and the smallest amount of dominant behavior was exhibited by a Dutch teacher. In the Dutch context teachers were perceived to show a broader range of Agency in their behavior; next to some rather high-level agentic behaviors teachers also showed

some rather low-level agentic behaviors. Cultural differences may be visible in classroom interactions and in the context of overall positive teacher-student interpersonal relationships. Agentic teacher interpersonal behavior in Chinese classrooms may typically be rather prominent, probably because Chinese students, as Hofstede et al, (2010) noted, may have a relative low tolerance of low teacher dominance and high expectation of teacher strictness (see Wei et al., 2009; Wei et al., 2015). Chinese students may accept, and maybe even expect, teacher dominance readily due to the Confucian culture that emphasizes the virtue of compliance to authority figures such as teachers (Chang et al., 2011; Cheung & Lau, 1985; Den Brok & Levy, 2005; Zhou et al., 2012; Zhu et al., 2010). Thus, to arrive at positive teacher-student interpersonal relationships, Chinese teachers might exhibit frequent agentic behavior and may refrain from exhibiting low-agentic behaviors. This finding is in line with the high expectation of teachers' strictness in Chinese classrooms (Wei et al., 2015).

Regarding Communion, processes were overall rather similar in the Chinese and Dutch contexts. We found that in the Chinese context the five teachers showed moderately communal or friendly behavior in classrooms with positive general teacher-student interpersonal relationships. In the Dutch context, teacher interpersonal behavior was coded as somewhat more communal. A possible explanation from a cultural perspective might be that the Chinese teachers tend to approach students predominantly as group members (Hofstede et al., 2010). This might result in less personal attention to individual students, which may reduce somewhat the perceived friendliness in teacher interpersonal behavior. Again, such personal attention may be valued specifically in Western cultural contexts (Hofstede et al., 2010).

Interpersonal Structure – how variable and predictable is teacher interpersonal behavior?

Regarding interpersonal structure, the results were in line with our expectations: the five teachers in the Chinese context were perceived as being rather stable and predictable. Chang et al., (2011) found that East Asian teachers tend to use consistent teaching methods and activities. Also, Jin and Cortazzi (1998) observed that interactions between teachers and students in Western classrooms seem to be more spontaneous than in East Asian classrooms.

Specifically, the behaviors of the Chinese teachers were perceived as shifting between rather similar behaviors. In the Dutch context teachers were perceived to exhibit larger changes in terms of levels of Agency and Communion (see the difference in cell range in Table 2 and Figure 3). Some caution is however in place

regarding this latter finding (see section Limitation and future directions).

Limitations and future directions

In this study, videos were coded within their cultural context: Chinese classrooms were coded by native Chinese coders and videos of Dutch classrooms were coded by native Dutch coders. Because we viewed the coders as proxies for students in that specific class, we deemed it necessary to have coders who were able to base their perceptions of teacher interpersonal behavior on cultural experiences and beliefs similar to that of the students in the video. In order to find out how a student from the Chinese context would perceive teacher interpersonal behavior exhibited in the Dutch context, it might also be interesting and insightful to explore cross-cultural coding by having coders from both cultural backgrounds code teachers from both cultural contexts. Future research could also explore possible differences in expectations of interpersonal behaviors of teachers with, for example, interviews with students about their most preferred teacher behaviors or how they perceive their most liked teacher. Similarly, interviews with teachers about their teaching ideals and how they view themselves in class might be insightful in this regard.

Further, in the present study ICCs supported good interrater reliability between the Chinese and the Dutch coders for coding the Canadian training videos (see section Analyses-Teacher moment-to-moment interpersonal behavior). According to the manual for joystick coding and previous studies that applied this coding method (e.g., Lizdek et al., 2012; Sadler et al., 2009), the ICC of the mean score of two dimensions was considered sufficient for establishing interrater reliability. Nonetheless, most of the available work we based our study on stems from western classrooms, and both the Chinese and the Dutch coders were trained in a predominantly western context. Therefore, it can be argued that our study may reflect, to a certain degree, a Western perspective on Chinese classroom processes. Further, a closer look at this training data revealed that the training data of one Chinese coder showed relatively more transitions between behaviors. Note that characteristics of coding are usually not considered as a part of the process of establishing interrater reliability. This may raise a challenge for future studies that apply moment-to-moment coding.

Finally, when sampling teachers for the current study, we gave precedence to overall teacher-student interpersonal relationships over other teacher characteristics. We sampled a homogeneous group of teachers with overall positive teacher-student interpersonal relationships (high Communion and moderately high Agency), and, given the intense coding work, only five teachers from each cultural context were included. In maximizing the similarity of the teachers with regard to the quality of the

overall teacher-student relationship, we accepted disparities in the subject and gender distribution of the selected teachers. In future research, it would be valuable to explore a larger sample including teachers with all kinds of teacher-student relationships (i.e., from all parts of the Interpersonal Circle, see Figure 1) and with more similar distributions of other characteristics such as gender, age, subject taught and teaching experience. Note however, that such variables typically do not explain much differences in teacher interpersonal behavior (Den Brok et al., 2006).

Practical and theoretical relevance

The findings of this study contribute to the understanding what interpersonal behaviors occur in positive teacher-student interpersonal relationships in East Asian cultures. Regarding the generalizability of findings and pending further replications, our findings point into the direction that teachers in different cultural contexts, but with students that have similar positive perceptions of the general teacher-student interpersonal relationship, may differ to a certain extent in their moment-to-moment interpersonal behavior. It seems that in an East Asian classroom, a positive teacher-student interpersonal relationship may be associated with rather agentic teacher interpersonal behavior. Likewise, in different cultural contexts, similar teacher behavior may have a different interpersonal meaning or contribute in different ways to the overall quality of teacher-student interpersonal relationships. For example, low teacher Agency or dominance may occur frequently in the context of positive teacher-student interpersonal relationships in Western cultures, whereas in an East Asian culture, this may not be the case due to differences in accepted power distance. Considering our results, it seems important for researchers and practitioners to be aware that findings about interpersonal classroom processes from Western samples may not be fully generalizable to other cultural contexts, such as the East Asian context, and vice versa. Additionally, and in line with ideas articulated in culturally responsive classroom management (Weinstein, Tomlinson-Clarke, & Curran, 2004), for teachers who work in schools with populations of students from multicultural backgrounds, the findings in this study point towards the importance of being aware of potentially different interpersonal meanings of behaviors in different cultures.

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CHAPTER 6

CHAPTER 6

GENERAL DISCUSSION

CHAPTER 6

Teacher-student interpersonal relationships are important for student learning and well-being (Cornelius-White, 2007; Den Brok, Brekelmans, & Wubbels, 2004; Den Brok, Levy, Brekelmans, & Wubbels, 2005; Goh & Fraser, 2000; Spilt, Koomen, Stoel, Thijs, & Van der Leij, 2011). As much of the studies related to teacher-student interpersonal relationships have mainly been carried out in Western educational contexts, this PhD thesis investigated the interpersonal framework of teacher-student relationships (Wubbels, Brekelmans, Den Brok, & van Tartwijk, 2006) in Chinese classroom contexts and assessed the relevance of teacher interpersonal behaviour for students' affective variables in school. We conducted four studies in this thesis titled *Teacher-Student Interpersonal Relationships in Chinese Secondary Education Classrooms*. In the first study, we developed a Chinese version of the Questionnaire on Teacher Interaction (QTI; Wubbels, Créton and Hooymayers, 1985), which is a conceptually parallel version of the original Dutch QTI and explicitly grounded in the Chinese secondary classroom context, in order to measure teacher-student interpersonal relationships in terms of how students perceive their teacher interpersonally in classroom. Then, in the second and third study, to further understand the role of teacher-student interpersonal relationships in the Chinese classroom context, we investigated the connection of teacher-student interpersonal relationships with student achievement goals, academic emotions and behavioural engagement. Finally, in the fourth study, in order to better understand what teacher behaviour underlies preferable teacher-student relationships in Chinese classroom contexts, we conducted video observations on teachers who were perceived by their students to have positive teacher-student interpersonal relationships.

This chapter first outlines a summary of the major findings of each study. Then, the contribution of this thesis to the current body of knowledge on teacher-student interpersonal relationships is discussed. Third, limitations and suggestions for future research are provided and finally, practical implications for teachers and educators are offered.

Summary of study findings

The **first study** developed a Chinese version of the Questionnaire on Teacher Interaction (QTI). Earlier translations of the QTI have focused on parallel items and direct translations (Wei, Den Brok, & Zhou, 2009; Sivan, Dennis, Chan, & Kwan, 2014; Xin & Lin, 2000), according to Hines (1993) however, different indicators may be required to measure the same concept in different cultural contexts. Therefore, it was deemed important to gain a conceptual equivalent version of the instrument when adapting it to the Chinese context. The Chinese version was developed by considering language and cultural embeddedness and was explicitly grounded in the

Chinese classroom context. Of the 40 items selected for this Chinese version, 12 items translated from the Dutch and English versions were moved to a different octant than they originally were intended for, since a more favourable model fit was indicated in a different octant in the Chinese sample. In addition, 13 items were newly created based on interviews with Chinese teachers and students. Thus, our adaptation process of the QTI to the Chinese context, transcended a narrow view of instrument adaptation to another culture as translation that yields parallel items and similar item loadings as for the original version. We strived for the 40 items of the newly developed Chinese QTI being structured in a circular pattern equivalent to the Dutch version thus representing the circumplex nature of the IPC-T. With this instrument the underlying dimensions (i.e., agency and communion) can effectively be assessed. There are three major strengths of this newly developed Chinese QTI. First, the item wording followed stringent criteria from the very beginning of the development process. The criteria stated by Wubbels et al. (2012) included that the items should describe general, unconditional situations rather than specific classroom situations, should focus on the behaviour of the teacher rather than students, should concentrate on interpersonal processes rather than pedagogic issues, and should avoid using negative formulations. Second, interviews with teachers and students were conducted to ensure face validity of items and to use a local classroom context for developing new items. Third, a strict confirmatory test was performed of the circular fit of items and scales to ensure the validity of the questionnaire. A test of the predictive validity was performed by relating the students' perceptions of their teachers with their academic emotions and this test supported the predictive validity. The Chinese version of the QTI developed in the first study not only provided a reliable and valid instrument for the other three studies in this thesis, it also can be used by other researchers in further research on teacher-student interpersonal relationships in China. Also, the method to adapt an instrument into another language and cultural context adopted in this study might be informative for future adaptations of other instruments.

The **second study** investigated how the classroom social environment, in terms of teacher-student interpersonal relationships, and students' achievement goals (Pekrun, Elliot, & Maier, 2006) functions as an antecedent of students' academic emotions. More specifically, this study tested the potential mediation of student achievement goals in the association between teacher-student interpersonal relationships and student academic emotions. This study applied structural equation modelling on questionnaire data from a sample of 2000 students in four Chinese secondary schools. The results of the second study indicated that classroom social environment was a more important predictor of student academic emotions than

their achievement goals. That is, teacher warmth and friendliness (i.e., communion) appeared to be a more important predictor of student emotions than teacher dominance and control (i.e., agency). Nevertheless, agency should not be discarded as an antecedent of emotions. The results also showed that the direct effects of teacher-student interpersonal relationships on emotions were stronger than indirect effects via student goals. Still, achievement goals mediated a portion of the association between teacher-student interpersonal relationships and student academic emotions. Hence, student goals may, at least in part, play a role in the underlying mechanism that binds the two. These findings increased the understanding of the antecedents of student emotion in class and might help teachers and teacher educators be aware of the various roles played by these antecedents in teaching practice.

The **third study** explored if teachers as warm demanders, who combine supportive and controlling behaviour (Bondy & Ross, 2008), can promote students' behavioural engagement (Roorda, Koomen, Spilt, & Oort, 2011) and reduce disaffection (Skinner, Kindermann, & Furrer, 2009) in the classroom, and specifically if teacher agency adds to the effect of teacher communion on student behavioural engagement. Multi-level regression analyses were applied on a sample consisting of ratings of 40 teachers from 800 students to investigate the association between student perceptions of teacher interpersonal behaviour and student behavioural engagement and disaffection. Results showed that teachers as warm demanders combining both teacher supportive (i.e., communion) and controlling behaviour (i.e., agency) could promote student behavioural engagement and reduce their behavioural disaffection. Again, teacher communion turned out to be the more important predictor of student behavioural engagement and disaffection, but teacher agency added to the strength of the effect of teacher communion. These findings suggested teachers who combine high levels of agency and communion (i.e., warm demanders) potentially have the most engaged and least disengaged students in class. In addition to offer care and respect to students (communion), it is also important for teachers to provide structure in the classroom by setting clear rules and stating high expectations to students (agency). These agentic teacher behaviours may especially be important in Chinese classroom contexts in which students have high expectations of teacher strictness (Wei et al., 2009; Wei, Zhou, Barber, & Den Brok, 2015).

Finally, the **fourth study** aimed to investigate how teachers with preferable interpersonal teacher-student relationships behave interpersonally from moment to moment in different cultural contexts. This study matched five Chinese teachers to five Dutch teachers which all had been rated by students on the QTI to have positive

interpersonal relationships with their students (i.e., displaying high communion and moderately high agency) and used classroom observations to track interpersonal behaviour of these ten teachers from moment to moment. A multiple case study design was applied to investigate the interpersonal content and structure of the teachers' interpersonal behaviour. As expected, the fourth study found that the five Chinese teachers showed rather frequent dominant and friendly moment-to-moment behaviour. The interpersonal behaviour of Chinese teachers was also perceived to be rather stable and to be shifting between rather similar behaviours. Dutch teachers were found to exhibit larger changes in their moment-to-moment behaviour in terms of agency and communion levels.

In sum, cultural differences may be visible in teacher-student interpersonal relationships and classroom interactions. Teacher interpersonal behaviour characterized by high agency may typically be rather prominent in Chinese secondary classrooms, probably because, as Hofstede et al, (2010) noted, Chinese students may have a relative high expectation of teacher strictness and low tolerance of teacher submissiveness (also see Wei et al., 2009; Wei et al., 2015). Positive teacher-student interpersonal relationships may be associated with more agentic teacher behaviour in East Asian classrooms than in Western classrooms.

Discussion

Teacher Agency

This thesis provided some evidence that the role of teacher agency in the Chinese classroom environment may differ from that in western classrooms as documented in previous studies conducted within western samples (e.g., Goetz, Sticca, Pekrun, Murayama, & Elliot, 2016; Mainhard, Oudman, Hornstra, Bosker, & Goetz, 2018; Roorda et al., 2011). It is plausible that a teacher-student interpersonal relationship characterized by high agency is a more important quality for being a good teacher in China than in western countries. In the interviews conducted in the first study, almost all participating teachers indicated rather high dominance when describing their behaviour in class. Some teachers even mentioned that high agency, for example, being able to have the whole classroom situation under control, was a general property that a qualified teacher should always have. This is in line with the large power distance found in the Chinese culture (Hofstede, Hofstede, & Minkov, 2010) and the observations that teachers being an authority and expert are highly valued in China (Zhu, Valcke, & Schellens, 2010), and that Chinese students seem to have an expectation of high teacher strictness (Wei et al., 2009; Wei et al., 2015). The uniformly large power distance in Chinese classrooms may also explain the inconsistency between our finding that teacher agency was not associated with

students' enjoyment or anxiety. Goetz and his colleagues (Goetz, Lüdtke, Nett, Keller, & Lipnevich, 2013) found teacher dominance enhances student enjoyment and reduces student anxiety and Mainhard et al. (2018) that high agency goes together with anxiety. Similarly, a differing cultural role of teacher dominance or power might explain our result that teacher agency was positively associated with mastery-approach goals while previous findings in western samples found that teacher control undermines student mastery-approach goals (Patrick, Kaplan, & Ryan, 2011). Within the Chinese sample in this thesis, we found that students reported teacher agency was not related to student enjoyment, anxiety or mastery-avoidance goals. As Chinese students tend to have high expectations (Wei et al., 2009; Wei et al., 2015) and acceptance of teacher strictness (Hofstede et al., 2010), they may thus be less likely than their western peers to have a change in their feelings or obtain avoidance orientation in learning when their teachers are very dominant.

In both samples that were included in this thesis, a relatively lower standard deviation in teacher agency was found as compared to the western samples in previous studies (e.g., Mainhard et al., 2018; Pennings et al., 2018). This finding aligns with what we stated above that Chinese teachers are usually expected to show high agency, probably leading to in generally high levels of perceived agency in Chinese teachers and a ceiling effect with a low standard deviation.

Specifically, it is possible that low-agentic teacher behaviour is deemed to be much less acceptable in Chinese classrooms (see study 4 in the current thesis). In the moment-to-moment video observation of ten teachers who were perceived by their students to have similar levels of moderate agency, all five participating Chinese teachers showed moderate to high levels of agency in their moment-to-moment behaviour across the first ten minutes of their class. In contrast, the five Dutch teachers showed a broader range in their agentic behaviour, ranging from very high to rather low. Also, the most submissive behaviour (i.e., showing the lowest level of agency) amongst all ten teachers was exhibited by a Dutch teacher. Thus, it is plausible that in the context of a classroom with positive teacher-student interpersonal relationships, the level of agency teachers exhibit in their moment-to-moment behaviour may be typically higher in the Chinese classroom context than in the Dutch classroom context. In fact, the different interpersonal meanings of certain teacher behaviour in different cultural contexts was also reflected in the adaption of some QTI items into the Chinese context. For example, the item "this teacher can take a joke" loads on the Helpful scale (high communion and moderately high agency) in the Dutch, American and Australian contexts, whereas in the Chinese context it loaded on the Compliant octant (moderately high communion and low agency).

Teacher Communion

Our findings regarding teacher communion are mostly in line with previous studies. Consistent with previous findings within western samples, we found in this thesis within Chinese samples, that teacher support and warmth contribute to student adaptive goals (Mainhard, 2015; Patrick et al., 2011; Turner, Gray, Anderman, Dawson, & Anderman, 2013), pleasant emotion (Goetz et al., 2013; Mainhard et al., 2018; Pekrun et al., 2006) and behavioural engagement (Roorda et al., 2011; Skinner & Belmont, 1993) in learning. As teacher communion seems to be a stronger predictor of student outcomes than teacher agency (Skinner & Belmont, 1993; Tucker et al., 2002), it is advisable for teachers to put major focus on their warmth and caring towards students in class. Nevertheless, one should not overlook the effect of teacher dominance or agency on student affective outcomes, since this variable explained a sizable amount of variance and may also change to the effect of teacher communion.

Although our findings regarding the level and functioning of macro-level teacher communion in the Chinese samples are mostly aligned with those found in previous western studies, at the moment-to-moment level, the five Chinese teachers in the fourth study seem to have a tendency of showing somewhat lower-communion behaviours than the five Dutch teachers in the context of positive teacher-student interpersonal relationships. This might be explained by the collectivistic nature of the Chinese classroom culture (Hofstede et al., 2010): teachers tend to treat students as a whole group rather than as different individuals and therefore might have less personal attention to each individual student which may reduce friendliness or communion in their behaviour. Nevertheless, the difference in teacher communion between the Chinese and the Dutch sample was not very pronounced, it would be important to investigate this further with larger samples.

In sum, considering the findings in this thesis, it appears to be worthwhile to apply the framework of teacher-student interpersonal relationships into the Chinese context. Overall, the results are largely comparable with previous findings on the interpersonal framework in western samples, however the results also show that it is important for researchers to be aware that there are some limitations to generalizability over cultural contexts, such as the East Asian classroom, and vice versa. In the Chinese context one should especially keep in mind the seemingly different functioning of teacher agency: teacher agentic or dominant behaviour may play a more important role in building a positive teacher-student interpersonal relationship in an East Asian classroom context than in a Western classroom context.

CHAPTER 6

Limitation and future orientation

The studies presented in this thesis have some limitations which should be kept in mind when interpreting the results and may inspire several valuable avenues for future research.

First, it is notable that the Complaint scale (i.e., low agency, intermediate high levels of communion) is the most problematic scale in the Chinese version of the QTI which had although the largest number of items the lowest reliability. In many other versions of the QTI, the Compliant scale was also found to be one of the more problematic scales considering reliability, such as the versions used in Singapore, Brunei, Australia (Den Brok, Fisher, Wubbels, Brekelmans, & Rickards, 2006), Turkey (Telli, Den Brok, & Cakiroglu, 2007), Indonesia (Maulana, Opdenakker, Den Brok, & Bosker, 2012) and Italy (Passini, Molinari, & Speltini, 2015). In the interview process of brainstorming for new items in the first study, Chinese teachers and students already showed difficulties in thinking of typical behaviour for the compliant octant, since they argued that they rarely experienced compliant teacher behaviours in classrooms. Future research may therefore pay additional attention to the formulation and selection of Compliant items. It is also valuable to attempt to make a more efficient Chinese version of the QTI which consist of fewer items than the current 40.

Second, the questionnaire data applied in this research was based on self-report measures collected at one moment in time. This type of measures is based on answers provided by participants, that although hopefully honest, may not always represent an accurate description of their true thoughts (Carducci, 2009), for example, due to social desirability (Lavrakas, 2008). This may result in bias in the data and technically to e.g., a skewed distribution. In addition, the studies related to student affective outcomes in this research were based on cross-sectional data which made it difficult to draw firm conclusions about associations over time and processes within individuals. It would be important in future research to conduct longitudinal studies with at least two or three measurement occasions.

Third, in the video observation process, videos of Chinese classrooms were all coded by native Chinese coders, and videos of Dutch classrooms were all coded by native Dutch coders. Although all coders attended trainings to code English spoken videos from a Canadian context and showed no evident differences in their coding of these interactions, we do not know if Chinese coders would code a Dutch video similar to Dutch coders and Dutch coders Chinese similarly. For example, would it be possible that Chinese coders may view a relatively strict teacher behaviour as indicating higher teacher communion than the Dutch coders when they are both rating a video of a Chinese classroom. Therefore, it might be interesting for future

studies to explore cross-cultural coding in which coders from both cultures also rate teachers in classrooms from both cultural contexts.

Fourth, for the video observation, it would be valuable to have a larger and more heterogeneous sample that includes teachers with a variety of teacher-student interpersonal relationships next to the more preferable relationships we investigated (Pennings & Hollenstein, 2019). Future research could also explore the origin of the dissimilarities in moment-to-moment behaviours of teachers from different cultures. A more personalized perspective might include a qualitative approach, for example, interviews with students about how they think of their teacher's moment-to-moment behaviour, and interviews with teachers about how they see themselves in class. Since an approach to micro-level interactions between teachers and students enriches the study of interpersonal behaviour within classrooms (Pennings et al., 2018), it would also be an insightful approach to include observation of student interpersonal behaviour in future studies to see how moment-to-moment teacher-student interactions unfold in different cultural contexts.

Practical implications

Findings in this thesis, if confirmed in future studies, would indicate practical implications for teachers and educational researchers.

The Chinese version of the QTI developed in the first study was actively grounded in the Chinese classroom context, and the follow-up studies in this thesis also supported the suitableness of this questionnaire to measure student perceptions of their teachers' interpersonal behaviour in Chinese secondary classrooms. Thus, this thesis provides Chinese secondary school teachers a valid measurement to gain feedback about their teaching.

The findings of the studies contribute to the understanding of the various roles played by the antecedents that promote student learning, especially the role of teacher dominance might differ in classrooms from different cultural context. To create an efficient classroom social environment for students, it is ideal that teachers are warm demanders who combine warmth (communion) and dominance (agency) in their behaviour in both the Chinese and western context. It is important for teachers to put major attention on supporting students with care and respect. However, teachers should not overlook the role of teacher dominance in class, as it not only works as an antecedent of student motivation and outcomes in school, but also contributes to the effect of teacher warmth on student learning engagement. One should especially attach importance to teacher agency in cultural contexts that highly value teachers' authority and strictness in classroom (Hofstede et al., 2010; Wei et al., 2015). For instance, in a Chinese classroom, students' favourite

interpersonal relationship with their teacher might be related to more dominant and somewhat less friendly teacher interpersonal behaviour than in a Dutch classroom. Likewise, a rather strict teacher behaviour might correspond to a less favourable relationship with students in a Dutch classroom, whereas it may be associated with a more positive relationship with students in a Chinese classroom. Therefore, one should keep in mind the different functioning of teacher agency in different cultural contexts, and that teacher agentic or dominant behaviour may play a more important role for being a good teacher in an East Asian classroom than in a Western classroom. Thus, the guidance to create a favourable learning environment for students could differ for teachers who work in classrooms in different cultural contexts.

The findings of this thesis may also inspire teachers who work in multi-cultural classrooms. According to the review of Den Brok and Levy (2005), there is evidence that students of various ethnic groups differ in how their perceptions of teacher-student interpersonal relationship are related to their outcomes. For example, Den Brok and his colleagues (Den Brok, Veldman, Wubbels, & Van Tartwijk, 2004) found for non-western students (i.e., Moroccan and Turkish students) a stronger association between their perceived agency/communion and their subject-related attitudes than their Dutch classmates, and students whose families come from large-power-distance countries, such as Moroccan students, reported higher teacher agency than students from other ethnic groups in class. It is possible that students' cultural perceptions immigrate to the host country and remain with them for a while. Thus, it is important for teachers to be aware of how their behaviour might have an impact on their students from different cultural backgrounds. More specifically, it is important that teachers pay attention to how students from different ethnic groups adapt to their host country differently without assigning stereotyped cultural "labels".

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APPENDICES

Appendix A. The 40 items of the Chinese QTI (with English translation) (Chapter 2)

Scale	Item (Chinese) 这位老师……	Item (literal English translation) This teacher…
1-统领 1-Directing (5 items)	……有威信。 ……对课堂上的一切了如指掌。 ……对学生的领导力强。 ……掌控学生课上的各种行为。 ……掌控学生何时能够讲话。	…is prestigious. …knows everything that goes on in the classroom. …shows good leadership with students. …controls students' behaviour in class. …controls when students can speak.
2-支持 2-Helpful (5 items)	……处事公正。 ……能抓住学生的注意力。 ……令人敬重。 ……很可靠。 ……很好地掌控课堂。	…is fair/impartial. …holds students' attention. …is respected. …is reliable. …manages class well. *Note.* This item is inspired by the original English item "This teacher is a good leader".
3-体谅 3-Understanding (4 items)	……幽默风趣。 ……上的课让人愉快。 ……愿意倾听学生的心声。 ……满面笑容。	…has a sense of humour. …'s class is pleasant. …listens to students. …has a smiling face.
4-顺从 4-Compliant (7 items)	……顺应学生的要求。 ……课上学生有很大自由。 ……容忍学生的很多行为。 ……可以和他/她开玩笑。 ……根据学生的意见改变主意。 ……课上学生的错误可以被放过。 ……课上学生可以做自己想做的事。	…is compliant to what students want. …'s students have a lot of freedom in class. …tolerates a lot of student behaviour. …can take jokes. …changes his/her mind in response to student feedback. … can let go students' mistakes in class. *Note.* This item is inspired by the original English item "This teacher lets students get away with a lot". …'s students can do what they want in class.

5-犹疑 5-Uncertain (4 items)	......容易被学生捉弄。	...is easy to be made fool of by students.
	......被学生牵着鼻子走。	...let students boss him/her around.
	......课上学生可以开小差。	...'s students can skive in class. *Note.* This item is inspired by the original English item "This teacher lets students fool around in class".
	......对纪律要求低。	...has low requirements on discipline. *Note.* This item is inspired by the original English item "This teacher's discipline is weak".
6-不满 6-Dissatisfied (5 items)	......说话不算话。	...break his/her words.
	......满腹牢骚。	... complains a lot.
	......推卸责任。	...passes the buck.
	......容易和学生起冲突。	...is easy to get conflicts with students.
	......猜疑学生。	...is suspicious of students.
7-对抗 7-Confrontational (5 items)	......容易发火。	...gets angry quickly.
	......强行占用课余时间。	...forcibly occupies spare time.
	......严厉处罚学生。	...punishes students severely.
	......用惩罚来威胁学生。	...threatens students with punishment.
	......令人害怕。	...is fearsome.
8-强权 8-Imposing (5 items)	......很严格。	...is strict.
	......对学生要求非常高。	...'s standards are very high.
	......要求学生服从他。	...requires students' obedience.
	......强制课堂保持安静。	...imposes silence in class.
	......强制学生按照其要求去做。	...forces students to do as what he/she says.

Note. The items above are ordered by the eight scales. Please randomise the items before using the questionnaire. The English translation is added for clarification, *these are not the actual items used in the English versions of the QTI*.

Appendix B. Results of SEM analyses at the teacher level on interpersonal teacher behaviour, student academic emotions and achievement goals
(Chapter 3)

In this appendix we provide specific information of the results of the teacher level which were not reported in the main text.

In this study, a two-level model was constructed to account for the nested data structure with students clustered in classes. At the student (or individual) level, a student's individual perception of a teacher was calculated as an individual student's score deviation from the class mean when leaving out class variance, which represents the unique perception of one individual student of the teacher (i.e., group mean centring). At the teacher (or shared) level, the shared perception was calculated as the average score of all students in a class. The ICC1 and ICC2 for a typical classroom with 50 students indicated sufficient variance at the teacher level of agency (ICC1 = 0.31, ICC2 = 0.96) and communion (ICC1 = 0.31, ICC2 = 0.96).

The results at the teacher level are presented in the Tables A1 and A2. Table A1 presents the path coefficients of direct effects, the variance components and the ICCs. Table A2 displays the path coefficients of indirect effects of agency and communion on the three emotions via the four goals.

Regarding the direct effect, in line with our expectations, teacher communion was positively connected to enjoyment and approach goals and negatively associated with anxiety, boredom and avoidance goals. However, agency only showed positive association with anxiety and approach goals, whereas it had no significant connection with other emotions or goals. Amongst all four goals, only performance-avoidant goals indicated significant associations with emotions: these goals were positively related to anxiety and boredom. Similar to the results at the student level, much less variance in goals than in emotions was explained in the models.

Regarding the indirect effect, we found a combined total indirect effect of the four goals combined on teacher communion and the three emotions, but none of the four goals independent of the other three had any indirect effects. No significant indirect effects via goals were observed between the association of agency and any of the three emotions.

Tables

Table B1. Standardized path coefficients of direct effects, and variance components at the teacher level.

Predictor variable	Enjoyment	Anxiety	Boredom	Mastery-approach goals	Mastery-avoidance goals	Performance-approach goals	Performance-avoidance goals
Communion	0.56***	-0.33*	-0.51***	0.56***	-0.60***	0.36**	-0.46***
Agency	-0.05	0.39*	0.03	0.25*	0.22	0.31*	-0.28
Mastery-approach goals	-0.05	-0.68	-0.85				
Mastery-avoidance goals	-0.20	0.10	-0.26				
Performance-approach goals	0.37	0.77	0.62				
Performance-avoidance goals	-0.18	0.47*	0.43*				
Explained variance							
Level 2	0.89	0.90	0.92	0.42	0.38	0.24	0.30
Total	0.53	0.54	0.34	0.16	0.04	0.07	0.03
ICC1	0.19	0.10	0.18	0.11	0.06	0.12	0.05
ICC2	0.92	0.84	0.92	0.86	0.76	0.87	0.71

Notes: $*p < .05$, $**p < .01$, $***p < .001$. This table presents the standardized path coefficients between the predictors (agency, communion and four goals) in the enjoyment model, as the values of these path coefficients are comparable in the three emotion models and only small differences exist at the second decimal place.

Table B2. Standardized path coefficients of indirect effects at the teacher level.

	Enjoyment	Anxiety	Boredom
Communion			
Total	0.30***	-0.39**	-0.31*
Via Mastery-approach goals	-0.03	-0.38	-0.48
Via Mastery-avoidance goals	0.12	-0.06	0.15
Via Performance-approach goals	0.13	0.27	0.22
Via Performance-avoidance goals	0.08	-0.21	-0.20
Agency			
Total	0.11	-0.04	-0.20
Via Mastery-approach goals	-0.01	-0.17	-0.22
Via Mastery-avoidance goals	-0.04	0.02	-0.06
Via Performance-approach goals	0.12	0.24	0.19
Via Performance-avoidance goals	0.05	-0.13	-0.12

Notes: *$p < .05$, **$p < .01$, ***$p < .001$.

Appendix C. The items of the Chinese behavioral engagement and disaffection questionnaire (with original English items)
(Chapter 4)

Scale	Item (Chinese)	Item (English)
Behavioral engagement	我会努力在学校表现优秀。	I try hard to do well in school.
	我在课堂上会尽自己最大努力学习。	In class, I work as hard as I can.
	我上课时会参与课堂讨论。	When I'm in class, I participate in class discussions.
	我上课很专心。	I pay attention in class.
	我在课堂上认真听讲。	When I'm in class, I listen very carefully.
Behavioral disaffection	我在课堂上会假装自己在学习。	When I'm in class, I just act like I'm working.
	我在学校不会特别努力。	I don't try very hard at school.
	我在课堂上只要能敷衍过去就行。	In class, I do just enough to get by.
	我在课堂上会想其他事情。	When I'm in class, I think about other things.
	我在课堂上会走神。	When I'm in class, my mind wanders.

NEDERLANDSE SAMENVATTING

(SUMMARY IN DUTCH)

Inleiding

Leraar-leerlingrelaties spelen een essentiële rol in het onderwijsleerproces. Wanneer die relaties goed zijn, dragen ze bij aan cognitieve en affectieve leeropbrengsten. Dergelijke relaties ontstaan uit gedrag dat leraren en leerlingen van moment tot moment vertonen en die relaties vervullen op hun beurt een rol in de interpretatie van leraren en leerlingen van elkaars momentaan gedrag. Eerder onderzoek over leraar-leerlingrelaties en over gedrag van moment-tot-moment is voornamelijk uitgevoerd in westerse klassen. Daarom wil dit proefschrift nagaan of de interpersoonlijke theorie over leraar-leerlingrelaties ook gebruikt kan worden in een Chinese context. Er zijn vier studies uitgevoerd; de eerste om een instrument te ontwikkelen om de leerling- en leraarsperceptie van de leraar-leerlingrelatie in kaart te brengen. Vervolgens is dit instrument gebruikt in studies die verbanden tussen de leerlingpercepties van de leraar-leerlingerelatie en affectieve variabelen in het onderwijs verkennen. Ten slotte is ook het leraarsgedrag van moment-tot-moment onderzocht in Chinese en Nederlandse klassen.

Dit proefschrift maakt gebruik van het interpersoonlijke kader voor het beschrijven van de leraar-leerlingrelatie en het momentaan leraarsgedrag. In dit kader speelt de interpersoonlijke cirkel een belangrijke rol; een circumplex model met twee orthogonale dimensies: invloed en nabijheid. Positieve leraar-leerlingrelaties worden gekenmerkt door gedrag waarin leraar en leerlingen emotioneel nabij zijn en de leraar behoorlijk invloed op zijn of haar leerlingen heeft. Dergelijke relaties dragen bij aan gunstige affectieve kenmerken van de leeromgeving en aan leerresultaten van leerlingen.

Gedragingen die een leraar van moment tot moment vertoont (het microniveau) zijn genest binnen de leraar-leerlingrelatie (het macroniveau) en kunnen beschouwd worden als bouwstenen voor die relatie. Aangezien cultuurkenmerken, zoals de mate van machtsafstand, individualisme en collectivisme, weerspiegeld worden in relaties tussen mensen (zoals de leraar-leerlingrelatie) is het redelijk te veronderstellen dat leraarsgedrag dat ten grondslag ligt aan goede leraar-leerlingrelaties kan verschillen tussen culturen zoals de westerse en Chinese.

Methoden en analyses

In dit proefschrift worden vier studies beschreven. De eerste (hoofdstuk 2) beschrijft de ontwikkeling van een instrument om de leerlingpercepties van het interpersoonlijk leraarsgedrag in China in kaart te brengen. Het is een vertaling en bewerking van de Vragenlijst Interpersoonlijk Leraarsgedrag (VIL), en de Engelstalige *Questionnaire on Teacher Interaction (QTI).* Met behulp van CircE-analyses in R werd de structurele validiteit getest met een model waarin de items werden verondersteld

geordend te zijn in een circumplex. In de tweede en derde studie (hoofdstuk 3 en 4) onderzochten we hoe in Chinese klassen, de leerlingpercepties van het leraarsgedrag samenhangen met doelen en schoolse emoties van leerlingen (hoofdstuk 3) en betrokkenheid (hoofdstuk 4). In de tweede studie onderzochten we met behulp van *Structural Equation Modelling* in welke mate het verband tussen de interpersoonlijke leraarsperceptie van leerlingen en hun schoolse emoties wordt gemedieerd door prestatiedoelen. De derde studie concentreerde zich op de leraar als *warm demander;* een leraar die betrokken is op zijn of haar leerlingen en tegelijk ook hoge eisen aan hen stelt. Onderzocht werd het effect op affectieve variabelen van hoge eisen en invloedrijk gedrag in combinatie met emotionele nabijheid. In studie 3 werd gebruik gemaakt van multi-level regressie-analyses in SPSS en HLM-tweeweg interactie-analyses om na te gaan in hoeverre de door leerlingen gepercipieerde mate van invloed van de leraar het effect van nabijheid op betrokkenheid van leerlingen in het onderwijs modereert. De vierde studie wilde inzicht verkrijgen in het interpersoonlijk gedrag dat Chinese leraren die volgens hun leerlingen een goede leraar-leerlingrelatie hebben van moment tot moment vertonen. Er werd gebruik gemaakt van *Continuous Assessment of Interpersonal Dynamics (CAID)*, een observatie- en coderingsmethode met behulp van een joystick voor (leraars)gedrag op video, waarmee twee keer per seconde dit gedrag wordt gecodeerd op de invloeds- en nabijheidsdimensie.

De resultaten

Studie 1: ontwikkeling van de Chinese versie van de Vragenlijst Interpersoonlijk Leraarsgedrag

Eerdere Chinese bewerkingen van de *Questionnaire on Teacher Interaction* maakten gebruik van het rechtstreeks vertalen van items. In onze bewerking namen we echter naast 27 vertaalde items ook 13 nieuwe items op, rekeninghoudend met de Chinese context en de betekenis van de begrippen invloed en nabijheid in China. Van de resulterende 40 items waren er 12 weliswaar een rechtstreekse vertaling, maar in de Chinese versie moesten deze op een enigszins andere plek op de interpersoonlijke cirkel geplaatst worden dan in de Nederlandstalig versie om een passend circumplexmodel te verkrijgen. We bevroegen met de uiteindelijke vragenlijst 2000 leerlingen uit groep 7 en 8 over 80 leraren in vier klassen van vier scholen voor voorgezet onderwijs. Met de resulterende vragenlijst kan betrouwbaar en met een passend circulair model de leerlingperceptie van de leraar-leerlingrelatie in kaart worden gebracht.

Studie 2: Leraar-leerlingrelaties, prestatiedoelen en schoolse emoties

In de tweede studie werd de sociale leeromgeving in termen van de leerlingpercepties van de leraar-leerlingrelatie onderzocht als voorspeller van prestatiedoelen en schoolse emoties (plezier, angst, verveling). In het bijzonder is nagegaan in hoeverre prestatiedoelen als mediërende factor tussen de leraar-leerlingrelatie en de schoolse emoties fungeren. Gegevens werden verzameld bij dezelfde 2000 leerlingen in vier Chinese scholen voor voorgezet onderwijs als in studie 1. De resultaten laten zien dat de leraar-leerlingrelaties een belangrijker voorspeller zijn van schoolse emoties dan van prestatiedoelen. Interpersoonlijke nabijheid (warmte en vriendelijkheid van de leraar) was een sterkere voorspeller van de emoties dan invloed, maar ook invloed had een substantiële waarde als voorspeller van emoties. De directe effecten van de leraar-leerlingrelatie op emoties waren sterker dan de indirecte effecten via prestatiedoelen van de leerlingen, maar deze prestatiedoelen waren wel een mediërende factor. Prestatiedoelen kunnen dus een rol spelen in een beschrijving van het mechanisme voor het verband tussen de leraar-leerlingrelatie en prestatiedoelen van leerlingen.

Studie 3: De leraar die eisenstellen combineert met emotionele betrokkenheid

De derde studie richtte zich op de rol in het onderwijsleerproces van de leraar die betrokken op leerlingen is en tegelijk ook eisen stelt. Nagegaan is in hoeverre deze combinatie van leraarsgedragskenmerken gerelateerd is aan door leerlingen ervaren betrokkenheid bij en desinteresse in het onderwijs. In het bijzonder werd onderzocht of de mate van eisenstellen (invloed) het effect van nabijheid van de leraar op leerlingbetrokkenheid en desinteresse kan vergroten. Het onderzoek werd uitgevoerd bij 800 leerlingen van 40 leraren. De resultaten laten zien dat betrokkenheid van leerlingen bij het onderwijs positief is gerelateerd aan de mate waarin leerlingen leraren als nabij en invloedrijk ervaren. Wat desinteresse betreft is het verband met deze gedragskenmerken negatief. De emotionele nabijheid van leraren was sterker dan invloed gerelateerd aan de leerlingbetrokkenheid en desinteresse. Invloed van de leraar versterkte de samenhang tussen nabijheid van de leraar en leerlingbetrokkenheid en desinteresse. Leraren met een hoge mate van nabijheid en invloed hebben dus de meest betrokken leerlingen en de minst ongeïnteresseerde. Het is daarom niet alleen van belang dat leraren emotioneel nabij zijn bij hun leerlingen, maar ook dat ze leerlingen structuur en leiding bieden. Het laatste versterkt het effect van de zorg die leraren bieden. Dit resultaat heeft specifiek in de Chinese context belang, omdat Chinese leerlingen van hun leraren streng gedrag verwachten.

Studie 4: Momentaan gedrag van Chinese leraren

In het vierde onderzoek werd in Chinese en Nederlandse klassen het gedrag onderzocht dat leraren van moment tot moment vertonen. Vijf Chinese leraren werden geselecteerd uit de groep van 40 leraren uit studie 3 op grond van hun scores op de Chinese versie van de Vragenlijst Interpersoonlijk Leraarsgedrag (VIL) die lieten zien dat deze leraren volgens hun leerlingen zeer nabij waren en gematigd invloedrijk, dat wil zeggen dat ze een positieve leraar-leerlingrelatie hadden. De Nederlandse leraren werden zo gekozen dat ze zo veel mogelijk vergelijkbare nabijheids- en invloedscores hadden op de VIL. Het gedrag van de tien leraren werd twee keer per seconde vastgelegd met scores op invloed en nabijheid om inhoud en structuur van het interpersoonlijk gedrag in beeld te brengen. Zoals verwacht bleken de Chinese leraren frequent dominant en vriendelijk gedrag te vertonen. Dit gedrag was behoorlijk stabiel en derhalve voorspelbaar. Nederlandse leraren vertoonden meer afwisseling in hun gedrag, zowel op de nabijheid- als op de invloeddimensie. Het lijkt er op dat culturele verschillen samengaan met verschil in gedrag bij een overigens vergelijkbare positieve leraar-leerlingrelatie. Leraarsgedrag met een grote mate van invloed kan in het Chinese onderwijs worden verwacht omdat Chinese leerlingen strengheid van hun leraren verwachten en weinig onzekerheid van hen accepteren. Positieve leraar-leerlingrelaties zijn dus in Oost-Aziatische klassen meer verbonden met dominantie van leraren dan in een Westerse context.

Toekomstig onderzoek

Op basis van het onderzoek gerapporteerd in dit proefschrift zijn er verschillende vervolgonderzoeken denkbaar.

Wat de Chinese Vragenlijst Interpersoonlijk Leraarsgedrag betreft is het de moeite waard om verder te werken aan het ontwikkelen van een kortere en daarmee efficiëntere versie. Verder is longitudinaal onderzoek met ten minste twee of drie meetmomenten nodig naar de verbanden tussen leraar-leerlingrelaties en affectieve variabelen om conclusies te kunnen trekken over causale verbanden tussen deze variabelen. Als vervolg op het observatie-onderzoek bij tien leraren is het interessant dergelijk onderzoek uit te voeren bij een grotere en vooral meer diverse groep leraren bijvoorbeeld ook leraren met een begrijpende, meegaande of directieve leraar-leerlingrelatie. Daarnaast zou het interessant zijn om inzicht te krijgen in het ontstaan van leraar-leerlingrelaties via andere manieren van gegevensverzameling zoals het houden van interviews met leerlingen over hun perceptie van het gedrag van hun leraren en met leraren over hun eigen gedrag. Aangezien het in de leraar-leerlingrelatie gaat om zowel het gedrag van de leraar als dat van de leerlingen zou het interessant zijn ook dat laatste gedrag van moment-tot-moment in kaart te

brengen in verschillende culturele contexten met de methode *Continuous Assessment of Interpersonal Dynamics*.

De onderwijspraktijk

De Chinese versie van de VIL die in dit onderzoek is ontwikkeld heeft een degelijke basis in de Chinese onderwijscontext en het vervolgonderzoek ermee heeft laten zien dat er waardevolle gegevens over de leerlingpercepties van het gedrag van Chinese leraren mee verzameld kunnen worden. Het ontwikkelde instrument lijkt daarom geschikt om door Chinese leraren gebruikt te gaan worden om feedback van hun leerlingen te verkrijgen.

De resultaten van de studies dragen bij aan het inzicht in de rol van verschillende variabelen die het leren van leerlingen kunnen beïnvloeden. In het bijzonder gaat het dan om de rol van nabijheid en invloed. Wanneer de gevonden verbanden bevestigd zouden worden in onderzoek waarin causale relaties kunnen worden vastgesteld dan is het voor het creëren van een positieve leeromgeving zowel in Chinese als westerse klassen van belang dat leraren nabijheid tonen en tegelijk structuur bieden. Het is belangrijk dat ze met zorg en respect leerlingen steunen. Ze moeten de rol van structuur en sturing echter niet onderschatten, omdat dit gedrag niet alleen van direct belang is voor betrokkenheid van leerlingen bij het onderwijs en leerresultaten, maar ook omdat het de rol van de zorg versterkt die leraren bieden voor het bevorderen van de leerlingbetrokkenheid.

Invloed en structuur lijken in verschillende culturele contexten een enigszins verschillende rol te spelen. In het bijzonder is leraarsinvloed van belang in een cultuur waar autoriteit en discipline worden gewaardeerd zoals in Oost-Aziatische klassen. In westerse klassen is dit minder het geval. De manier waarop leraren een goede leeromgeving kunnen creëren kan daarom verschillen in verschillende culturen.

De resultaten kunnen ook van belang zijn voor leraren die in een multiculturele omgeving lesgeven, omdat het verband tussen leerlingpercepties van de leraar-leerlingrelatie en affectieve variabelen kunnen verschillen voor leerlingen uit verschillende etnische groepen. Het is voor leraren belangrijk zich bewust te zijn van de verschillende invloed van hun gedrag op leerlingen met verschillende culturele achtergronden. Specifiek gaat het er daarbij om dat leraren rekening houden met de manier waarop leerlingen die in een ander land in een nieuwe omgeving terecht komen zich aanpassen aan die omgeving, zonder daarbij overigens te vervallen in stereotype culturele labeling.

Conclusie

Samenvattend lijkt het de moeite waard het interpersoonlijk kader voor leraarsgedrag en de leraar-leerlingrelatie dat in Westerse contexten is ontwikkeld ook toe te passen in de Chinese context. Over het algemeen zijn de bevindingen uit westers onderzoek vergelijkbaar met die in de Chinese context. Echter, het blijkt ook dat de resultaten van westers onderzoek niet zonder meer gegeneraliseerd kunnen worden naar de Chinese context of omgekeerd. In de Chinese context moet men vooral rekening houden met de andere rol van leraarsinvloed: invloed speelt een belangrijker rol bij het creëren van een goede leraar-leerlingrelatie in een Oost-Aziatische dan in en westerse klas.

中文摘要

简介

师生人际关系在学生的校园生涯中扮演着不可替代的重要角色。师生间良好的人际关系能够促进学生的在校情感体验与产出。良好的人际关系是通过教师在课堂上每时每刻的人际行为构建起来的，而人际关系反过来也塑造着课堂上的实时人际行为。此前关于师生人际关系、尤其是关于教师实时人际行为的研究大多是基于西方教育环境进行的研究。因此，本研究项目致力于探讨师生人际关系框架是否能够在东亚、特别是中国的中学课堂环境中适用。为达成此研究目标，本项目共包含问卷本土化、测量师生人际关系与学生情感变量之间的关系、以及探索课堂上的教师实时人际行为等四个子研究项目。

本博士论文主要使用人际理论来阐述师生关系和教师实时行为。人际理论在教育学中的应用表现为教师人际环状模型（IPC-T），该模型用两个互相垂直的维度来阐释人际行为的概念，这两个维度即驾驭力（或优势度、控制力）和亲和力（或友善度、亲近关系）。结合了高亲和力和中等偏高驾驭力的教师行为意味着积极的师生人际关系，而积极师生人际关系有利于为学生创造高效的学习氛围，从而促进学生在校情感方面的积极发展，例如学业情绪、成就目标以及行为投入等。

教师实时人际行为（微观层面）既构建于整体的师生人际关系（宏观层面）之中，又可被看作是师生人际关系的基本构成要素。由于权力距离、个人主义和集体主义等社会文化特点通常亦会在校园环境下的师生关系中反映出来，东亚与西方课堂中积极宏观师生人际关系下的微观教师人际行为亦可能有所差异。

研究方法与数据分析概述

本博士论文共包括四个子研究项目。第二章（项目一）阐述了对于测量学生对教师的整体人际感知（即宏观师生人际关系）的工具——教师互动问卷（QTI）的中文本土化改编。在该章节中，我们使用了 R 语言的 CircE 程序包进行数据分析，该软件包专用于检验环状模型中各条项目的结构效度。在第三章（项目二）和第四章（项目三）中，为了加深对中国课堂背景下师生人际关系的理解，我们测量了宏观师生人际关系与学生成就目标、学业情绪以及行为投入之间的关联。第三章主要探讨了师生人际关系与学生学业情绪之间的联系有多大程度是经由

学生成就目标的中介效应。在第三章中，我们使用了 Mplus 分析软件的结构方程模型来检测变量之间的直接与间接关系。第四章主要通过研究亲和型与驾驭型教师行为的协同作用，探讨"亲切的高要求者"型教师对中国学生的课堂行为投入有怎样的影响。在第四章中，我们使用了 SPSS 分析软件进行多水平回归分析，并使用双向交互分析进一步探讨教师亲和力对学生行为投入产生的作用是否受教师驾驭力的影响。第五章（项目四）着重探讨在学生宏观感知中与学生有着积极人际关系的中国教师在微观层面上的人际行为是怎样的。在第五章中我们采用了案例研究，使用基于控制杆的观察程序——人际动态连续评估（CAID）对五个课堂进行视频观察，并对实时教师人际行为进行编码。

成果概述

第二章阐述了中文版的教师互动问卷（QTI）的编制。先前的 QTI 翻译版本多侧重于对平行项目的直接翻译。然而，在不同的文化环境下测量同一概念可能需要不同的指标。本章节的样本包含来自中国四所公立中学初中一至三年级 40 个班级的 2000 名学生，对 80 名教师进行问卷评估。本章节编制的中文版问卷共包含 40 个项目，其中 12 个来自荷兰语版与英语版原始问卷的项目在本中文版中被移动到了与原版不同的八分象限，以此使基于中国数据的问卷更好地符合环状模型。此外，本中文版基于对中国师生的采访增加了 13 个原版问卷中没有的新项目。因此，本章节编制的中文版 QTI 问卷体现了测量工具本土化的更高标准，即从狭义上的项目翻译提升为使问卷的象限与维度与原版问卷具有近似的项目因子负载。我们在该中文版 QTI 的编制过程中力求其 40 个项目在其环形阵列结构与体现 IPC-T 的环状模型性质上能够与荷兰语原版对等。该中文版问卷能够有效测量师生人际关系的两个维度（即驾驭力和亲和力）。

第三章研究了师生人际关系这一角度下的课堂社会环境是如何与学生成就目标一起对学生学业情绪产生影响的。本章更进一步探索了学生成就目标在师生人际关系与学生学业情绪的关联中所起的中介效应。本章使用了结构方程模型对来自中国四所中学 2000 名学生的问卷数据进行了分析。结果显示，与学生成就目标对于学生学业情绪的影响相比，课堂社会环境对学生学业情绪的影响更强。另外，与教师驾驭力相比，教师的亲和力对于学生的学业情绪有着更强的影响。

然而，对于学生的学业情绪来说，驾驭力仍是不可忽视的影响因素。结果还显示师生人际关系对于学生学业情绪的直接影响远强于其通过学生成就目标中介产生的间接影响。然而，一小部分中介作用亦确实存在于师生人际关系与学生学业情绪的关联中。因此，在二者的关联机制中学生成就目标至少扮演了一定角色。这些发现有利于加深理解学生课堂情绪的影响因素，以及进一步认识这些影响因素在教学实践中扮演的多元角色。

第四章探讨了在课堂行为中结合了高驾驭力与高亲和力的"亲切的高要求者"型教师是否能够促进学生的课堂行为投入、减少学生的课堂行为不满，特别是教师驾驭力是否对于教师亲和力对学生行为投入和行为不满的影响有增强作用。我们对来自 800 名学生就 40 名教师进行评估的问卷样本数据进行了多水平回归分析，检测师生人际关系与学生行为投入及行为不满之间的关联。结果显示结合了高驾驭力行为与高亲和力行为的"亲切的高要求者"型教师能够促使学生在课堂上的行为投入，同时降低学生的行为不满。与第三章的结果类似，本章节的结果显示对于学生行为投入和行为不满来说，教师亲和力比起教师驾驭力有着更强的影响。然而，教师驾驭力对于教师亲和力的影响有着增强作用。这些结果说明在结合了高驾驭力与高亲和力的教师（即"亲切的高要求者"）课堂上，学生可能在课堂行为上会更加投入并更少表现出行为不满。对于教师来说，除了关心与尊重学生（高亲和力），组织引领课堂、设立明确规范、向学生阐明自己对他们的高期望值（高驾驭力）也是很重要的。这些高驾驭力的教师行为可能在学生对于教师严格有着一定预期的中国课堂环境中尤为重要。

第五章探讨了在不同文化环境下有着积极师生人际关系的教师的实时人际行为是怎样的。本章节的研究样本包含五位中国教师和五位荷兰教师，这些教师在各自学生的问卷测评中均显示出了积极的师生人际关系（即高亲和力与较高驾驭力），我们通过课堂观察来追踪这十位教师在课堂上每时每刻的人际行为，并使用多案例研究设计来探讨教师实时人际行为的人际内容与人际结构。结果显示五名中国教师表现出了较为频繁的主导行为和友好行为，行为模式相对稳定并在相似性较高的行为之间变换。五名荷兰教师的实时行为则在驾驭力与亲和力的程度上表现出了较大的变化性。总而言之，文化差异在师生人际关系和课堂互动中有所体现。中国学生可能对于教师的严格有着一定的预期，因此以高驾驭力为特

征的人际行为在中国初中课堂上可能尤为显著。与西方课堂相比，东亚课堂上的积极师生人际关系可能同相对更具驾驭力的教师人际行为有所关联。

未来研究建议

本博士论文中涉及的四个子研究项目及其结果对未来的研究方向提出了以下可能。

首先，未来研究可尝试将本论文中编制的中文版 QTI 问卷在效率上进行更进一步优化，如在保证信度和效度的基础上对现有的 40 个项目数量进行缩减。其次，由于数据收集条件所限，本论文中关于学生情感变量的研究样本采用的是横断数据，因此难以从统计模型中得出坚实的因果关系结论。未来的研究若能采用纵向研究、即以时间为轴线收集至少两到三次数据并对该纵向数据加以分析，方能就本论文结果中显示的变量关系得出更为坚实的结论。再次，就视频观察研究来说，未来研究可考虑收集更多样化的样本，可以囊括具有如体谅型、顺从型、强权型等各种不同宏观师生人际关系类型的教师。除此之外，未来的研究还可以尝试更进一步探讨来自不同文化的教师在其实时人际行为中表现出的不同来源。可以采用更加注重个性化的视角，比如加入对学生和教师的采访等质性研究方法。另外值得一提的是，微观层面的师生互动能够丰富并完善课堂人际行为方面的研究，因此，通过加入对于学生人际行为的观察来探讨不同文化背景下的师生实时互动亦是一个很有价值的未来研究方向。

实践意义

在第二章中编制的中文版 QTI 是对原问卷基于中国课堂环境的有效本土化，本博士论文中涉及的几项后续研究亦支持了该问卷在测量中国中学生对其教师的人际行为感知（即师生人际关系）的适用性。因此，本论文为中国中学教师获取教学反馈提供了一项有效的测量工具。

本论文的研究结果为进一步了解促进学生课堂学习的各种因素提供了参考，特别是关于教师驾驭力在不同文化背景下的课堂中表现出的差异。无论在中国还是在西方课堂上，为了创造高效的课堂环境，教师的理想行为模式均为"亲切的高要求者"型，即在人际行为中将亲和力与驾驭力二者加以综合。教师们应尤其

注重其行为中的亲和力，关心并尊重学生。然而，教师们也不应忽视驾驭力在课堂中的作用。教师驾驭力不仅影响学生的学习动机和产出，亦能增进教师亲和力对学生学习投入产生的影响。教师驾驭力在重视教师严格与教师权威的文化环境中尤为重要：要成为一名优秀教师，比起在西方课堂上，东亚课堂环境中教师的高驾驭力行为或许扮演着更重要的角色。因此，关于如何创造对学生最有利的学习环境，对于在不同文化背景下任教的教师应给予不同的指导。

因为对于来自不同种族的学生来说，师生人际关系对其学习产出的影响亦不相同，本论文的研究结果亦可对在多元文化课堂中任教的教师有一定启迪。教师们应意识到自身行为对于来自不同文化背景的学生有可能产生的影响。更确切地说，教师们应关注来自不同种族的学生是如何以其各自的不同方式融入所在国，而不是简单地为他们贴上刻板印象的文化"标签"。

结语

总而言之，根据本论文的研究结果，将师生人际关系理论框架应用于中国课堂是一次很有价值的尝试。总体而言，本论文的研究结果与前人基于西方样本所得出的研究成果很大程度上具备一致性。然而，本论文的结果亦提醒了研究人员应留意将西方成果应用于东亚课堂会在跨文化普遍适用性上表现出一些局限，反之亦然。特别值得留心的是教师驾驭力在中国课堂环境下可能会表现出不同机能：比起西方课堂环境，在东亚课堂环境中教师的驾驭力或主导型行为可能对于建立积极的师生人际关系起着更为重要的作用。

ACKNOWLEDGEMENT

Read read read,

Write write write.

From night to day,

And from day to night.

Research never ends,

They used to told me that.

Now I can only say:

Damn you are so right.

Even when paper gets rejected,

Do not feel so sad.

It will make you stronger,

Look at the good side.

Life as a researcher,

Schedule is always tight.

But we have Sinterklaas,

Who brings here happy time.

Though work might be tough,

The future will be bright.

When they ask what is research,

It is something I like.

This is a poem which I wrote for the department Sinterklaas party in December 2018. At that time, I was still worrying about when I could finish my PhD, and now, I have to be surprised by how time flies.

There is a metaphor. Doing research is like an adventure of hunting for treasure: you explore a dark cave which you assume there would be treasure inside, but you may or may not find the treasure at the end of the cave. If you find the treasure (expected or interesting findings), you are lucky and then can inform the public what you find (publishing your findings). If there is no expected treasure inside (unexpected or non-significant findings), it is normal because the chance of finding treasure or not is always half-half. Now you can choose to explore another cave (choose another perspective/method/topic), or just to give up your adventure and change to another career. To me, I'm happy that I did not give up my adventure of being a PhD. Although I explored quite some empty caves, some other caves did have treasures. The process of walking in the dark caves was long and sometimes rather

tough. However, I become a much stronger and more independent explorer than five years ago when I first started the adventure, and the discovery of treasure was so delightful that the previous exploration of empty caves seemed worthwhile. Above all, I was not alone in my adventure. I had been receiving support from people around me all along the journey, and they shed light on me so I could become brave enough to overcome the darkness in the caves. Here, in this section, I would like to express my sincere thankfulness to those who brought me light during my PhD journey.

Theo, I still remember the first time we met at the PhD workshop in Beijing which represents the very start of my PhD journey. I received a key-ring from you that day as a souvenir, which was shaped as small Dutch wooden shoes with UU logo on them, and this key-ring was attached to my bike key over my four and half years in The Netherlands. ;) You are like a lighthouse always shining in the front, leading me in to the route and providing me directions throughout my PhD journey. There are never enough words that can express my gratefulness. I just want to say: dank je wel, I'm very lucky to have you as my promoter!

Tim, you are a great daily supervisor and I cannot complete my PhD journey without you. "You are the boss!" This is what you told me at one of our first meetings which impressed me a lot. From your words I learned one of the most important qualities to be a researcher: being independent. That is, I should be the one who knows best of my research program, and should be able to take charge of and be responsible for it. When I had questions about my research, you always give me suggestions on how to find the answers no matter how basic or stupid the questions were. There is a Chinese saying, "To teach someone how to fish is better than to just give this person a fish". Thank you for teaching me how to fish in the river of academic research!

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CURRICULUM VITAE

Xiaojing Sun studied Hungarian Language at Beijing Foreign Studies University (2007-2011). During her study, she received a scholarship from the China Scholarship Council (CSC) and had a one-year exchange study at the Balassi Institute, Budapest, Hungary (2008-2009). After receiving her bachelor degree, she studied for a Master of Teaching Chinese to Speakers of Other Languages (MTCSOL) in Beijing Foreign Studies University (2011-2014). During her master program, she had a one-year internship as a volunteer Chinese teacher and an administrative assistant at the Confucius Institute, Eötvös Loránd University, Budapest, Hungary (2012-2013). After graduation, she received a scholarship from CSC and started her PhD project in September, 2014 at Utrecht University.

Her PhD project focused on teacher-student interpersonal relationships in Chinese secondary classrooms, under the supervision of Prof. dr. Theo Wubbels and Dr. Tim Mainhard. She also cooperated with other researchers on her project. She presented her work at several international conferences and symposiums. She has been publishing her findings in international journals and working as a voluntary reviewer of an international journal. She is a member of the Interuniversity Center for Educational Sciences (ICO) Research School and has received a certificate for fulfilling all required courses. Recently, Xiaojing went back to China and she will continue her research in teacher-student interpersonal relationships.

LIST OF PUBLICATIONS

Peer-reviewed Publications

Sun, X., Mainhard, T., & Wubbels, T. (2018). Development and evaluation of a Chinese version of the Questionnaire on Teacher Interaction (QTI). *Learning Environments Research, 21*(1), 1-17.

Submitted papers

Sun, X., Hendrickx, M. M. H. G., Goetz, T., Wubbels, T., & Mainhard T. The classroom social environment as an antecedent of student emotions: the mediating role of achievement goals. *The Journal of Experimental Education*, in revision.

Sun, X., Pennings, H. J. M., Mainhard, T., & Wubbels, T. Teacher interpersonal behavior in the context of positive teacher-student interpersonal relationships in East Asian and Western classroom environments. *Teaching and Teacher Education*, in revision.

Sun, X., Mainhard, T., & Wubbels, T. (2019). *Teachers as warm demanders: the synergetic effect of teacher warmth and dominance on students' behavioral engagement and disaffection.* Manuscript submitted for publication.

Conference contributions as presenter

Sun, X., Mainhard, T., & Wubbels, T. (2015, September). Development and Evaluation of the Chinese Version of The Questionnaire on Teacher Interaction (QTI) and Comparison with Other Languages. Paper presented at the European Educational Research Conference (ECER), Budapest, Hungary.

Sun, X., Hendrickx, M. M. H. G., Goetz, T., Wubbels, T., & Mainhard T. (2016, November). *Student interpersonal perceptions of their teacher, academic emotions and achievement goals in Chinese secondary classrooms.* Paper presented at the ICO International Fall School, Bad Schussenried, Germany.

Sun, X., Pennings, H. J. M., Mainhard, T., & Wubbels, T. (2017, December). *Teacher behaviour and teacher-student relationships: comparing Chinese and Dutch classroom environments.* Poster presented at the symposium Behavioral Dynamics in Interpersonal Interactions and Relationships, Zwolle, The Netherlands.

Sun, X., Pennings, H. J. M., Mainhard, T., & Wubbels, T. (2018, April). *Teacher behaviour and teacher-student relationships: comparing Chinese and Dutch classroom environments.* Paper presented at the annual conference of the American Educational Research Association (AERA), New York, USA.