
The Influence of Need-Supportive Teacher Behavior on the Motivation of Students with Congenital Deafblindness

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Structured abstract: *Introduction:* Research has indicated that need-supportive learning environments positively influence students' motivation. According to self-determination theory, a *need-supportive learning environment* is one in which teachers provide structure, autonomy support, and involvement, and thereby support their students' psychological needs for competence, autonomy, and relatedness. In this study, we aimed to explore whether teachers of students with congenital deafblindness provide such an environment and how they adjust their need-supportive teaching to these students. *Methods:* We conducted an in-depth analysis of teacher-student interactions using a multiple-case-study design. We analyzed videos of teacher-student interactions from the perspective of self-determination theory. *Results:* We found that successful need support for this group requires careful adjustments for each individual student. Only if the provision of structure, autonomy support, and involvement is tailored to the student can a positive influence on motivation be noticed. Another important finding is that teachers provide more structure and involvement than autonomy support. *Discussion:* This study showed that need-supportive teaching is important in the education of students with congenital deafblindness. By using video analysis, we were able to point out teaching strategies that led to greater motivation for these students. *Implications for practitioners:* Motivation is a prerequisite for learning, and teachers' behavior might add to that motivation. This study showed that need support leads to enhanced motivation in students with congenital deafblindness. We provided practical insights that teachers can use to create need-supportive learning environments for these students.

The behavior of teachers 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 affect students' learning outcomes by fostering motivation, it is important to learn how they can do so. These insights may be especially important when teaching students

with congenital deafblindness, who often encounter difficulties in the learning process because of their sensory, and often additional, impairments. This article describes in-depth case studies we undertook to explore the behavior that fosters motivation in students with congenital deafblindness.

We used self-determination theory (Deci & Ryan, 2000) to explore teachers' behavior. Self-determination theory provides an encompassing framework, part of which stresses the importance of basic psychological needs: competence, autonomy, and relatedness. It assumes that students are motivated when teachers support the fulfillment of these needs.

We chose to use this theory to study motivational processes in this target group for several reasons. First, it not only focuses on individuals, but also on interactions with their environments (Opdenaker & Minnaert, 2011). It addresses how social factors facilitate or undermine people's sense of volition and initiative. For children with deafblindness, the social context is extremely important. They need dependable others who can provide access to interesting things in the environment for exploration and further learning.

Second, self-determination theory has been applied in a variety of domains, including educational settings. Related research about students with special needs is scarce (Deci, Hodges, Pierson, & Tomassone, 1992), however, and we could find no research in which self-determination theory was applied in the education of students with sensory loss.

Third, self-determination theory states that the psychological needs for competence, autonomy, and relatedness are uni-

versal. It also provides examples of practical applicable strategies teachers can use to support students' needs. Therefore, self-determination theory might also provide strategies for teachers of students with congenital deafblindness.

Need-supportive teaching

In need-supportive teaching, teachers use instructional behaviors that support students' basic psychological needs for competence, autonomy, and relatedness. Meeting students' needs positively influences their motivation and engagement in learning. *Competence* refers to the experience of behavior as effectively enacted (Niemiec & Ryan, 2009). Teachers can support this need by providing structure (such as clear expectations and guidance) (Jang, Reeve, & Deci, 2010). *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 relevant learning activities, providing optimal challenges, highlighting meaningful learning goals, and supporting students' unforced endorsement of classroom behaviors (Reeve, Jang, Carrell, Jeon, & Barch, 2004). *Relatedness* refers to the need to experience a sense of security, connectedness, or belonging. Teachers can support this need by showing interest, understanding, or affection, and by being available and responsive (Skinner & Belmont, 1993).

The opposite of engagement is disengagement. Its behavioral components include passivity, a lack of initiations, and giving up. Its emotional components include dejection, discouragement, and

apathy (Skinner, Furrer, Marchand, & Kindermann, 2008).

Students with congenital deafblindness

Students with congenital deafblindness face many difficulties that might also affect their engagement in learning activities. The dual-sensory loss severely limits their opportunities to learn and to communicate with others (National Consortium on Deaf-Blindness, 2007). Moreover, they often demonstrate decreased responsiveness, joint attention, and mutual enjoyment in interaction with caregivers; self-stimulatory behavior; and a restrictive repertoire of preverbal communicative behaviors (Chen & Haney, 1995). These students may also only be aware of events that occur within their immediate physical proximity (Sall & Mar, 1999). Finally, 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).

To overcome these difficulties, students rely upon the support of their teachers. Therefore, we expect need-supportive teaching to be especially important for students with deafblindness. Creating teacher-student interactions that support students' needs for competence, autonomy support, and involvement requires much sensitivity and skills from the teacher, and knowledge of the individual student. Unfortunately, research has shown that most teachers have difficulty with the competencies required to understand these children's experiences and emotions and connect with them in a mean-

ingful way (Janssen, Riksen-Walraven, & Van Dijk, 2002).

This study aimed to provide a better understanding of how teachers motivate students with congenital deafblindness to complete learning tasks. The research question was: "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.

Methods

PARTICIPANTS

Four teachers and their students with congenital deafblindness participated in the study presented here. We used a convenience sampling method to recruit participants from a school for students with deafblindness in the Netherlands. All the participating teachers volunteered to participate in the study. At this school, the education is highly individualized: one teacher works with one student most of the day.

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 parents of participating students signed consent forms.

Tables 1 and 2 describe the participants' characteristics. For privacy reasons, all their names were changed. Although we use the term "deafblindness," none of the students were totally deaf and totally blind. All the students had cognitive delays in addition to deafblindness.

Table 1
Characteristics of the participating teacher-student pairs.

Participant	Characteristic	James ^S and Bruce ^T	Tanya ^S and Helen ^T	Peter ^S and Betty ^T	Diane ^S and 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
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

S = student; T = teacher.

DATA COLLECTION

A trained camera operator made 10 to 20 hours of video recordings of each teacher-student pair over a two-month period. The large-scale data collection

was part of a larger research project in which we aimed to record everyday “practice as usual” teaching practices to examine what actually happens in the classroom on a regular school day. To

Table 2
Students’ communication, social-emotional functioning, and adaptive skills.

Student	Student’s method of communication	Teacher’s method of communication	Social-emotional functioning	Adaptive skills
James	Reaching, hand leading, signing, short sentences, and sounds	Speech supported with tactile sign language	Makes contact, shows displeasure by walking away or pushing objects away, or shows pleasure or surprise by laughing or making happy sounds	Matches colors and forms
Tanya	Spoken language and signs	Speech supported with sign language	The quality of the relationship with adults is best when adults are predictable and consistent; can have sudden, intense mood swings; expresses discomfort by throwing material, kicking objects, screaming, and hitting herself or others	Largely independent in daily care tasks; enjoys drawing, cooking, and moving; can make own decisions; has many ideas and wants to take initiative
Peter	Hand leading, approaching, looking, sounds, and some signs	Verbal keywords and short sentences	Enjoys interaction games; shows displeasure by crying, yelling, hitting himself or others, biting, or throwing objects away	Makes choices by pulling objects toward himself or pushing them away; can ask for help by grabbing a teacher’s hands; can match colors and forms
Diane	Signs, sounds, and pictures	Speech supported with tactile sign language	Enjoys spending time with others, can name emotions in others and in herself	Matches categories of animals, fruit, form, colors; understands function of money and time

ensure that the teachers would act the way that they would normally act without a camera operator present, teachers were instructed to follow their usual schedule of activities and act as they would normally.

DATA SELECTION

We chose to examine one activity for each teacher-student pair. This method gave us the opportunity to do a very detailed, thorough, and in-depth study of teacher-student interaction instead of analyzing a large dataset in a more global manner.

We applied the following selection criteria to each video. First, the teacher and student were both present and undertook a learning activity with which they were both familiar. To enhance ecological validity, we chose prototypical and representative videos of common situations. The filmed activity was part of their normal daily schedule and was chosen by the teacher. Moreover, we selected videos in which both the teacher's and student's behavior and communication were clearly visible all the time. For each pair, we randomly chose one video from all the videos that met these inclusion criteria.

To ensure the comparability of cases with respect to the amount of teacher-student interactions, we selected 25 sequential teacher-student interactions for each pair, the maximum number of interactions for each of the pairs. An *interaction* refers to an action and a response: a teacher's action, followed by a student's response (or vice versa).

DATA ANALYSIS

A researcher who was not informed about the purpose of the study transcribed the

Table 3
Teacher codes.^a

Dimension of need support	Present (1)/ Absent (0)	Components
Structure (S)	1/0	Provide clarity Offer guidance Provide support and encouragement Provide constructive, informational feedback
Autonomy (A)	1/0	Provide choice Foster relevance Show respect
Involvement (I)	1/0	Show affection Express attunement Dedicate resources to the student Be dependable and available to offer support

^a Based on a review of need-supportive teaching by Stroet, Opendakker, & Minnaert (2013).

teachers' and students' behaviors and communications. Another researcher watched the videos, read the transcripts, and coded them using the coding form developed for this study. This second researcher was trained to fully understand all categories of the coding form. The training was based on steps described by Hartmann (1984) and included, among other things, learning the coding manual, practicing, and retraining. The researchers were given detailed information about each teacher, student, and setting.

The coding forms were based on analyses of many video recordings, student files, and literature about self-determination theory and deafblindness. There were separate coding forms for the behavior of teachers (see Table 3) and students (see Table 4). Teachers' behavior included provision of structure, autonomy support, and involvement. For each interaction, these need-supportive components were assessed as being present (1) or absent (0). For student behavior, we coded the

Table 4
Student codes.

Variable	Disengaged				Engaged
	E1 Active negative	E2 Passive	E3 Neutral	E4 Active positive	E5 Flow ^a
General description	Student actively expresses a desire not to engage in the activity: student communicates, shows frustration, or is distracted.	Student is passive and inactive.	Student does what is being asked, nothing more or less. Student is not disengaged but does not seem to find the activity interesting or fun.	Student takes self-initiated action, enjoys the activity, and finds it interesting. Student expresses positive emotions.	Student is absorbed in the learning task. Student is involved, focused, and showing high levels of enjoyment.
Behaviors	Distracted ^b Mentally disengaged ^b Stereotypical behavior ^d Restless ^a Aggressive ^c Self-abusive ^c	Passive ^b Inattentive ^b Bored ^b Disinterested ^b Apathetic ^d Helpless ^d Withdrawn ^b Inactive ^d	Concentration ^b Attention ^b	Effort ^b Exertion ^b Attempts ^b Involvement ^b Interest ^b Focused ^d Approaching ^d Initiating action ^b Cooperative ^c Enjoyment ^b	Absorption ^b Persistence ^b Exploring ^c
Emotions	Frustration ^b Anger ^b Sadness ^b Anxiety ^b Nervousness ^d	Indifference ^d Lethargy ^d Emotionlessness ^d Stoicism ^d	Calmness ^d		Excitement ^c Enthusiasm ^b Satisfaction ^b Pride ^b

^a Based on Csikszentmihalyi's (1990) conceptualization of the concept of flow.

^b Based on Skinner et al. (2008), who defined engagement in behavioral and emotional dimensions.

^c Based on Martens et al.'s (2014) observation categories for people with CDB and intellectual disabilities.

^d Added by the authors of this study.

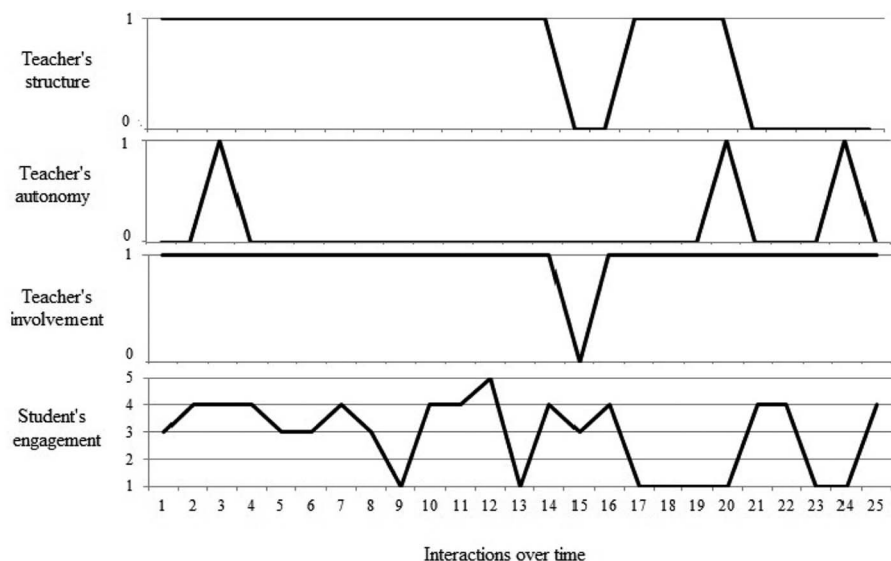


Figure 1. Interaction patterns of Bruce and James.

extent to which they were engaged during a learning task. In line with Skinner et al. (2008), we defined engagement in behavioral and emotional dimensions.

We developed a five-point scale ranging from active disengagement to flow, in which *flow* represents a state in which a student is absorbed in the learning task (totally involved, focused, and showing high levels of enjoyment; Csikszentmihalyi, 1990). The scale was based on analyses of many video recordings and student files. To adjust it for students with congenital deafblindness and intellectual disabilities, we added some deafblind-specific observational categories (see Table 4) described by Martens, Janssen, Ruijssenaars, Huisman, and Riksen-Walraven (2014). In the final coding, we merged behavioral and emotional components into one overall engagement code.

Inter-rater reliability

To assure reliability, 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 and student 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 (see Figures 1–4). In each figure, the x-axis indicates the sequential interactions between a pair over time. An interaction refers to a teacher's action, followed by a student's response. For example, the teacher asks a question (coded as need supporting or not) and the student answers (coded on a scale from disengaged to engaged). The x-axis presents the teacher's need support

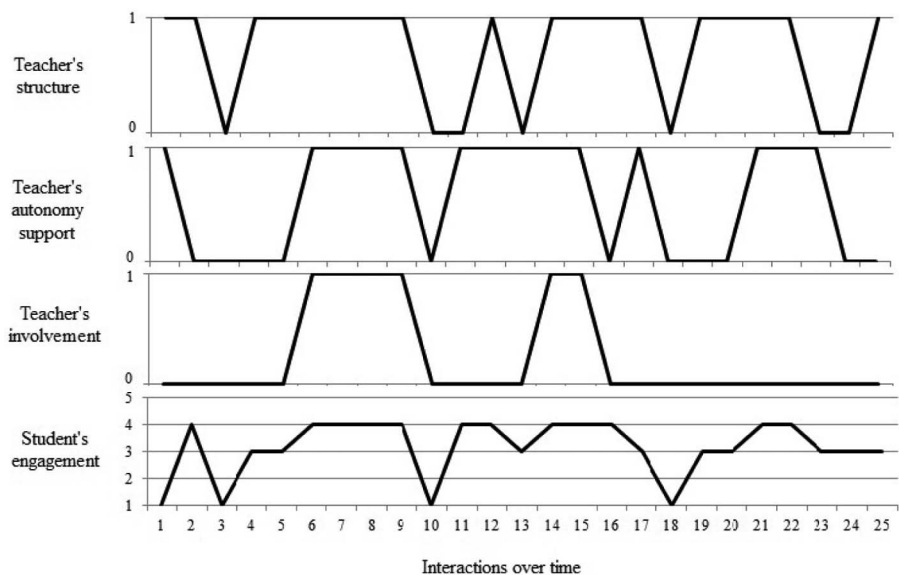


Figure 2. Interaction patterns of Helen and Tanya.

(1 = present or 0 = absent) and the student's engagement (1 = disengaged to 5 = engaged). The findings were interpreted by the researcher who coded the videos and by the first author.

Results

BRUCE AND JAMES

We made video recordings during physical education class. Together with a few other teacher-student pairs, James com-

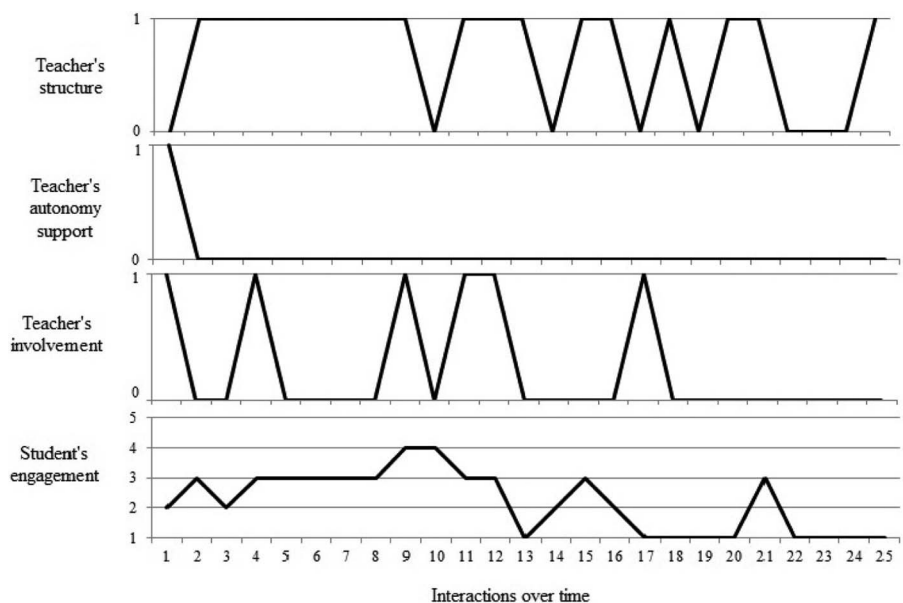


Figure 3. Interaction patterns of Betty and Peter.

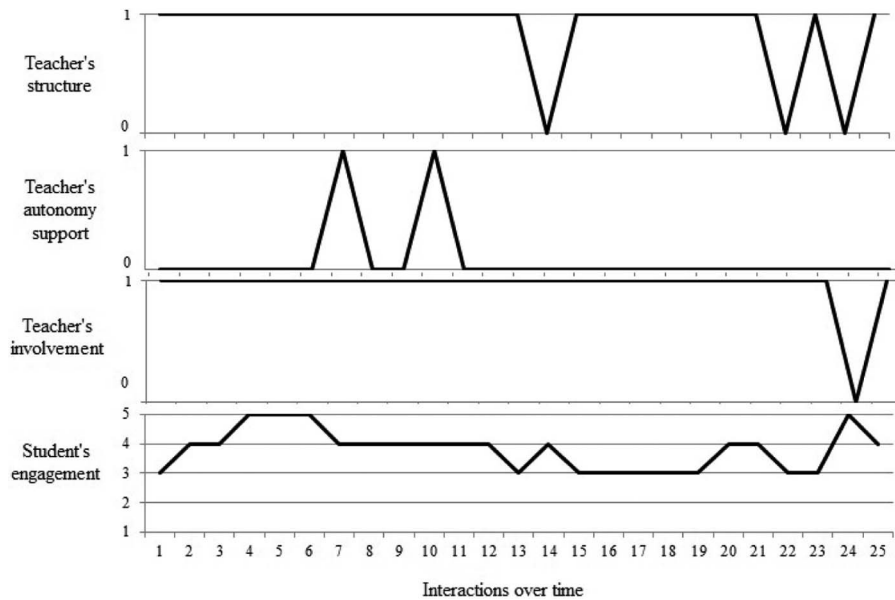


Figure 4. Interaction patterns of Rachel and Diane.

pleted a parkour course full of obstacles, assisted by Bruce, his teacher.

Teacher's provision of structure

Bruce provided continuous structure until interaction 15 (see Figure 1). He clearly and playfully explained what he expected from James, encouraged James, and gave feedback. 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.

Teacher's autonomy support

Although James was able to follow the track almost independently, he had to follow it in a prescribed order without the possibility of providing any input. During interactions 20 and 24, Bruce provided autonomy support and James' engagement rose from disengaged to engaged.

Teacher's involvement

Bruce exhibited optimal involvement: he was patient, responsive, and attentive. 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, except for when he had to wait for another student. The first times he had to wait (interactions 1–9) did not influence his engagement, but he became increasingly frustrated.

HELEN AND TANYA

Helen and Tanya worked together on a computer with a sign language dictionary program. One of them chose 10 words; Helen, the teacher, then wrote each word on paper and entered them into the program. The words were then demonstrated in a video with a person who signed the words.

Teacher's provision of structure

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. A decline in structure always coincided with a decline in Tanya's engagement (see Figure 2). However, a decline in 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. This support was provided by letting Tanya choose the words or by linking a word to Tanya's interests. The three declines in engagement were accompanied by a lack of autonomy support.

Teacher's involvement

When Helen showed involvement, Tanya's engagement level was high. However, low levels of involvement were followed by a decline in engagement. This situation could occur when Helen did not show affection or express attunement. These declines were significant when accompanied by a lack of structure.

Student's engagement

Tanya was engaged most of the time, although sometimes she was distracted. This seemed to occur when Helen chose the word. Tanya was most engaged when the lesson content was adapted to her interests and she could provide input.

BETTY AND PETER

Peter had to move plastic rings from one bucket to another. The buckets stood a few meters apart against the wall in the hallway and Peter had to walk back and

forth alongside the wall. Betty, his teacher, usually stood behind him.

Teacher's provision of structure

Figure 3 shows that, in general, Betty provided structure and Peter was engaged until interaction 9. Thereafter, they both showed more fluctuations. Although Betty provided directions and expressed feedback and encouragement, Peter did not seem to receive her communications since Betty was standing behind him.

Teacher's autonomy support

Betty provided autonomy support once. In this activity there was little room for Peter to take initiatives; he only had a small amount of 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. 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, Betty showed affection. When Peter's behavior was not effectively enacted, Betty tended to be more directive.

Student's engagement

At first, Peter did exactly what was asked of him. 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.

RACHEL AND DIANE

Diane was learning to identify and spell the names of colors. Rachel, her teacher, used different tools, such as a card with the colors and their names, as well as the environment.

Teacher's provision of structure

Overall, Rachel provided a lot of structure: she was very active, talked and moved a lot, and used many different materials. When Rachel did not provide structure, by giving overly vague or unclear directions, Diane's engagement level still 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 more active. Nevertheless, Diane stayed engaged.

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 was generally not very expressive. She closely observed Rachel, answered questions, and laughed at jokes.

OVERALL PATTERNS

A comparison of dimensions of need-supportive behaviors and their effect on students' engagement provided a number of insights. First, not all needs were supported to the same extent. Teachers expressed more support for structure and involvement than for autonomy. Second,

need support can be relatively stable or fluctuate over time. Third, there seemed to be a hierarchy of need support: a lack of structure seemed to have the most negative effect on student engagement. Fourth, there seemed to be connections between needs. The presence or absence of support of one need could have been strengthened or compensated for by the presence or absence of another. Fifth, the presence or absence of need support appeared to affect student engagement.

Discussion

In general, teachers provided more structure and involvement than autonomy support. Previous research (Reeve et al., 2004) also found a lack of autonomy support, indicating that teachers often use more controlling than autonomy-supportive strategies. Reeve (2009) provided reasons 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.

We also found a possible hierarchy in the influence of the different types of need provision on student engagement. Structure seems to be most influential, 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.

However, relatedness is assumed to play a more important role when educating students with deafblindness. According to Janssen et al. (2002), harmonious interactions are the foundation for learning,

communication, well-being, and quality of life for these students. Therefore, we think that it is crucial to support students' need for relatedness by showing involvement in this setting.

Another important finding involves possible interconnections between types of need support. The presence or absence of support of one need may be strengthened or compensated for by the presence or absence of another. Previous studies (for instance, Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Trouiloud, Sarrazin, Bressoux, & Bois, 2006) have addressed possible connections between needs. More research is needed to unravel these linkages and to look for differences between students with and without impairments.

IMPLICATIONS FOR PRACTITIONERS

The results have valuable practical implications for teachers of students with congenital deafblindness. Provision of structure seemed to have the largest effect on student engagement. Teachers can positively influence engagement by communicating clear expectations, providing support and directions when needed, being available to answer questions, and giving feedback. It also appears that by providing involvement, teachers can prevent or change a student's decline in engagement.

In our observations, autonomy support was the least present of the three needs. We did, however, notice that autonomy support positively affected engagement. When teachers offered opportunities to explore and broaden students' worlds and capabilities, even in small ways, the students became more engaged. Therefore, teachers need to explore their students'

interests and devise how different learning materials, lesson content, or approaches influence their engagement, which is an important starting point for developing instruction for students with intensive support needs.

First, it is important to provide structure and clarify goals. Students need to know what is expected from them and what they need to do to attain the goal. Tanya, for instance, knew they were going to pick 10 words, because the teacher wrote the number at the start of the lesson. Peter, on the other hand, had no idea how many rings he had to bring back and forth and he was unpleasantly surprised when a bucket of balls was added after he finished the rings. This lack of structure could have diminished his feeling of competence, because he did not know what to expect. If a student completes some of the task and then complains or refuses to continue (like Peter), the teacher could offer a choice (through representative objects) of continuing the activity or changing to another.

Second, goals should be realistic. Goals that are too difficult or too easy are very demotivating. We found that teachers sometimes set too-easy goals for their students, who might be more motivated by a greater challenge.

Third, goals should be meaningful and adapted to the student's interest. The tasks selected for James, Tanya, and Diana appeared to be meaningful. However, Peter's task did not seem very meaningful, so it is unsurprising that he showed less engagement. This is where offering a choice would have been helpful; doing so would contribute to engagement and foster autonomy.

These results stress the essential role of student preferences, interests, and opportunities to make choices. They contribute to self-determination by motivating participation, autonomy, and learning.

STUDY LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

In coding each interaction, we noted whether the three dimensions of teachers' need-supportive behavior were present. However, each dimension included 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 their roles, effects, and the possible interplay between 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 only 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 the behavior of teachers can contribute to the motivation and engagement of students. Our findings indicate that students with congenital deafblindness need teachers who are able to create a need-supportive environment that will catch and hold them in a learning activity.

References

- Barlow, D. H., Nock, M. K., & Hersen, M. (2009). *Single case experimental designs: Strategies for studying behavior change* (3rd ed.). Boston, MA: Allyn & Bacon.
- Chen, D., & Haney, M. (1995). An early intervention model for infants who are deaf-blind. *Journal of Visual Impairment & Blindness*, 89(3), 213–221.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper and Row.
- Deci, E. L., Hodges, R., Pierson, L., & Tomassone, J. (1992). Autonomy and competence as motivational factors in students with learning disabilities and emotional handicaps. *Journal of Learning Disabilities*, 25(7), 457–471. doi:10.1177/002221949202500706
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. doi:10.1207/S15327965PLI1104_01
- Hartmann, D. P. (1984). Assessment strategies. In D. H. Barlow & M. Hersen (Eds.), *Single case research designs* (pp. 107–139). New York, NY: Pergamon Press.
- Hersch, M. (2013). Deafblind people, communication, independence, and isolation. *Journal of Deaf Studies and Deaf Education*, 18(4), 446–463. doi:10.1093/deaf/ent022
- Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology*, 102(3), 588–600. doi:10.1037/a0019682
- Janssen, M. J., Riksen-Walraven, J., & Van Dijk, J. P. M. (2002). Enhancing the quality of interaction between deafblind children and their educators. *Journal of Developmental and Physical Disabilities*, 14(1), 87–109. doi:10.1023/A:1013583312920
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159–174. doi:10.2307/2529310

- Martens, M. A. W., Janssen, M. J., Ruijsse-naars, A. J. J. M., Huisman, M., & Riksen-Walraven, J. M. (2014). Applying the intervention model for fostering affective involvement with persons who are congenitally deafblind: An effect study. *Journal of Visual Impairment & Blindness*, 108(5), 399–413.
- National Consortium on Deaf-Blindness. (2007). *Children who are deafblind*. Monmouth, OR: Author.
- Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, 7(2), 133–144. doi:10.1177/1477878509104318
- Opdenakker, M.-C., & Minnaert, A. E. M. G. (2011). Relationship between learning environment characteristics and academic engagement. *Psychological Reports*, 109(1), 259–284. doi:10.2466/09.10.11.PR0.109.4.259-284
- Prain, M. I., McVilly, K. R., & Ramcharan, P. (2012). Being reliable: Issues in determining the reliability and making sense of observations of adults with congenital deafblindness? *Journal of Intellectual Disability Research*, 56(6), 632–640. doi:10.1111/j.1365-2788.2011.01503.x
- Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educational Psychologist*, 44(3), 159–175. doi:10.1080/00461520903028990
- Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion*, 28(2), 147–169. doi:10.1023/b:moem.0000032312.95499.6f
- Sall, N., & Mar, H. H. (1999). In the community of a classroom: Inclusive education of a student with deaf-blindness. *Journal of Visual Impairment & Blindness*, 93(4), 197–210.
- Sierens, E., Vansteenkiste, M., Goossens, L., Soenens, B., & Dochy, F. (2009). The synergistic relationship of perceived autonomy support and structure in the prediction of self-regulated learning. *British Journal of Educational Psychology*, 79, 57–68. doi:10.1348/000709908X304398
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement. *Journal of Educational Psychology*, 85(4), 571–581. doi:10.1037/0022-0663.85.4.571
- Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology*, 100(4), 765–781. doi:10.1037/a0012840
- Stroet, K., Opdenakker, M.-C., & Minnaert, A. (2013). Effects of need-supportive teaching on early adolescents' motivation: A review of the literature. *Educational Research Review*, 9, 65–87. doi:10.1016/j.edurev.2012.11.003
- Trouilloud, D., Sarrazin, P., Bressoux, P., & Bois, J. (2006). Relation between teachers' early expectations and students' later perceived competence in physical education classes: Autonomy-supportive climate as a moderator. *Journal of Educational Psychology*, 98(1), 75–86. doi:10.1037/0022-0663.98.1.75
- Wigfield, A., & Cambria, J. (2010). Students' achievement values, goal orientations, and interests: Definitions, development, and relations to achievement outcomes. *Developmental Review*, 30(1), 1–35. doi:10.1016/j.dr.2009.12.001

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