Introduction

Students differ widely in the extent to which they are motivated to engage in learning tasks. While some students can be fully engaged in a particular task, others might be completely disengaged. The motivation of students is affected by basic processes in learning. Similar to the variation in motivation for learning that can be observed in students without sensory impairments, considerable variation is observed in the motivation of students with hearing and visual impairments. Due to the lack of research, we do not know whether the motivation of students with deafblindness is affected by the same basic processes.

Over time, the concept of motivation has evolved from a purely personal attribute of the individual student into a concept that is also subject to external influence (Opdenakker & Minnaert, 2011). This has turned the focus of contemporary research on motivation toward interactions between the student and the learning environment.

A well-known motivational theory describing the link between student motivation and the learning environment is Self-Determination Theory (SDT: Deci & Ryan, 2000).

An important aspect of SDT is its focus on the role of basic psychological needs. According to SDT, the extent to which the learning environment (the teacher) supports a student’s basic psychological needs for competence, autonomy, and relatedness affects the extent to which the student will be motivated to learn. In other words, in the classroom students need to perceive the interactions they have with their teachers as supporting their basic psychological needs. Therefore, teacher-student interactions form the basis of the social context in which learning takes place. The interactions of students with their teachers affect their social and emotional adjustment, as well as their academic motivation and learning (Connell & Wellborn, 1991).

The influence of the learning environment (i.e., the teacher-student interactions) on student motivation could be expected to be even greater for students with sensory impairments. Children without sensory loss learn from what they do and what happens around them (Aitken et al., 2000). Children with deafblindness cannot learn from what they see or hear. These children have difficulty learning incidentally from events around them. The environment is bounded by their reach and their motivation to explore is minimal (McInnes & Treffry, 1982). Their learning is limited by what others bring to them in a form that they can perceive. Unlike that of children without sensory loss, their learning must be specially arranged (Aitken et al., 2000). The teacher has a crucial role in helping the
student to overcome the restrictions imposed by sensory impairments, to encounter and make sense of the world, and to make the most of every learning opportunity. Moreover, the task of supporting the basic psychological needs of students in this challenging group demands thorough insight and comprehensive skills from their teachers. To date, there is no overview of exactly what teachers must do in order to support the basic psychological needs of students. The aim of this thesis is therefore to study motivation in students with deafblindness by using the unique approach offered by SDT. The central question concerns to what extent need-supportive teacher-student interactions influence motivation and engagement of students.

THEORETICAL FRAMEWORK
According to SDT, motivation involves aspects of activation and intention, including energy and persistence (Ryan & Deci, 2000). The theory distinguishes different types of motivation and depicts a continuum from amotivation, extrinsic motivation to intrinsic motivation in which need-support has a crucial role, amply documented by Deci and Ryan's theory. As the needs for competence, autonomy, and relatedness are more fulfilled, motivation will shift from amotivation, to extrinsic motivation, and towards intrinsic motivation.

In this thesis, we focus on engagement, which is the outward manifestation of motivation. Engagement expresses the behavioral intensity and emotional quality of a student’s active involvement during a given learning activity (Skinner, Furrer, Marchand, & Kindermann, 2008).

Figure 1 presents a model based on SDT, adapted from Appleton, Christenson, and Furlong (2008). As shown in the figure, a student’s level of engagement results from interactions within the learning environment. The context (the teacher) influences the self (the student) by supporting the needs of the student. The actions of students (their level of engagement) result from their perceptions of how well equipped their teachers are to meet their needs (Connell & Wellborn, 1991; Appleton et al., 2008). In line with SDT, the level of engagement consequently affects the students’ educational outcomes. In turn, outcomes might influence teacher behavior and student perceptions.

PSYCHOLOGICAL NEEDS
This dissertation focuses on an important aspect of SDT: the theory of basic psychological needs, which addresses the concept of the psychological needs. The needs that teachers must meet are described in SDT, which postulates that all students have psychological needs for competence, autonomy, and relatedness. The need for competence refers to the need to feel able to control outcomes and to possess the strategies and capacities needed in order to meet the challenges of schoolwork (Deci, Vallerand, Pelletier, & Ryan, 1991; Niemiec & Ryan, 2009). The need for autonomy refers to individuals’ perceptions of their own behavior as voluntary and self-endorsed (Niemiec & Ryan, 2009). The need for relatedness refers to the desire to form and maintain strong and stable interpersonal relationships (Baumeister & Leary, 1995; Bowlby, 1979).

The literature on SDT literature provides examples of need-supportive teaching strategies. For example, to support a student’s need for competence, a teacher should provide structure through such strategies as clearly communicating expectations, or by providing explicit step-by-step directions and guidance (Skinner & Belmont, 1993; Jang, Reeve, & Deci, 2010). Strategies for supporting students’ need for autonomy include using non-controlling language (Reeve, 2006) or providing students with opportunities for their own initiatives (Assor, Kaplan, & Roth, 2002). To support the need for relatedness, teachers should show involvement by expressing affection (Skinner & Belmont, 1993) or being responsive (La Guardia & Ryan, 2002).

Numerous studies based on SDT indicate that positive learning outcomes have been achieved in classrooms in which teachers support their students’ needs for competence,
autonomy, and relatedness (Reeve, 2009; Niemiec & Ryan, 2009). To our knowledge, however, no studies to date have investigated the need-supportive behavior of teachers of students with deafblindness.

STUDENTS WITH DEAFBLINDNESS
Various terms are used to refer to people with a combination of hearing and visual loss, including “deafblindness,” “dual sensory loss,” and “combined vision and hearing impairment” (Wittich, Southall, Sikora, Watanabe, & Gagné, 2013). In this dissertation, we use the term “deafblindness,” even though many students may not be completely deaf and blind. This usage is consistent with recent studies (e.g., Boers, Janssen, Minnaert, & Ruijssenaars, 2013; Martens, Janssen, Ruijssenaars, Huisman, & Riksen-Walraven, 2014; Damen, Janssen, Huisman, Ruijssenaars, & Schuengel, 2014).

The group of students with deafblindness can be divided into two subgroups: those with congenital deafblindness (CDB) and those with early acquired deafblindness (ADB). Students with congenital deafblindness are born with sensory impairments. In students with acquired deafblindness, the sensory impairments develop later in life, after they have developed a means of communication. Students with deafblindness differ in their type and degree of vision and hearing loss, as well as in the age of onset of deafblindness, language development, mode of communication, and level of independence (Dalby et al., 2009). Moreover, students with deafblindness often have additional disabilities.

SDT was chosen to study motivational processes in this target group for a number of reasons. First of all, SDT not only focuses on individuals, but also on their interactions with their environment. It addresses how social factors facilitate or undermine people’s sense of volition and initiative. Second, the theory has a broad applicability. It had been applied in a variety of domains, including educational settings. Third, as described in SDT, the needs for competence, autonomy, and relatedness are universal. We may therefore assume that students with sensory impairments have these needs as well. However, students with impairments may very well differ from students without impairments, with regard to the ways in which they express these needs and the ways in which they are fulfilled. Last, SDT provides practical answers for complex motivational questions. For instance, SDT literature describes examples of practical applicable need-supporting teaching strategies.

IMPROVING NEED-SUPPORTIVE TEACHING
Previous studies have indicated that interventions can improve need-supportive teaching. For example, McLachlan, and Hagger (2010) report that a brief intervention targeting autonomy-supportive behaviors resulted in significant increases in autonomy-supportive behaviors. According to Reeve (2006), a need-supportive teaching style does not consist of a prescribed set of strategies and techniques. Instead, the content of need-supportive teaching in practice relates to the educational context (Stroet, Minnaert, & Opdenakker, 2014). We should therefore investigate what need-supportive teaching entails for teachers of students with deafblindness. This knowledge could be used to provide teachers with the strategies they need to help students with congenital and acquired deafblindness to become motivated and engaged in learning tasks.

METHODOLOGICAL CONSIDERATIONS
The heterogeneity of the population is also reflected in the existing research on people with deafblindness (Ronnberg & Borg, 2001). In general, researchers have paid little attention to this group. Most of the studies that do exist are case studies or descriptive studies (Ronnberg & Borg, 2001). Moreover, as observed by Fletcher and Guthrie (2013), research on people with deafblindness tends to focus on people with congenital deafblindness. Knowledge concerning people with acquired deafblindness is fragmentary and, in many cases, anecdotal (Möller & Danermark, 2007). More quantitative and qualitative research is needed, which addresses both students with congenital and students with acquired deafblindness.

In SDT literature, most studies use questionnaires to study students’ perceived need support. As pointed out in a review by Stroet et al. (2013), observational research of teachers’ need-supportive teaching is not frequently conducted. The authors recommend conducting studies using observation. They argue that observational research provides concrete examples of need-supportive behavior that can be used to inform practitioners. Both teachers’ need-supportive behavior and students’ motivation could be studied by means of observations. Video observation is the most commonly used and most appropriate technique for studying the behavior of children with deafblindness. The interaction signals of children with congenital deafblindness are often subtle, may unfold at a slow pace, and can be difficult to interpret. Video thus provides a tool for identifying and understanding these interaction signals (Janssen, Riksen-Walraven, & Van Dijk, 2002).
For this reason, observations constitute our primary means of data collection.

**THESIS AIM**

The underlying framework of this study is based on SDT, which argues that the social context influences the motivation, engagement, and outcomes of students by supporting or not supporting their basic psychological needs. The research to date has tended to focus on motivational processes of students without disabilities. There is a lack of insight in motivational processes of students with deafblindness. We do not know what triggers their motivation to learn. Moreover, we do not know if there are differences with respect to motivation to learn between the two main types of deafblindness, namely congenital and acquired. Thereby, we also contribute to a greater understanding of acquired deafblindness, which has not been studied as extensively as congenital deafblindness. Therefore, the objective of this research is to determine what triggers the motivation of students with congenital and acquired deafblindness. We seek to provide insights in the way teachers can foster their students’ engagement for learning tasks. In this thesis, we apply SDT to the education of students with deafblindness. We focus on teacher-student interactions. By gaining insight into the relationship between instructional practices and the motivation and engagement of students with deafblindness, we aim to contribute to the body of research describing the conditions that foster motivation and engagement in students with special needs, while providing teachers with insight into teaching strategies that could enhance the motivation and engagement of their students.

The first central question of this thesis is, “To what extent do teachers support the basic psychological needs of students with deafblindness?” A second question is, “To what extent does need-supportive teacher behavior influence the motivation and engagement of students with deafblindness?” To answer these questions, we explore the following:

1. the basic psychological needs of students with sensory impairments;
2. the influence of teacher behavior on motivation, engagement, and learning outcomes of students with sensory impairments;
3. the extent to which an intervention enhances need-supportive behavior of teachers and the extent to which it also enhances motivation and engagement of students;
4. the manner in which need-supportive behaviors of teachers affect motivation and engagement of students with congenital and acquired deafblindness.

**THESIS OUTLINE**

Based on the objectives stated above, the thesis is organized as follows.

Chapter 2 describes the results of a systematic literature review focusing on students’ perceptions. In this chapter we describe the psychological needs of students with hearing impairments, visual impairments, or deafblindness. More specifically, we provide an overview of the available literature on the following: a) the extent to which students feel competent, autonomous, and related; b) the extent to which they perceive their classroom contexts as need-fulfilling; and c) the impact of the students’ perceived need fulfillment on their motivation, engagement, and outcomes in terms of learning, achievement, and well-being.

Chapter 3 focuses on the social context. This chapter contains a literature review concerning the extent to which teachers of students with hearing impairments, visual impairments, or deafblindness use need-supportive teaching strategies. It also describes literature on the effects of need-supportive teaching on the motivation, engagement, and outcomes of students in terms of learning, achievement, and well-being. In contrast to chapter 2, which addresses students’ perceived need support, this chapter focuses on the behavior that teachers actually display in the classroom to support the needs of students. Whereas the literature reviews in Chapter 2 and 3 also consider students with only hearing impairments or visual impairments, the rest of this thesis addresses only students with congenital and acquired deafblindness. We broadened the scope of the literature reviews to include both groups of students, as we did not expect to find much evidence specific to students with deafblindness.

Chapter 4 describes a newly developed teacher-focused intervention aimed at improving the need-supportive behavior of teachers, thereby enhancing the motivation and engagement of students. This chapter is based on results from pilot studies and a main study in which the intervention was tested. A multiple case study approach with a pretest, post-test, and follow-up design was used to evaluate the intervention effect. Video analysis and teacher questionnaires were used to assess improvements in the need support provided by teachers and in the engagement of students. Within-group and between-group differences (congenital versus acquired deafblindness) over time (pre-test versus post-test and follow-up) were explored.

Chapter 5 describes a detailed, in-depth analysis of the interaction between teachers and students, using a multi-method design. The aim of this chapter is to provide
additional insight into the manner in which teachers of students with congenital deafblindness capture and retain their students’ motivation for learning tasks. We describe the extent to which teachers support the need for competence, autonomy, and relatedness in students with congenital deafblindness. We also describe the influence of changes in teacher support on the engagement of students.

Chapter 6 presents results from an in-depth study of the relationship between teacher-student interactions and the motivation and engagement of students with acquired deafblindness. A multiple-case study and multiple method design were used to generate detailed insight into the relationship between need-supportive teaching behavior and student engagement in students with acquired deafblindness. As in chapter 5, we describe the extent to which teachers demonstrate need-supportive behavior and how this behavior influences the engagement of their students.

Chapter 7 provides a general discussion of the results of the studies described with regard to the research questions. It also addresses important limitations of the studies, along with the implications of the results and suggestions for future research.