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Drawings Tell the Difference: Student Characteristics and Student-Teacher Relationships in a Cross-Cultural Context

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ABSTRACT

Student-teacher relationship drawings were employed to investigate how students' mental representations of student-teacher relationships were affected by their gender, age, and shyness across the Netherlands and China. The sample included 752 third- to sixth-graders (48.5% boys; M_{age} = 9.96) from the Netherlands and 574 third- to- sixth-graders (53.7% boys; M_{age} = 11.48) from China. Students' drawings were double-coded on eight relationship dimensions. Multiple group models showed that Chinese students' drawings scored lower on anger/tension, role reversal, emotional distance/isolation, and global pathology but higher on vulnerability than those of Dutch students. Boys' drawings displayed higher global pathology than girls' drawings and this difference was larger in the Netherlands than in China. Other associations between student characteristics (gender, age, shyness) and drawing dimensions were equally strong across countries. As an implication, findings from Western countries may not necessarily generalize to students and teachers in Eastern countries. Drawing may be a promising method to further understand differences and similarities in the formation of student-teacher relationships across countries.

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The importance of affective student-teacher relationships (STRs) for students' school adjustment long has been supported by previous research (for meta-analyses, see Lei et al., 2016, 2018; Roorda et al., 2011, 2017). Students experiencing positive relationships with teachers tend to feel confident exploring the school environment, whereas experiences of negative student-teacher relationships may hinder students' intention to explore and harm their well-being (Pianta et al., 2003). How students perceive their relationships with teachers, however, may be affected by cultural values (M. Chen et al., 2019; Pianta et al., 2003). More specifically, students in Eastern, collectivistic cultures have been found to perceive their relationships with teachers more favorably than students in Western, individualistic cultures (M. Chen et al., 2019; Jia et al., 2009; Yang et al., 2013). Furthermore, students' background and temperamental characteristics may also affect their relationship experiences with teachers, and this link also can be shaped by cultural values (M. Chen et al., 2021b; Pianta et al., 2003).

Previous cross-cultural studies, however, often assessed students' relationship perceptions using relationship questionnaires (e.g., M. Chen et al., 2019; Yang et al., 2013). Relationship questionnaires measure students' conscious feelings, thoughts, and emotions about the relationship. However, questionnaires may be less suitable for capturing students' unconscious thoughts and feelings about the relationship. Furthermore, in cross-cultural comparisons, relationship questionnaires need to be translated into different languages, and therefore may suffer from measurement bias due to different translations and interpretations of questions across countries (Pinto & Bombi, 2008). A possible way

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to solve this problem is to use non-verbal methods to measure students' relationship perceptions, such as student-teacher relationship drawings (STRDs; Harrison et al., 2007; McGrath et al., 2017; Zee et al., 2020).

With relationship drawings, students are asked to draw a picture of themselves and their teachers, which are subsequently coded by independent raters. This drawing task hardly involves verbal statements and is thus less affected by cultural differences in interpretations and translations of questions. Furthermore, this method can capture students' unconscious feelings and thoughts about their relationships with teachers. Some previous studies suggest that students' unconscious relationship perceptions are uniquely associated with their school adjustment on top of their conscious relationship perceptions (M. Chen et al., 2021a; Harrison et al., 2007). As such, relationship drawings may provide additional insight into students' relationship perceptions, especially in a cross-cultural context. As far as we know, however, student-teacher relationship drawings have not been used in cross-cultural comparisons. The present study, therefore, applied relationship drawings to assess students' unconscious relationship perceptions in the Netherlands (a Western, individualistic country) and in China (an Eastern, collectivistic country). We first investigated cultural differences in students' unconscious relationship perceptions. Second, we explored how students' background (gender and age) and temperamental characteristics (shyness) were linked with their unconscious relationship perceptions across cultures.

Attachment theory and relationship drawings as a measure of mental relationship representations

Research on student-teacher relationships is often based on attachment theory (Bowlby, 1980; Pianta et al., 2003). According to this theory, positive student-teacher relationships provide students with a secure base to confidently explore the school environment and a safe haven where students can seek support and comfort from their teacher in times of stress (Pianta et al., 2003). Consequently, students sharing positive relationships with teachers tend to become competent and well-adjusted in later life (Pianta et al., 2003). In contrast, negative relationships with teachers evoke students' feelings of insecurity, harming their well-being and discouraging them from exploring the surrounding environment (Pianta et al., 2003).

The concept of mental representations plays a central role in attachment theory. Mental representations refer to students' and teachers' feelings, beliefs, thoughts, and emotions about themselves, the relationship partner, and the mutual relationship (Pianta et al., 2003). Both students and teachers form mental representations of the relationship, based on their repeated daily interactions with each other, as well as their previous relationship experiences with significant others (e.g., parents, previous teachers, and students). As such, both teachers' and students' personal characteristics (e.g., gender, age, and behaviors) play pivotal roles in the formation of mental relationship representations (Pianta et al., 2003). Once established, these mental representations will guide teachers' and students' actions, expectations, and interpretations of each other's behaviors in future interactions (Pianta et al., 1999, 2003).

Attachment theorists often classify mental representations of student-teacher relationship quality into three different dimensions: closeness, conflict, and dependency (Pianta et al., 2003; Verschueren & Koomen, 2012). Closeness is a positive relationship dimension, reflecting the degree of warmth, open communication, and trust in the relationship (Koomen & Jellesma, 2015; Verschueren & Koomen, 2012). Conflict is a negative dimension, reflecting the degree of negativity, tension, disharmony, and fights between teachers and students (Koomen & Jellesma, 2015; Verschueren & Koomen, 2012). Last, dependency refers to students' clinginess, age-inadequate dependent behaviors, and strong reactions to separation from the teacher, which hinders students' ability to use the teacher as a secure base (Pianta et al., 2003; Verschueren & Koomen, 2012).

According to attachment theorists, mental representations include teachers' and students' feelings and thoughts reflected at both a conscious level and an unconscious level (Koenen et al., 2019; Spilt &

Koomen, 2009). Conscious relationship perceptions are the feelings and beliefs that teachers and students are directly aware of (Spilt & Koomen, 2009). To measure conscious relationship perceptions, a frequently used approach is to ask teachers and students to fill in a questionnaire (Koenen et al., 2019; Pianta, 2001). In contrast, unconscious relationship perceptions refer to the emotions and feelings that are implicit and outside teachers' and students' conscious awareness (Maier et al., 2004; Spilt & Koomen, 2009). To capture unconscious relationship perceptions, narrative techniques, such as narrative interviews, can be used. For instance, the Teacher Relationship Interview is often used to grasp teachers' unconscious perceptions of relationships with students (Koenen et al., 2019; Pianta, 1999; Spilt & Koomen, 2009).

To assess students' mental relationship representations, previous research often has invited students to fill in a questionnaire about the degree of closeness and conflict, and sometimes also dependency in the relationship (e.g., Koepke & Harkins, 2008; Koomen & Jellesma, 2015). Questionnaires, however, mainly capture students' feelings and thoughts at a conscious level (Spilt & Koomen, 2009). As such, this method may not reflect relationship-related thoughts and feelings that students' are not consciously aware of. Previous research has found that students' conscious and unconscious relationship perceptions are only weakly correlated (M. Chen et al., 2021a; Harrison et al., 2007). Furthermore, students' unconscious relationship perceptions shared a unique link with students' school adjustment on top of the influence of students' conscious relationship perceptions on their school adjustment (M. Chen et al., 2021a; Harrison et al., 2007). As such, it seems important to pay attention to students' unconscious relationship perceptions as well.

To measure students' unconscious mental representations, a handful of studies have employed student-teacher relationship drawings (Harrison et al., 2007; McGrath et al., 2017; Zee et al., 2020). Such drawings of students themselves and their teachers are coded on eight dimensions reflecting attachment patterns between students and teachers (see Table 1 for detailed descriptions of the dimensions). Two dimensions are considered to reflect positive student-teacher relationships and link to the closeness dimension in relationship questionnaires (Harrison et al., 2007; Zee et al., 2020). Pride/happiness shows the positive emotions, warmth, and togetherness between teachers and students (e.g., happy faces, the teacher and student having fun together). Vitality/creativity reflects the

Table 1. A description of student-teacher relationship drawings dimensions.

Mental representations	Drawing dimensions	Detailed descriptions and indicators of the construct
Closeness	Vitality/Creativity	Students' emotional involvement in making the drawings **Indicators**: Use of different colors, creative scenes, additional details in depicting the figures (e.g., clothes and accessories) or background (e.g., classroom, playground).
	Pride/Happiness	Students' belongingness and emotional connection to the teacher. **Indicators**: Happy faces, student and teacher are holding hands or are having fun together.
Conflict	Anger/Tension	Students' anger and frustration toward the teacher and tensions in the relationship. **Indicators**: The presence of angry faces, scratches, or student and teacher are hurting each other (e.g., blood in the drawing).
	Bizarreness/ Dissociation	Students' extreme feelings of hostility and resentment toward the teacher. **Indicators**: Inclusion of fantasy themes and unusual symbols in the drawings (e.g., devils, monsters, sharp teeth).
	Role Reversal	Students viewing the teacher as unreliable and lacking authority. **Indicators**: Students being larger than the teacher, showing more power over the teacher, or teachers being unable to help when students are in need.
Dependency	Vulnerability	Students' fear of the teacher and feelings of emotional vulnerability in the relationship. **Indicators**: A very large teacher versus a very small student, figures crowded in the corner of the paper, overlapping figures, disproportionate body parts.
	Emotional Distance/ Isolation	Students' feelings of being estranged from the teacher and lonely feelings in the relationship. **Indicators**: A large physical distance or a barrier between the teacher and student.
Overall quality	Global Pathology	The overall degree of perceived pathology and discordance in the relationship. **Indicators**: Gloomy and sloppy drawings; distorted figures; presences of a lot of disturbing elements.

emotional investment and visibility of emotions in the drawings (e.g., inclusion of colors and details). This dimension usually represents students' effort in describing positive affect and connections with teachers. However, sometimes it also suggests high negativities in the relationships (e.g., detailed illustrations of disturbing scenes, such as the student being angry with the teacher). Nevertheless, vitality/creativity is still regarded as being indicative of positive relationships, as it shows students feeling safe and open to express their emotions and thoughts about the relationship. This dimension thus measures an aspect of positive teacher-student relationships that is seldom covered by relationship questionnaires.

Five dimensions reveal negative relationships, among which three dimensions parallel to the conflict dimension in questionnaires. Anger/tension indicates the anger, frustration, and disappointment between teachers and students. Bizarreness/dissociation reflects the extreme aspect of conflictual relationship representations, such as students' hostility and resentment toward the teacher. The third dimension, role reversal, identifies students having problems with accepting their teacher's authority (e.g., drawing themselves as larger and more powerful than the teacher). This aspect of student-teacher relationships is less explicitly measured by most relationship questionnaires.

Two dimensions are conceptually related to the dependency dimension in relationship questionnaires, indicating students' inability to use the teacher as a secure base (vulnerability) or their fear of being emotionally isolated from the teacher (emotional distance/isolation). Finally, global pathology assesses the overall quality of the relationships by looking at the general tone of the drawings. Such an overarching dimension covering multiple aspects of the relationship at the same time is also lacking in most relationship questionnaires. As such, drawings dimensions may provide more detailed and nuanced information about relationship mental representations in addition to what is known from relationship questionnaires (M. Chen et al., 2021a; Harrison et al., 2007; Zee et al., 2020).

Cultural differences in students' relationship perceptions

Students' mental relationship representations may be affected by cultural values (Pianta et al., 2003). More specifically, in Western, individualistic cultures, autonomy, and independence are likely to be valued and teachers are expected to keep an adequate distance from students to stimulate their autonomous development (Triandis, 2018). In Eastern, collectivistic cultures, however, interpersonal connectedness and interdependence are generally emphasized, and teachers tend to have intimate interactions with students to encourage their social engagement (Rothbaum et al., 2000; Triandis, 2018). As such, students in Eastern, collectivistic cultures may experience more favorable relationships with teachers than students in Western, individualistic cultures.

In line with this theoretical assumption, previous cross-cultural studies employing relationship questionnaires found cultural differences in students' relationship perceptions across Western and Eastern contexts (M. Chen et al., 2019; Jia et al., 2009; Yang et al., 2013). For instance, both Jia et al. (2009) and Yang et al. (2013) found that middle childhood students in China perceived more closeness with teachers than students in the United States. Likewise, M. Chen et al. (2019) showed that third- to sixth-graders in China reported more closeness, and also less conflict, in their relationships with teachers than third- to sixth-graders in the Netherlands. Although teacher-child dependency is far less studied than closeness and conflict, some preliminary evidence has been found to show that dependency may be perceived more positively in collectivistic cultures than in individualistic cultures (Rudasill, 2021). In individualistic countries (e.g., the U.S. and the Netherlands), children's overly dependent behaviors on teachers can be deemed as immature or irritative (Rudasill, 2021), and were often found to be associated with behavioral and academic problems (Arbeau et al., 2010; Bosman et al., 2018; see; Roorda et al., 2021, for an overview). In contrast, in collectivistic cultures (e.g., Portugal, Greece, China), where the interdependence between members is emphasized, dependency is viewed in a more prospective way (Rudasill, 2021). Supporting this idea, previous studies conducted in Greece found teachers to perceive dependency as a positive construct (Gregoriadis & Grammatikopoulos, 2014; Tsigilis et al., 2018). Ferreira et al. (2021) investigated preschool teachers

in Portugal and found teacher-reported dependency was longitudinally and positively associated with children's executive function. The abovementioned studies, however, mainly looked at teachers' perceptions of dependency. As far as we know, not much research has explored whether students in collectivistic countries also have a more positive perception toward student-teacher dependency than students in individualistic countries.

Furthermore, no previous studies have used relationship drawings to investigate cross-cultural differences in students' mental relationship representations. Nevertheless, in making cross-cultural comparisons, relationship drawings may have added values on top of relationship questionnaires. For instance, relationship drawings do not suffer from different translations and interpretations of questions across countries. Furthermore, drawings are probably less affected by students' social desirability concerns (Zee et al., 2020), which may play a role in cross-cultural comparisons as well (Bernardi, 2006). For example, students in Eastern countries may tend to feel uncomfortable reporting discordances in teacher-student relationships (X. Chen & French, 2008). Making relationship drawings, however, is a relatively easy and enjoyable task and thus may help students to reflect culturally sensitive or anxiety-provoking information in relationships (Zee et al., 2020). Therefore, the present study aimed to employ relationship drawings to make a cross-cultural comparison of students' mental representations about their relationships with their teachers across Western and Eastern cultures.

Students' gender and age and student-teacher relationships across cultures

The quality of student-teacher relationships also may be affected by students' gender and age (McGrath & Van Bergen, 2015). For instance, previous Western studies based on teacher questionnaires have frequently found that teachers perceived less close and more conflictual relationships with boys than with girls (Hajovsky et al., 2017; Koepke & Harkins, 2008). Studies employing student questionnaires also found boys to report less closeness and more conflict with teachers than girls (Hughes, 2011; Jellesma et al., 2015). Furthermore, Western studies using relationship drawings confirmed this pattern and found that girls' drawings displayed higher levels of relational positivity (vitality/creativity and pride/happiness) and lower levels of relational negativity (vulnerability, emotional distance/isolation, anger/tension, role reversal, bizarreness/dissociation, and global pathology) than boys' drawings (McGrath et al., 2017; Zee et al., 2020).

With regard to age, children in Western, individualistic countries are often expected to become more independent, assertive, and self-oriented as they grow older (X. Chen & French, 2008). As a result, older children may be more likely to be alienated from teachers or even confront teachers to show their growing autonomy. Supporting this idea, previous studies conducted in Western countries found older students to share less close (Hughes & Cao, 2018; Wu & Hughes, 2015) and sometimes also more conflictual relationships with teachers than younger students (Jerome et al., 2009; Zee & Koomen, 2017). Older students' drawings were also rated lower on vitality/creativity and higher on vulnerability, emotional distance/isolation, and global pathology than younger students' drawings (Zee et al., 2020). Thus, in Westerns countries, boys and older students tend to share less favorable relationships with teachers than girls and younger students.

In Eastern, collectivistic countries, however, gender and age may be interpreted differently and thus have different impacts on student-teacher relationship quality. Specifically, boy preference is more prevalent in Eastern cultures (Guo et al., 2018; Schmitt et al., 2008) and teachers in Eastern countries may show more tolerance toward boys than teachers in Western cultures. Thus, in Eastern countries, boys may not necessarily develop less favorable relationships with teachers than girls. In line with this idea, previous studies conducted in Eastern contexts did not find solid evidence for gender differences in student-teacher relationship quality (Han et al., 2016; Zhang & Nurmi, 2012). For example, Han et al. (2016) and Zhang and Nurmi (2012) found that teachers in China reported equal levels of closeness, conflict, and dependency in their relationships with boys as with girls.

With regard to age, in Eastern, collectivistic countries, social maturity is regarded as showing more obedience and understanding toward parents and teachers (X. Chen & French, 2008; Rothbaum et al.,

2000); hence, older students may share equally favorable or even more favorable relationships with teachers than younger students. For instance, teachers in China were found to report equal levels of closeness, conflict (Guan et al., 2020), and dependency (Han et al., 2016) for younger and older students. Li et al. (2015) even found that teachers in China reported more closeness with older children than with younger children. In contrast, Lan and Moscardino (2019) found that in China, older students in upper elementary school reported less positive relationships with teachers than younger students. Thus, it is still not clear how students' age links to the quality of teacher-student relationships in Eastern contexts. In sum, students' gender and age may impact student-teacher relationship quality differently in Western and Eastern countries. As far as we know, however, no previous research has investigated cultural differences in how students' gender and age are linked with student-teacher relationship quality.

Students' shyness and student-teacher relationships across cultures

Similar to students' gender and age, students' temperamental characteristics, such as shyness, also may affect student-teacher relationship quality (Pianta et al., 2003), and this link may also differ across Western and Eastern cultures (X. Chen, 2019; M. Chen et al., 2021b). Shy children are situated in the so-called *approach-avoidance conflict*, where they desire social contact with teachers but refrain from doing so due to fear of social evaluation (Coplan & Arbeau, 2008). Western, individualistic societies appreciate autonomy and assertiveness in social initiatives (X. Chen, 2019; Oyserman et al., 2002). Shy students, however, have difficulties interacting with teachers and thus may be at risk of becoming "invisible" in the classroom and going unnoticed by teachers (Coplan & Arbeau, 2008; Rudasill & Rimm-Kaufman, 2009). Hence, shy students may encounter difficulties in establishing close, supportive relationships with teachers (X. Chen, 2019). In line with this idea, studies conducted in Western countries often found shyness to be linked with less close student-teacher relationships, both in cross-sectional studies (Koles et al., 2009; Sette et al., 2019) and in longitudinal studies (Rudasill, 2011; Rudasill & Rimm-Kaufman, 2009). In a meta-analysis of six Western studies, shyness also was found to be associated with less student-teacher closeness (Nurmi, 2012).

In Eastern, collectivistic cultures, however, shyness used to be appreciated and valued, as shy behaviors are regarded as being humble, polite, and socially mature (X. Chen, 2019). As such, shy children may receive more approval and support from peers, parents, and teachers, and thus form better relationships with them. Earlier studies in Eastern countries also found that children with higher levels of shyness experienced more peer acceptance and more maternal acceptance (X. Chen et al., 1992, 1997; Kim et al., 2008). More recent studies, however, suggest that due to globalization, there is a trend toward depreciating shyness in Eastern, collectivistic cultures (X. Chen, 2019; X. Chen et al., 2005). For instance, similar to findings from Western countries, more recent studies found teachers and adults in China to view shyness as a negative trait (cf. Coplan et al., 2015; Li et al., 2016; Xiao & Coplan, 2021). As a result, students' shyness was found to be associated with less teacher-student closeness in Eastern countries as well (Liu et al., 2018). Furthermore, M. Chen et al. (2021b) found not only that students' shyness associated with less teacher-student closeness and more teacher-student conflict in China, but also that these associations were even stronger in China than in the Netherlands. None of these studies, however, used student-teacher relationship drawings to measure students' unconscious relationship perceptions. As drawings may ease shy students' nervousness in expressing their feelings and emotions about relationships (Zee et al., 2020), drawings may provide a more accurate way to investigate cross-cultural differences in the association between shyness and students' relationship perceptions.

The present study

The present study employed student-teacher relationship drawings to investigate upper elementary school students' mental relationship representations with teachers across the Netherlands (a Western,

individualistic country) and China (an Eastern, collectivistic country). We first examined whether there are cultural differences in students' mental representations between the Netherlands and China. Based on previous cross-cultural studies (M. Chen et al., 2019; Yang et al., 2013), we expected that Chinese students' drawings would display higher levels of close relationship representations (pride/happiness and vitality/creativity), lower levels of conflictual relationship representations (anger/tension, bizarreness/dissociation, and role reversal), and lower levels of global pathology than those of Dutch students. Due to a lack of empirical evidence about cultural differences in student perceived dependency in the relationships, we did not form specific hypotheses for vulnerability and emotional distance/isolation.

Second, we investigated whether students' gender, age, and shyness were linked differently with students' mental relationship representations across the Netherlands and China. In the Dutch sample, we expected to find lower levels of positive relationship representations (vitality/creativity and pride/happiness) and higher levels of negative relationship representations (all negative drawing dimensions) in the drawings of boys, older students, and more shy students than in the drawings of girls, younger students, and less shy students (McGrath & Van Bergen, 2015; Nurmi, 2012). As mixed results were found in previous Eastern studies (c.f., Chen et al., 2021b; Han et al., 2016; Kim et al., 2008; Lan & Moscardino, 2019), we were not able to form specific hypotheses for how students' gender, age, and shyness were linked with their unconscious relationship perceptions in the Chinese sample.

Methods

Participants

The Dutch sample included 752 students (48.5% boys, 51.5% girls) from 35 classrooms across eight elementary schools in the Netherlands. Students were in third ($n = 164$), fourth ($n = 214$), fifth ($n = 193$), or sixth ($n = 181$) grade and had an average age of 9.96 years ($SD = 1.21$; range = 7–13 years). Most of the students (71.5%) identified themselves as having the majority ethnic background (i.e., Dutch). Other students (28.5%) identified themselves as belonging to a minority ethnic group, such as Moroccan (5.9%), Turkish (5.0%), and Surinamese (1.2%).

The Chinese sample consisted of 574 students (53.7% boys, 46.3% girls) from 14 classrooms in three elementary schools in Zhejiang, China. The participants were also from third ($n = 120$), fourth ($n = 217$), fifth ($n = 119$), and sixth ($n = 118$) grade. On average, the students were 11.48 years old ($SD = 1.29$, range = 9–14 years). To make students' experience with formal education comparable across the two countries, we selected students based on their grade level (i.e., grade 3 to 6). As students in China started elementary school one year (at 8 years old) later than Dutch students (at 7 years old), the Chinese sample was on average one year older than the Dutch sample. Given the age difference between the two samples, we also tested models including students' age as a covariate. As including age did not change the results, we reported the more parsimonious models without age as a covariate. Most of the students (94.6%) reported themselves as belonging to the majority ethnic group (i.e., Han Zu). Other participants (5.4%) regarded themselves as having a minority ethnic background, which includes 55 minor ethnic groups in China (e.g., She Zu).

Procedure

Data collection in the Netherlands was approved by the University of Amsterdam (file number: 2018-CDE-9940). As there was no official ethical committee in China at the time of data collection, we invited an independent senior researcher in China to review the proposal and confirm that our data collection procedure complied with the Chinese laws. The Dutch data were collected by master thesis students during February and March 2017. The first author collected the Chinese data in March 2018. Schools were contacted through phone or e-mail by master thesis students or the first author. After

schools agreed to participate, an information letter was sent to students' parents, who could object to their child's participation in the present study.

In both countries, students completed a questionnaire about their gender, age, shyness, and some other topics beyond the scope of the present study. At the end of the questionnaire, students made a drawing of themselves and their teacher. Completing the questionnaire took approximately 30 minutes in total and most students spent 10 to 15 minutes finishing the drawing. During data collection, the master thesis students or the first author explained the procedure to the students and answered possible questions. The response rate of the students was 99% and students' nonparticipation was mainly due to their absence on the day of data collection.

Measures

Students' unconscious mental relationship representations

To measure students' unconscious mental relationship representations, students were invited to "draw a picture of yourself and your teacher" on a white A4 paper (Harrison et al., 2007; Zee & Roorda, 2017). No further instructions were provided. Students could use everything available in the classroom to make the drawings (e.g., colored pencils and ink pens).

Each drawing was coded based on the coding manual of Zee and Roorda (2017), which is an adaptation of the Family Drawing Global Rating Scale of Fury et al. (1997) to the school context. Drawings were assessed across eight different dimensions (see Table 1) and raters indicated on a 7-point Likert scale how well the drawings fit the description of each dimension, including "no or little evidence for the construct" (scores of 1–2), "mixed evidence for the construct" (scores of 3–5), and "ample evidence for the construct" (scores of 6–7). All drawings were double-coded. Two native Dutch raters coded the Dutch drawings. The first author (native Chinese) and a third native Dutch rater coded the Chinese drawings. Every rater coded the drawings independently and did not know other raters' coding scores. In data analysis, for each drawing, we aggregated the scores of the two raters for each drawing dimension. Before coding the drawings, raters were trained. During this training, raters independently coded six example drawings. The raters then discussed with the trainer which scores were considered as the most appropriate by researchers, and were instructed to adjust their scores to be as accurate as possible.

Drawing examples are provided in Figure 1 to help describe the eight dimensions. Vitality/Creativity (the inclusion of colors and additional details) and Pride/Happiness (presence of happy faces or a scene where the teacher and student are having fun together) reflect students' representations of closeness with teachers. Conflictual relationship representations are inferred by the degree of Anger/Tension (angry facial expressions and irritable symbols like scratches), Bizarreness/Dissociation (fantasy themes or unusual symbols, such as sharp teeth and devils), and Role Reversal (students drawing themselves larger and more powerful than the teachers) in the drawings. Vulnerability (disproportionate sizes of the figures and unnatural placement of the figures) and Emotional Distance/Isolation (a barrier or a large distance between the student and teacher) indicated students' degree of dependency on their teacher. Lastly, the overall quality of the relationship is described by the degree of Global Pathology (the overall degree of disharmony and disturbance) in the drawings (see Table 1 for a more detailed description).

Previous studies in Western contexts supported the reliability, convergent validity, and predictive validity of the student-teacher relationship drawings (Harrison et al., 2007; McGrath et al., 2017; Zee et al., 2020). That is, the drawing dimensions showed substantial associations with both student-reported and teacher-reported relationship quality on validated and often used relationship questionnaires, and also with students' behavioral and academic adjustment (M. Chen et al., 2021a; Harrison et al., 2007; McGrath et al., 2017; Zee et al., 2020). Furthermore, M. Chen et al. (2021a) found evidence for measurement invariance of student-teacher relationship drawings across China and the Netherlands for making cross-cultural comparisons. In the present study, intraclass

Figure 1. Examples of student-teacher relationship drawings. *Note*. Drawings from both Dutch (drawings a, c, and e) and Chinese (drawings b, d, and f) students are provided. Drawings a and b show abundant evidence of student-teacher closeness, as both drawings are colorful and detailed (vitality/creativity); in both drawings, the teacher and student are smiling and showing affection toward each other (pride/happiness). Drawings c and d show indications of conflict between teachers and students, such as angry faces and a scene in which teachers and students attack each other (anger/tension). There were also unusual symbols, such as sword, cannon, and dark cloud (bizarreness/dissociation), and the student is showing more power than the teacher (role reversal). Drawings e and f suggest the student's dependency on the teacher, where the student is upset by the teacher (vulnerability) and there are physical distances and barriers between the student and teacher (emotional distance/isolation).

Table 2. Interrater reliabilities (IRRs) of student-teacher relationship drawing dimensions and correlations between study variables.

	IRR	1	2	3	4	5	6	7	8	9	10	11	IRR
1. Gender (0 = boys)	–	–	−.08	−.00	.35**	.25**	−.30**	−.15**	−.31**	−.27**	−.37**	−.35**	-
2. Age	–	−.03	–	−.05	−.17**	−.09*	.09*	.06	.08	.07	.10*	.09*	-
3. Shyness	–	.22**	−.02	–	.07	−.04	.01	−.03	.03	.03	.08*	.04	-
4. Vitality/Creativity	.84	.37**	−.06	.06	–	.35**	−.54**	−.24**	−.35**	−.47**	−.42**	−.48**	.85
5. Pride/Happiness	.78	.25**	−.05	.08*	.42**	–	−.55**	−.55**	−.81**	−.33**	−.69**	−.87**	.77
6. Vulnerability	.71	−.29**	.01	−.07	−.47**	−.57**	–	.75**	.61**	.54**	.66**	.66**	.78
7. Emotional Distance/ Isolation	.86	−.21**	.02	−.10**	−.35**	−.68**	.72**	–	.60**	.45**	.58**	.59**	.84
8. Anger/Tension	.68	−.33**	−.02	−.12**	−.48**	−.75**	.55**	.55**	–	.39**	.77**	.85**	.77
9. Role Reversal	.72	−.25**	−.06	−.15**	−.43**	−.28**	.34**	.31**	.32**	–	.53**	.44**	.72
10. Bizarreness/ Dissociation	.69	−.33**	−.06	−.08*	−.48**	−.68**	.58**	.55**	.76**	.40**	–	.79**	.72
11. Global Pathology	.76	−.37**	.02	−.11**	−.71**	−.70**	.66**	.59**	.74**	.48**	.75**	–	.81

*$p < .05$, **$p < .01$; IRRs and correlations for the Dutch sample are presented below the diagonal and IRRs and correlations for the Chinese sample are presented above the diagonal.

correlations (ICCs) were used to calculate inter-rater reliability. According to the guidelines of Cicchetti et al. (2006), inter-rater reliability can be considered good when ICCs ≥ .60, and excellent when ICCs ≥ .75. In the present study, inter-rater reliabilities were good to excellent for all drawing dimensions, both in the Dutch sample (.68 < ICC < .84) and in the Chinese sample (.72 < ICC < .85; see Table 2).

Student's gender, age, and shyness. Students provided information about their gender (0 = boys, 1 = girls) and age (measured in years) at the beginning of the questionnaire. Students also reported their levels of shyness on the shyness subscale from the School Questionnaire (SVL; Smits & Vorst, 1982). This subscale contains seven items that describe students' wariness and nervousness when they experience attention-attracting events. Example items include *"If I enter a room full of people, I feel anxious," "If suddenly everyone in the classroom looks at me, I feel shy,"* and *"I do not like it when I have to come in front of the class."* Students rated to what extent each statement applied to themselves on a five-point Likert scale, from 1 (*No, that is not true*) to 5 (*Yes, that is true*). The SVL is a Dutch questionnaire and was translated into Chinese by the first author with a back-translation procedure. The psychometric properties of the SVL have been supported in the Dutch context (Evers et al., 2013). Support of measurement invariance of the shyness items across the Netherlands and China was found by M. Chen et al. (2021b). In the present study, the shyness items also showed satisfactory reliabilities, both in the Dutch sample (Cronbach's alpha = .82) and the Chinese sample (Cronbach's alpha = .72).

Analyses

Data were analyzed with Mplus 7.31 (Muthén & Muthén, 1998–2012). First, to examine cultural differences in students' mental relationship representations, we employed multiple-group models to estimate the means of each drawing dimension in the Dutch and Chinese sample (taking Country as the grouping variable). The Wald chi-square test was used to test whether means were equal across both samples (Muthén & Muthén, 1998–2012). For dimensions showing significant mean differences, Cohen's d was calculated to indicate whether the effect was small ($0.2 \leq d < 0.5$), medium ($0.5 \leq d < 0.8$), or large ($0.8 \leq d$; Cohen, 1988).

Second, multiple-group analysis was also used to investigate cultural differences in the associations between student characteristics (Gender, Age, Shyness) and students' mental relationship representations. First, a fully constrained model was constructed, where all the associations between student characteristics and the drawing dimensions were constrained to be equal across the Dutch and the Chinese sample. Second, these associations were freed one by one, based on modification indices, to see whether freeing a constraint improved model fit. In the case the model fit was significantly improved, this association would be kept freely estimated and we continued freeing another equality constraint.

Maximum likelihood estimation with robust standard errors and a chi-square test statistic (MLR) was used in model estimation. Our data appeared to have a multi-level structure, as students were nested within classrooms. As presented in Table 3, we found the intraclass correlations (ICCs) to be small for most drawing dimensions, both in the Dutch sample ($2.2\% \leq \text{ICCs} \leq 8.7\%$) and in the Chinese sample ($3.0\% \leq \text{ICCs} \leq 16.3\%$; J. J. Hox & Maas, 2002). Hence, most of the variance in students' relationship perceptions was at the student level, whereas a small proportion of the variance was at the classroom level. Nevertheless, to account for the multi-level nature of the data, we used the "Type = Complex" option in Mplus for all multiple-group models, which computes standard errors

Table 3. Cultural differences in student-teacher relationship drawing dimensions between the Netherlands and China.

	ICCs		Mean	Mean	Wald test
	Dutch	Chinese	$(SD)_{Dutch}$	$(SD)_{Chinese}$	χ^2 value
Vitality/Creativity	7.3%	16.3%	3.95 (1.14)	4.16 (1.15)	1.86
Pride/Happiness	8.7%	3.0%	4.71 (0.93)	4.64 (0.97)	1.83
Anger/Tension	6.4%	7.9%	3.00 (0.86)	2.68 (1.03)	10.66**
Role Reversal	2.2%	4.5%	3.02 (0.91)	2.69 (0.95)	15.97***
Bizarreness/Dissociation	4.1%	6.0%	2.75 (0.92)	2.76 (0.98)	0.12
Vulnerability	3.7%	5.3%	3.54 (1.32)	3.87 (1.45)	7.65**
Emotional Distance/Isolation	8.6%	4.1%	3.36 (1.23)	3.08 (1.40)	5.54*
Global Pathology	6.6%	5.0%	3.88 (1.09)	3.15 (0.92)	69.92***

*$p < .05$, **$p < .01$, ***$p < .001$; intraclass correlations (ICCs) are reported for the percent of variance at the classroom level. The Wald test is conducted with one degree of freedom.

with a sandwich estimator. Missing values (<2.30% were missing per variable) were handled with Full Information Maximum Likelihood (FIML). Model fit was indicated by the Satorra-Bentler Scaled chi-square test, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR). Satisfactory model fit was suggested by non-significant chi-square values, RMSEA and SRMR < .08, and CFI > .90 (Hu & Bentler, 1999; Kline, 2005). To compare nested models for the second research question, the Sattora-Bentler chi-square difference test was used, and a significant chi-square difference value suggested a better model fit of the freely-estimated model.

Results

Correlations between study variables

Correlations between study variables are presented in Table 2 for the Dutch and Chinese samples separately. Both in the Dutch and Chinese sample, girls had significantly higher scores on the positive drawing dimensions and lower scores on the negative drawing dimensions than boys. Students' Age was not significantly correlated with any drawing dimensions in the Dutch sample, whereas in the Chinese sample, Age was negatively associated with Vitality/Creativity and Pride/Happiness, and positively associated with Vulnerability, Bizarreness/Dissociation, and Global Pathology. In the Dutch sample, Shyness was positively correlated with Pride/Happiness and negatively correlated with most negative drawing dimensions. In the Chinese sample, however, Shyness was positively correlated with Bizarreness/Dissociation but was not significantly correlated with the other drawing dimensions.

Cultural differences in students' mental relationship representations

Means of the drawing dimensions for both the Dutch and the Chinese samples are provided in Table 3. Significant differences between the Dutch sample and the Chinese sample were found for the means of Anger/Tension (χ^2 (1) = 10.66, p = .001), Role Reversal (χ^2(1) = 15.97, p < .001), Vulnerability (χ^2 (1) = 7.65, p = .006), Emotional Distance/Isolation (χ^2(1) = 5.54, p = .019), and Global Pathology (χ^2 (1) = 69.92, p < .001). The Dutch sample scored higher on Anger/Tension (M_{Dutch} = 3.00; M_{Chinese} = 2.68), Role Reversal (M_{Dutch} = 3.02, $M_{Chinese}$ = 2.69), Emotional Distance/Isolation (M_{Dutch} = 3.36, $M_{Chinese}$ = 3.08), and Global Pathology (M_{Dutch} = 3.88, $M_{Chinese}$ = 3.15) than the Chinese sample. These differences were small for Emotional Distance/Isolation (Cohen's d = 0.22), Role Reversal (Cohen's d = 0.36), and Anger/Tension (Cohen's d = 0.34), and medium to large for Global Pathology (Cohen's d = 0.72). In contrast, the Dutch sample scored lower on Vulnerability (M_{Dutch} = 3.54, $M_{Chinese}$ = 3.87) than the Chinese sample, with a small effect size (Cohen's d = −0.24). No significant differences between samples were found for Vitality/Creativity (χ^2 (1) = 1.86, p = .173), Pride/Happiness (χ^2 (1) = 1.83, p = .176), and Bizarreness/Dissociation (χ^2 (1) = 0.12, p = .726).

Cultural differences in associations between student characteristics and mental relationship representations

The baseline model (i.e., all associations constrained to be equal across countries) already had a good fit, χ^2 (24) = 35.48, p = .062, RMSEA = .027, 90% CI [.00, .05], CFI = .998, SRMR = .025. We still checked modification indices, which suggested that freeing the equality constraint on the association between Gender and Global Pathology could further improve model fit. This association was therefore freely estimated and the model fit was significantly improved compared to the baseline model, $\Delta\chi^2$ (1) = 13.58, p = .002. Freeing other associations did not significantly improve model fit. Therefore, in the final model, only the association between Gender and Global Pathology was freely estimated, whereas all other associations were kept equal across countries. This final model also had an even better fit than the baseline model, χ2 (23) = 24.07, p = .400, RMSEA = .008, CFI = 1.000, SRMR = .021. Table 4

Table 4. Associations between student characteristics and relationship drawing dimensions for both the Dutch sample and the Chinese sample.

	Pride/Happiness		Vitality/Creativity		Vulnerability		Emotional Distance/Isolation	
	Dutch b (S.E.)	Chinese b (S.E.)	Dutch b (S.E.)	Chinese b (S.E.)	Dutch b (S.E.)	Chinese b (S.E.)	Dutch b (S.E.)	Chinese b (S.E.)
Gender	0.45(0.07) ***	0.45(0.07) ***	0.83(0.07)***	0.83(0.07)***	−0.79(0.09) ***	−0.79(0.09) ***	−0.46(0.08) ***	−0.46(0.08) ***
Age	−0.04(0.03)	−0.04(0.03)	−0.07(0.05)	−0.07(0.05)	−0.02(0.04)	−0.02(0.04)	−0.02(0.04)	−0.02(0.04)
Shyness	0.01(0.03)	0.01(0.03)	0.06(0.04)	0.06(0.04)	−0.002(0.04)	−0.002(0.04)	−0.07(0.04)	−0.07(0.04)
	Anger/Tension		Role Reversal		Bizarreness/Dissociation		Global Pathology	
	Dutch b (S.E.)	Chinese b (S.E.)	Dutch b (S.E.)	Chinese b (S.E.)	Dutch b (S.E.)	Chinese b (S.E.)	Dutch b (S.E.)	Chinese b (S.E.)
Gender	−0.57(0.06) ***	−0.57(0.06) ***	−0.47(0.05) ***	−0.47(0.05) ***	−0.66(0.07) ***	−0.66(0.07) ***	**-0.81(0.08) *** **	**-0.62 (0.06)*** **
Age	−0.02(0.03)	−0.02(0.03)	−0.02(0.03)	−0.02(0.03)	−0.01(0.03)	−0.01(0.03)	0.02(0.03)	0.02(0.03)
Shyness	−0.01(0.03)	−0.01(0.03)	−0.04(0.03)	−0.04(0.03)	−0.04(0.03)	−0.04(0.03)	−0.003(0.03)	−0.003(0.03)

*: $p < .05$; **: $p < .01$; ***: $p < .001$. Gender (0 = boys, 1 = girls) is a dummy variable. The association with significant cultural differences is presented in bold.

displays the associations between student characteristics and the drawing dimensions for both samples based on the final model. As can be seen in this table, girls scored lower on Global Pathology than boys and this difference was stronger in the Dutch sample than in the Chinese sample ($b_{Dutch} = -0.81$, $b_{Chinese} = -0.62$). Furthermore, in both samples, girls scored higher on Vitality/Creativity and Pride/Happiness and lower on all the negative dimensions than boys. Age and Shyness, however, were not significantly associated with the drawing dimensions, neither in the Dutch sample nor in the Chinese sample (see Table 4).

Discussion

The present study investigated cross-cultural differences in students' unconscious mental representations of their relationships with teachers as measured by student-teacher relationship drawings. Furthermore, we examined how students' gender, age, and shyness were associated with students' mental relationship representations across the Netherlands and China. Several main findings emerged from this study.

Cultural differences in students' mental relationship representations

In contrast to our hypotheses (M. Chen et al., 2019; Yang et al., 2013), Dutch and Chinese students displayed equal levels of close relationship representations (pride/happiness and vitality/creativity) in their drawings. This is an interesting finding, as studies based on questionnaire data primarily suggest that students in Eastern contexts generally report higher levels of closeness with teachers than students in Western contexts (M. Chen et al., 2019; Jia et al., 2009; Yang et al., 2013). These different findings may be due to different methods used to measure students' mental relationship representations. Specifically, students' responses on explicit measures such as questionnaires are more likely to be influenced by social desirability concerns (Hofmann et al., 2005). Given the emphasis on social harmony in Eastern cultures, students in Eastern contexts may be more heavily affected by this bias than their counterparts in Western contexts. More specifically, when filling out questionnaires, they may be more likely to over-report the degree of closeness with their teachers than students from Western contexts (Bernardi, 2006). In contrast, implicit measures such as drawings may be less affected by social desirability bias (Hofmann et al., 2005). Accordingly, students from Eastern and Western cultures might have drawn their relational security with teachers as equally favorable. These

findings also confirm that drawings may capture different information about student-teacher relationship quality than questionnaires when making cross-cultural comparisons. Future researchers are thus encouraged to combine questionnaires and drawings to get a more detailed picture of cultural differences in student-teacher relationships.

Supporting our hypotheses (M. Chen et al., 2019; Triandis, 2018), Chinese students appeared to show lower levels of conflictual relationship representations in their drawings (as indicated by anger/tension and role reversal) than Dutch students. These findings concur with previous findings that conflictual student-teacher relationships may be less prevalent in Eastern, collectivistic cultures than in Western, individualistic cultures (Acar et al., 2019; M. Chen et al., 2019). Surprisingly, Dutch and Chinese students showed equal levels of bizarreness/dissociation in their drawings. Different from anger/tension and role reversal, bizarreness/dissociation reflects the more extreme part of conflictual relationship representations, and it seems that this specific aspect of students' mental relationship representations may not differ across cultures. This finding also underlines the relevance of using relationship drawings in cross-cultural comparisons, as questionnaire data cannot distinguish between different aspects of relational conflict between teachers and students (c.f., M. Chen et al., 2019).

Interestingly, for teacher-student dependency, the findings were less consistent. Just as for representations of conflict, Chinese students showed less emotional distance/isolation than Dutch students, which may further confirm that Chinese students were less likely to feel emotionally insecure in relationships with teachers than their Dutch counterparts. However, Chinese students' drawings displayed more vulnerability than those of Dutch students. As vulnerability taps students' fear of the teacher and feelings of being threatened in the relationship (Zee & Roorda, 2017), this dimension seems to be related to the degree of power distance in a society (i.e., unequally distributed power between teachers and students and the acceptance of superior-subordinate relationships; Hofstede et al., 2010). In China, the power distance between students and teachers is high and teacher-student dyads share a more hierarchical relationship where students are supposed to show high levels of compliance and obedience toward teachers. In the Netherlands, however, teachers and students tend to share a more equal relationship with low power distance (M. Chen et al., 2019; Hofstede et al., 2010). Thus, as a result of such hierarchical relationship structures, Chinese students may feel more vulnerable and scared in their relationships with teachers than Dutch students. Nevertheless, the present study is the first to investigate cultural differences in students' mental representations of relational dependency and more research is needed to investigate whether our findings and explanations can be supported.

Last, as expected (M. Chen et al., 2019), Chinese students perceived the overall relationship quality more favorably than their Dutch counterparts (as indicated by lower levels of global pathology in their drawings). As Chinese students' drawings were rated lower on most negative dimensions than those of Dutch students, these findings together suggest that students in Eastern cultures may not only have more favorable relationship perceptions at a conscious level (M. Chen et al., 2019), but also have more favorable unconscious relationship perceptions than students in Western cultures. Our findings also further support the theoretical assumption that cultural values may affect students' relationship experiences with teachers (Pianta et al., 2003), and therefore it may be important to make school practices and interventions more culturally sensitive.

Students' gender, age, shyness, and mental relationship representations across cultures

In line with previous Western studies (Jellesma et al., 2015; McGrath & Van Bergen, 2015), in the Dutch sample, boys' drawings displayed lower levels of positive relationship representations and higher levels of negative relationship representations than those of girls. These findings further confirm the well-established gender differences in student-teacher relationship quality in Western contexts, as gender differences are found not only in teachers' relationship perceptions (Hajovsky et al., 2017; Koepke & Harkins, 2008) and students' conscious relationship perceptions (Jellesma

et al., 2015), but also in students' unconscious relationship perceptions. Moreover, in the Chinese sample, boys' drawings also showed lower levels of positive relationship representations and higher levels of negative relationship representations than those of girls. As such, these gender differences seem to generalize to Eastern contexts as well. Therefore, it is important for researchers and school practitioners to be aware that boys may be at risk of having unfavorable relationships with teachers, and may need additional help and interventions to develop healthy student-teacher relationships.

Furthermore, the gender difference in global pathology was stronger in the Dutch sample than in the Chinese sample. Although boys' drawings displayed worse overall relationship quality with teachers than girls in both samples, this gender difference was smaller in the Chinese sample than in the Dutch sample. However, gender differences were just as large in the Chinese sample as in the Dutch sample for the other seven dimensions. A possible explanation could be that boy preference in China might still be strong enough to affect students' overall relationship quality with teachers (i.e., global pathology). However, due to the promotion of gender equality in China in recent decades, boy preference may be diminishing (Lan & Moscardino, 2019; Wang et al., 2020) and may not be as evident as to affect how boys and girls experience specific aspects of teacher-student relationships. More research, however, is needed to examine this hypothesis.

In contrast to our expectations (Jerome et al., 2009; Rothbaum et al., 2000), students' age was not associated with their unconscious mental representations. This was found for all eight dimensions, both in the Dutch sample and the Chinese sample, providing rather strong support for this finding. A possible explanation for this unexpected finding could be that previous studies looking at associations between age and relationship quality mostly focused on teachers' relationship perceptions (Hughes & Cao, 2018; Jerome et al., 2009) or students' conscious relationship perceptions (Zee & Koomen, 2017). Also, the present study included a student sample with a relatively small age span (i.e., third- to sixth-graders), whereas the influence of age on relationship quality may be more salient when looking at a larger age span, such as from kindergarten till sixth grade (e.g., Jerome et al., 2009). Future research including a student sample with a larger age span is encouraged to explore whether students' age would affect their unconscious relationship perceptions.

Unexpectedly (Chen et al., 2021b; Nurmi, 2012), students' shyness did not show significant associations with their unconscious relationship perceptions either. Again, this applied to all drawing dimensions in both countries. As such, our findings are inconsistent with the cross-cultural study of M. Chen et al. (2021b), who found that both in the Netherlands and China, students' shyness was linked to less student-teacher closeness and more student-teacher conflict, with associations being even stronger in China than in the Netherlands. A possible explanation could be that M. Chen et al. (2021b) employed a questionnaire to measure students' conscious relationship perceptions, whereas we used relationship drawings to measure students' unconscious perceptions. As shy children tend to feel insecure and vigilant on social occasions (X. Chen, 2019), filling out questionnaires may elicit feelings of nervousness in shy students. Therefore, they might report their relationships with teachers as less favorable than non-shy students. In contrast, making a drawing is easier and more enjoyable for children (Zee et al., 2020), and therefore shy students may feel less stressed and draw their relationships with teachers as favorably as non-shy students. Although further support for this explanation is still needed, school practitioners may consider employing relationship drawings to get a better view of shy students' perceptions of their relationship with teachers.

Limitations and future directions

Several limitations of the present study should be considered. First, caution is warranted when generalizing our findings to a larger population (e.g., Chinese students in other areas). To make the Chinese and Dutch samples more comparable in social-economic status, we included a Chinese sample from a relatively developed area in China (Zhejiang province). However, as China is a large country, there might be within-country differences in the understanding of student characteristics and

student-teacher relationships. For instance, previous research has suggested that people in rural and urban areas of China may have different views of students' gender (Wang et al., 2020) and shyness (X. Chen et al., 2011). Future research may include students from other areas of China to explore whether our findings generalize to less developed areas of China as well.

Second, data employed in the present study were cross-sectional in nature. Hence, although we investigated the associations between students' age and their unconscious relationship perceptions, we cannot make inferences about developmental changes in students' unconscious relationship perceptions. Following students across the elementary school with a longitudinal design may provide a richer picture about how students experience their relationships with teachers as they grow older.

Third, although cultural differences were found in students' unconscious relationship perceptions, we did not include third variables and thus cannot draw definite conclusions about the mechanisms behind these cultural differences. For instance, it would be interesting to include how students perceive the degree of individualism (collectivism) and power distance in the school environment and investigate how these cultural values affect their relationship perceptions. Furthermore, students' mental relationship representations also may be influenced by other factors, such as students' attachment history with parents and previous teachers (Pianta et al., 2003). Future research is encouraged to include these variables and further explore how students in different cultural contexts form their mental relationship representations.

Fourth, the shyness subscale of the SVL mainly captures students' wariness and withdrawal in eye-attracting situations. Another important aspect of shyness, however, is children's anxiousness and wariness in the face of novelty (e.g., novel people, things, and places; Coplan & Rubin, 2010). Hence, it may be beneficial to examine whether our findings can be replicated when employing other shyness measures that look into students' fear of novelty (e.g., the Children's Behavior Questionnaire; Rothbart et al., 2001).

Lastly, the present study focused on student characteristics and students' relationship perceptions. As such, our data were based merely on student reports and did not include teachers' perceptions. Nevertheless, student-teacher relationships are dyadic and teachers play an important role in the relationship as well. Previous research also suggested that cross-cultural differences in student-teacher relationships may depend on whether students' or teachers' relationship perceptions are investigated (M. Chen et al., 2019, 2023). As far as we know, not much research has looked at teachers' unconscious relationship perceptions across different countries. Hence, future research may use the Teacher Relationship Interview (Pianta, 1999) and examine whether teachers' unconscious relationship perceptions also differ across countries.

Implications for school practitioners and researchers

Despite these limitations, some suggestions can be provided for school practitioners and researchers. First, relationship drawings may be regarded as a helpful method in a multi-cultural context, in addition to relationship questionnaires. The present study showed that relationship drawings may provide a unique, detailed picture of students' unconscious mental representations in different cultures that goes beyond relationship questionnaires (M. Chen et al., 2021a). In making cross-cultural comparisons, researchers may therefore consider combining or choosing between relationship drawings and questionnaires, depending on the research aim and design. Researchers are also encouraged to further investigate whether previous findings regarding teachers' perceptions and students' conscious relationship perceptions as measured by questionnaires also pertain to their unconscious relationship perceptions as measured by drawings.

Second, teachers and other school practitioners also may make good use of drawings to get a nuanced understanding of students' relationship experiences, especially for students having difficulties expressing their feelings at a verbal level (Pinto & Bombi, 2008). In addition, our findings provide further evidence that students' mental representations of their relationships with teachers

differ across cultures (cf., M. Chen et al., 2019). As such, when applying interventions developed in Western contexts (e.g., Relationship-Focused Reflection program; Spilt et al., 2012) to Eastern contexts, special attention should be paid to make sure that these interventions can be suited to local students.

Third, our results showed that boys may be at risk of experiencing unfavorable relationships with teachers, both in Western and Eastern cultures. Therefore, teachers and other school practitioners are encouraged to pay special attention to help boys develop healthy relationships with teachers. To reach this goal, relationship drawings may be used to identify which specific relationship dimensions where an individual boy may be at risk (e.g., anger/tension), and thereafter, personalized interventions focusing on specific aspects of the relationship can be provided for boys.

Disclosure statement

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Data availability statement

The data used in the research cannot be publicly shared because data contain confidential information about the participants, whereas data and used materials are available upon request, by emailing: Mengdi Chen (mengdichen@um.edu.mo), or Dr. Debora Roorda (d.l.roorda@uva.nl).

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