Motivation to learn
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Abstract

Since little is known about teacher-student relationships that involve students with acquired deafblindness, we performed a multiple case study with a multiple method design to investigate the relationship between need-supportive teaching behavior and student engagement. We analyzed video observations of interactions using Self-Determination Theory. We found that teachers’ provision of structure, autonomy support, and involvement often coincide in combination with positive student engagement levels. Moreover, varying degrees of need support over time seems to result in varying levels of student engagement. We provided examples of need-supportive teaching behaviors that can be used to foster the motivation of students with acquired deafblindness.

KEYWORDS

acquired deafblindness; motivation; engagement; Self-Determination Theory; teacher-student interactions
Introduction

Research has shown that the quality of the teacher-student relationship influences students’ school outcomes (Brophy, 1988; Niemiec & Ryan, 2009; Opdenakker & Minnaert, 2014). Supportive teacher-student relationships have been found to increase students’ motivation (Wentzel, 2002), which leads to positive educational outcomes (Eccles, Wigfield, & Schiefele, 1998). Despite growing awareness of the importance of teacher-student relationships, less is known about these relationships among students with acquired deafblindness. Since there are indications that teacher-student relationships are particularly important for students who are academically at risk (Roorda, Koomen, Spilt, & Oort, 2011), we assume that they are tremendously important for students with acquired deafblindness.

Students with acquired deafblindness are not born with both visual and hearing impairments but acquire one or both during their life (Dalby et al., 2009). Causes of acquired deafblindness can include head injuries, tumors, or genetic disorders such as Usher syndrome (Dammeyer, 2014). Visual and auditory impairments, and especially the combination of both, can cause problems with incidental learning, loss of energy, headaches, concentration problems, or a lack of spirit (de Kok, 2009; Ellis & Hodges, 2013). All these problems influence a student’s ability to engage in learning.

Moreover, receiving a diagnosis that one will become visually or hearing impaired, or acquiring these impairments suddenly, has an enormous impact on a person’s life and education. For instance, it is difficult for a student with a progressive impairment to choose what to study, since it is impossible to predict what he or she may be capable of in the future (de Kok, 2009). This may mean that a student has to change schools or alter or say goodbye to a dream for the future, for instance with regard to his or her profession (Ellis & Hodges, 2013). This could clearly have a great impact on a student’s motivation for learning. There is a need for research that explores how teachers of students with acquired deafblindness can create teacher-student relationships that foster these students’ needs. This research can provide input for teacher training programs designed to prepare teachers of students with deafblindness.

Students with acquired deafblindness are often educated in schools for deaf students. Teacher preparation programs for teaching deaf and hard of hearing students often do not train teachers to work with students with deafblindness (Bruce, DiNatale, & Ford, 2008). Teachers need to realize that methods for teaching deaf or hard of hearing students are not totally adequate for students with dual sensory loss (Prickett & Prickett, 1992). Although students with acquired deafblindness form a small segment of the student population, they deserve and require extensive assistance in order to achieve their full potential (Hicks & Hicks, 1981).

NEED-SUPPORTIVE TEACHER-STUDENT INTERACTIONS

Teacher-student interactions are embedded in teacher-student relationships (Gallucci, 2014). The literature on students without impairments tells us that teacher-student interactions in which students’ needs are supported have a positive impact on students’ motivation (for a review, see Stroet, Opdenakker, & Minnaert, 2013). Self-Determination Theory (SDT) states that all students have the same three basic psychological needs: competence, autonomy, and relatedness (Deci & Ryan, 2000). Teachers can support those needs by providing structure, autonomy support, and involvement in the interactions they have with their students.

COMPETENCE

Competence refers to the experience of efficacy while completing a learning task (Deci & Ryan, 2000; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). Competence-supportive teaching involves providing structure, which refers to the amount and clarity of information that teachers provide about their expectations and how students can effectively achieve desired educational outcomes (Skinner & Belmont, 1993). Competence-suppressing teacher behavior includes chaos, in which teachers provide confusing or contradictory information, do not communicate clear expectations and directions, and do not explain how to attain an outcome.

AUTONOMY

Autonomy refers to the experience of choice and psychological freedom with regard to study activities (Deci & Ryan, 2000; Sierens et al., 2009). Autonomy-supportive teaching involves behaviors that promote students’ tendencies to engage in learning because they value an activity or find it interesting (Roth, Assor, Kanat-Maymon, & Kaplan, 2007). Autonomy-supportive teachers acknowledge students’ frames of reference, identify and nurture their needs, interests, and preferences, provide optimal challenges, highlight meaningful learning goals, and present interesting, relevant, and enriching activities
In contrast, autonomy-suppressing teacher behavior includes using controlling language, external controls, or incentives and threats (Reeve, 2006). This behavior pressures students towards specific outcomes and thereby interferes with their self-determination and denies them the experience of choice (Deci & Ryan, 1980).

**RELATEDNESS**

The need for relatedness refers to feeling connected to others (Baumeister & Leary, 1995; Deci & Ryan, 2000). It also involves developing secure and satisfying connections with others (Deci, Vallerand, Pelletier, & Ryan, 1991). Teachers’ involvement supports students’ need for relatedness. Involved teachers give timely and appropriate responses to the student’s initiations, signals, and needs (La Guardia, Ryan, Couchman, & Deci, 2000). They also convey warmth, care, and respect (Niemiec & Ryan, 2009). Moreover, they express their attunement and understanding, show affection, dedicate resources, make themselves available, and dependably offer support (Belmont, Skinner, Wellborn, & Connell, 1992).

**STUDENT ENGAGEMENT**

Research on students without impairments indicates that supportive teacher-student interactions are connected with students’ learning, academic motivation, and engagement (Stroet et al., 2013). Engagement can be seen as the outward manifestation of motivation and captures the quality of students’ participation with learning activities in the classroom (Opdenakker & Minnaert, 2011; Skinner, Kindermann, & Furrer, 2009).

Engagement includes behavioral and emotional participation in the classroom. The opposite of engagement is disengagement or disaffection (Connell & Wellborn, 1991). Engaged behaviors include exerting effort, persisting, paying attention, focusing, being pro-active, or being on-task and highly engaged in a learning task. Disengaged behaviors include apathy, withdrawal, alienation, lack of initiation, giving up, or being reactive and passive. Emotional states range from enthusiasm, interest, and enjoyment to dejection, discouragement, apathy, and learned helplessness (Skinner et al., 2009).

**THE PRESENT STUDY**

There are few studies about educating students with acquired deafblindness. As Fletcher and Guthrie (2013) noted, most research on people with deafblindness has focused on congenital deafblindness. The studies that have addressed acquired deafblindness are mostly quantitative and focused on collecting data about the characteristics of people with deafblindness. In general, knowledge about students with acquired deafblindness is fragmentary and often anecdotal (Möller & Danermark, 2007). Moreover, there is a lack of qualitative studies that provide an in-depth understanding of individual experiences (Fletcher & Guthrie, 2013).

This study aims to bridge the research gap by analyzing interactions between teachers and students with acquired deafblindness. In contrast to previous studies on people with acquired deafblindness, we will combine quantitative and qualitative research methods. By using a multiple case study and multiple method design, we aim to gain detailed insights into the relationship between need-supportive teaching behavior and the engagement of students with acquired deafblindness. The two research questions that will be addressed are: 1) Do teachers of students with acquired deafblindness support students’ needs? 2) How does need-supportive teacher-student interaction influence students’ motivation?

**Method**

**PARTICIPANTS**

We recruited students by contacting all the schools in the Netherlands that focus on teaching deaf or hard of hearing students, blind or visually impaired students, or students with deafblindness. We also contacted Usher Network groups, hospitals with cochlear implant centers, and organizations that provide diagnostic, care, and educational services for deaf, blind or deafblind people. Criteria for inclusion were students in secondary education classes who have a combination of hearing and visual impairments.

Three students with acquired deafblindness and three of their teachers participated in this study. In line 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 the participating students signed informed consent forms before the study began. None of the students were completely deafblind and none of them had intellectual disabilities. Table 1 presents background information about the participants. This information was derived from file analysis and interviews with the
For privacy reasons, all names have been changed.

### TABLE 1: PARTICIPANT CHARACTERISTICS

<table>
<thead>
<tr>
<th>Student</th>
<th>Gender</th>
<th>Age</th>
<th>Diagnosis</th>
<th>Visual impairment</th>
<th>Hearing impairment</th>
<th>Mode of communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selina &amp; Susan</td>
<td>Female</td>
<td>15</td>
<td>Duane's syndrome</td>
<td>Abnormal eye movements</td>
<td>Profound</td>
<td>Dutch Sign Language</td>
</tr>
<tr>
<td>Marie &amp; Katherine</td>
<td>Female</td>
<td>14</td>
<td>Usher syndrome, type 1C</td>
<td>Difficulties rotating one or both eyes outward</td>
<td>Mild (with glasses)</td>
<td>Dutch Sign Language</td>
</tr>
<tr>
<td>Violet &amp; Clark</td>
<td>Female</td>
<td>15</td>
<td>Refsum disease</td>
<td>Mild (with glasses)</td>
<td>Moderate</td>
<td>Spoken language</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Gender</th>
<th>Age</th>
<th>Years of experience in education</th>
<th>Years teaching this student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selina &amp; Susan</td>
<td>Female</td>
<td>60</td>
<td>30 years at this school</td>
<td>1 year</td>
</tr>
<tr>
<td>Marie &amp; Katherine</td>
<td>Female</td>
<td>31</td>
<td>4.5 years at this school</td>
<td>2 years</td>
</tr>
<tr>
<td>Violet &amp; Clark</td>
<td>Male</td>
<td>62</td>
<td>4 years as a teacher in regular primary education; 27 years as a school principal in regular primary education; 12 years as a teacher in regular secondary education</td>
<td>1 year</td>
</tr>
</tbody>
</table>

Note. S = student; T = teacher.

Settings

Special Secondary School

Marie and Selina attend a special secondary school in the Netherlands for students with hearing impairments or severe speech disorders. They are the only students in either of their classes with vision loss. Both of them are able to read the teacher’s and other students’ sign language.

Marie and her teacher were recorded during cooking class (home economics), which had a student-teacher ratio of 5:1. Cooking classes took place in a kitchen that contains four countertops, each of which has a sink and a gas cooktop. Marie and another girl worked together, two boys worked together, and another boy worked alone. In each class, students prepared a meal which they ate afterwards.

Selina and her teacher were recorded during biology class, which had a student-teacher ratio of 6:1. The tables were arranged in a U-shape around the teacher’s desk. Selina and Selina sat opposite the teacher, facing her. Each class started with a discussion of homework assignments, followed by the teacher introducing a new topic. Students then worked individually on a learning task, which they discussed at the end of the class.

Regular Secondary School

Violet attends a regular secondary school in the Netherlands. She and her teacher were recorded during Dutch language class, which has a student-teacher ratio of 25:1. In this classroom, seats were arranged two by two into three rows. Violet sat at the first desk in the middle row in front of the classroom. A typist interpreter sat at the desk next to hers and transcribed the classroom communication. During class, Violet could read along on the interpreter’s laptop. The teacher wore an FM system and used both a blackboard and a large screen with an overhead projector that was connected to his computer. The lessons were structured the same way as Selina’s biology classes were. When the homework assignments were discussed, the answers were projected on the large screen.

Data Collection Procedure

A trained cameraman recorded the lessons one or two days a week over a two-month period. The home economics class was taught once a week, for 90 minutes per class. The biology class was taught once a week, for 45 minutes per class. The Dutch language class was taught twice a week, for 45 minutes per class.

Data Selection Procedure

From all the collected video material, we selected one activity from each teacher-student pair for analysis. Following Preisler, Tvingstedt, and Ahlström (2002), we selected video fragments that illustrated characteristic features of the interaction at the time of the video recordings and transcribed and analyzed them in detail. By analyzing a video fragment in which a common situation takes place, we can gain insights into what happens on a regular school day and thereby enhance the study’s ecological validity. Other selection criteria were that the teacher and student both be present and that they be carrying out learning activities with which they were both familiar.

We tried to select activities with comparable numbers of interactions. This was possible for Susan and Selina and Clark and Violet: we selected fragments with 35 interactions for each of them. However, it was impossible to find a fragment with 35 successive
interactions for Katherine and Marie. This can be explained by the difference in lesson content: while Selina and Violet were recorded in a traditional classroom setting with the teacher standing in front of the class, Marie was recorded during cooking class. Fewer interactions took place between the teacher and student because students worked independently most of the time. Therefore, we selected a fragment with 9 interactions for this pair.

**CODING PROCEDURE**
The selected video fragments were analyzed in several steps. First, a trained researcher transcribed all interactions between the teachers and students. The transcriber was unaware of the study’s purpose. Second, two different trained researchers coded the transcriptions. Both researchers were very familiar with coding videos of teacher-student interactions, had knowledge about the characteristics of the teachers and students, and were well-informed about the observation categories. One researcher coded all the videos; the second coded 25% of them. Cohen's Kappa statistic was 0.74 for the dimension structure provision, 0.93 for autonomy support, 0.78 for involvement and 0.66 for engagement. All values were all above the recommended cut-off value of 0.60 for Kappa-like statistics.

**OBSERVATION CATEGORIES**
The observation categories (Appendix E) were operationalized according to descriptions of need-supportive teaching behavior and student engagement found in the literature. For more information on the development of the coding form, see chapter 5.

**TEACHERS' BEHAVIOR**
Teachers’ provision of structure, autonomy support, and involvement were coded as present or absent. Since all the video recordings were made in classrooms with other students, the teacher often provided instructions for everyone together, instead of individual instructions. These classroom instructions were also coded since they could also include need support and affect the student’s motivation.

**STUDENTS’ ENGAGEMENT**
Students’ engagement was coded on a 5-point scale ranging from disengagement to engagement. We only coded the engagement of the three students with deafblindness and not that of their classmates.

**ANALYSIS**
The unit of analysis was the interaction between the teacher and the student. Each number on the X-axis represents an interaction between teacher and student. An interaction refers to an action and a response. An interaction refers to an action by the teacher, followed by the response of the student, or vice versa. For example, the teacher asks a question (which is coded as need supporting or not) and the student answers the question (which is coded on a scale for disengaged to engaged).

Each interaction in a fragment was assigned teacher codes for structure (plus or minus), autonomy support (plus or minus), and involvement (plus or minus) and a code for student engagement (1 to 5). These codes are presented in figures in which the X-axis represent interactions over time. The Y-axis presents the teacher’s need support (1: present /0: absent) and student’s engagement (1 = disengaged to 5 = engaged).

In addition, we thematically analyzed the videos using the phases of thematic analysis described by Braun and Clark (2006). First, we transcribed the data. Second, we identified themes within the data using a deductive method: provision of structure, autonomy support, and involvement for teachers and engagement for students. We then analyzed and interpreted the data. Illustrative data extracts are provided.

**Results**

**SUSAN (TEACHER) AND SELINA (STUDENT)**
Figure 1 presents the results related to Susan and Selina. Overall, the lesson content can be divided into two parts: part 1 includes starting up the lesson (interactions 1 to 10), and part 2 includes the main lesson in which a new topic was explained (interactions 10 to 35).
In Transcript 2 a summary of interaction 10 through 15 is presented. In the second part of the lesson, the teacher introduced a new topic and asked related questions. Susan’s instructional style is generally supportive of all three needs.

TRANSCRIPT 2

The teacher asks another student if he knows the title of today’s theme. The student gives the wrong answer. She repeats the question. Selina answers: “people and the environment.” The teacher says to the whole group: “look at her, she said people and the environment.” She writes it on the blackboard. “What do these two have in common?” Several students give incorrect answers. One student says that they have to pay attention to it. The teacher responds: “Yes, people need to pay attention. They need to take into account the environment because they are…?” Another student finishes her answer: “dependent.” The teacher says: “Yes, dependent on their environment.”

TEACHER BEHAVIOR

STRUCTURE

Susan provided structure in the sense that she provided clear instructions, clearly explained her expectations, gave informative feedback, and organized the classroom in an orderly manner. Since Selina has lost her vision on the outer left and right sides of her visual field, she is unable to see students signing on her left or right. Susan helped Selina by pointing to the student who was talking and repeating what was said.

AUTONOMY SUPPORT

Susan provided interesting and challenging learning activities. The lesson content seemed to be adjusted correctly: it did not seem to be too easy since the students’ answers were not always correct, but it did not seem to be too hard since students also provided correct answers. They all paid attention and actively participated in the classroom.

Susan communicated in an open manner; she encouraged students’ own initiations and communicated in a non-directive manner. A lot of interaction took place between the teacher and the students and between students.

Selina often raised her hand to answer a question or share some thoughts about the lesson subject. Susan did not always respond to Selina’s raised hand. In other words, Selina was not always given the opportunity to say what she wanted to say. This would seem to suppress autonomy, but Susan explained that she does this because she wants to equally distribute students’ input. Selina has to learn to wait her turn. Otherwise, only Selina

In Transcript 1 a summary of interaction 1 through 5 is presented. In the first part of the lesson, students entered the classroom, took their seats, and handed in their homework. Susan checked whether all the students completed their homework. She mainly provided structure. Susan took Selina’s visual needs into account by asking whether Selina wanted the curtains closed for better sight (interaction 2). At interaction 3, Selina’s engagement level was low: the other students were talking, but Selina did not participate in the conversation. When the teacher asked Selina whether she did her homework, she was eager and enthusiastic to explain what she did (engagement level 4).

TRANSCRIPT 1

The students enter the classroom and take their seats. The teacher asks whether they finished their homework assignment (a book report). The teacher says: “You have to finish it by Friday. Friday is the deadline. Otherwise, you’ll need to stay Friday afternoon.” Selina hasn’t finished the book report. The teacher says: “Friday is the deadline. If it is done tomorrow, then hand it in tomorrow.” The teacher asks the cameraman and Selina whether the curtains need to be closed. Selina answers: “Closed.” She helps the teacher close the curtains. Meanwhile, the other students are talking with each other. Selina takes her seat. The teacher tells everyone to open their books. The teacher asks Selina whether she has done her homework. Selina replies enthusiastically that she did and that she did even more than was asked.

FIGURE 5 Interaction patterns of Susan and Selina
would get the opportunity to provide input.

INVolVEMENT
At the beginning of the lesson, Susan’s involvement was mostly absent. She was focused on collecting the homework and did not want to hear any excuses for not completing it. When they moved on to discussing the lesson’s topic, Susan almost continuously showed involvement. She divided her attention between all the students and was responsive and available. Moreover, she was friendly and kind and made jokes; she showed interest and understanding.

STUDENT ENGAGEMENT
Selina was eager to learn. She was always the first to raise her hand to answer the teacher’s questions. The only time she was disengaged was during a classroom discussion in which she did not participate. She might have been unable to follow the discussion because of her sensory loss. However, Selina was engaged most of the time: she did what Susan asked and took initiative to share ideas.

THE RELATIONSHIP BETWEEN THE TEACHER’S BEHAVIOR AND STUDENT’S ENGAGEMENT
The fluctuating patterns in the amount of need support provided by the Susan are dissimilar to the patterns in the levels of Selina’s engagement. In general, Susan supported all three needs most of the time and Selina was engaged most of the time.

CLARK (TEACHER) AND VIOLET (STUDENT)
Figure 2 presents the results for Clark and Violet. The lesson can be divided as follows. First, Clark gave classroom instruction: he explained a topic and asked students questions (interactions 11 through 18). They then checked the answers to an assignment (interactions 18 through 25). Thereafter, Clark continued giving classroom instruction.

Violet paid attention during the first part of the lesson, but her attention seemed to drift after a while (see Figure 2). She often looked around, yawned, and wrote in her diary. Her attention returned when Clark asked her a question. However, as described in Transcript 3 (a summary of interaction 11 through 18), she barely reacted because she did not seem understand the question.

TRANSCRIPT 3
Clark says to the whole class: “You can derive the meaning of a word by looking at the context of the text”. He asks Violet: “Where should you look for it in the context?” Another student wants to give the answer, but the teacher corrects him by saying: “Sshhh!” Violet looks up at Clark. She thinks for a second and asks: “What exactly was the question?” The teacher replies: “It is about how you look at the context of a text. How do you know the meaning of a word? By looking at the context. And where exactly should you look for it?” Violet does not respond. Clark looks around to see whether other students have an idea. Another student says: “Examples”. Clark repeats the student’s answer. He asks Violet if she knows another example. She does not respond. Three other students add: “Contradictions, pictures and illustrations and descriptions”. Clark repeats all the answers for Violet and asks whether she remembers them. Violet looks vaguely at the teacher and does not react. Clark again asks: “Yes or no?” The expression on Violet’s face is difficult to read; it seems like she still does not understand. Clark directs his attention to the whole class and repeats where to look for it in the context of the text. Although he directs his attention to other students, he keeps involving Violet by looking at her now and then. Violet looks at Clark while he is explaining and nods every now and then. He ends his explanation with: “Do you understand?” Violet nods. Clark says to the whole class: “Any questions about this subject? Then let’s continue with the answers.”
In the second part of the lesson, Clark wanted to check the students' answers to an assignment (interactions 18 through 25). He used an overhead projector to project the answers and asked the students to correct their own assignments. At interaction 22, Violet asked whether the screen could be enlarged because she could not read it.

At interaction 25, Clark continued with his instruction. He asked questions and explained the answers. However, Violet was still busy checking the answers to the assignment. She kept looking at the screen instead of listening to Clark. On the one hand, she was engaged since she was really active and independently corrected her answers. On the other hand, she was simultaneously disengaged because she was not paying attention to what the teacher said.

At interaction number 28, Violet asked whether the next assignment could be put on the large screen. Clark interrupted his instruction and responded to Violet that the next assignment was not part of the homework. Violet replied that she had already done the assignment. Clark put the answer on the screen and continued with his classroom instruction. Meanwhile, Violet kept checking her answers.

TEACHER BEHAVIOR

STRUCTURE
Clark tried to provide clarity, support, encouragement, and constructive feedback. However, his explanations could sometimes be vague. Students often indicated that they did not understand the question or the explanation. Instead of trying to explain it in another, clearer manner, he kept repeating what he had already said.

This is also visible in the transcript. Violet did not seem to understand Clark, even after he repeated the questions several times. Violet nodded in the end to indicate that she understood, but it is unclear whether she really did. So the lack of structure was mostly caused by the teacher’s choice of words.

Moreover, sometimes the classroom could be a bit chaotic. The same students often spoke out of turn. However, Violet did not seem to be affected by the classroom noise. She continued with her task, even when other students were talking.

AUTONOMY SUPPORT
Clark did not provide a lot of autonomy support. He did not clearly indicate the relevance of the learning task or adjust the content to the students' interests. However, he did try to activate students by asking them questions. Overall, the students' participation levels were low and most were distracted very quickly.

INvolVEMENT

In a classroom with nearly 30 students, it seemed to be difficult for Clark to show personal involvement. He mostly stuck to the lesson content and showed little personal interest in students. However, he was available to and responsive to his students. For instance, he enlarged the screen for Violet and asked her numerous times if she really understood the lesson content.

STUDENT ENGAGEMENT
Violet's engagement level fluctuated a lot over time. Sometimes she paid attention, looking at Clark or writing things down. Other times, she seemed not focused and attentive. When she was checking her answers, she was really focused on the schoolwork although she was not paying attention to the teacher.

THE RELATIONSHIP BETWEEN THE TEACHER'S BEHAVIOR AND THE STUDENT'S ENGAGEMENT

Clark expressed a lot of variety in his provision of need support. Violet also showed great variety in her engagement level. Violet's engagement levels were highest when Clark expressed autonomy-supportive behavior.

KATHERINE (TEACHER) AND MARIE (STUDENT)

Figure 3 presents the results related to Katherine and Marie. In this classroom setting, students prepared a meal in pairs or alone. They could choose the meal they wanted to make a week before cooking class: one week they shopped for groceries and the next week they cooked.
Katherine did not express the relevance of the learning task but it seemed clear: they were going to eat the meal after they made it. Katherine did not use controlling language.

INVOlVEMENT
Although Katherine was not always present in the classroom and she often helped other students, overall she was approachable and available to support Marie. She expressed attunement and showed affection. There was plenty of room for informal contact between Katherine and her students.

STUDENT ENGAGEMENT
As Figure 3 shows, Marie was engaged in the task most of the time. She did not need much encouragement. Instead, Marie initiated the task herself, continued it, and finished without much help from Katherine. She seemed to enjoy the task: she looked relaxed and happy and worked steadily.

At the beginning of the activity, Katherine supported all three needs and Marie was engaged. After a while, Katherine started providing less structure and autonomy support. Her provision of involvement also declined and remained low. The decline in Katherine’s support was followed by a decline in Marie’s engagement.

THE RELATIONSHIP BETWEEN THE TEACHER’S BEHAVIOR AND STUDENT’S ENGAGEMENT
At the beginning of the activity, Katherine supported all three needs and Marie was engaged. After a while, Katherine started providing less structure and autonomy support. Her provision of involvement also declined and remained low. The decline in Katherine’s support was followed by a decline in Marie’s engagement.

OVERALL PATTERNS
The results provided indications that the provision of need support is associated with positive student engagement levels. In general, Susan and Katherine provided more need support than Clark did. Their students’ levels of engagement were correspondingly higher than that of Clark’s student. The extent to which teachers provided need support during their lessons also varied. Overall, teachers provided structure in their lessons the most. Within their lessons some teachers showed much fluctuation in their provision of need support. For instance, Clark showed more variations in his need support than Katherine did. Fluctuations in teachers’ need support were accompanied by fluctuations in students’ engagement level. As the figures show Violet’s engagement levels fluctuated more than Marie’s. Furthermore, the presence or absence of need support did not always immediately led to enhanced or declined levels in student engagement. Another finding is that, in some
cases need support seems to be connected. Katherine’s provision of structure was exactly the same as her provision of autonomy support. This was also the case for Susan’s provision of autonomy support and involvement. Last, teachers’ need support and students’ engagement also seem to depend on the lesson content. Students’ engagement levels seem to change in accordance with a particular parts of the lesson.

Discussion

This study aimed to answer two research questions: 1) Do teachers of students with acquired deafblindness support students’ needs? 2) How does need-supportive teacher-student interaction influence students’ motivation? In this section, we will discuss the main findings that answer these two questions.

First, our analysis of videotaped teacher-student interactions revealed that there are indications that provision of need support might indeed lead to student engagement, as suggested in previous research. This is similar to previous research which has found that need-supporting teacher-student relationships greatly affect students’ school engagement and achievement (Connell & Wellborn, 1991; Opdenakker, Maulana, & Den Brok, 2012; Opdenakker & Minnaert, 2011).

Second, we also found indications that variations in teachers’ need support over time might lead to more variation in student engagement. A lot of variation in a teacher’s instructional style might confuse students; they might lose track of the teachers’ intentions and expectations, which consequently could lead to varying levels of engagement.

Third, when looking at the effect that a lack support has on student engagement, we found that the former is not always directly followed by a decline in the latter. For instance, at one time, Susan provided no support for any of the three needs. However, this did not impact Selina’s engagement levels. It could be that a temporary lack of need support does not result in a decline in students’ engagement when the teacher provides need support most of the time. Contrary, the presence of teachers’ need support did not always immediately led to enhanced engagement levels.

Previous research by Stroet, Minnaert, and Opdenakker (2014) also indicated that need-supportive teacher behavior does not always have an immediate positive effect on students’ motivation. Based on SDT, they videotaped teacher-student interactions in regular educational settings and coded them in terms of being supportive for the three needs. They found that students appeared to be more motivated when they were taught by a teacher who, over the course of the school year, expressed higher levels of need support. However, when they looked at the teachers’ behavior at a specific moment, they found no association between the teacher’s need support and students’ motivation. They concluded that need-supportive teaching has a positive impact on students’ motivation, but the impact is not immediate. These findings seem to be consistent with our research and indicate that changing teacher behavior, even if it is more need supportive, might cause unpredictability.

Fourth, the findings indicate that teachers’ need support and students’ engagement seem to depend on the lesson content. For instance, Susan first mainly provided structure. Later on, when introducing the lesson’s topic, she provided more autonomy support and involvement. In addition, Selina was more engaged when Susan asked probing questions than when classroom discussions were occurring. Classroom discussions might be difficult for Selina to follow because of her sensory loss.

All in all, we can conclude that there are indications that students are most engaged when teacher-student interactions are need supportive. This implies that it is worthwhile to create teacher-student interactions that support students’ needs for competence, autonomy, and relatedness. However, given the sample size of three students, the findings must be applied cautiously as they might not be transferable to every other teacher-student pair.

A strength of this study is the combination of both quantitative and qualitative analysis. Reeve, Jang, Carrell, Jeon, and Barch (2004) reported that almost all previous studies on the relationship between teacher behavior and student engagement have relied on correlational designs with self-report measures. However, self-reports may be susceptible to social desirability bias (McLachlan & Hagger, 2010). Given the need for more observational SDT research, the specificity of the target group, and the need for ecological validity, we chose to use video observations instead of self-reports.

A disadvantage of using video is that it is difficult to know whether students actually perceive that their needs are being met. According to Connell and Wellborn (1991), the social context influences students’ perceptions, which influences their engagement and consequently their outcomes. However, we cannot tell from observations whether students actually perceive their needs as supported. Future studies should combine video
Another disadvantage of using observations is that it is very time consuming. Observers need to be trained to correctly code the teachers' and students' behavior. For example, when coding student engagement, the observer needs detailed information about what kinds of behavior can be identified as engaged or disengaged. The coding process itself is also time consuming. Observers need to take time for the coding process and act cautiously when drawing conclusions. For instance, we often saw Violet writing in her diary while the teacher was talking. At first glance, it seemed as if she was not paying attention to the teacher. However, after a while, she said to the teacher: “Sir, haven't we already checked this assignment?” Instead of not paying attention, she was verifying whether he was right. This example shows that coding should be done carefully and is therefore time consuming.

In future research, it would be interesting to study other aspects of the learning environment that might impact students' motivation, such as peer interactions. This study's results show that it is not always easy for students with impairments to connect with other students. For instance, Selina did not always appear able to follow classroom conversations. Moreover, Violet was seated in front of the classroom next to her interpreter, which hindered her social inclusion. She could not hear conversations behind her and could not pair up with a neighboring student for pair activities. Previous research have showed that students with sensory loss in inclusive settings would often rather communicate with peers who have the same mode of communication than with peers without sensory loss (chapter 2). In addition, from research on deaf students, we know that students who feel at ease communicating with teachers and peers are more likely to be engaged in school tasks (Long, Stinson, & Braeges, 1992). Their study demonstrated that ease of communication is related to achievement in school. In line with earlier studies (e.g., Furrer & Skinner, 2003; Hughes & Chen, 2011), future studies might therefore address the possible influence of peer relationships on students' motivation, or possible correlations between teacher-student relationships and student-peer relationships and their impact on the motivation and achievements in school of students with acquired deafblindness.

Last, only female students participated in this study. Previous research has found that teacher support is more closely related to motivation for girls than for boys (Goodenow, 1999). Hence, future research should investigate the influence of need-supportive teacher-student interactions on male students with acquired deafblindness.