USING KELLY'S THEORY TO EXPLORE STUDENT TEACHERS' CONSTRUCTS ABOUT THEIR PUPILS

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This study builds on and adapts a procedure to reveal teachers' constructs about their pupils and a method to categorise these constructs. Kelly's Personal Construct Theory (PCT) and his accompanying repertory grid technique are used to study the constructs of Dutch student teachers about their pupils. The elements used to elicit the constructs consisted of the student teachers' entire class. Seven categories were used to categorise the constructs: Attitudinal, emotional, relational, personal, intellectual, interests and physical. In addition to Kelly's original technique, the student teachers were asked to provide descriptions of their construct and contrast poles. These descriptions facilitated reliable coding.

Key words: Personal construct theory, classification system for teachers' personal constructs, student teachers' thinking, repertory grid technique, research methodology.

INTRODUCTION

This study focuses on the identification of student teachers' perceptions about their pupils in special schools. As in many other countries, education that is more inclusive lies ahead in the Netherlands. On 1 August, 2014, a new law derived from the Salamanca Statement called 'suitable education' has taken effect in the educational field (UNESCO, 1994). As a result of this change of law not only the teachers already working at special schools, but all teachers will come into contact with pupils who need additional support. Therefore, it is essential to know (student) teachers' perceptions about their pupils: those who need additional support as well as those who do not.

We operationalised teachers' perceptions and beliefs about their pupils as constructs in accordance with Kelly's Personal Construct Theory (PCT, 1955/1991). Kelly originally developed his theory and technique to focus on psychotherapeutic clients' views of their world in their own terms. The 'repertory grid technique' became a well-established technique for clarifying constructs underlying these views and can be used in a wide range of contexts (e.g. Anderson, 1990; Fransella & Dalton, 1990; Solas, 1992; Walker, 1996; Baxter, Schröder, & Bower, 1998; Coakes, Fenton, & Gabriel, 1999; Luque, Rodríguez, & Camacho, 1999; Feixas & Saúl, 2004; Ortega, 2007; Köing, Jöri, & Knüsel, 2011). As Solas (1992) argued, "Personal Construct Theory has a role to play in education. The theory offers ways of seeing and doing which are potentially applicable to many teaching and learning issues" (p. 209).

This manuscript will use the technique for investigating student teachers' constructs underlying beliefs about their pupils. These beliefs may influence their expectations of these pupils and the way they relate to and interact with them (Munthe & Thuen, 2009; Koomen, Verschueren, & Thijs, 2006; Opdenakker & Van Damme, 2006). Since the extent to which someone has positive or negative expectations of another person may have far-reaching implications for their relations with that person (Pajares, 1992), understanding teachers' constructs about their pupils is an important topic of research.

For a better understanding of differences in constructs about pupils, knowledge of these constructs is needed. However, PCT in the last decades only has been applied sporadically in education, perhaps because it was originally designed for psychotherapy (Butt, 2008). Educational research projects in which Kelly's repertory grid technique has been used show that this technique provides reliable data to elicit teachers' perceptions about teaching and the learning process (e.g., Christie & Menmuir, 1997; Pope & Denicolo, 2001; Roberts, 1999; Van der Wolf, 1984; Yorke, 1978; Nash, 1976). Kleine and Smith (1989) used PCT as a framework to examine the relationship of early socialisation to teachers' belief systems. They stated that PCT emerged as "a basis for empirical and theoretical work in psychology and education" (p. 309).

Our principal aim for using PCT is to chart student teachers' underlying beliefs about pupils in order to improve the guidance during their teacher education. This is especially useful for articulating constructs that were previously unarticulated. The primary aim of this study is to develop and describe a coding system for these beliefs. Users of the PCT repertory grid thus might acquire new ideas about adapting and implementing the repertory grid technique for different populations and settings. Readers from education who are not familiar with PCT may get an impression of the way constructs from student teachers can be elicited and analysed.

THEORETICAL FRAMEWORK

Personal construct theory

George Kelly (1955/1991) coined the term 'personal constructs' to refer to thoughts, feelings, intentions etc. that a person is not necessarily aware of. His theory concerns the manner in which personal convictions guide the thinking and actions of people. He advances the idea that, behind the judgment and behaviour of a person, an individual theory is hidden. This hidden theory is based on an individual's personal perceptions of occurrences. According to Kelly, people construe their views of their current surroundings and experiences by comparing them with previous experiences. Their assessments are based on the views and convictions they have acquired over time. These views and convictions are completely unique. Personal constructs are embedded in an individual (personal) construct system. Each individual's construct system is constantly adjusted in the light of events. The personal construct system helps an individual to assess a situation and act in specific circumstances. Constructs can vary in the meanings they cover and the way they are valued. According to Kelly, an individual personal construct system consists of double entities or 'contrast poles'. Their meanings can only be established in contrast to the other 'pole', for example, *brave–afraid, brave–anxious* or *brave–quit*. These examples of constructs do not illustrate the concept *brave*, but rather a bipolar formation: brave versus another pole. The contrast gives meaning to the content of both poles of the construct. Individual constructs change slowly and are seen as stable building blocks that characterise a person (Kelly, 1963).

Repertory grid technique

The repertory grid technique is a procedure to investigate personal constructs (Kelly, 1963). In working with the repertory grid, participants are asked to name 'elements'. There are many ways in which grids can be and have been elicited (Epting, Suchman, & Nickeson, 1971; Baillie-Groham, 1975; Van der Wolf, 1984; Anderson, 1990; Walker, 1996; Baxter et al., 1998; Coakes et al., 1999; Köing et al., 2011). Kelly's procedure to find elements, which we adapted in this study, consists of asking stock questions. For example, 'Who is the friendliest person at work?' The answer, 'Tom', is one of the elements. This name is then written on a card. When all the questions have been answered, the cards with names are gathered into a pile. Three cards are then put in front of the participant with the question in what way two of the persons on the cards are alike and differ from the third. The participant might reply, 'these two are *quiet* but the third one is *noisy*'. The construct *quiet–noisy*

is written down. The cards are returned to the pile of cards. Three more cards are selected at random, and the same question is asked. This technique is repeated until the participant cannot think of new constructs. Kelly (1963) found that this is usually after 8 to 12 constructs. Every person mentions different constructs about elements during this technique, even where the elements they refer to are the same (Schwandt, 1994). Kelly stated this is because people perceive elements in different ways, coloured by their previous experiences (Kelly, 1955/1991).

With regard to teachers, Solas (1992) concluded that the repertory grid procedure makes them aware of their constructs and gives 'voice to their otherwise silent thoughts' (p. 220). Schwandt (1994) argued that the repertory grid technique elicits the constructs that already exist and that are, therefore, not 'created' at that moment. Furthermore he states, "Kelly's repertory grid technique is useful for researchers who wish to understand thinking from the inside, the world of lived experience from the point of view of those who live it" (1994, p. 118).

Table 1: *Criticisms and adaptations related to Van Kan et al. (2010)*

Criticism	**Adaptation**
Provision of elements without involving the teacher (p. 1555).	Actively involving the student teachers in providing elements by letting them take all the pupils in one class as their elements.
A too abstract, generalized representation of the elements that have been provided by the researcher disconnected from teacher's personal meaning and experienced practice (p. 1555).	Using their own pupils as elements, student teachers refer to well-known, concrete and meaningful elements, thus maintaining connection with their own practice as teachers.
The complexity of the triadic aspect: "The risk that in comparing three rather complex elements at the same time too much attention is paid to the rules of the technique instead of the content of elements" (p. 1558).	The use of pupils from only one and one's own class as elements reduces the complexity.
The strictly dichotomous character of constructs disregarding the possibility that construct and contrast poles are categorised differently (p. 1556).	We analysed the poles separately in the pilot phase. Only in three out of 113 cases were the construct and the contrast poles categorised differently,
The superficiality of the constructs. Van Kan et al. (2010, p. 1555) found the meaning underlying the construct to be crucial, whereas the repertory grid technique focuses on the elicited constructs and allows little room for their meaning.	The procedure was adapted by asking the participants to elaborate on each of the construct poles after the elicitation of constructs, thus providing scope for the meaning of the constructs.

Theoretical and practical challenges

Kelly's work has also been criticised, for instance by Corporaal (1988). Her most fundamental criticism of the PCT concerns the dichotomy proposition. The objection highlighted by Corporaal is that information is lost when strictly adhering to the bipolar formation. She also states that people tend to prefer the construct pole more, and the contrast pole becomes something that "does not belong to the construct pole" (Corporaal, 1988, p. 67). Other studies also criticise the validity of the dichotomous nature of constructs (Riemann, 1990). Bonarius, Van Heck and Smid (1984) noted that the bipolar formation might reduce the complexity of the topic under investigation into clear-cut contrasting poles. Referring to this debate, Van Kan, Ponte, and

Verloop (2010) recently questioned the application of the repertory grid technique in educational contexts. In their study about teachers' views on classroom interactions, they reported five difficulties in applying the repertory grid technique in its standard form. We address the criticisms of Van Kan et al. (2010) because these authors are among the few who have recently used the grid technique *in education*. In our study methods were sought to take advantage of the strong points of the repertory grid procedure and, at the same time, deal with the objections raised. In Table 1 we have listed the criticisms and the adaptations made to deal with them.

Categorising personal constructs

The diversity of the constructs elicited from participants (Yorke, 1978; Van Kan et al., 2010) shows the need to classify the content of the constructs. Such classification for example is helpful for comparing different groups of respondents.

In the literature, we found two general classification systems to categorise personal constructs according to their content. The first is the classification system by Landfield (1971), which consists of 32 categories. The second is by Feixas, Geldschläger, and Neimeyer (2002), who noted several disadvantages in Landfield's system. To overcome these, they designed another classification system (the Classification System for Personal Constructs [CSPC]) consisting of 38 subcategories organised into six main categories (Moral, Emotional, Relational, Personal, Intellectual/Operational and Values/Interests) with a possible extension of two categories (Existential and Concrete descriptors) to increase the CSPC's usefulness in some contexts, as reported by Neimeyer, Anderson, and Stockton (2001). In the present study, we investigate whether this classification system can also be used for student teachers' constructs.

RESEARCH QUESTION

This article examines how Kelly's repertory grid can be used as a procedure to investigate student teachers' constructs about their pupils. The following research questions were addressed:

1. Can student teachers' descriptions, when characterising their pupils, be elicited and categorised in a reliable way?
2. What constructs do student teachers mention and how often do they mention these? Creating a coding system enables the study of similarities and differences between groups of individuals. In this manuscript we study a group of student teachers preparing for teaching at inclusive schools with pupils with special needs.

CONTEXT AND METHODOLOGY

Participants

Twenty-two student teachers at a teacher training college in the Netherlands, teaching 4 to 12-year-old pupils during their practical placements, participated from December 2010 until May 2012 in our study. At the time of their participation, the student teachers were in their third year of a four-year teacher education programme. During that year, they attended classes four days a week at the teacher training college and taught one day a week at their placement schools, which were, in this case, inclusive schools with pupils with special needs. The mean size of the class the student teachers taught was for the younger pupils (4–8 years old) 21.3 and for the older pupils (9–12 years old) 25.6.

Eight additional student teachers from the same teacher training college previously took part in a pilot study. At the time of participation, all student teachers had been teaching at least ten weeks at their placement schools. This insured familiarity with their pupils.

Pilot

In the pilot study, we followed two steps to elicit the constructs from eight student teachers. The original procedure to find elements with stock questions was not applied. Instead, all pupils in one class were conceived as 'elements'. Accordingly, the student teachers used their own pupils as elements in their individual grids. We elicited the student teachers' personal constructs about pupils and they determined the construct and contrast poles. In the pilot this resulted in 226 construct and contrast poles. We investigated the number of unique constructs named by the student teachers and found that more than 50% of the constructs mentioned were unique. In addition, even together with the contrast construct, the constructs tended to be multi-interpretable. As Yorke suggested, "A strong case can be made for going back to the respondent to ask for further clarification in the light of the analysis of his grid" (Yorke, 1978, p. 73). Therefore, we went back to the participants and asked them to take an additional step, which was to explain the words that they used as construct and contrast poles. Thus, the meaning of the constructs became clearer, and this addition to the conventional grid technique was included in the procedure of the main study.

Data collection

In the main study, data were collected from 22 student teachers following the procedure developed in the pilot study. The student teachers wrote the names of all pupils in their class (the elements) on small cards. Then, following Kelly's 'triad procedure', the cards were shuffled and three cards were laid down with the names facing up. The student teacher answered the following question: In what way are two of these pupils alike and different from the third? The elicited word or combination of words was written down by the student teacher. All cards were reshuffled, and the procedure was repeated – answering the question, writing down the word or combination of words, shuffling the cards and laying down new triads of pupils – until the student teacher was unable to produce new words. Thereafter, the student teacher formulated the opposite of each elicited word and wrote down all these opposites. From this moment, the elicited word and its opposite formed unique contrasting pairs, for example, *quiet–restless, reactive–laid back* or *afraid–brave*. Then, the student teacher indicated which of the two words from the construct pair he or she viewed as the positive, 'preferred' pole. The pole designated as preferred is from here on referred to as the construct pole and its opposite as the contrast pole. Finally, the student teacher briefly elaborated, on paper, on each of the poles in their own words. For example, a participant defined his construct pole *active* as 'largely contributes during lessons, takes initiative', and the contrast pole *work-shy* as 'not willing to work or do any activity that needs effort'.

Data analysis

In the data analysis, we first used the existing CSPC by Feixas et al. (2002). The CSPC has six categories (Moral, Emotional, Personal, Relational, Intellectual/Operational and Values/Interests) with supplemental categories (Existential and Concrete). For these categories descriptors were formulated by Neimeyer, Anderson, and Stockton *(*2001). We found that the subcategories did not cover the constructs of our student teachers. Many subcategories (e.g. in the main categories of existential and moral) remained empty. The main categories, however, provided enough distinction between data. Therefore, the subcategories of Feixas et al. (2002) and Neimeyer et al. (2001) were not included. We decided to take the system of eight categories as a starting point.

We followed the hierarchical order that Feixas et al. (2002) suggested to increase the reliability of the system and to eliminate potential overlap among the categories. Thus, a construct that could fit into two categories was classified at the highest level.

Data analysis during the pilot study showed that six constructs belonged in the first category, 'Existential'. Constructs in the first category

were, for example, *pragmatic*, *philosophical* and *modern*. Because of the hierarchical ordering of the system, we decided to merge the first category (Existential) with the second category (Moral) and rename this category 'Attitudinal'. This led to a Classification System for Teachers' Personal Constructs (CSTPC) based on the existing CSPC system. It contained seven categories, three of which were slightly relabelled: (1) Attitudinal, (2) Emotional, (3) Relational, (4) Personal, (5) Intellectual, (6) Interests and (7) Physical. The results section includes two tables, in which these categories are listed, described and illustrated with construct and contrast pole examples from our data.

Reliability of the coding system

To determine the reliability of the CSTPC, we calculated the inter-rater agreement. First, an independent researcher, and the first author of this article held a 30 minute consultation on the coding procedure and the meaning of the categories, before independently coding an identical sample of 100 construct and contrast poles. Cohen's Kappa was then calculated.

RESULTS

The data collection resulted in 289 construct pairs consisting of 578 construct and contrast poles, and the same number of elaborations of these construct and contrast poles. The written elaborations provided by the student teachers clarified the content of the constructs, which was necessary for reliable coding.

In order to categorise student teachers' constructs about their pupils in a reliable way (research question 1), we modified an existing coding system for personal constructs. Our pilot study showed that the use of the subcategories that Feixas et al. (2002) and Neimeyer et al. (2001) developed were not applicable to our student teachers' constructs. Therefore, we developed the CSTPC based on the main categories of the CSPC. This system allowed us to reliably classify the constructs elicited from student teachers; Cohen's Kappa appeared to be satisfactory at.91.

Regarding our second research question (what constructs do student teachers mention and how often do they mention these?), Table 2 presents the main categories on the left, the description of the content of the categories Feixas (2002) and Neimeyer (2001) used in their studies in the second column, the way we describe the categories in this study in the third column, the frequencies we found and in the last columns the number of users of each category. The 22 student teachers mentioned 578 construct poles (general M = 13.2, 4–8 years 12.6 and 9–12 years 14.7). The class size positively correlates quite substantially (.39, p =.07) with the number of constructs.

The findings show that student teachers most often (154 construct or contrast poles) used constructs that were categorised as Attitudinal. These constructs refer to the meaningful, valuable and characteristic aspects teachers notice about their pupils when they think and act. The second most frequently occurring category (119) is Relational, or the constructs about the social functioning of pupils and pupils' relationships with others, including parents and caregivers.

The third most frequently mentioned category, Emotional, contains constructs about a pupils' emotional and psychological functioning; it included 110 construct and contrast poles. By far, the least frequently mentioned constructs related to Interests (11). This category includes constructs about the artistic, expressive and physical abilities of pupils and various other activities.

Table 2 also shows the number of student teachers mentioning constructs in a particular category specified for the age of the pupils, between 4–8 and 9–12. The age of the pupils does not seem to be strongly related to the use of the categories by the student teachers, although relatively more constructs were elicited from student teachers in the categories of Interest and Physical for the older pupils (9–12 years).

Table 2: *Classification System for Teachers' Personal Constructs (CSTPC); categories, frequencies of use and number of student teachers using constructs in a category*

Category**	**Feixas et al. (2002) and Neimeyer et al. (2001)**	**This study**	**Fre-quency**	**Number of users of category**		
				N=22*	N=21* Pupil age	
				Total	4–8	9–12
1: Attitudinal (was Existential, 1, and Moral, 2)		The constructs in this category concern attitudinal functioning. These constructs refer to the meaningful, valuable and characteristic aspects the teacher notices when their pupils think and act.	154	21	13	7
2: Emotional	This category concerns an element of differentiation with respect to the degree of emotionality or sexuality of the person described: their emotional attitude toward life (optimistic) with regard to specific feelings.	The constructs in this category concern emotional and psychological functioning. The constructs refer to the emotionality of the person.	110	19	13	6
3: Relational	This category concerns all of the aspects that describe types of relationships with others. Although all constructs influence relationships, this category concentrates primarily on those aspects limited to the scope of relationships.	This category is for constructs concerning social functioning and relationships with others. It also contains the constructs about the relationship with the parents and caregiver	119	21	13	7
4: Personal	This category refers to a variety of characteristics traditionally pertaining to the category of personality, character, or way of being. It excludes those traits typically thought of as moral, relational, or emotional, since these have been included in previous categories.	This category relates to constructs about pupils' actions and the way they perform them. The constructs in this category will describe the individuality of a person.	72	18	12	6
5: Intellectual (was Intellectual/ Operational, 6)	This category refers to a variety of skills, abilities and knowledge both on intellectual and operational levels.	This category refers to constructs about intellectual functioning and school achievement. This finds expression in constructs about learn-	61	21	14	6

		ing performance: the learning progress and performance in academic subjects.				
6: Interests (was Values /Interests, 7)	This category refers to ideological, religious, or distinct values, as well as diverse interests such as music, culture, sports, etc.	This category refers to artistic, expressive and sports abilities.	11	4	2	2
7: Physical (was Concrete descriptors, 8)	This category refers to concrete, as opposed to abstract, features or positions of people, as well as their actions. No clear implication about their dispositional qualities is given.	This category refers to constructs about physical functioning, physical capabilities, physical characteristics and outward appearance.	45	8	4	3
Not classified		Constructs that cannot be classified in categories 1–7	6	3	1	1
Total			578			

* One of the teachers did not list the age of the pupils; therefore the number in the column (N=22) can differ from the sum of the two age groups (maximum 21).

** In case of differences in naming between the various systems, this information has been briefly added.

Table 3 presents examples of construct poles, contrast poles and personal elaborations, collected from 7 different teachers. The elaborations were crucial to the interpretation of each construct.

Table 3: *Classification system for teachers' personal constructs: Examples of construct poles, contrast poles and personal elaborations*

Categories	**Construct poles with personal elaborations**	**Contrast poles with personal elaborations**
1: Attitudinal	1: *Motivated:* 'Preparedness to want to do it all' 2: *Concentrated:* 'Always attentive to what they are doing'	1: *Unmotivated:* 'Do not want to join, no point in doing something' 2: *Unfocussed*: 'Always pays attention to things around him/her'
2: Emotional	1: *Optimistic:* 'Happy and cheerful' 2: *Confident:* 'Positive self-image and know what they can achieve'	1: *Pessimistic:* 'Downhearted and gloomy' 2: *Unsure of himself:* 'Has a negative self-image and needs much guidance'
3: Relational	1: *Helping others:* 'Prepared to help other pupils without being prompted' 2: *Good social skills*: 'Gets along very well with other people'	1: *Egoistic:* 'Thinks of him/herself first, does not like to help others' 2: *Manipulating*: 'Plays people against each other'

4: Personal	1: *Full of humour*: 'Making funny remarks, positive about life, can relativise' 2: *Honest*: 'Will never lie and adheres to the class rules'	1: *Dull:* 'Does not see the humour, is stodgy, cannot relativise' 2: *Secretly*: 'Secretive, aware of being watched'
5: Intellectual	1: *Smart*: 'Able to cope well with the level of the curriculum' 2: *Quick on the uptake*: 'Sees through a situation quickly, and promptly takes the next step'	1: *Difficult learner*: 'Has difficulty coping with the curriculum' 2: *Slow on the uptake*: 'Needs help to see through a situation, then takes the next step'
6: Interests	1: *Creative*: 'Full of nice ideas and elaborations and puts them into practice' 2: *Active exerciser*: 'Loves being actively engaged'	1: *Lacks inspiration*: 'No ideas, cannot handle open plan task' 2: *Spiritless*: 'Unenterprising, somewhat lazy and slothful'
7: Physical	1: *Physically healthy*: 'No physical pain/inconvenience or illness' 2: *Attention to appearance*: 'Attentive to own personal care'	1: *Physical discomfort/pain*: 'Teacher unable to help the pupil when in pain and discomfort' 2: *Uncared for appearance*: 'Unwashed, uncared for teeth/hair'

To demonstrate individual data Table 4 presents the construct pairs used by two different student teachers in all categories. Table 5 shows the construct pairs of three teachers in a single category together with the elaborations provided by the same teachers on the meanings attached to the construct pairs. It can be noted that the constructs are quite similar, but that the contrast poles and the elaborations differ.

Table 4: *Number (#) of constructs of student teacher A and B categorised in CSTPC categories.*

Category	Student teacher A		Student teacher B	
	#	Construct pairs	#	Construct pairs
1: Attitudinal	3	*works independently–lazy* *works fast–works slowly* *heeds well–doesn't heed*	5	*works silently–chats during lessons* *able to collaborate–works independently* *often puts up hand–seldom puts up hand* *prefers to ask classmate–prefers to ask teacher* *invents/undertakes–reticent attitude*
2: Emotional	0		0	
3: Relational	4	*often collaborates–never collaborates* *often asks the teacher for help – doesn't ask the teacher for help* *prepared to help a classmate–not prepared to assist a classmate* *many friends in the group–few friends in the group*	2	*many friends in the group–few friends in the group* *ready to help others–busy with own affairs*
4: Personal	1	*discusses much–silent, discusses*	2	*doesn't speak up–talks loudly and noisi-*

		little		*ly* *social animal–introverted*
5: Intellectual	2	*works accurately–works poorly* *able to read accurately–not able to read well*	2	*fast and clever at arithmetic–needs more instruction* *reads fast with intonation–reads slowly*
6: Interests	0		1	*likes playing soccer–not very sporty*
7: Physical	0		2	*wears casual clothes–fashion doll* *writes neatly–writes untidily*
Not classified	0		1	*healthy lunch 'fruit'–unhealthy lunch 'chocolate cookies'*
Total	10		15	

Table 5: *Construct pairs and elaborations of three teachers in CSTPC category 'Emotional'.*

	CSTPC category Emotional			
	Construct	***Elaboration***	**Contrast**	***Elaboration***
Student Teacher X	*Doesn't fear failure*	Risks making mistakes	*Fears failure*	Afraid to make mistakes. Therefore finds much trouble in many tasks
	Happy	Enjoys many things at school	*Quickly angered*	Does not like many things at school
	Contented	Can be made happy with small things. Does not easily feel short-changed	*Often feels short-changed*	Personally affected by everything classmates say and do. Envious
Student Teacher Y	*Self-confident*	Knows quite well what he/she wants. Not easily in doubt	*Uncertain*	Often in doubt over choices made
	Happy	Cheerful. Sunny disposition, character	*Sombre*	Views life from a negative rather than a positive perspective
	Accessible/ Open	Easy-going. Extraverted	*Timid*	Reserved disposition. Bottles up
Student Teacher Z	*Extraverted*	Child expresses everything outward	*Introverted*	Child reacts at himself
	Self-confident	Child feels sure and at ease in the classroom	*Fears failure*	Child thinks little of his/her abilities and has little self-confidence
	Happy	Pupil who always enters smiling and is always heard to be laughing	*Sad*	Pupil who is very much on his/her own and prefers doing things alone

CONCLUSION AND DISCUSSION

In this research, we established a reliable way to elicit and categorise student teachers' constructs about their pupils. This study shows that student teachers' constructs about their pupils can be investigated with a slightly adapted version of Kelly's repertory grid technique (1955/1991). The first adaptation was taking all pupils in one class as elements. In this way all participants were actively involved in providing the elements for the grid procedure. A second advantage of using the pupils as elements is that they are well known to the student teachers. Our participants were capable of following all the steps in the repertory grid technique. No participant complained about the complexity of the task.

The second adaptation is the extension of the original repertory grid technique by requesting the participants to give a personal written elaboration of each of their construct poles. This adaptation appeared to be crucial in interpreting the meaning of each construct. This was in line with the suggestion from Yorke to "ask the respondent for further clarification in the light of the analysis of his grid" (Yorke, 1978, p. 73). The elaborations showed a deeper understanding of each construct. We, therefore, suggest that educational researchers who use Kelly's grid incorporate this step into their research method. This enhances the procedure for understanding and interpreting the meaning of teachers' constructs about their pupils, increases reliability and might even be indispensable in an educational context.

To underpin the usefulness of clarification, we give an example. It is hard to understand the meaning of the construct pole *Quick-witted* (Dutch: *Bijdehand*) without a personal description by the student teacher. The additional information in the personal description shows the student teacher's idea of *Quick-witted*: 'Good at expressing themselves verbally, assertive'. This description, coupled with the contrast pole *Shy* (Dutch: *Verlegen*) and the description of *Shy* ('should be encouraged to express themselves') facilitated the categorisation of this construct.

In the original classification system by Feixas et al. (2002) and Neimeyer et al. (2001), each main category was divided into several subcategories, which proved unfit to distinguish between the domain-specific constructs of our student teachers. We concluded that student teachers' constructs and accompanying descriptions, when characterising their pupils, could, however, be reliably categorised in seven main categories. Together, these categories make up the CSTPC. The seven categories are: (1) Attitudinal, (2) Emotional, (3) Relational, (4) Personal, (5) Intellectual, (6) Interests and (7) Physical. The hierarchical structure in the system of Feixas et al. (2002) was maintained, and the coders used the descriptions of the construct and contrast poles given by the student teachers when identifying the best category for coding the constructs. This classification system enabled student teachers' constructs about their pupils to be categorised, apparently reliably, thus answering the first research question (Can student teachers' descriptions, when characterising their pupils, be categorised in a reliable way?) in the affirmative.

Regarding the second research question (What constructs do student teachers mention and how often do they mention these?), student teachers in our study most often used constructs referring to the meaningful, valuable and characteristic aspects the teachers notice when their pupils think and act (Attitudinal), constructs about pupils' social functioning and relationships with others (Relational) and constructs about pupils' individuality (Personal). Least frequently, student teachers used constructs about their pupils' artistic, expressive and physical abilities (Interests). Unexpectedly, student teachers infrequently mentioned constructs that referred to a pupil's intellectual functioning and school achievement. This category (Intellectual) refers to pupils' cognitive and intellectual functioning. Ten per cent of the student teachers' constructs were classified within this category. This seems interesting, considering the educational context. We had expected that more attention would be given to this category, especially in view of the great emphasis the school inspectorate places on learning outcomes and academic skills.

The age of the pupils does not seem to be strongly related to the use of the categories by the student teachers.

The average number of constructs from our student teachers (13.2) is slightly above Kelly's

findings (1963). He found that a repertoire of personal constructs was exhausted after 8 to 12 separate constructs. This difference might be related to the specific context of our study. Our sample consisted of student teachers whose profession it is to adapt to the characteristics of individual pupils. Therefore, we may assume that they have a more differentiated view of pupils than the average person has of people and have developed more constructs than the average person has to describe their perceptions of pupils. Other explanations might be connected to the fact that Kelly's and our participants lived in a different era and in different cultures. For example, the differences might arise from differences in individual development between student teachers and Kelly's patients.

In the pilot phase of this study, we first analysed the construct poles separately. As this resulted in the construct and the contrast pole being categorised differently in only three out of 113 cases, in the present study construct and contrast poles were kept together as a bipolar formation as Kelly (1955/1991) suggested in his PCT.

Implications for practice and research

After completing the procedure, the reactions of the student teachers showed that they had often been unaware of the constructs about their pupils that were elicited by the grid technique. Thus, this procedure offered them an opportunity to become aware of these constructs. This experience felt 'new' to them and might open a road to reflection and coaching. This could be meaningful during teacher training. The student teachers' supervisors could facilitate the articulation of the cognitive processes and this could be valuable for helping student teachers develop their awareness of useful and powerful constructs for understanding their pupils. The procedure might be helpful when individuals receive teaching or counselling, as provided in a teacher training college. Student teachers might benefit from becoming more articulate about their understanding of their own learning styles and personality make-up.

The results of this study might be used as the basis for developing self-awareness and cognitive awareness of student teachers with regard to the ways they understand their pupils. In this study, we therefore described the techniques used in order to enable teacher educators to apply them in their practice.

In this manuscript, we have described a coding system that will allow comparisons between various groups. The results of such comparisons, for example between beginning and experienced teachers, may help to guide and coach student teachers. Further useful comparisons might include teachers teaching in different types of education or subjects and teachers in different phases of their careers.

In Tables 3, 4 and 5 we showed some of the cognitive complexity of the individual construct systems. Future research and analysis of individual data is needed to provide more insight into the cognitive complexity of student teachers' construct systems.

Further research could also include the question of whether a set of norm scores could be derived from data collected from a representative sample. Such a norm would allow individual teachers to compare their constructs with those of the larger group, which might facilitate possible incorporation of some of them. Insight into this topic might help teacher educators better prepare teachers for the challenges of their chosen complex profession.

In this research all student teachers worked at inclusive schools with pupils with special needs. It would be interesting to investigate whether constructs of student teachers for pupils in a more 'standard' population would differ.

This study is limited to the perceptions of student teachers about their pupils. We did not study how the constructs related to the way teachers acted toward their pupils. How these constructs underlie their relationships and interactions with their pupils would be an interesting topic for further research. It is important to recognise that we only studied the constructs of Dutch student teachers. An interesting future question would be whether there is a cultural component, which implies questioning a sample of teachers from other countries. Our coding system might be a useful starting point.

We hope that the ideas on adapting and implementing the repertory grid technique for educational settings described in this article could also be used in different settings and with different populations. We do hope this can be a starting point for other PCT users and educational researchers to further explore the possibilities offered by the present study.

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