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Chapter 5

The influence of need-supportive teacher behavior on the motivation of students with congenital deafblindness

Abstract

Research has indicated that teachers play an important role in influencing students' learning outcomes by fostering their motivation. Yet, little is known about how teachers foster motivation in students with congenital deafblindness. We conducted an in-depth analysis of teacher-student interactions using a multiple case study design. Videos of teacher-student interactions were quantitatively and qualitatively analyzed by taking the perspective of Self-Determination Theory. We found that teachers express more support for the need for structure and involvement than for the need for autonomy support. Moreover, we observed that teachers' need support had both immediate and delayed effects on student engagement. We concluded by discussing implications for practice and future research.

5

Introduction

Research has shown that teachers' behavior plays an important role in fostering students' motivation. Motivation has been associated with positive learning outcomes, such as academic performance (Wigfield & Cambria, 2010). Since teachers can positively impact students' learning outcomes by fostering motivation, it is important to gain insights into how they can do so.

These insights may be especially important in a setting in which learning is not self-evident, such as when teaching students with congenital deafblindness. They often encounter difficulties in the learning process because of their sensory, and often additional, impairments. This paper describes multiple in-depth explorative case studies we undertook to explore the behavior that fosters motivation in students with congenital deafblindness.

We used Self-Determination Theory (SDT) to explore teachers' behavior (Deci & Ryan, 1985; 2000). SDT provides an encompassing framework, a part of which stresses the importance of basic psychological needs. SDT assumes that students will be motivated when teachers support the fulfilment of their basic psychological needs: competence, autonomy, and relatedness (Ryan & Deci, 2000). Indeed, SDT-based research has shown that students attain positive learning outcomes in classrooms that support these needs (e.g., Niemiec & Ryan, 2009; Reeve, 2009; Stroet, Opdenakker, & Minnaert, 2013).

NEED-SUPPORTIVE TEACHING

The need for competence refers to the experience of behavior as effectively enacted. Students need to feel that they are able to meet the challenges of their schoolwork (Niemiec & Ryan, 2009). Teachers can support this need by providing structure, which includes providing clear expectations, explicit directions, and guidance (Jang, Reeve, & Deci, 2010; Skinner & Belmont, 1993; Tucker et al., 2002).

The need for autonomy refers to the experience of behavior as volitional, unforced, and self-endorsed (Niemiec & Ryan, 2009). Teachers can support this need by considering students' perspectives and providing meaningful rationales for learning activities, presenting interesting and relevant learning activities, providing optimal challenges, highlighting meaningful learning goals, and supporting students' unforced endorsement of classroom behaviors (Assor, Kaplan, & Roth, 2002; Reeve, 2006; Reeve, Jang, Carrell, Jeon, & Barch, 2004).

The need for relatedness refers to the need to experience a sense of security, connectedness, or belonging (Baumeister & Leary, 1995; Ryan & Deci, 2000; Ryan, Stiller, & Lynch, 1994). Teachers can support this need by showing interest, understanding, or affection and being available and responsive (Skinner & Belmont, 1993).

STUDENT MOTIVATION

Academic engagement has been conceptualized as the outward manifestation of students' motivation (Skinner, Kindermann, & Furrer, 2009). It refers to students' active involvement during learning activities (Fredricks, Blumenfeld, & Paris, 2004; Skinner, Furrer, Marchand, & Kindermann, 2008) and is assumed to have both behavioral and emotional components (Appleton, Christenson, & Furlong, 2008). The behavioral component includes students' efforts, on-task attention, and persistence during learning activities. The emotional component includes students' emotional involvement during a learning activity such as enthusiasm, interest, and enjoyment. The opposite of engagement is disengagement. Its behavioral component includes passivity, a lack of initiations, giving up, and the absence of effort and persistence. Its emotional component includes dejection, discouragement, and apathy (Skinner et al., 2009).

STUDENTS WITH DEAFBLINDNESS

SDT-based research is rare in special educational settings. More in-depth research is needed to explore the motivational processes of students with congenital deafblindness. We know that they face many difficulties that might also impact their engagement in learning activities. For instance, the combination of hearing impairments and visual impairments, especially from birth or early in life, can severely limit a student's opportunities to learn and to communicate with others (National Consortium on Deaf-Blindness, 2007). Moreover, students with deafblindness often demonstrate decreased responsiveness, decreased joint attention, and decreased mutual enjoyment in interaction with caregivers, self-stimulatory behavior, and a restrictive repertoire of preverbal communicative behaviors and functions (Chen & Haney, 1995). These students may also only be aware of events that occur within their immediate physical proximity (Sall & Mar, 1999). Last, these students, especially those who communicate through touch, often face barriers to interacting with their environments, which can lead to high levels of stress and difficulties in remaining focused (Hersch, 2013).

5

To overcome these difficulties, students rely upon teachers who understand and support them. Unfortunately, research has shown that most teachers have difficulty with the high level of sensitivity, insights, or skills required to understand these children's experiences and emotions and really connect with them (Janssen, Riksen-Walraven, & Van Dijk, 2002).

STUDY AIM

This study aims to gain a better understanding of how teachers motivate students with congenital deafblindness to complete learning tasks. The research question is as follows: "How does teachers' need-supporting behavior influence the engagement of students with congenital deafblindness?" To answer this question, we conducted a detailed, in-depth analysis of teacher-student interaction using a multi-method design. By understanding the relationship between instructional practices and student engagement, we aim to contribute to the body of research that describes the conditions that foster engagement in students with special needs and that offers teachers insights into relevant teaching strategies.

Method

PARTICIPANTS

Four students with congenital deafblindness and four of their teachers participated in this study. All the students attended a school for students with deafblindness in the Netherlands. Although this study uses the term 'deafblindness', none of the students were totally deaf and totally blind. Table 1 lists participants' characteristics. This information was derived by analyzing student files and interviewing teachers. For privacy reasons, all names have been changed.

TABLE 1 Participants' Characteristics

		James[S] & Bruce[T]	Tanya[S] & Helen[T]	Peter[S] & Betty[T]	Diane[S] & Rachel[T]
Student	Gender	Male	Female	Male	Female
	Age	12	15	13	17
	Diagnosis	Zellweger Spectrum syndrome	CHARGE syndrome	Cornelia de Lange Syndrome	CHARGE syndrome
	Visual impairment	Mild (with glasses): nystagmus	Moderate: coloboma	Moderate: nystagmus	Mild: coloboma
	Hearing impairment	Severe. Moderate with hearing aid	Moderate	Moderate	Deaf. Moderate with hearing aid
	Developmental age	0-2 years	2-5 years	0-2 years	2-5 years
Teacher	Gender	Male	Female	Female	Female
	Age	49	53	49	45
	Years working at this school	23	29	17	12.5
	Years teaching this student	3	2	1	1.5

Note. S = student. T = teacher.

DATA COLLECTION

This study conforms with the guidelines described in the World Medical Association's Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects. The teachers and the parents of participating students signed consent forms. A trained cameraman made video recordings during the school day approximately two days per week over a two-month period. The cameraman was instructed to be minimally obtrusive.

DATA SELECTION

We applied the following criteria to select the videos. We selected one video per teacher-student pair for this study. We choose to analyze only one video so we could study one fragment in depth. We selected videos in which both the teacher and student were present the whole time and a learning task was undertaken. The task was a frequently performed task that both the teacher and student were familiar with. We choose a commonly occurring task because prototypical situations can be representative for the larger sample of video data, thereby enhancing the ecological validity. Next, we selected 25 interactions from a 20 minute fragment in which all the interactions started with the teacher. This was done in

order to make the four cases of teachers and students comparable.

QUANTITATIVE ANALYSIS

A researcher who was not informed about the purpose of the study transcribed the teachers' and students' behavior and communication. A second researcher watched the videos, read the transcripts, and coded them using the coding form developed for this study (Appendix D). Before doing so, the researcher received in-depth training to gain a thorough understanding of the coding form and insights into characteristics of the teacher, student, and educational setting. The researcher made an overall assessment of the extent to which the teacher's behavior did (1) or did not (0) provide structure, autonomy support, and involvement. Student behavior was coded on a 5-point scale, scale ranging from active disengagement to flow.

The coding form was based on analyses of many video recordings, student files, literature on SDT, literature concerning deafblindness and a previous developed coding form (Appendix C). The observational categories of teachers' behavior were based on a review of need-supportive teaching by Stroet et al. (2013). The observational categories of student behavior were based on Skinner et al. (2008), who defined engagement in behavioral and emotional dimensions; Csikszentmihalyi (1990) who conceptualized the term flow; and Martens, Janssen, Ruijssenaars, Huisman, and Riksen-Walraven (2014) who created observation categories for people with congenital deafblindness and intellectual disabilities.

INTER-RATER RELIABILITY

To assure the reliability of the first researcher's coding, a second researcher coded 25% of the material (see Barlow, Nock, & Hersen, 2009). In line with Prain, McVilly, and Ramcharan (2012), we calculated Cohen's Kappa statistics for the teacher (S, A, I) and student (E) codes. The value of the Kappa statistic was 0.92 for the dimension structure, 0.92 for autonomy support, 0.97 for involvement and 0.96 for engagement, which indicates a substantial to almost perfect agreement (Landis & Koch, 1977).

DATA INTERPRETATION

We presented the results in figures and looked for patterns within and between teacher-student pairs. In the figures the X-axis indicates the interactions between teacher and student over time. Each number on the X-axis represents an interaction between teacher and student. An interaction refers to an action by the teacher, followed by a response of the student. For example, the teacher asks a question (coded as need supporting or not) and the student answers the question (coded on a scale from disengaged to engaged).

The Y-axis presents the teacher's need support (1: present /0: absent) and student's engagement (1 = disengaged to 5 = engaged). The findings were interpreted, analyzed and discussed by two researchers.

Qualitative Analysis

For the qualitative analysis we used Braun and Clarke's (2006) checklist of criteria for thematic analysis. First, the data was transcribed. We then checked the transcriptions against the tapes for accuracy. Next, we identified themes within the data in a theoretical or deductive way: for the teacher, they were provision of structure, autonomy support, and involvement, and for the student it was engagement. Finally, we analyzed and interpreted the data. Last, data extracts were selected that demonstrate the essence of the themes.

Results

Bruce and James

Video recordings were made during physical education class. Together with a few other teacher-student pairs, James completed a parkour course full of obstacles (monkey bars, tunnels, benches), assisted by Bruce.
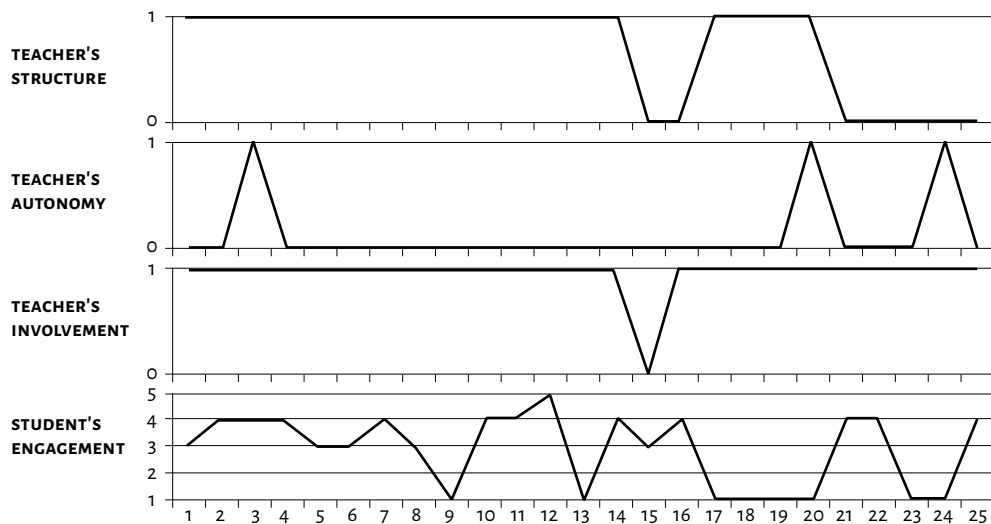
FIGURE 1   Interaction patterns of Bruce and James

TEACHER'S PROVISION OF STRUCTURE

Figure 1 presents the results for Bruce and James. Bruce provided continuous structure until interaction 15. He clearly and playfully explained what he expected from James, encouraged James, and gave feedback. James showed generally positive engagement levels until interaction 15. From interactions 15 to 25, Bruce's provision of structure declined, rose, and declined again. Those declines were followed by a decline in James' engagement (though somewhat later).

TEACHER'S AUTONOMY SUPPORT

Although James was able to follow the track almost independently, he had to follow it in a prescribed and fixed order without the possibility of providing any input. Therefore, his level of autonomy was low. During interactions 3, 20, and 24, Bruce provided autonomy support: he allowed James to walk freely around the room. During interactions 20 and 24, James' engagement accordingly rose from disengaged to engaged. During interaction 3, his engagement was already high, which might imply that Bruce was able to compensate for the absence of provision of structure by providing autonomy support.

TEACHER'S INVOLVEMENT

Bruce exhibited optimal involvement: he was patient, responsive, and attentive, and

followed James closely. The one time he did not pay attention to James, we observed a small decline in James' engagement.

STUDENT'S ENGAGEMENT

James was engaged most of the time. Sometimes he was nervous, frustrated, or exhibiting stereotypical behaviors. This was mostly caused by him having to wait for the student in front of him. The first few times he had to wait for another student (interactions 1-9) did not influence his engagement, but he became increasingly frustrated. However, as Table 2 shows, Bruce could likely influence James's frustration level.

TABLE 2	Transcript Extract of Bruce and James	
Interaction	**Transcript**	**Comments**
4	*James has to wait for another student in line. He looks around and stares at the lamp on the ceiling. Bruce also looks at it and makes the sign for lamp. Then the other student moves on and they can continue the track.*	By focusing on something other than waiting, James' engagement level remained positive.
21	*James has to wait. He starts hitting the bench. Bruce simultaneously starts hitting the bench nearby. James calms down.*	When James noticed Bruce repeating his behavior and joining him, his frustration diminished.
23	*James has to wait. He stomps on the floor. Bruce joins this behavior by stomping on the floor with James. James keeps showing frustration.*	This time, James did not calm down, probably because he could not feel the stomping. Joining James and repeating his behavior only works if James can notice it.
25	*James shows frustration. Bruce tickles James' back. James relaxes and smiles.*	Behavior such as tickling James seems to calm him down when he is frustrated and even appears to make him happy.

HELEN AND TANYA

Helen and Tanya worked together on a computer with a sign language dictionary program. One of them chose ten words; Helen then wrote each word on paper and entered them into the computer program. The words were then demonstrated in a video with a person who signed the words. Helen repeated the sign in the video and asked Tanya to repeat it.
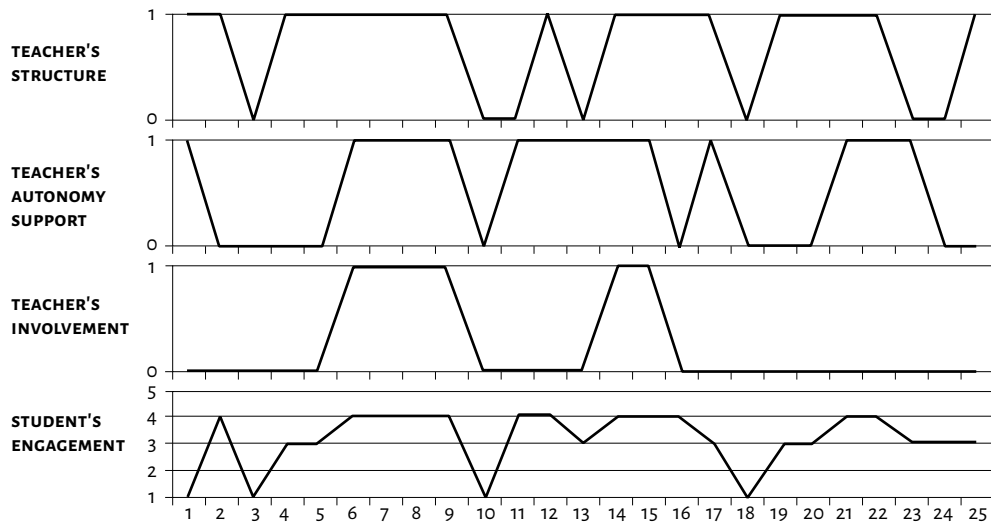
TEACHER'S PROVISION OF STRUCTURE

Figure 2 illustrates the results for Helen and Tanya. A decline in Helen's provision of structure was mostly caused by too-sudden transitions, such as introducing a new word before finishing discussion of the previous word (see Transcript 3). A decline in provision of structure always coincided with a decline in Tanya's engagement. However, the decline in Tanya's engagement was much smaller when Helen provided autonomy support at the same time. Autonomy support appeared to mitigate the lack of structure.

TEACHER'S AUTONOMY SUPPORT

In general, Tanya's engagement level was high when Helen provided autonomy support. Helen provided autonomy support by letting Tanya chose the words or by linking a word to Tanya's interests, as shown in Table 3. The three declines in Tanya's engagement were accompanied by a lack of autonomy support.

TEACHER'S INVOLVEMENT

When Helen showed involvement, Tanya's engagement level was high. The two declines in involvement (interactions 9 and 15) were followed by a decline in engagement. This could occur when Helen did not show affection or express attunement. For instance, Tanya laid her head on Helen's shoulder, but Helen did not react but instead kept focused on the lesson. This decline was larger when accompanied by a lack of structure (interaction 9).

STUDENT'S ENGAGEMENT

Tanya was engaged most of the time, though sometimes she was distracted and paid attention to something else (e.g., pictures on the wall). This seemed to occur when Helen chose the word. Tanya was most engaged when she could chose the words and when the lesson content was adapted to her interests and she could provide input.

TABLE 3 Transcript Extract of Helen and Tanya

Interaction	Transcript	Comments
1	*Helen chose the sign.* *Tanya twiddled with her ear.*	Helen chose the word to practice. Tanya was distracted.
2	*Helen wrote "market" and pointed to it.* *Tanya said something unintelligible.*	Helen wrote the word and Tanya had no active role. Tanya said something, but too softly and without using signs. Helen did not seem to notice.
3	*Helen did not react to what Tanya said. Helen typed "market" on the computer.* *Tanya looked at a photo on the wall and ticked a few times on the photo.*	Helen was busy typing and did not react to Tanya, who appeared to be more interested in the photo than in looking at what Helen is typing.
4	*Helen watched the computer screen, where a video showed a person making the sign for market. Helen repeated the sign. Tanya looked at the screen and repeated the sign.*	Tanya engaged in the learning activity without enthusiasm.
5	*Helen repeated the sign and pointed at the screen. Tanya looked closer at the screen.*	It is unclear why Helen pointed at the screen, but Tanya did what she requested.
6	Helen: Did you buy fruit with your father on the market last Saturday? *Tanya shook her head.*	Helen connected to Tanya's world. By showing involvement, Helen positively influenced Tanya's level of engagement. Tanya's interest seemed to be triggered.
7	Helen: Buying fruit. Tanya: Yesterday.	Tanya was actively involved in the lesson.
8	Helen: Yesterday, very good! *Tanya smiled.*	Helen complimented Tanya and adjusted the lesson content to her experiences. Tanya became enthusiastic and smiled.

9	Helen: Yesterday. Now pay attention.	Tanya paid attention to Helen.
	Helen wrote 'yesterday' on paper while Tanya watched her. Tanya grabbed the computer mouse and clicked on different things on the screen.	
10	*Helen grabbed the mouse and typed "post".*	The conversation about the market ended suddenly and Helen introduced a new word before Tanya seemed to be done talking about the previous one. This caused a decrease in Tanya's engagement level. She was getting excited talking about the market, but her engagement declined when the subject suddenly changed.
	Tanya did not look at the computer screen but at the wall on her right.	

BETTY AND PETER

Peter had to bring plastic rings from one bucket to another. The buckets were placed a few meters apart against the wall in the hallway and Peter had to walk back and forth alongside the wall. Most of the time, Betty was standing behind him.
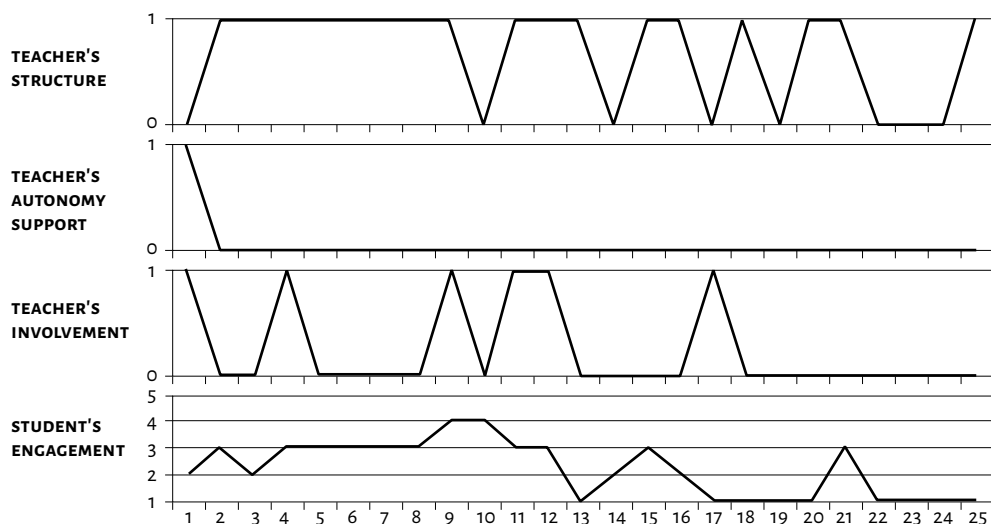
TEACHER'S PROVISION OF STRUCTURE

Figure 3 presents the results for Betty and Peter. In general, Betty provided structure and Peter was engaged until interaction 9. Thereafter, they both showed more fluctuations. Betty provided directions and expressed feedback and encouragements (e.g., "come on, you can do it, three to go"). However, Peter did not seem to receive her communications. Peter was facing the wall with Betty standing behind him, talking to his back instead of to

his face. Due to his sensory impairments, this positioning is not ideal.

TEACHER'S AUTONOMY SUPPORT

Betty provided autonomy support once. In this activity there was little room for Peter to take initiatives; he only got some time to look around at the beginning. Betty insisted that Peter finish the activity, even when he complained, struggled, or sat down.

TEACHER'S INVOLVEMENT

At the beginning of the activity, Betty was involved only now and then; at the end, she was uninvolved (e.g., she was too far away to be easily available). Peter sometimes responded to Betty's lack of involvement with a decline in engagement. The lack of structure seemed to strengthen this effect. Moreover, when Peter exhibited good on-task behavior, Helen showed affection (e.g., laughed or gave compliments). When Peter's behavior was not effectively enacted, Helen tended to be more directive.

STUDENT'S ENGAGEMENT

At the beginning, Peter did what was asked of him. At interactions 9 and 10, after Betty told him the activity was almost finished, he sped up to finish it. When she introduced a new activity, Peter became less engaged and more frustrated, and exhibited more stereotypical behavior, as described in Table 4.

TABLE 4 Transcript Extract of Betty and Peter

Interaction	Transcript	Interpretation
6	*Peter places the ring in the bucket.*	
7	Betty: Yes! Well done, next.	Betty provides positive feedback and encouragement.
	She walks towards the ring bucket.	
8	*Peter stands near the wall, looking at someone who enters the door. After the person passes, he continues his path towards the bucket of rings.*	Peter is distracted. Although he appears to have difficulties keeping motivated, he still continues.
9	Betty: Well done, Peter. The rings are almost finished.	Betty again provides feedback and encouragement.
10	*Peter walks faster.*	Peter seems to walk faster when he hears he has almost finished the activity.
11	*Betty takes a box with balls.*	

12	*Peter gets distracted, walks towards Betty, makes a circle, and continues on his way to the bucket.*	Peter has difficulties walking in a straight line.
13	*Betty laughs.* Well done, Peter. Look, now we will continue with the balls. *Throws a box full of balls in the bucket.*	When Peter finally finishes the activity, Betty introduces a new one.
14	*Peter looks disappointed. He takes a ball, walks towards the box, and puts it in.*	It appears that Peter did not expected the second activity. He seems disappointed but still participates.
15	Betty: Well done, very good!	
16	*Peter again goes towards the balls and takes one, walks back, and throws it in the box.*	
17	Betty: Yes! Well done.	
18	*Peter walks the wrong way, and sits down.*	Peter is increasingly showing stereotypical behavior.
19	Betty: No, Peter! *Picks him up and puts him back on his feet.* This is not necessary. We are working on a task.	Betty is directive.

RACHEL AND DIANE

Diane is learning to identify and spell the names of colors. Rachel uses different tools, such as a card with the colors and their names.
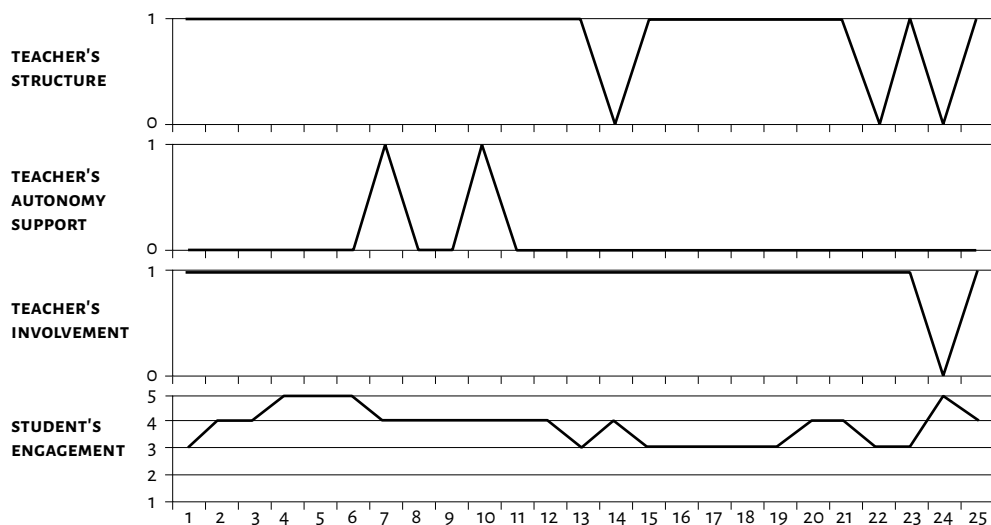

FIGURE 4 Interaction patterns of Rachel and Diane

TEACHER'S PROVISION OF STRUCTURE

Figure 4 shows the results for Rachel and Diane. As Table 5 shows, Rachel provided a lot of structure: she was very active, talked a lot, moved a lot, and used a lot of different materials. The few interactions that lacked structure (14, 22, and 24) occurred because what she was explaining seemed to be somewhat vague and unclear. Despite those interactions, Diane's engagement level remained high.

TEACHER'S AUTONOMY SUPPORT

Rachel asked a question and Diane answered, leaving little room for independent initiatives. Rachel did most of the work and was most active. Nevertheless, Diane stayed engaged in the task.

TEACHER'S INVOLVEMENT

Rachel's involvement was almost continuously high. She paid attention to Diane, created a friendly atmosphere, and made Diane laugh.

STUDENT'S ENGAGEMENT

Diane clearly stayed engaged, although she is generally not very expressive. She closely observed Rachel, answered questions, and laughed at jokes.

TABLE 5 Transcript Extract of Rachel and Diane

Interaction	Transcript	Interpretation
15	*Rachel points at a red chair in the room.*	Using learning material (color card) and the environment (chair) seems to make the activity interesting for Diane.
	Diane points at the color orange on the color card and makes the sign for orange.	
16	Rachel: Orange?	Instead of stating that Diane has given the wrong answer, Rachel helps her give the correct answer.
	Rachel grabs the color card and places the orange color next to the red chair to compare the two.	
	Diane shakes her head.	
17	*Rachel places the red color card next to the chair. Asks if it is better this way.*	Again, without given the answer, Rachel helps Diane provide the right answer.
	Diane nods.	
18	*Rachel points at the color red on the color card and asks which color it is.*	
	Diane signs red.	

19	Rachel: So that is red! Oh, you should use the other finger.	Rachel stays calm and patient. She keeps correcting and guiding Diane in a friendly manner.
	Rachel makes the sign with the right finger.	
	Diane repeats the sign using the correct finger.	

OVERALL PATTERNS

All the teachers provided structure by using day planners to outline the activities they were going to perform. Each new activity was announced by a reference object and the teachers used scripts to make the activities understandable and predictable. Other examples of structure provision are communication clear, detailed, and consistent guidelines, providing step-by-step directions and constructive feedback. A lack of structure was mostly due to unclear directions, not communicating expectations, or too-sudden transitions.

The teachers provided autonomy support in situations where students could make their own decisions and when learning activities were meaningful for the student. In all four cases, autonomy support was rather incidental instead of being incorporated in the learning activity. Sometimes teachers incorporated students' preferences or tried to make the activity interesting. A lack of autonomy support was observed in the fact that students were not able to make their own choices. Activities were not always altered to students' interests.

Furthermore, we observed much involvement on the part of teachers. In general, they talked in a friendly tone, demonstrated affection and interest, showed warmth, and were responsive and available. A lack of involvement was observed when teachers did not respond to students' initiatives.

Comparison of dimensions of need-supportive behaviors and their effect on students' motivation provided a number of insights. First, not all needs were supported to the same extent. Teachers express more support for the need for structure and involvement than for the need for autonomy support. Second, need support can be relatively stable or fluctuate over time. Third, there seems to be a hierarchy in need support. For instance, a lack of structure seem to have the most negative effect on student engagement. Fourth, there seem to be connections between needs. The presence or absence of support of one need may be strengthened or compensated for by the presence or absence of another. For example, a lack of structure seems to have a less negative impact on student engagement when autonomy support and involvement are provided.

Moreover, a decrease in involvement seems to strengthen the effect of a decrease in structure. Furthermore, high levels of structure and involvement might compensate for low levels of autonomy support. Fifth, the presence and absence of need support appear to have immediate or delayed effects on student engagement. For instance, in some cases autonomy support directly changed students' engagement from disengaged to engaged. On the other hand, the absence of structure did provide a decline in students' engagement at a later time.

Discussion

The purpose of this study was to explore how teachers' need-supporting behavior influences the engagement of students with congenital deafblindness. The results indicate that, in general, teachers provided more structure and involvement than autonomy support. Previous research conducted in regular education settings (Reeve et al., 2004) also found a lack of autonomy support, which indicates that teachers often use more controlling than autonomy-supportive strategies. Reeve (2009) provided reasons for why teachers adopt this controlling style, even when it is associated with negative student functioning. For instance, some teachers believe that controlling motivating strategies are more effective than autonomy-supportive ones.

Another interesting finding was that the presence or absence of need support can have an immediate or delayed effect on student engagement. A possible explanation is that students need some time to process what is happening. Rødbroe and Janssen (2006) described how people with deafblindness need many breaks during their interactions with others to be able to receive, perceive, and reflect on the information they get.

This study also found a possible hierarchy in the influence of the different dimensions of need support on student engagement. Structure seems to be most influential to students' engagement, followed by involvement and autonomy support. According to Deci and Ryan (2000), autonomy and competence are the most powerful influences on intrinsic motivation, since people often engage in intrinsically motivated behavior in isolation. Relatedness is therefore assumed to play a more distal role in the maintenance of intrinsic motivation. However, relatedness is assumed to play a more important role when educating students with deafblindness. In a world that can be chaotic,

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unpredictable, and difficult to understand, relationships provide a secure base from which they can explore the world. According to Janssen et al. (2002), harmonious interactions are the foundation for learning, communication, well-being, and quality of life in students with deafblindness. Therefore, we think that providing support for students' need for relatedness by showing involvement is crucial in this setting.

Another important finding involves possible connections between dimensions of need support. Previous studies (e.g., Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Trouilloud, Sarrazin, Bressoux, & Bois, 2006) have paid attention to possible connections between needs. However, more research is needed to unravel these linkages and look for possible differences between students with and without impairments.

IMPLICATIONS FOR PRACTICE

The results appear to have some valuable practical implications for teachers. First, teachers of students with congenital deafblindness need to adopt a different instructional approach than teachers of students without sensory impairments. Students with deafblindness need more intensive support. They have difficulty learning about objects or actions incidentally. They might not be able to tie together the fragmented input they receive without a teacher's interpretation and instruction.

This study has additional implications for teachers. For instance, provision of structure seems to have the largest impact on student engagement. Teachers can positively influence engagement by communicating clear guidelines and expectations, providing support and directions when needed, being available to answer questions, and giving feedback. This study also highlights the importance of teachers' involvement. There are clues that by providing involvement, teachers can prevent or change a student's decline in engagement.

In our observations, autonomy support seemed to be the least present of the three needs. There are a number of reasons why teachers of students with deafblindness might not provide autonomy support: difficulties in communication, being rushed, tight schedules, or overprotectiveness (Aitken, 2000). In line with previous research (Reeve et al., 2004), we found that autonomy support has positive effects. When teachers offer students opportunities to explore and broaden their world and capabilities, even in small ways, the students become more engaged. Therefore, teachers need to explore their students' interests and how different learning materials, lesson content, or approaches will

influence their engagement. Moreover, we found that teachers set realistic goals, but they were sometimes too easy. Students might need more challenges.

STUDY LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

In coding each interaction, we noted whether the three dimensions of teachers' need-supportive behavior were present or absent. However, each dimension of need support includes different components, which future research could code separately to gain additional information about their specific influences. In addition, the results indicate that needs are interconnected. Future research could further crystallize the role, impact, and possible interplay of each of them.

Finally, it would be interesting to compare need-supportive teaching in different educational settings. All the students in this study attended a special school for children with deafblindness. Their teachers were highly trained and had years of experience teaching students with congenital deafblindness. However, teachers in mainstream schools or schools for only deaf or blind students might not have the knowledge and experience to teach these students. Therefore, it might be valuable to study teacher-student interactions in those contexts.

By conducting this in-depth explorative study, we gained insights into how teachers' behavior can contribute to students' motivation and engagement. Our findings indicate that students with congenital deafblindness need teachers who are able to create a need-supportive environment that will foster their engagement in a learning activity.

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