SEPTEMBER 22-23 2022

EARLI SIG15 CONFERENCE

A VILLAGE TO TEACH A CHILD
-
THE INFLUENCE OF CONTEXTUAL FACTORS ON LEARNING AND DEVELOPMENT

Earli

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INCLUSIE IN-ZICHT

Content

Thursday Sept 22

	Sint-Aubertuskerk	Sint-Lucas	Sanctus Erasmus
8h30-9h00	Registration desk open		
9h00-9h30	**Opening speech** *Petra Warreyn*		
9h30-10h30	**Keynote** Parental engagement in learning: what we know, what we misunderstand, and what we need to know *Janet Goodall*		
10h30-10h50	Coffee break		
10h50-12h20	**Invited symposium** The need for parental involvement in realizing inclusive education: from start till finish *Sara Nijs*	**Symposium** Peer influence in children and adolescents with developmental disabilities *Gina Nenniger*	**Individual papers** Prediction
12h20-13h20	Lunch & Posters		
13h20-14h20	**Keynote** Promoting executive function skills in young children through classroom interventions *Megan McClelland*		
14h20-14h40	Coffee break		
14h40-16h10	**Invited symposium** A 360° view on inclusive education: exploring teachers' and students' views on inclusion from intercultural and disability studies *Wendelien Vantieghem*	**Individual papers** Learning problems 1	**Symposium** Classroom activities and teacher-student interactions: what role do they take in the development of children's self-regulation and executive functions? *Friederike Blume*
16h10-17h30	**Individual papers** Teacher's inclusive practices	**Individual papers** Learning problems 2	**Individual papers** Secondary education
	Reception		
	Conference dinner		

Friday Sept 23

	Sint-Aubertuskerk	Sint-Lucas	Sanctus Erasmus
9h00-10h00	Keynote It takes a village to raise a child: recent theoretical developments pushing the importance of contextual factors in studying children's development. *Martin Valcke*		
10h00-11h30	Invited symposium From context to collaboration: the role of school in supporting the well-being and mental health of young refugees, migrants and their families *Lucia Dehaene*	Symposium The role of teacher-related variables in the implementation of inclusive education *Susanne Schnepel*	Individual papers Behavioural and socio-emotional problems
11h30-11h50	Coffee break		
11h50-13h10	Individual papers Special educational needs	Individual papers Executive functioning	Individual papers School level & beyond
13h10-13h55	Lunch & Posters		
13h55-14h55	SIG15 business meeting		
14h55-16h25	Symposium Social referencing processes in inclusive classrooms *Jenny Lenkeit*	Individual papers Interventions	Symposium Integrating digital technologies into the assessment and teaching of students with intellectual and developmental disorders. *Béata Szenczi*
16h25-16h45	Coffee break		
16h45-17u15	Debate *Annemie Desoete*		
17h15-17h30	JURE award & Farewell *Dieter Baeyens*		

Keynotes

Context 1: parents and home environment

Parental engagement in learning: What we know, what we misunderstand, and what we need to know

Keynote speaker	Janet Goodall – Swansea University, Swansea, United Kingdom j.s.goodall@swansea.ac.uk

Janet Goodall (EdD) is professor in the Department of Education and Childhood Studies, at Swansea University. Her main area of research is family and parental engagement in young people's learning. She has researched, written and lectured widely on this topic, working with schools, families, local authorities and charitable bodies in the UK and further afield.

Her keynote will examine the research base around parental engagement in learning. It will also problematise both the research base and practice in the area, and set out discussion points for future research.

Context 2: Teacher and classroom factors

Promoting executive function skills in young children through classroom interventions

Keynote speaker	Megan McClelland – Oregon State University, Oregon, United States of America megan.mcclelland@oregonstate.edu

Dr. Megan McClelland is the Katherine E. Smith Professor of Healthy Children and Families at Oregon State University (OSU), USA, where she serves as Endowed Director at the Hallie E. Ford Center for Healthy Children and Families. Her research focuses on optimizing children's development, especially as it relates to children's executive function, self-regulation, and school success.

Her recent work has examined links between executive function and long-term outcomes from early childhood to adulthood, advances in measuring executive function, and intervention efforts to improve these skills in young children.

Her talk will provide current research about the importance of children's executive function and self-regulation for school readiness and success. It will focus on the malleability of executive function and the evidence base for interventions designed to improve these skills in young children. The talk will highlight classroom interventions that are practical, scalable, and include teacher-child interactions and activities that strengthen children's cognitive and socio-emotional development.

Context 3: Broader school and policy factors

It takes a village to raise a child: recent theoretical developments pushing the importance of contextual factors in studying children's development.

Keynote speaker	Martin Valcke – Ghent University, Ghent, Belgium martin.valcke@ugent.be

Dr. Martin Valcke is head of the department of Educational Studies at Ghent University. He is a full professor in instructional sciences and his research covers themes focusing on the micro-, meso- and macrolevel of learning and instruction problems. He is – since 2000 – (co)promotor of the PISA and PIAAC studies and as such involved in large scale school effectiveness studies. A large part of his research is set up in developing countries and deals as such upfront with challenging context to educate children. It takes a village to raise a child is in these context not but a statement.

An increasing number of theoretical frameworks stresses the importance of the context in studying and fostering educational development of children. The context interacts – in these models – with individual variables and accounts for a significant proportion of explained variance in critical outcome variables. We will explore a number of examples of recent studies. These focus on retention, learning loss due to COVID, and learning performance. Key is to identify operational variables in children's context that can be managed in educational settings. This calls for more complex perspectives in studying children's development and broader ways of setting up effective interventions.

Invited symposium sessions

The need for parental involvement in realizing inclusive education: from start till finish

Organizer	Sara Nijs – KU Leuven, Leuven, Belgium sara.nijs@kuleuven.be
Discussant	Sara Nijs – KU Leuven, Leuven, Belgium sara.nijs@kuleuven.be
Presenters	Laura Fluyt – KU Leuven, Leuven, Belgium laura.fluyt@kuleuven.be Mabel Giraldo – University of Bergamo, Bergamo, Italy mabel.giraldo@unibg.it Hanne Vandenbussche and Elisabeth De Schauwer – Ghent University, Ghent, Belgium hanne.vandenbussche@ugent.be elisabeth.deschauwer@ugent.be

Worldwide inclusive education is high on the agenda, although, realizing inclusive education for students with special educational needs is not always self-evident. It asks for professionalization of the school team and active involvement of all partners such as teachers, school counselors, and school leaders. Over the past years is has become clear that to realize inclusive education the active engagement of parents of children with special educational needs is essential. They are, as experts-by-expertise, seen as an important source of knowledge to adapt the school environment to the needs of the pupils with special educational needs. Despite the added value of parental involvement, scholars often report on the missing voices of parents in the inclusion trajectory of their child. Parents often indicate they do not feel heard or actively engaged.

In this symposium will be focused on the parental involvement at various points of the inclusive trajectory of pupils with special educational needs. By the start of the inclusive trajectory, various decisions need to be taken regarding how this trajectory will take form. Laura Fluyt, will present her study in which she focusses on the start of the inclusive trajectory by investigating the experience of parents regarding the decision-making process on reasonable accommodations for their child with special educational needs. During the inclusive trajectory it remains important to involve parents as this might increase the effectiveness of the learning of the child. Mabel Giraldo will describe her study in which she makes a call for a family-school co-responsibility action in promoting self-determination for children with disabilities. By the end of the inclusive trajectory at school, inclusion does not stop. In the final presentation of this symposium Hanne Vandenbussche and Elisabeth De Schauwer describe this transition from an inclusive school trajectory to an inclusive life path.

The experience of parents regarding the decision-making process on reasonable accommodations for their child with special educational needs: an interpretative phenomenological analysis

Laura Fluyt – KU Leuven, Leuven, Belgium

Theoretical background

Reasonable accommodations (RA) are a legal right, formulated in various national and international legislations, for students with special educational needs (SEN) in mainstream education. Recently, RA were included in the Belgium constitution, which further underlines the legal obligation on a national level. Consequently, students with SEN and their parents have the right to demand for RA to make the school environment more accessible, where RA refer to the adjustments or changes schools can make to compensate for every individual student's need. RA can take on many forms, like providing computer assisted software, assigning a buddy for a student or outlining an individual education plan (IEP). Notwithstanding the extensive types of possible accommodations, the CRPD indicates that RA should always entail individualized measurements that need to compensate for students' needs. Regardless RA are a legal right, students do not always receive the needed and individually tailored RA to maximize accessibility and to participate in mainstream education. This may be due to various difficulties experienced during the decision-making process on RA. First, the term RA is often not clear and ambiguously. Parents and professionals miss a strong legal background and recommendations on RA. Second, RA often strongly dependent on the school's policy on care for students with SEN. A policy that parents are often not familiar with.

Sometimes schools decide on using the same RA for students with various kinds of special needs, resulting in an approach that does not suit the student. Third, although there are the experts by expertise on their special needs, the students with SEN and their parents are often not invited by school professionals to discuss RA. As a result, parents and students are frequently not involved in the decision-making process on RA, despite the described benefits of parental involvement in inclusive school trajectories for children with SEN. Parental involvement is often associated with higher satisfaction in children, better learning and higher academic achievement. Especially in countries (e.g., Belgium and the Netherlands) were parents have the right to choose between special education or mainstream inclusive education for their child with SEN, parental involvement is crucial. This decision-making process on RA is often an ongoing, never-ending process for many parents, that once started when the first signs of a developmental delay were noticed. Although, many scholars have investigated the results or output of a decision-making process on RA (e.g., for students with an autism spectrum disorder) and are focusing on received accommodations for children with a specific disability, this inquiry attempts to grasp the decision-making process from the parents' point of view. We want to offer insight in how parents in their specific context, make sense of the decision-making process on RA. Thus, together with parents, we aim to look back on a process and focus on specific influential elements that have had an effect on the child's educational career. These specific elements include a possible diagnostic trajectory, the co-operation and communication regarding RA with school stakeholders, parents' expectations and satisfaction towards the school's care policy, and how all of this intervenes with the child's developmental needs at the time.

Research questions

(1) How do parents experience the decision-making process regarding RA for their child with special educational needs in primary mainstream education?

(2) Which factors affect the decision-making process regarding RA, according to parents of a child with special educational needs in primary mainstream education?

Methods

Interpretative Phenomenological Analysis (IPA, Smith et al., 2017) was selected as methodology to focus on the experiences of parents towards the decision-making process on RA. The main objective of the qualitative framework of IPA is to gain insight into the detailed lived personal experience of participants from a hermeneutic, phenomenological point of view. As a result, the focus lies on specific life events that have had an important effect on participants' lives. IPA prescribes a small homogenous sample with an ideographic focus. Therefore, between six to eight participants will be selected by a purposeful sampling technique. A semi-structured interview will be used to interview participants and interviews will be video recorded. Every interview will be transcribed verbatim and analyzed one by one, before moving to the next participant. The analysis starts with a specific coding phase applied for every interview, consisting of descriptive (the content), linguistic (specific language use), and conceptual codes (interrogative level). After, one moves to the next case before looking for patterns across themes and formulates more general claims.

Results and interpretations of findings

Interviews will be carried out between March and June 2022 with six to eight participant parents. We expect findings on the different experiences of parents when going through the decision-making process on RA and what has helped them in this process. Further on, we expect findings on the role of parents as contributors in this process and insight into influential (positive/negative factors) in the decision-making process on RA. The results and interpretations of this inquiry will be discussed later.

Promoting self-determination for children with disabilities: the Italian call for a family-school co-responsibility action

Mabel Giraldo – University of Bergamo, Bergamo, Italy

Self-determination (SD) is the person's ability to act as a causal agent in his/her life without undue external influences/interference (Wehmeyer 1992). SD is often critical for persons with disabilities for which to make decision, express their own values, preferences, and needs is often difficult due to their functional limitations and the (poor) opportunities offered by life contexts.

Even though SD is not generally explored in early childhood studies (Doll et al. 1996), key developmental milestones in early childhood reflect many of the same behavioral characteristics associated with it (Brown&Cohen 1996; Erwin&Brown 2003). Thus recently an ever-expanding research (Brotherson et al. 2008; Shogren&Turnbull 2006) suggests that acquiring life-long skills/behaviors associated with SD is an important priority for children with disabilities (CwD) (Erwin et al. 2009) and can play an essential part in creating a high quality of life as well as consistent opportunities to interact with the world in an active, meaningful, and highly

personalized way (Erwin&Brown 2003). Even though CwD cannot be fully self-determined early in life (Wehmeyer 2007), according to Palmer et al. (2013), prior to becoming causal agents in their own lives, they need to develop the three foundational SD skills: self-regulation; expressing/making choices or solving problems; and engagement. Particularly, collaboration between adults in both home and school is vital to promote these positive child outcomes (Palmer, 2010) and to provide supportive and coordinated environments (Turnbull et al. 2015).

This article discusses the importance of SD for CwD proving a framework to support SD across routines/tasks in different early childhood settings. In particular, the paper intends to reflect how SD skills/behaviors could be promoted today within the Italian schools in the light of the recent Interministerial Decree no. 182/2020, formalizing the national model of individualized educational plan (IEP). Indeed, the new Italian IEP includes a specific section dedicated to social/personal autonomy and its drafting requires the active participation of both CwD in the compliance with the principle of SD and the Operational Working Group for Inclusion (GLO) composed by school professionals and parents recalling the need for their joint, integrated and shared action to promote a real school/social inclusion.

Imagining transition after an inclusive school trajectory: young adults with a disability and their parents in search of an inclusive life path

Hanne Vandenbussche - Ghent University, Ghent, Belgium
Elisabeth De Schauwer - Ghent University, Ghent, Belgium

Theoretical background

In this research we follow three stories of young adults who are transitioning to a new phase in their lives after an inclusive school trajectory. The young adults and their parents chose very convinced for an inclusive path. This has not always been easy. On the road they were confronted with difficulties, possibilities and (un)expected events. At this point in their life a lot is changing. The structure the youngsters knew from school is disappearing. They must find out what they want to do and where this is possible. Together we look at the three stories. We focus on five emerging hotspots (Maclure, 2013) : need of putting passion and talent first; importance of selfdetermination-in-connection; qualitative and sufficient support; meaning of shared response-ability; and significance of a network.

Research questions

(1) How can these young with a disability following inclusive education and their family be supported in the complex transition process?

(2) Who is involved in this transition process and what role can each one of them play?

(3) What is important for a youngster with a disability and the parents in order to belong when known structures of school tend to disappear and the transition from school to a new situation demands attention (finding a job, studying, living alone, ...)?

Methods

Our method is one of collecting events (Deleuze, 1969). We walk together with the youngster and the family, we meet regularly and discuss how to proceed. Being on the road together and meanwhile trying to grasp important insights and steps. It concerns a form of postqualitative inquiry, where 'method' as such doesn't exist. Drawing on new materialist concepts as entanglement, response-ability, bring us the language to work from an ethico-onto-epistemology (Barad, 2007). It also means we stay very close to concrete small stories. By connecting in an intensive way, we can work from a relational approach where researcher, 'participant', other human and more-than-human beings are all being part of. We worked together with an artist to make drawings of the process. Making-thinking-doing are entangled.

Results

We focus on five important hotspots for Gabria, George and Wout and their families. These 'themes' arise out of each story: the need for putting passion and talent central; the importance of selfdetermination; support; the meaning of shared response-ability; and the significance of a network. The outcome is a little book where a draftsman approached the arising themes in order to move to the multiple layers present in these complex life stories. We wanted to transcend the very concrete material life stories to the more encompassing themes. The way the drawings interact with the stories and the concrete events is inspirational for other disabled youngsters and their family in this transition process.

Interpretation of findings

The results and interpretation of findings go hand in hand. Especially the connections between the drawings, the stories, theoretical input and the hotspots are bringing us more deep insights in the important foci we should consider as researcher and as support worker or school professional in the cooperation with the young adults with a disability and their parents.

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A 360° view on inclusive education: exploring teachers' and students' views on inclusion from intercultural and disability studies

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Inclusive education (IE) has gained international importance as an educational approach (Burns & Shadoina-Gersing, 2010). However, IE is a complex concept to grasp due to its continuous evolution. The most widespread use of IE is linked to the participation of pupils with disabilities in mainstream education, while the most recent formulation considers IE an educational system ensuring maximal learning opportunities for all students regardless of their background (Opertti, Walker, & Zhang, 2014). Despite this evolution, studies often focus on one group instead of a employing a broad definition of diversity (Messiou, 2017) and work on IE is hampered by a fragmentation across different fields, such as disability studies, intercultural & gender studies, sociology, pedagogy, and so on. Thus, an interdisciplinary approach is needed that brings together insights from different fields. Furthermore, insights would be deepened when research accounts for the interaction between agency & structure, accounting for the agency & experiences of both the student & teacher, as well as the context in which they operate and the systematic barriers this may create. This symposium wishes to present a more 360° view on inclusive education in two ways. First, by including research which considers students' experiences with IE, as presented by prof. De Boer, as well as research which takes teachers' perspective as its focus, presented by Dr. Van de Putte and Prof. Tudjman. Second, where the research of Prof. De Boer and Dr. Van de Putte departs from disability studies and focuses on SEN students, prof. Tujdeman departs from an intercultural perspective. By considering IE from these vantage points (i.e., the student & teacher perspective, and departing from intercultural & disability studies), we hope to contribute to an interdisciplinary view on IE with eye for common denominators as well as possible nuances stemming from these distinct perspectives.

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In, out or in between? Voices of special education students about their social inclusion when part-time attending regular education

Anke de Boer – University of Groningen, Groningen The Netherlands

Introduction

Implementing inclusive education is a challenge, especially for countries with a strong history of a segregated education system (Norwich, 2008). This is the case in the Netherlands: until now, app. 3,7% students with SEN attend secondary special education and this number even increased in the last years. To bridge the gap between special and regular education, to promote inclusive education, and to meet the cognitive and social-emotional needs of special education students, these students can attend both part-time regular and special education in The Netherlands. This form of education might promote students' social inclusion, particularly their acceptance and friendships with typically developing peers. Yet, research shows that the social inclusion of students with SEN in regular schools does not automatically occurs, which is particularly true for students with social-emotional and/or behavioral problems (Schwab et al., 2015).
Although much research has been conducted on the social inclusion of students with SEN (Van Mieghem et al., 2020), most research used self-report measurements. Studies in which students' voices are taken into account are scarce. Because of the right of students to be heard (article 12, UNCRC, Unicef, 1989), it is important to listen to students' voice in research and to act upon the insights this reveals (Bron & Veugelers, 2014).

Due to the increased number of special education students attending part-time regular secondary education (Van Veen et al., 2018), it is important to listen to students' voices and to gain insights in their experiences with this. In this presentation, we will share the results of an ongoing study in which we focus on students' experiences of attending part-time secondary regular education on the cognitive development and social inclusion. As the data-collection is currently still running, this paper only includes preliminary results. At the EARLI SIG15, the final results will be available and presented at the symposium.

Method

A qualitative study was set up to examine students' experiences with attending part-time regular secondary education. A total number of 20 special education students are part of the study. These students were recruited from seven schools for secondary special education. All students are formally assessed as having social-emotional and/or behavioral problems, or psychiatric disorders and all are officially referred to secondary special education.

We used a semi-structured interview, including topics as the impact of part-time regular education on their cognitive development and social inclusion. After transcribing the interviews, thematic analysis was conducted (Braun & Clarke, 2006).

Results

Preliminary results show that students are, in general, positive about attending part-time regular education. Some students indicate that the lessons at the regular school are more quiet, compared to special education. Regarding the social inclusion, students indicate to feel accepted by peers, and have friendships with peers at the regular school. Moreover, their social self-concept is evaluated positively.

Conclusion

The first results indicate positive experiences of special education students with attending part-time regular secondary education. However, the results of the analysis of the final sample should give more and deeper insight in their experiences.

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Sami the Incredible Hulk: bringing in new thoughts in teachers' professional development

Inge Van de Putte – Ghent University, Ghent, Belgium
Elisabeth De Schauwer – Ghent University, Ghent, Belgium

Introduction

The Flemish context in particular is characterized by a strong historic tradition of assessing special educational needs and pull-out practices, which has led to the highest percentage of children being referred to special schools all over Europe with an over-presentation of children with social and behavioural needs (De Schauwer, 2017). Learners who differ from the standard are seen as 'less valuable' or even 'non-educable, unmanageable or too violent' to stay in the regular school. If these systemic social and school inequities are not challenged, teachers' beliefs seem to remain unchanged and even though teachers organize their classroom practices differently, exclusionary practices still prevail. As teacher beliefs are relatively stable conceptions and are experienced to be true by teachers, they act as a filter through which teachers decide on the more or less inclusive actions they undertake (Roose et al, 2019). Therefore it's important to position the teacher as an active agent in professional development initiatives. To see them as agents of reforms rather than objects that need to be informed about different labels, training in new techniques, etc, with the idea that those specific competences will drive behavioural change.

Over the last five years we have been involved in several professional developments projects (GOL(L)D), to become competent in a support concept with a strong focus on achieving shared responsibility to teach all students. We work in a groups of 10 teachers and SENCO's. They process the content collectively and also carry out action research.

In another research project Potential, we were involved with Ellen Vermeulen in creating a documentary about 'missing voices', presenting the narrative of four children and their parents. In our professional development about the support concept GOL(L)D, we use the documentary to provoke a dialogue between teachers and SENCO's. We pay special attention to Sami, a boy with social and emotional needs. Normally, we let the reactions stand as they are, and have faith that the documentary will affect viewers and maybe change minds towards a more inclusive way of thinking. In ten groups, we experimented with working differently to bring in new thoughts. We asked ourselves: 'How can we think critically?' and answered the question: 'By not pathologizing the problem, but looking for the line of forces in relation to one of the children, Sami'. We set up a community of inquiry and plugged in Shildrick's (2002) concept of 'monstrosity' to make visible the ambivalent processes through which difference is abjected and at the same time reclaimed.

Method

We used the community of inquiry to examine teachers ' responses and perspectives. For instance, in the dialogue with teachers we reflect on the question: 'What does the concept of monster produce?' We analyzed how they looked at children with social and emotional needs, classroom practice and how a professional view was broadened.

Results

In the professional development, the collective work of watching the film, employing the concept of monster and reflecting upon its mutual entanglement with other agents, helped teachers and SEnco's to become aware of their own thinking and acting. The attention shifts from disability to connections, to move away from guilt and individual responsibility, instead a relational discourse comes to the foreground.

Conclusion

By bringing in new thoughts and concepts in the professional development of teachers, we refuse the 'inclusion phobia' (Goodley, 2017) about children with emotional and behavioural needs and open up the response-ability of

teachers to the question: 'What is needed to see the human in all his entanglements?' Inclusion is not only about having the competence to differentiate, to manage a group of students, but also about reflecting on our own positions.

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Inclusive and diversity-sensitive education

Tom Tudjman – Erasmus University Rotterdam, Rotterdam,The Netherlands

Introduction

Countries face challenges in catering for the diverse needs of migrant students and narrowing the gaps in education outcomes between native students and immigrant students. (Inter)national evidence suggest that strategies to raise education outcomes for migrant students need to focus on school level and system level. The objective of an Erasmus+ project NAOS (2014-2017) was to strengthen professional capacity in nine European partner countries and their respective schools.

Theoretical Framework

A mapping exercise was conducted to find out to what extent and in what ways teacher training institutes for primary education in nine NAOS countries prepare teachers for teaching in diverse classrooms. The five areas of expertise as described by Severiens, van Herpen and Wolff (2014) were used as a theoretical framework. This framework suggests that in order to be an effective teacher in diverse classrooms, one needs expertise in the areas of language development, pedagogy/didactics, social interaction and identity, parental involvement and school-community relationships.

Questions

Our NAOS Handbook (Severiens & Tudjman, 2017) shows that developing policies and curricular adaptations at the national level is not enough for closing the achievement gap between native and immigrant students. It also needs institutional changes, made within every school, including changes in school leadership, teaching methodologies and school-home co-operation. NAOS examined the following questions: (1) What kind of institutional changes inside schools are needed by looking at the professional capacity in schools? (2) What can teachers practically do in their diverse classroom?

Methods

NAOS has conducted several activities and produced several outputs. Within these activities, a distinction was made between initial teacher training and professional development. In two separate scoping exercises, the partners collected good practices in initial teacher training for primary education using a designed set of indicators. For professional development, ten study visits in the nine partner countries were conducted. In these study visits, good practice schools were visited using methodology specifically developed for these visits (using a theoretical framework, a setup and an interview instrument).

Results and Interpretation of findings

The project NAOS shows that strengthening professional capacity with the aim to stimulate school success among diverse groups of migrant students asks for expertise in five content areas.

1.
    a. Teachers in classrooms with a diverse student populations should first of all know about language development in classes of pupils whose first language is not the language of instruction.

   b. They should then incorporate mother-tongue education to become inclusive using multilingual learning materials as well as the option to use other languages during the lessons.
2.
   a. These teachers should be competent in using pedagogic and didactic resources that support the learning of all their pupils. Diverse classes need different didactic resources and different types of instruction than homogeneous classrooms.
   b. If schools and teachers are committed to encouraging the talents of all their pupils they should have knowledge of the use of teaching materials, methods and types of instruction designed for diverse classes. Encourage teachers to use different teaching strategies. Techniques like project-based learning, differentiated instruction and blended learning all allow teachers to help learners with different needs.
3.
   a. Urban teachers should know about social psychology issues such as stereotyping, teacher expectations and ethnic-identity development issues.
   b. Make sure all students are participating in the classroom discussion and activities. It is sometimes difficult to tell if one group is participating more or less, so encourage teachers to track class participation and adjust as necessary.
4. Urban teachers that succeed in engaging the parents of their diverse pupils as well as cooperate with community organisations on a basis of equality will further support school achievement in their urban schools.
5. The NAOS partners concluded that if schools are committed to increase achievement among migrant groups, and to close the achievement gap, they should facilitate high levels of professional capacity in these areas of expertise.

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From context to collaboration: the role of school in supporting the well-being and mental health of young refugees, migrants and their families

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Supporting the well-being of refugee and migrant minors represents a growing challenge in many European host societies. Research on the mental health of young refugees and migrants highlights their at-risk mental health status. Related to home and host society stressors, young refugees and migrants in Europe experience high prevalence of posttraumatic stress disorder and a range of internalizing and externalizing behavioral problems. Developing care modalities to adequately meet these mental health needs, scholars increasingly point to the school context as a key locus for mental health care provision.

This symposium first situates mental health profiles of refugee and migrant populations within Belgian and European school settings, presenting findings from two recent European studies and documenting the role of contextual factors in mental health difficulties (e.g., classroom climate, daily stressors, discrimination). Further, we discuss the emerging scholarly interest in school-based mental health interventions.

This symposium presents the work of different scholars. First, de Smet presents a thick description of teachers' and refugee parents' perspectives on the role of schools in mental health. Second, Spaas discusses two studies on the effectiveness of school-based creative interventions in supporting refugee and migrant mental health. Third, Soye & Watters present Peer Integration and Enhancement Resource' (PIER) and share qualitative findings from an implementation of this intervention in the United Kingdom. Finally, Verbiest describes an emerging practice of school-based collaborative mental health care, wherein mental health care providers, school partners collaborate and refugee families engage in a joint assessment of child development, joint intervention planning and provision.

This symposium reflects state of the art developments in the field of school-based mental health care for refugee and migrant children, answering to the need for more evidence on preventive school-based mental health interventions through a contextualized perspective on refugee and migrant mental health.

Teachers' and parents' perspectives on the role of school in shaping refugee and migrant children's mental health: a qualitative exploration

Sofie de Smet – Ghent University, Ghent, Belgium

A growing body of research stresses the potential preventive and curative role of the school's social arena in the mental health of refugee and non-refugee immigrant children and their families. This has given rise to a diversity of school-based mental health interventions, including creative expression interventions. Fostering expression and the relational dynamics at stake in children's school trajectories within the relationships between peers, their teachers and parents cover key objectives in the process of improving children's well-being in creative expression interventions. To data, the evaluation of these interventions has however mainly focused on children's individual symptomatic functioning and teachers' and parents' understanding of creative expression interventions remains largely unknown. With this study, we aim to further the development of creative expression interventions as a school-based intervention to promote the well-being of refugee and immigrant children in European multi-ethnic societies. Herein, we particularly stress the importance to embrace the voices of teachers and parents in developing and evaluating such interventions and explore their voices in furthering the understanding of salient relational dynamics in working with creative expression interventions.

Therefore, we conduct a qualitative exploration within a larger intervention study on the implementation of a creative expression program in three Flemish reception schools. We explore parents' and teachers' perspectives on the role of the school and central relational processes within the school context in supporting child well-being in the aftermath of migration. Second, we aim to scrutinize parents' and teachers' understanding of the potential role of a creative expression intervention in fostering children's mental health in the context of migration and the life in exile with a particular focus on these relational dynamics between them. In order to do so, focus groups were set up with teachers ($N = 7$) and parents ($N = 16$) of the intervention condition. Qualitative data-analysis consisted of a cross-case inductive thematic analysis approach to explore teachers' and parents' lived experiences of the role of the school in supporting child well-being and the role of the intervention in supporting child-wellbeing.

In our analysis, we observed that for both parents and teachers the school arena offered the important opportunity for children to rebuild elements of trust and safety and to foster emotional expression in the new environment. Remarkably, parents expanded the potential role of the school context in supporting psychosocial well-being to a more societal scope by particularly foregrounding how the classroom as a culturally diverse micro-cosmos may assist children in the process of integration in the host society. In this respect, our findings on the potential role of a creative expression intervention strongly resonate with how parents understood the role of the school and school trajectories in coping with histories of migration in a multicultural society. Indeed, both parents and teachers allocated an important role to the intervention as a pathway to foster children's emotional expression. But similarly, listening to the voices of parents, we observed that parents explicitly broadened the potential scope of the creative expression intervention in the school beyond a focus on children's individual well-being maintaining a broader societal lens on school-based interventions.

In sum, with this study, we aim to contribute to the evidence base for creative expression interventions in schools and delineate its role as an important vehicle for the promotion of well-being as well as a forum to discuss current social conditions, promote cultural belonging and social integration of refugee and non-refugee immigrant children and their families, fostering the transition into the host society across generations.

The effect of school-based creative intervention programs on migrant and refugee children's and adolescents' mental health and social relationships

Caroline Spaas – KU Leuven, Leuven, Belgium

Studies increasingly document the at-risk mental health and development of refugee and migrant children and adolescents in Europe. Both scholars and policy-makers are turning their attention to fostering young refugees' and migrants' well-being and development through effective preventive psychosocial intervention. For children and adolescents, schools are identified as being in the fore in providing psychosocial support, reflected in the development and scientific evaluation of different modalities of school-based psychosocial care provision. School-based creative expression interventions constitute a particular type of school-based psychosocial intervention showing promising results. However, scholars delineate the need for larger and controlled studies, and for researchers to adopt a broader scope in striving to understand these interventions' effectiveness. Here, scholars recommend for researchers not to look only at children's levels of mental health symptomatology as a central study outcome, but also to consider interventions' effectiveness impacting central social determinants of refugee and migrant children's and adolescents' mental health in resettlement (e.g., social support, belonging, detrimental relational experiences such as discrimination and social exclusion).

Answering to this scholarly call for a larger and more nuanced evidence-base on the effectiveness of school-based mental health interventions, this contribution presents empirical findings from two cluster-randomized control studies on school-based creative interventions developed at McGill University in Canada. The first study looks at a creative expression program implemented in three urban primary schools in Belgium in relation to children's mental health and the social climate in the classroom. The second study, part of a European Horizon2020 project called *RefugeesWellSchool*, examines the effectiveness of classroom drama intervention in secondary schools in Belgium, Denmark and the United Kingdom in fostering both mental health and the quality of adolescents' social relationships. The findings from both studies point to school-based creative interventions' potential to impact refugee and migrant children's and adolescents' social relationships, both at home and in the classroom.

Introducing PIER: Peer Integration and Enhancement Resource

Emma Soye – University of Sussex, Sussex, United Kingdom
Charles Watters – University of Sussex, Sussex, United Kingdom

The 'Peer Integration and Enhancement Resource' (PIER) is one of several psychosocial support interventions which were implemented and evaluated in UK and European schools through the 'RefugeesWellSchool' project. The PIER intervention aims to encourage empathy and understanding for the experiences of migrants and refugees through stories, videos, role-plays, and other activities in the classroom. In recognition of the complexity and fluidity of 'identity', the intervention also encourages young people from diverse migration backgrounds to reflect on their multiple and intersecting differences and similarities through various forms of group work and discussion. The PIER intervention was designed by Professor Charles Watters and dr. Emma Soye at the University of Sussex in the United Kingdom. In this symposium, Charles and Emma present the PIER intervention, describing its theoretical underpinnings and the process of intervention design. They also draw on empirical qualitative research to show how young people in a United Kingdom school engaged with the PIER intervention, highlighting contextual factors influencing the intervention's effectiveness in this setting and briefly outlining implications for psychosocial support policy and practice.

Developing school-based mental health intervention in collaborative care practice with refugee families

Siel Verbiest – KU Leuven, Leuven, Belgium

Scholars increasingly point towards schools as meaningful contexts in which to provide psychosocial care for refugee children. School-based collaborative mental health care (SCC) constitutes a particular school-based mental health practice developed in Canada. SCC revolves around the formation of an interdisciplinary and intercultural support network, in which specialized mental health care providers, school partners, relevant professional or non-professional partners and refugee families engage in a joint child developmental assessment and joint intervention planning and provision. As such, collaborative mental health care aims to move away from an individual perspective on refugee children's development, towards a contextualization of children's psychosocial and school-related functioning against the background of families' migration histories, cultural identifications, and social condition in resettlement.

This contribution describes a developing implementation of SCC practice in schools in Leuven, Belgium. We first provide a detailed description of the intervention, developed through an integration of SCC practice and case-based reflections with scholarly literature on transcultural and systemic refugee trauma care. Second, we present

the results of a co-constructed case analysis of case work collected through the SCC practice in Leuven schools. We engage with preliminary evidence on central processes and working mechanisms at play in SCC, emphasizing how SCC may mobilize the school context and family-school interactions as important vehicles for the restoration of safety and stability in the wake of collective violence and forced migration. We conclude by outlining interesting avenues for future research emerging from our findings, such as the examination of power dynamics at play in collaborative mental health care practices and gaining a further in-depth understanding of child development in the context of forced migration.

Symposium sessions

Integrating digital technologies into the assessment and teaching of students with intellectual and developmental disorders

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Digital technologies are bringing massive changes to special education (Hasselbring & Glaser, 2000; Cheng & Lai, 2020). Accessibility, accommodating educational needs, personalization of materials, and providing independence for individuals with disabilities are just some of the buzzwords that describe how these rapidly changing technologies assist students with special educational needs. The aim of this symposium is to extend our knowledge regarding beneficial ways of integrating digital technologies into the practice of assessing and teaching school-aged children with intellectual and developmental disorders. The four presentations of the symposium represent four different ways (Csapó et al., 2008) of integrating computer-based technologies. In the first paper speech perception of students with mild intellectual disabilities was assessed using standard but manipulated (white noise, narrow frequency, artificially accelerated) sound recordings to ensure same sound quality for all students independent of the administrator of the test. Using a digital interface and technology for collecting data is also beneficial when collecting self-reported data on sensitive topics. In line with this, the second paper presents the results of two studies in which the validity and reliability of a computerized measure of self-concept are analyzed with a sample of mild intellectually disabled children. The third paper discusses users feedback on software that enables the exploration of learning communities' peer relationships in a way that does not disproportionately burden the participants and provides equal access for students with special educational needs. Finally, the fourth paper employs live animation where students interact with an avatar to learn social skills. The four studies are contrasted in terms of how they make use of digital technologies, but all yield valuable information on how students can benefit from it.

Analysis of speech perception processes in children with mild intellectual disabilities

Mónika Macher – Eötvös Loránd University, Budapest, Hungary

Children with mild intellectual disabilities (MID) may show a developmental delay in elementary basic skills (Mesterházi, 2021). The developmental characteristics that determine the cognitive activities of children with MID also affect the quality of perception, execution and emotional domain. Accordingly, there are differences to be found in language competence in comparison to children with typical development, including speech perception, processing and vocabulary (Boets et al., 2010; Punnoose et al., 2017; Short et al., 2003).

The hierarchical and interactive model of speech perception (Mády, 2013; Pléh, 2014; Shannon & Howard, 2014) provides the basis for a standardized test series developed in Hungary widely used in speech perception research as well as diagnostic work with children, which allows the description of the separately and interactively

functioning levels of speech perception and speech comprehension. The GMP diagnostic test of speech perception (Gósy, 1995/2006) diagnose the functioning of each of the three levels of speech perception: acoustic detection is examined by sentence and word identification in white noise subtests, phonetic perception by narrow frequency (2,200-2,700 Hz) sentence identification subtests, and phonological perception by artificially accelerated (+20%) sentence identification subtests. The two lower (syntactic and semantic) levels of speech comprehension are tested with sentence comprehension (non-verbal test) and text comprehension subtests (verbal). Standard sound recordings ensure the same sound quality for all children. The level of interpretation and association functioning can also be inferred from the performance in this latter subtest. From the age of 7 the expected standardized value in all subtests is 100%. The Objective of the research was to pilot the GMP in a sample of students with MID and to map the speech perception processes of 7 and 10 year-old children with MID studying in integrated education settings. Participants were 50 children aged 6;10-7;4 and 50 children aged 9;10–10;4 with MID receiving integrated education. Children (50/50) who attended the same class or grade with average abilities served as the control group in both examinations.

All students were able to take the whole test, and all children tested were affected by a deficit/interference at some level of perception/understanding. Results also show that compared to the expected performance at their age, the delay of children with MID in functioning of speech processing mechanisms is an average of 3.5 years at age 7, and is higher at age 10. The average performance in speech comprehension is significantly higher than in speech perception. Acoustic and phonological perception results are remarkably weak.

Average speech processing results of children with MID show a significant difference between age 7 and 10, on the benefit of 10-year-olds. The average of 7-year-olds is 52.14% compared to the 58.66% average result of 10-year-olds. ($t = -2.252$, $p = 0.027$). The severity of perceptual dysfunction is indicated by a decreased performance in phonological perception compared to phonetic perception results. Precise knowledge of the type of dysfunction helps in planning and predicting the duration of therapy. Values inferred from the results of 7-year-old children with MID indicate very severe delays and require several years of intensive development.

Data from the present research confirm that a weaker perceptual performance shows closer correlations between processes (Gósy, 2017; Krepsz, 2013). Findings also demonstrated that in the case of atypical development, processing is only capable of functioning – even at a low level – if the sub-processes form a constant-strengthening relationship, they function in close cooperation, where relative independence of processes represents qualitative change. This trend cannot be observed in the activation of mental vocabulary, so that development is ensured by autonomous processes. Findings indicated that the teaching methodology used in inclusive education might not always be suitable for the development of an integrated child's abilities. In case of the examined children, a careful selection of the method for reading instruction would require particular attention, one that takes the quality of the spoken language into account along with a speech-based balance. In the examined target group, intellectual disability affects productive and receptive aspects of speech, hindering communication and increasingly worsening cognitive disposition.

Computer-based assessment of the multicomponent hierarchical self-concept for students with mild intellectual disabilities

Beáta Szenczi – Eötvös Loránd University, Budapest, Hungary
Éva Bank – Eötvös Loránd University, Budapest, Hungary

The role of self-concept in the school outcomes of typically developing students have received been focused on in educational literature in recent decades (e.g. Marsh, Pekrun, Murayama, Arens, Parker, Guo, Dicke, 2018). However, less research has focused on the self-concept of students with atypical development. Besides the lack of research, existing results are inconclusive and available studies have several weeknesses, including that very few studies demonstrated validity and reliability for youth with intellectual disability (Maiano et al., 2018). The most commonly used instruments for the assessment of the hierarchical, multidimensional self-concept are Self-Description Questionnaires. A modified, individually administered version of the self-report SDQ-I proved to be valid for students with MID, but the administration of the questionnaire takes appr. 30 minutes per participant, a lengthy procedure for a large-sample study or a practitioner with a class of students with MID with little independence provided for respondents in the process (Tracey & Marsh, 2002). As computer-based self-report questionnaires in special education has promising results (e.g. Tanis et al. 2012), the aim of this research was to pilot a computer-based version (Józsa, Szenczi & Kis, 2014) of the Hungarian adaptation (Szenczi & Józsa, 2009) of the Self-Description Questionnaire (SDQ-I, Marsh, 1992) among students with MID. This presentation discusses the applicability and the psychometric properties of the computerized SDQ-I questionnaire in a sample of Hungarian students with MID. The research questions were: (1) Is the computerized questionnaire applicable for individuals with MID? (2) Is the computerized questionnaire a valid and reliable tool for the assessment of the multidimensional, hierarchical self-concept of individuals with MID?

The study used the Self-Description Questionnaire-I (Marsh, 1992). The computerized version of the questionnaire reads items from the questionnaires to students who then respond by clicking on a pictogram of a Likert scale. Each statement is shown on a separate screen. Students can also click on a small audio icon to listen to the statement of the questionnaire again. Before the data collection began, participants watched a short video explaining how to fill in the questionnaire and a sample item was used to practice the independent use of the interface. To analyse the factor validity, reliability and appropriateness of the computerized questionnaire, two pilot studies were carried out. In pilot study 1, the original questionnaire with the 73 items were used, and students were asked to respond on a five-point Likert-scale. Pilot study 2 used a questionnaire in which negatively worded items were deleted, and students were asked to respond on a three-point Likert-scale. Pilot study 1 involved students (N=87) with MID in grades 6, 8 and 10 about half of whom were educated in regular education at the time of data collection. In the second pilot study there were 163 students with MID in grades 4, 6, 8, 10, 12.

Both studies provided evidence for the applicability of the computerized questionnaire for students with MID. Fill-out rates were quite high, almost every student get to the end of the questionnaire. Exploratory factor analyses were carried out to identify factors based on data. In pilot study 1 the results of factor analysis partially supported the structure of the questionnaire (KMO=0.75): the self-concept components at the lower levels of the Marsh/Shavelson hierarchical self-image model on which the questionnaire is based were separated in the factor structure, but statements related to general school self-concept and general self-concept were organised into four factors instead of two. Negatively worded items loaded onto a separate factor, and some statements, which were more complex in their linguistic form, were also separated. Reliability coefficients (Cronbach's alpha) of the scales ranged from 0.73 to 0.89, which is acceptable but lower than those usually obtained on samples of typically developing learners (Józsa, Szenczi & Kis, 2014). Both the factor structure and the reliability analysis justified the omission of negatively worded items and the rewording of some items. In a pilot study two we also performed exploratory factor analysis to explore the relationships between items with different content (KMO = 0.81) Some of the items in reading, math, and school self-concept were mixed. The items which refer to subject attitude separated from the other components of reading self-concept. Similar to study1 some of the negatively worded items separated into an independent factor, and some items of different types of self-concept also formed own factors which maybe caused by complex wording. The reliability coefficients (Cronbach's alpha) of the scales ranged from 0.76 to 0.91. Results suggest that the computerized SDQ-I may work well for students with MID when applying the five-point pictorial Likert scale and omitting negatively worded statements. The computerized SDQ-I may be employed in future research and by practitioners and educators working with students with MID.

Using an ICT-based peer nomination method from the perspective of students

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In Hungary students with special education needs (SEN) are increasingly learning together with their peers in general schools/institutions (Hungarian Central Statistical Office, 2019), like in other countries (Schwab, 2018; Williamson et al., 2020) It is important to understand how peer relationships among students with SEN develop, as this can affect many aspects of their school life, such as their academic achievement (Wentzel et al., 2018), the development of their communication and social skills (Daley & McCarthy, 2021), and their later social inclusion (Giesbers et al., 2019). Some research suggests that achieving good social relationships is much more difficult for SEN students than their typically developing (TD) peers (Nepi et al., 2013), so teachers may have a role in supporting these peer relationships.

Information and communication technologies (ICT) are an increasingly important concept in integration research (Virányi, 2014). In Hungary the spread of ICT tools in the field of special education can be observed not only in the use of educational technologies, but also in the field of assessment (e.g. Borsos et al., 2019; Mohai et al., 2016) and disability-specific support (e.g. Havasi et al., 2019). Sociometric methodologies based on ICT tools are becoming increasingly important in learning about the social relations of students with SEN (van den Berg et al., 2015; van den Berg & Cillessen, 2013). However, extensive data collection, even consisting of multiple sets of questionnaires, is still often used to examine peer relations (e.g. Azad et al., 2017), which raises the issue of disproportionate burden on participants and does not always ensure equal participation of some groups with SEN in the research.

The primary goal of the SMETRY framework we have developed (Horváth et al., 2016, 2019) is to ensure that the learning communities' peer relationships are explored in a way that does not disproportionately burden the participants and provides equal access for students with special educational needs. To ensure this, we developed an ICT-based data collection process based on the peer nomination sociometric methodology that implements

data collection without literacy using photographs of participating children to construct a repertoire of choices. Data can be collected in individual or group settings using a PC, tablet or smartphone. The data collection process gained its current form after a multi-stage adaptation, in which it was important to be applicable in the communities of students with intellectual disabilities (Almási et al., 2018; Horváth et al., 2016, 2019).

In the development of the SMETRY framework, we paid particular attention to students' feedback on the data collection process, in order to create the least burdensome environment for them. As part of this, three questions on user experience are presented to participants after each data collection. In this study, we focus on the analysis of the answers to these three questions. The research questions were: (1) How do the participating students feel about the data collection process we have developed? (2) Have we succeeded in creating a favourable data collection environment for students with special educational needs?

In the present study, we analyse the sociometric data of 23 integrated (271 TD students and 56 with SEN) and 15 special educational (83 students with SEN) class communities (grades 1-8) based on peer nomination. Data were collected in individual (grades 1-3) and group (grades 4-8) settings using PCs. In the individual data collection situation, the questions were read by teachers and students marked their answers by clicking on their peers' photos; in the group situation, students read the questions themselves and marked their answers by clicking on their peers' names. Both data collection situations ended with 3 questions on user experience, where students could mark their answers by clicking on pictograms, where the pictograms corresponded to a scale from 1 to 5.

On the question on participation ("How much did you like the task?"), both students with SEN in integration ($N=56$, $mean1 = 4.21$) and their typically developing classmates ($N=271$, $mean2 = 4.42$) gave a high score with a small difference ($U = 6787$, $p = 0.047$, $r= 0.015$). For the question on fatigue ("How tired did you feel during the task?"), both groups gave similarly high scores ($mean1 = 4.29$, $mean2 = 4.49$) with no significant difference ($U = 6806$, $p = 0.204$). For the question on choice repertoire ("How easy did you find the person you were looking for?"), both groups scored lower than the other two questions ($mean1 = 3.95$, $mean2 = 3.95$). Analysing the responses of students with SEN in integration ($N=56$) and special education ($N=83$), we found differences in participation ($U = 1773$, $p = 0.005$, $r = 0.04$) and choice repertoire ($U = 1703$, $p = 0.003$, $r = 0.04$). In our presentation, we will further analyse these differences and explore the underlying reasons by examining further details of the data collection. Our results show that students with SEN in integrated settings are less likely to participate in ICT-based peer nomination than their peers in special education. For them, the choice repertoire was also less helpful in the data collection process. However, the results show that a user-friendly data collection process has been developed in which both students with SEN and their peers are keen to participate.

Exploring the use of live animation and virtual characters (Avatars) to increase engagement and teach social skills to individuals with disabilities

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Research has established that competence in social exchanges is one of the key components of academic success and school engagement (Kindermann, 2007); however, for some individuals with disabilities, deficits in social skills can have detrimental impact in other domains as well (Hsiao, Tseng, Huang, & Gau, 2013). Especially for those diagnosed with autism spectrum disorder (ASD) or intellectual disability (ID). As is evidenced by the literature some individuals with disabilities lack adequate social skills which impacts all aspects of their life. One method showing promise to teach social skills is live animation. Live animation is where students interact with an avatar that is being controlled in real time by another person. So imagine that the student is in a room and talking to an avatar (think Finding Nemo) on a TV screen and the character is able to carry on a conversation with the student that is natural and not scripted. The avatar can also deliver instruction such as coaching the student in the appropriate ways to start, maintain and end a conversation or how to read facial expressions ("this is what I look like when I am sad"). Utilizing live animation and avatars has the promise of reaching some students more effectively that a human could and therefore would lead to increased learning opportunities. The students can then generalize what they learned from the avatar to interactions with other humans. This project explored the effectiveness of live animation as an instructional method, whether virtual learning/live animation is cost effective compared to traditional video modeling and face-face teaching methods.

Research questions

(1) Do individuals with disabilities engage differently with an avatar than they do with humans
(2) What are the effects of utilizing live animation in teaching social skills? (3) What is the social validity of using live animation and avatars to teach social skills? The participants were six students (age 9-11) who met the inclusion criteria of having ASD and deficits in social skills.

Research design

A single-subject multiple probe across behaviors design was utilized. The IES quality indicators of single subject design were followed. Measures: Assessment and data collection were completed through direct and recorder observations.

Results

Data demonstrates that all six participants had higher levels of engagement with the avatar than they did with the human and that live animation and avatars is an effective way of teaching social skills. All six participants acquired and maintained the targeted social skill (initiating a conversation) demonstrating a functional relation between an increase of social skills and the intervention. Some students demonstrated immediate task acquisition while others took several sessions to meet criteria.

Discussion points: This study indicated that students with disabilities had higher levels of engagement with avatars than humans leading to the possibility that avatars could be an effective potential instructional tool. Results also showed live animation and avatars to be an effective method of teaching social skills to students with disabilities. Understanding this new promising intervention and technology will allow teachers more options when teaching social skills to their students. There is also the potential that this method may be effective for some students that may not respond to other existing intervention.

Social referencing processes in inclusive classrooms

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Teachers create cognitive and emotional links with their students through their implicit and explicit interactions in everyday school life. Social Referencing Theory (Webster & Foschi, 1992) can frame these interactions, according to which children perceive the teacher's displays of like and dislike towards other children and may use them for their own formations of attitudes and behaviour. The need for a social referent is higher, the less experience a student has him-/herself with the concerned object (Huber, 2011; Hughes et al., 2001). Therewith, the theory may be of high explanatory value in the ongoing process of implementing inclusive education in Germany and Switzerland. In this context, social referencing can also further explain evidence showing that students with special educational needs (SEN) are of higher risk of social exclusion (Bossaert et al., 2013). With its three contributions this symposium aims to map out the relevance of the teacher as a referent in promoting aspects of social participation among students in inclusive classrooms.

The first paper investigates if teacher's feedback on social behaviour and social learning goals relates to students' peer acceptance. Using data from Switzerland, they unexpectedly found that feedback on correct social learning goals lead to a decrease of peer acceptance.

The second paper examines if peer-perceived teacher feedback is associated with social acceptance. Using data from Germany, they found that students were more socially accepted the more their peers perceived them to receive positive feedback from their teacher.

The third paper investigates the relationship between teacher and student attitudes towards inclusion and their effects on classroom climate. Using data from Germany, they found that student attitudes predicted.

Teacher feedback behaviour and peer acceptance in elementary classrooms

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In classrooms students get the opportunity to learn next to their peers and to be considered full members of the peer group. However, many studies reveal that some students are more often rejected and are less accepted by peers than their classmates (Grütter et al., 2015; Koster et al., 2010). Reasons have been found at different levels. On the individual level, students with poor social skills seem to struggle in the peer group (Garrote, 2017). In addition, students who are more rejected by peers are more likely to experience subsequent peer rejection (Cillessen et al., 2000). On the classroom level, there is increasing evidence for the influence of teacher behaviour (e.g., feedback) in social processes among students (Farmer et al., 2019; Huber, 2013). Social referencing theory states that children tend to base their understanding of a situation on their perception of how adults interpret it (Feinman, 1992; Hughes et al., 2001). Thus, students decide whether to like or dislike a classmate based on the perceived interactions of the teacher with the classmate. Consequently, students' acceptance by their peer group depends on how their interactions with the teacher are perceived by peers (Hendrickx et al., 2017; Hughes et al., 2014). However, studies on social referencing processes in realistic settings are scarce. In addition, little is known about the types of feedback (e.g., correct vs. incorrect; on social behaviour vs. on achievement) which affect peer acceptance. Furthermore, it is not clear whether teachers facilitate peer acceptance through their feedback and/or whether they reinforce social rejection.

Research question

To what extent do different types of teacher feedback behaviour (i.e., correct vs. incorrect, on social behaviour vs. on social learning goal) predict students' peer acceptance and rejection, controlling for students' social skills and previous peer acceptance and rejection?

Methods

The data used for this study was drawn from a longitudinal study in Switzerland. Data from two waves within a school year of 18 teachers in 18 elementary classes (N = 379 students) were analysed. In the first wave at the beginning of the school year (t1), students' sociometric status and social skills were assessed. Students were asked to rate the extent to which they liked to play with their classmates. Scores with the number of highest ratings (peer acceptance) and number of lowest ratings (peer rejection) were calculated for each student. Students' social skills were rated by peers with two scales of the Self- and Other-oriented social Competences Questionnaire (Perren et al., 2012) with four items each on prosocial behaviour and on cooperative behaviour. In the second wave at the end of the school year (t2), the sociometric status of students was assessed again. Teacher feedback behaviour was videotaped in a standardized group discussion on the topic "working in pairs". The standardized discussion was guided by the teacher. Teacher feedback was coded by two coders in three steps: (1) recipient (student, group, class), (2) content: social behaviour during the group discussion, social learning goal of working in pairs, and (3) assessment (correct, incorrect). The inter-coder agreement of two coders was $\kappa = 0.81$. In this study, only feedback addressing individual students was considered. Recipients of feedback were identified which means that teacher feedback were introduced in the analyses as scores for each student.

Results

The observation data revealed that up to 30% of teacher feedback addressing individual students assessed their incorrect social behaviour and up to 75% assessed their correct social learning goal in the group discussion. Feedback assessing correct social behaviour and incorrect social learning goal were very rarely given by teachers. Thus, in further analyses the latter types of feedback were excluded. Using structural equation modelling, teacher feedback (i.e., correct social behaviour, incorrect social learning goal), student social skills, and previous sociometric status (i.e., acceptance and rejection) at t1 were examined as predictors of peer acceptance and rejection at t2. The hypothesised model fit the data well, $\chi2(1) = 2.05$, $p = .152$, CFI = 0.99, RMSEA = .05 [90% CI: 0, .2, p =.331], SRMR = 0.01. Students who were rated by peers as being socially skilled were more likely accepted and less rejected by peers. In addition, the sociometric status of students at t1 was a strong predictor of the sociometric status at t2, indicating a high stability. Further, teacher feedback assessing the social learning goal was the only significant predictor of student's sociometric status. More specifically, students who received more feedback on their correct social learning goal were less accepted at t2.

Discussion

Unexpectedly, feedback on correct social learning goal led to a decrease of peer acceptance. The other types of feedback were not significantly related with the sociometric status of students. These findings could indicate that the influence of teacher feedback on social processes among students is only marginal. However, the effects might have been affected by the standardized setting of the group discussion. In addition, other teacher behaviour, or types of feedback that were not assessed in this study, might have impacted the outcome.

A matter of attitude? The moderating role of teachers' reference norm orientation in the effect of teachers' feedback on social acceptance

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Contextual background

With the steady increase of inclusively working schools in Germany, questions arise about the prerequisites for its successful implementation. Attitudes of different actors involved in inclusive education have gained much attention as an important factor supporting its implementation (e.g. Goldan & Schwab, 2018), because attitudes influence how individuals perceive and behave in classroom-based learning situations (e.g. MacFarlane et al., 2013). Much research is concerned with determinants of students and teachers' attitudes. We know from this research that girls and students who have a friend/classmate with SEN hold more positive attitudes as well as those who perceive themselves to have a good quality of life and perceive their teacher's behaviour as positive (Hellmich & Loeper, 2018; McDougall et al., 2004; Vignes et al., 2009). Only few studies proceed further though to investigate how attitudes affect peer relations in the classroom (de Boer at al., 2012; Spörer et al., 2020). Less is also known about teachers' attitudes and their effects on inclusive processes (Bosse et al., 2017). Studies find that positive teacher attitudes are related to more inclusively oriented classroom practices (Hellmich et al., 2019). What has largely been neglected though, is whether teachers' attitudes towards inclusive practices and students with SEN are associated with respective student attitudes.

Such a relationship may be postulated in accordance with Social Referencing Theory, where children form their own attitudes and behaviour in reference to the affective displays of an adult or a role model (Webster & Foschi, 1992). Further evidence is also needed on the associations that students' and teachers' attitudes hold with peer processes in the classroom, such as the perceived classroom climate.

Research question

Against this background, the following research questions arise: (1) Do students' and teachers' attitudes towards inclusive practices and students with SEN directly affect the classroom climate? (2) Are students' attitudes towards inclusive practices and students with SEN affected by their respective teacher's attitudes?

Methods

Data stem from a study on inclusive schooling in the federal state of Brandenburg, Germany. At the end of the school year 2018/2019 (cohort 1) and 2019/2020 (cohort 2) N = 1368 students from 60 6th and 7th grade classes provided information on two facets of attitudes towards inclusion: their cognitive attitudes towards inclusive classroom practices for students with SEN in the area of learning difficulties (LD; α = .82) and emotional and social difficulties (ESD; α = .92) ("It is okay that students with learning/behaviour difficulties receive more time to finish their tasks.") and their respective affective attitudes (LD α = .83; ESD α =.86; "How would you feel if next year there will be a student with learning/behaviour difficulties in your class?" Uneasy (1) – pleasantly (7)) and on the perceived classroom climate (α = .83; "We help each other out."). Class teachers provided information on their cognitive attitudes towards inclusive practices (α = .80; "Lessons can in principle be designed to suit all students.") and their affective attitudes towards students with SEN LD (α = .87) and ESD (α = .86) ("How would you feel if next year there will be a student with learning/behaviour difficulties in your class?" Uneasy (1) – pleasantly (7)). Not all class teachers provided information and the final analytical sample included n = 817 students from 38 classes. To examine the research questions data is analysed with a multilevel path analysis using Mplus, where teacher attitudes are modelled to directly predict student attitudes and classroom climate and student attitudes to directly predict classroom climate.

Results

Twenty-five percent of variation in classroom climate is attributed to the class level, 7% and 6% of students' affective attitudes towards students with SEN LD and ESD respectively. Students' cognitive attitudes vary only by 2% and 3% respectively across classes. Students hold neutral to positive cognitive attitudes towards inclusive practices and affective attitudes towards students with SEN LD, but negative to neutral attitudes in the area SEN ESD. Preliminary results suggest that students' affective attitudes towards their peers with SEN LD and ESD significantly predict classroom climate ($p < .01$; $p < .01$), where more positive attitudes are associated with a more positive climate. This association is also significant for students' cognitive attitudes towards inclusive practices for students with SEN LD ($p < .05$). Unexpectedly, teachers' cognitive and affective attitudes are not significantly related to either classroom climate or students cognitive and affective attitudes.

Discussion

Contrary to what was theoretically expected, teachers' attitudes seem unrelated to students' attitudes in the analysis conducted so far. Further examination will differentiate between different groups of students (e.g. by gender), school characteristics (e.g. by socioeconomic stratification) and control for experience with students with SEN LD and/or ESD. Taken together findings will contribute to mapping out the role of teachers' cognitive and affective attitudes for the successful implementation of inclusive education in more detail.

Do you feel what I feel? On the relationship between teacher and student attitudes in inclusive contexts and their effects on classroom climate

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The role of teacher-related variables in the implementation of inclusive education

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While many countries have adopted policies to implement inclusive education, there are aspects of inclusive practice that require further investigation. Teacher characteristics such as attitudes, beliefs and self-efficacy seem to play an important role in the implementation of inclusive education (Avramidis et al., 2019; Kiel et al., 2020). However, it remains unclear whether and to what extent teacher-related variables affect the implementation and whether the variables are interrelated. The presence of both a general education teachers (GET) and special educations teacher (SET) working in concert adds a further layer of complexity to this picture.

The purpose of this symposium is to explore the association between teacher-related variables and the implementation of inclusive teaching practice by presenting and discussing four research papers.

Paper 1 investigates how demographic variables and self-efficacy influence teachers' attitudes to inclusion. The results reveal that teachers' opinions seem to be important for the implementation of inclusive education.

Paper 2 is based on the Theory of Planned Behavior. It examines the association between attitudes, perceived behavioral control, subjective norms, inclusive leadership, and teachers' intentions to use differentiation in the classroom. The results show that teachers' attitudes predict their intention to use differentiation.

Paper 3 examines the impact of teachers' attitudes towards inclusion and the collaboration between the GET and SET on the frequency of joint learning settings in inclusive classrooms. It shows that the GET and SET variables have different effects.

Paper 4 presents a study which identifies four different teacher profiles in inclusive education by examining the variables attitudes towards inclusive education, beliefs about learning, and perception of collaboration.

The papers give an insight into the relationship between teacher-related variables and the implementation of inclusive education.

Teaching staff's attitude towards integration and inclusion

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Theoretical background

Developing an inclusive culture within schools is important and include shared values and an accepting culture. Attitudes of teaching staff is an important factor to create such a culture (Booth & Ainscow, 2002). Teacher attitudes toward inclusion is neutral to negative (Van Miechem et al., 2020). Attitudes can be influenced by pupil- or personal characteristics. The study in this presentation focusses on the personal characteristics of teaching staff: demographics (such as age and teaching experience), self- efficacy, and concerns. Evidence regarding demographics as predictive for attitude is inconsistent (Avramadis & Norwich, 2002). Evidence regarding self-efficacy shows a direct association with attitudes (Hsien et al., 2009). Though concerns are important to implement educational changes successfully (Geijsel et al., 2001), not much is known about this factor when implementing inclusive education.

In our study we define inclusion as: to teach pupils with and without special needs together in the same group. Integration is defined as: to teach pupils with different special needs together in de same group. Different types of special schools in The Netherlands participated in this study. These schools collaborate intensively aiming to become so-called "integrated schools" as an important step towards inclusive education. Research on this type of integration – special schools becoming more inclusive - is scarce. This study aims to gain insight in the attitude and influencing variables of attitudes of teaching staff within integrated special schools.

Research questions

(1) What attitudes do teaching staff hold toward integration and inclusive education?

(2) Which variables influence the attitude of teaching staff?

Method

Design and procedure

The current study is part of a longitudinal study the integration process of different types of special schools. Data of the first measurement moment are used. Data was collected via an online survey.

Participants: A total of 82 participants are working as either teacher or teaching assistant in one of the seven participating integrated settings.

Instrument: An adapted version of the Attitude Questionnaire for Inclusive Education (de Boer, 2012) was used to assess attitudes towards inclusion (13 items; $\alpha = .79$). An adapted version of the Self Efficacy Scale (Zee, 2016) was used to assess self-efficacy (20 items; $\alpha = .88$). An adapted version of the Stages of Concern Questionnaire (George, Hall, & Stiegelbauer, 2006) was used to assess the concerns of the participants (27 items; $\alpha = 93$). All questions on attitude, self-efficacy, and concerns were answered on a five-point Likert scale (1, total disagreement – 5, total agreement). In addition, data on age and teaching experience were collected.

Analysis: First, descriptive statistics were used to answer the first research question. Second, multiple regression analysis were carried out to answer the second research question.

Results

Teaching staff hold a neutral - moderate positive attitude toward inclusion and integration ($M = 3.27$, $SD = .48$). Background variables age and teaching experience do not correlate with attitudes towards inclusion. A minor positive correlation was found between self-efficacy and attitudes, $r(73) = .25$, $p < .05$. Concerns and attitudes show a minor negative correlation, $r(71) = -.26$, $p < .05$. Both variables were included in the regression analysis, with attitude as the dependent variable. The model showed an overall significant association ($F(2,70) = 4.41$, $p = .02$), and explained 11% of the variance. In this model, concerns showed a significant association with attitudes ($\beta = -.18$, $p = .04$).

Interpretation of findings

Teaching staff within the integrated settings hold a neutral to moderate positive attitude toward inclusion and integration. Demographics as age and teaching experience do not seem to influence attitudes. Although self-efficacy and concerns both correlate with attitudes, concerns seems to be most strong related with attitudes: The more concerns a person has, the less positive the attitude towards inclusion and integration is. This insight shows the importance of taking concerns into account when developing inclusive settings. Further research is needed to gain insights on long-term development of attitudes, and to include pupil characteristics as influencing factor.

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Testing the Planned Behavior Theory in an inclusive context

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Introduction

Applying differentiation in a regular class becomes more important with the ongoing trend towards inclusive education. Yet, before teachers actually apply differentiation, they need to be willing to do so. In the current study, we tested the Theory of Planned Behavior (TPB) to predict teachers' willingness to apply differentiation in class. The review study of Opoku (2021) indicated that the TPB can be used to predict teachers' behavioral intentions for implementing inclusive education. Yet, school leadership is originally not included in the TPB, while it has been underlined to play an important role when implementing inclusive education (Van Mieghem et al., 2020). Also, background variables seem to influence teachers' behavioral intentions (e.g., De Boer et al., 2011), but were not included in the review of Opoku (2021). Therefore, the following research questions were formulated for the current study: (1) To what extent is there an association between attitudes, perceived behavioral control, subjective norms, inclusive leadership and teachers' behavioral intentions? (2) Which background variables have influence on the association

Method

Design and procedure: A cross-sectional study was set up in which quantitative data was collected via an online questionnaire. The current study was part of a larger study on differentiation of secondary education teachers (NRO-projectnr. 405 17 302).

Participants: A total number of 180 regular secondary education teachers filled out an online questionnaire. These teachers came from different schools located in the Netherlands and were recruited via the personal network of the researchers and social media. Almost half of the participants had between 0-10 years teaching experience (47%), while the other participants had more than >10 years of teaching experience.

Instruments: A self-developed questionnaire was used, which included several existing scales that we adopted for the current study. First, the MATIES was used to assess attitudes (12 items) and behavioral intentions (6 items) (Mahat, 2008). Twelve items of the TSES were used to assess perceived behavioral control (Tschannen-Moran & Woofolk Hoy, 2001). Self-constructed scales were used to assess teachers' subjective norms (12 items) and inclusive leadership (5 items). A 6-point Likert scale was used for all items, with a higher score reflecting a more positive score. All scales showed a high reliability coefficient, ranging from 0.81-0.89.

Analysis: Regression analysis was carried out to answer the research questions. Prior to the analysis the assumptions were tested. A significance level of 0.05 was used in all analysis.

Results

Teachers hold neutral attitudes, together with a neutral score on inclusive leadership and behavioral intentions. A bit more positive are the scores on the perceived behavioral control and subjective norms (see Table 1 for descriptives and correlations).

Table 1. Summary of the descriptive statistics and correlations

	M	SD	1	2	3	4	5
1. Attitudes	3.8	.79	1	0.33**	0.09	0.17*	0.63**
2. Perceived behavioral control	4.7	.57	--	1	0.31**	0.16*	0.40**
3. Subjective norms	4.9	.62	--	--	1	0.41**	0.32**
4. Inclusive leadership	4.1	.80	--	--	--	1	0.28**
5. Behavioral intentions	4.5	1.02	--		--	--	1

Note. **= $p < .01$. *= $p < .05$.

When testing the TPB model with behavioral intentions as dependent variable, it shows the model predicts 49% of the variance. None of the background variables (age, years of teaching experience, educational degree) showed a significant association, and were therefore not included in the final model.

As already showed with the correlations, teachers' attitudes strongly predict behavioral intentions (B = 0.55, t = 9.59, p = .000), followed by subjective norms (B = 0.19, t = 3.04, p = .003). Least strong, though significant, an association was found for the perceived behavioral control (B = 0.14, t = 2.33, p = .021). Though included in the model, inclusive leadership was non-significant (p > .05).

Interpretation of the findings

This study indicates that, on the one hand, teachers' beliefs and feelings are important factors in their intentions to apply differentiation. On the other hand, the environment of the teacher (norms of team leader) also plays a role. It indicates that solely focusing on teachers is not enough when aiming to implement differentiation in class.

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How teachers' attitudes towards inclusion and collaboration influence the frequency of joint learning settings in inclusive classrooms

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Theoretical background

Research into inclusive education emphasizes the importance of having joint learning settings (JLS) where students with and without SEN are taught together (e.g. Kurth, Lyon & Shogren, 2015; Wiener & Tardif, 2004). However, little is known about which teacher-related variables may influence the frequency with which JLSs are implemented. Lütje-Klose and Urban (2014) suggest that the attitudes of the general education teacher (GET) and the special education teacher (SET) towards inclusive education and collaboration are important for the successful implementation of a JLS. According to Vangrieken et al. (2015) and Hellmich et al. (2017), the attitudes of the teachers towards inclusive education influence how well they collaborate and GETs and SETs may have different attitudes towards inclusion and collaboration. A survey by Gebhard (2014) revealed that SETs have a more negative view of collaboration than GETs and Hernandez et al. (2016) showed that they had a more positive attitude towards inclusive education than GETs. It is therefore important to consider the teacher related variables of the GET and the SET. This study investigated whether the frequency of implementation of a JLS may be affected by the SET and GET's attitudes towards inclusive education and their views of collaboration. Because teacher collaboration could be affected by class composition (e.g. the number of students with low achievement), this was also considered.

Research question

What is the relationship between the attitudes towards inclusion of the GET and the SET, their views on teacher collaboration, inclusive class composition, and the frequency with which joint learning settings are implemented in inclusive classrooms?

Method

The sample included 79 pairs of GETs and SETs who work together at least 2 hours per week (M = 4.3 hours, SD = 1.7) in inclusive classrooms (Grade 2 to 4). Each class included some students with SEN.

Measures

Joint learning setting: Structured interviews about how JLSs were implemented were conducted with each GET and the SET (in- depth interviews). Teachers were asked how often students with SEN were taught together with

the students without SEN in a JLS. The interviews were rated by two independent raters (Cohen's Kappa = .71, p < .001). The rating scale ranged from 1 to 4 (1 = almost never, 4 = almost always). Attitudes towards inclusive Education: Questionnaire: "Attitude towards the inclusion of students with SEN" (Sharma & Jacobs, 2016, 8 Items, α = .73). Perception of collaboration: Questionnaire about collaboration: "Fragebogen zur Arbeit im Team (FAT)" (Gebhard et al., 2014, 10 Items α = .87). Heterogeneity: Students carried out a standardized math test (e.g., BASIS-MATH G3+, Moser Opitz et al., 2019) at the beginning of the school year (41 Items, α = .92). The heterogeneity variable is the standard deviation of the class mean in math.

Analyses

Structural equation models with joint learning setting as the dependent variable were run. The variables attitude of GET and attitude of SET to inclusion were inserted as direct and indirect predictors (moderated by perceived collaboration) of the joint learning setting. The heterogeneity variable was inserted as further predictor of the frequency of joint learning settings.

Results

A T-test revealed that, on average, the attitude of the GETs towards inclusive education is significantly less positive than the attitude of the SETs ($t(78) = -4.19$, $p < .001$). No significant difference between the groups of teachers was found for the perception of collaboration variable. The SEM shows that only the SET's attitude towards inclusion has a positive impact on the implementation of JLS ($r = .33$, $p = .005$). The attitude of the GET – but not of the SET – is positively correlated with the views of collaboration ($r = .26$, $p < .001$). The views of collaboration of the GET and SET correlate ($r = .16$, $p < .001$), but do not affect the JLS. The heterogeneity of the class has a very small negative effect on the frequency of implementation of the JLS ($r = -.004$, $p = .043$): The more heterogeneous the class, the less frequent the joint learning settings.

Interpretation of findings

The results show that the attitude of the SET affects whether SEN students are taught in the classroom and seems to be more important than the attitude of the GET, which was the focus of previous studies. No relationship between perception of collaboration and the implementation of JLS was found. But the attitudes towards inclusive education of the GET does affect the GET's view of collaboration. It is assumed that their attitude influences their willingness to collaborate. The teachers' opinions about collaboration have no effect on the frequency of implementation of a JLS. In some cases, the perception of the collaboration may possibly be perceived more positively when there are less JLS. In conclusion, the results show that it is important to consider the teacher-related factors of the SET and the GET.

The relationship between attitudes towards inclusive education, beliefs about learning, and perceptions of collaboration in general education and special education teachers

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Theoretical background

Teacher characteristics such as attitudes and beliefs play an important role in the implementation of inclusive teaching practices.Teachers with positive attitudes towards the inclusive education of pupils with special educational needs have a higher level of self-efficacy for inclusive practices and therefore implement these practices more often (Avramidis et al., 2019). Teachers with constructivist beliefs show higher levels of cognitive activation than those with instructivist beliefs (Blömeke, 2012). Furthermore, scholars emphasize the importance of teacher collaboration (Lütje-Klose & Urban, 2014). It is assumed that the willingness of the general and special education teacher to engage in cross-disciplinary, intensive and high quality, cooperation is beneficial for the implementation of inclusive education. Research suggests that factors such as teacher collaboration can be influenced by professional training with trained special education teachers (SET) evincing a more positive attitude towards the inclusive education of students with special educational needs than general education teachers (GET) (Moser et al., 2014). However, SETs have a less positive view of collaboration than GETs (Gebhard et al., 2014). There is no information available on whether the GET and SET differ in their epistemic beliefs on learning. To date studies have usually examined individual teacher characteristics and factors related to inclusive education so there is a lack of research on the relationships, if any, among these

variables. For example, a teacher might be critical about inclusive education (negative attitude), believe in the transmission of knowledge (instructivist belief), but have a positive view of collaboration. It is important to be able to consider this information in order to better understand the factors that contribute to the successful implementation of inclusive education. This study aims to investigate how GETs' and SETs' attitudes, beliefs, and views of their collaboration are related.

Research questions

The study aims to answer the following questions. (1) What teacher characteristic profiles based on the variables attitudes towards inclusive education, epistemic beliefs on learning and the perception of collaboration can be differentiated? (2) How are teachers with different professional training (general education vs. special education) represented across the profiles?

Methods

Sample: The sample includes N = 173 2nd – 4th grade teachers (93.5% female) working in 80 inclusive classrooms. All teachers had completed their GET training, 34.1% (n = 59) had also completed additional training in special education. Measures: Attitudes: AIS, 8 Items, α = .73 (Sharma & Jacobs, 2016); beliefs: 6 Items, α = .70 (researcher developed scale), perception of collaboration: 10 Items α = .87 (Gebhard et al., 2014). All questionnaires were completed online. Analyses: In order to answer RQ1 (determine the number and types of clusters), hierarchical cluster analyses (Ward's method) and ANOVAs were conducted. The aim was to form clusters that, with respect to the three variables, were as homogeneous as possible within, and as different as possible between. Each cluster represents a disposition profile. In order to examine differences between the profiles (categorical variables) and the professional training (dichotomous variable), Chi-square tests were performed.

Results

RQ1: The cluster analyses suggest three solutions with either 2, 3 or 4 clusters. In each scale, the 4-cluster-solution (see figure) is the one that divides the sample into the most homogenous groups within and most heterogeneous between (attitude: f = .51***; beliefs: f = 54***; cooperativeness: f = .44). In Figure 1, beliefs are represented along the x-axis, attitudes along the y-axis. The size of the circles indicates the perception of the quality of collaboration (the bigger the better). The red cluster (n = 25), labelled "progressives", is characterized by high scores across all variables. Teachers in the green cluster (n = 87; labelled "inclusion- moderates") are critical about inclusion (compared to the red and blue clusters) but show average values in the other two scales. The blue group (n = 51, "progressive-instructivists" is characterized by a tendency towards instructivist beliefs. The yellow group (n = 10, "individualists") includes 10 teachers It is characterized an especially by low level of cooperation, but also by skepticism towards inclusion. RQ2: The Chi-square test shows a weak to moderate effect for the 4-cluster solution. This means that GET and SET are unequally distributed across the four clusters (w = .28**). In the "progressive" group, the density of SET is significantly higher than in the other groups, indicating that training in special education may lead to a more progressive mindset. In the "individualist" group, only 1 of the 10 teachers completed a degree in special education.

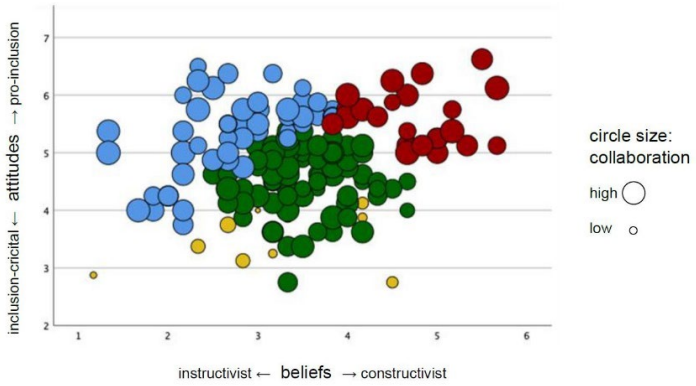

Figure 1: 4-cluster-solution, each circle representing one teacher.

The results show that teachers working in inclusive classrooms have different profiles in terms of attitudes towards inclusive education, epistemic beliefs on learning and the perception of collaboration. SET were overrepresented in the progressive group. We cannot know if this is a result of their special education training, or if teachers with a progressive mindset tend to choose further training in special education.

Peer influence in children and adolescents with developmental disabilities

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Little is known about peer influence in individuals with developmental disabilities, such as intellectual disabilities (ID) or autism spectrum disorder (ASD). Due to their social, communicative, and cognitive characteristics, these groups face specific challenges in dealing with their peer context, which may result in increased risk for negative peer influence. However, under specific conditions the peers may also provide a context helpful for social learning and the promotion of positive development. In the present symposium there will be presented three studies from the Netherlands and Switzerland focusing on the following questions: To what extent are children and adolescents with developmental disabilities influenced by their peers? How can we best possibly support them in their peer context? How can peers be included as positive developmental agents in school and treatment?

Using a longitudinal design, Study 1 considers the relationship between communication skills and challenging behavior in children and adolescents with ID in the peer context of special needs classrooms. It is examined if this relationship is moderated by classmates' levels of communication skills and if the classroom-level of communication skills is indirectly related to challenging behavior through individual communicative abilities. Based on a literature review, Study 2 examines, in collaboration with adolescents with lower cognitive abilities, their parents, and therapists, how peers can be involved in treatment for mental health problems to promote a positive and powerful learning environment. Study 3 investigates if the prosocial behavior level of classmates in special needs classrooms longitudinally affects individual development of autistic traits, using a sample of 330 children and adolescents with ID and high levels of autistic traits. A discussant will summarize the results and conclude the symposium with perspectives for further research.

Challenging behavior in students with intellectual disabilities: the role of individual and classmates' communication skills

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Christoph Michael Müller – University of Fribourg, Fribourg, Switzerland

Theoretical background

Children and adolescents with intellectual disabilities (ID) are at increased risk of developing challenging behavior (Kurtz et al.,2020).Challenging behavior may be partially explained by low individual communicative competences, as the inability to verbally express needs, intentions and feelings may lead to frustration and thus to behavioral problems (Marrus & Hall, 2017). However, communication involves at least two partners, thus outcomes may also vary according to the interaction partners' abilities (Hatton, 1998). At school, classmates provide an important context for social interaction and social learning (Akers & Jennings, 2009; Onnis et al., 2018). The aim of this study was thus to investigate the degree to which the interplay between individual and classmates' communication skills predicts changes in challenging behavior among students with ID in special needs schools.

Research questions

Based on the theoretical background, our research questions were (1) whether higher individual communication skills at the first measurement were related to a subsequent decrease in challenging behavior and (2) whether this effect was moderated by classmates' levels of communication skills. In addition, we examined (3) if classroom communication skills were indirectly related to a decrease in challenging behavior by influencing individual communicative abilities.

Methods

This study used a longitudinal design with two measurement points across one school year. Challenging behavior (DBC-T; Einfeld & Tonge, 1995) and communication skills (subscale of the ABAS; Harrison & Oakland, 2015) were measured by teacher reports in 1125 students with ID attending special needs schools. We applied a multilevel approach to control for the hierarchical data structure of students in classrooms.

Results

Higher individual communication skills at the first measurement were significantly related to a decrease in challenging behavior over the school year ($p = .027$). This effect was not moderated by classroom-level communication skills ($p = .148$). However, classmates' communication skills exerted an indirect influence by enhancing individual communicative abilities ($p = .030$). Further analyses on sub-domains of challenging behavior suggested the same individual and indirect effects for 'Self-absorbed behaviors', 'Communication disturbance', and 'Problems relating socially' (all $p < .001$). However, no effects were found regarding the domains 'Disruptive/antisocial behaviors', 'Anxiety', and a mixed category of 'Other behaviors'.

Interpretation of findings

The study results suggest that both individual communicative competences and those of the classroom context are relevant to understanding challenging behavior development in ID. Students with ID appear to be receptive to their peers' communicative behavior and to learn from other students in spite of (sometimes severe) cognitive and adaptive difficulties that could complicate social learning. The present results therefore suggest that individual students with lower abilities in special needs schools may benefit from classroom compositions that allow for positive social modelling among peers in the domain of communication.

Facing fears together: Including peers in treatment for mental health problems in adolescents with lower cognitive ability

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Mental health problems are highly prevalent among adolescents with lower cognitive ability. Treatment for mental health problems such as anxiety, while efficacy of treatments is relatively low in this group. The peer-group provides an important learning environment for all adolescents, but may be especially influential in adolescents with special education needs. A previous study on prosocial peer influence shows the potential powerful way in which peers could promote positive development by creating a social learning context. In this presentation we will explore the possibilities of including peers in treatment to help foster a positive and potentially powerful learning environment.

Methods

Literature review was used to identify potentially important aspects of peer involvement during treatment for mental health problems. The results of the literature review were discussed in focus groups of adolescents with lower cognitive ability, their parents and therapists to co-create an intervention model for collaboration between peers and therapists.

Results

Results from the literature review show that peer-mediated interventions are potentially powerful in teaching new skills and fostering a sense of being supported. There are some unresolved questions about the characteristics of the peers, for example whether the peers themselves have experienced similar mental health problems or not, whether peers are trained to teach specific skills, or their role is only to provide support and encouragement. Preliminary results from focus groups show that it is important to adolescents themselves that the peer-mentor did also experience mental health problems themselves and have experience with receiving treatment. The study is still running and more extensive results will be presented during the presentation.

Interpretation of findings

Involving peers during treatment for mental health problems may be especially beneficial to adolescents with lower cognitive ability, because this group shown an increased openness to advice from peers. This could therefore be a potentially powerful way to improve efficacy of treatment of mental health problems in this group. Initial results are promising. The potential applications will be discussed.

The influence of classmates' prosocial behavior on students' autistic traits development

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Research indicates that the behavioral development of individual students can be influenced by the behavioral characteristics of their classmates trough processes such as social learning or adaptation to peer norms (Müller & Zurbriggen, 2016). However, very little is known on peer influence in students with high levels of autistic traits. We therefore examined the extent to which the level of prosocial behavior in special needs classrooms influences the development of students' individual autistic traits. As peers' prosocial behavior includes various forms of positive interaction and support, we expected it to contribute to less individual autistic traits exhibited over time.

We used data from a longitudinal study with measurements at the beginning and end of a school year collected in 16 special needs schools for students with intellectual disabilities (total N = 1124). In our analyses we focused on students with high levels auf autistic traits: Using anonymous teacher reports on the autism algorithm of the Developmental Behavior Checklist (Einfeld & Tonge, 1995; DBC-ASAR1; Steinhausen & Winkler Metzke, 2004), 330 students with ID were above the scale's cutoff score showing high levels of autistic traits (age T1 M = 10.17 years, SD = 3.74; 20.6 % girls). Prosocial behavior was measured at T1 using the subscale "Social" of the German version of the Adaptive Behavior Assessment System-3 (Bienstein et al., 2018; Harrison & Oakland, 2015). To assess the classroom-level of prosocial behavior, we used the mean of all students' scores of the subscale "Social" within class at T1.
To analyze the influence of classmates' prosocial behavior on the development of autistic traits we followed a procedure proposed by Kindermann (2016): Future individual autistic traits (T2) of students with high levels of autistic traits were predicted by the classroom-level of prosocial behavior (T1), controlling for students' earlier individual autistic traits (T1), general functioning level, gender, and age.

Results of multilevel models showed no significant effect of the classroom-level of prosocial behavior at T1 on individual autistic traits at T2 ($p = .968$), controlling for individual autistic traits at T1, general functioning level, gender, and age. In terms of control variables, more autistic traits at the beginning of the school year predicted more autistic traits at the end of the school year ($B = 0.819$, $SE = 0.054$, $p < .001$). In addition, greater levels of general functioning at T1 predicted lower individual autistic traits at T2 ($B = -0.007$, $SE = 0.002$, $p = .001$).

Our results suggest that autistic traits of children and adolescents with ID and high autistic traits are relatively stable and unlikely to be affected by classmates' prosocial behavior. However, this does not necessarily mean that individuals with high levels of autistic traits are completely unaffected by their peers' characteristics. It remains to be investigated whether other behavioral domains may be influenced by peers and how these children and adolescents can be supported in their peer context to benefit from the competences of t eir peers. Directions for further research and support for individuals with high autistic traits in the peer context will be discussed.

Classroom activities and teacher-student interactions: what role do they take in the development of children's self-regulation and executive functions?

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Self-regulation (SR), the ability to orchestrate thought, feeling, and action in the service of goal striving, is key to school readiness and student academic success (McClelland & Cameron, 2011). Similarly, executive functions (EF; shifting, working memory [WM], inhibition) were shown to be associated with academic outcomes (Diamond, 2013). Accordingly, students with impaired SR and EF were shown to experience academic difficulties and to be at risk for being diagnosed with special educational needs (SEN; e.g., LeFever et al., 2002).

Classrooms are considered pivotal in shaping the development of children's SR and EF. First, it has been suggested that regular activities where children have the opportunity to practice their SR are beneficial for their SR development (Diamond & Lee, 2011). Additionally, the role of teacher-student interactions (TSI) at both the classroom and the dyadic level (i.e., emotional, organisational, constructive classroom support; e.g., Downer et al., 2010), and particularly that of TSI quality, has been emphasised (e.g., Sankalaite et al., 2021). Classroom activities and TSI may therefore be expected to have the potential to improve student functioning and reduce the risk of SEN being diagnosed. Nevertheless, a number of questions need to be answered before their full potential can be realised.

The first talk will present findings on whether time spent in child-led classroom activities matters for the development of pre-schoolers' EF (Eberhart). The second presentation will address strategies teachers employ to support students' WM development in class and their potential mechanisms of action (Hens). The third talk will present evidence as to the uni- and bidirectional interrelations between dyadic TSI and children's WM development (Sankalaitė). The fourth talk will, based on intensive longitudinal data obtained through daily diaries, address associations of lesson-specific student-perceived TSI and SR within students (Blume).

Are children's daily classroom experiences associated with their executive function development?

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Donna Bryce – University of Tübingen, Tübingen, Germany
Sara Baker – University of Cambridge, Cambrigde, United Kingdom

Theoretical background

Executive functions are higher-order cognitive skills that are crucial for children's school readiness, academic achievement, and social-emotional abilities (Blair, 2002; Blair & Razza, 2007; Riggs et al., 2006). Many researchers aim to understand how children's executive functions can be improved (Takacs & Kassai, 2019). Educational settings such as preschool and school offer a great opportunity to promote skills as most children attend school (Yoshikawa et al., 2013). However, it is not yet clear how children's executive functions can be promoted in school contexts.

Executive functions are considered as a component of self-regulation, which develops from other-regulation to self-regulation (Kopp, 1982). That is, initially children receive support from adults or more experienced peers to regulate their own behavior. Over time children become more skilled in regulating their behavior without external

support. It can be assumed that all children benefit from opportunities where they can practice these skills and it is theorized that child-led situations where children must guide their own behavior are more taxing than teacher-led situations where children follow instructions. At school, children spend time in different schedules with varying levels of support including whole group activities, small group activities, transitions and free play. In whole group and small group activities children typically receive a lot of instruction and guidance from their teachers. In turn, in free play, children are required to guide and regulate their own behaviors. Having more time at school to practice regulating their own behavior might be beneficial for children's executive function development.

Research questions

In this study, we asked whether the proportion of time in different classroom schedules was associated with children's executive function development. We hypothesized that children who spent more time in child-led activities, where they had to guide and regulate their own behavior, would show more gains in their executive function development than their counterparts who spent less time in child-led activities.

Methods

The sample of this study included 207 preschool children (Mage = 62.88 months) from 32 classrooms and 14 schools in England. Most schools were in socially disadvantaged areas. Children's executive functions were assessed at the beginning and at the end of the school year with a battery of executive function tasks, tapping children's working memory, inhibitory control and shifting. Additionally, children's language skills, their non-verbal reasoning and family background were assessed. In spring, all classrooms were visited for one day and the Child Observation in Preschool and Teacher Observation in Preschool (COPTOP; Bilbrey et al., 2017; Farran, 2017) was applied to capture children's daily activities and the classroom schedule. The COPTOP is a snapshot coding approach consisting of cycles of observations throughout an entire day. Trained researchers who observed children in their naturalistic classroom environment collected cycles of snapshots of the observed situation as well as children's behavior. Based on the classroom observation, the proportion of time that children spent in different schedules was calculated. This included the proportion of time that children spent in child-led and teacher-led activities. Furthermore, the proportion of time in transitions, defined as times when children were waiting for activities to start or moving from one activity to another, was determined.

Results

Results indicated that on average children spent more time in child-led activities than in teacher-led activities. Interestingly, children also spent a substantial amount of time in transitions. That is, times with no learning content such as standing in line or waiting for activities to start. Analysis showed that child characteristics such as children's executive functions at the beginning of the school year, their non-verbal reasoning, and vocabulary skills were predictors of children's executive functions at the end of the school year. The proportion of time spent in different child-led and teacher-led activities was not associated with children's executive functions at the end of the school year.

Interpretation of findings

To conclude, the assessed classroom characteristics seemed to play a minor role in children's executive function development. Instead, child characteristics were more important for children's executive function development. It is well established that early skills are important predictors for children's later development. This study adds to this evidence and suggests that children's early skills are more important than the proportion of time that children spent in different schedules. Alternative interpretations of these findings as well as implications for educational settings with SEN children will be discussed.

The association between teacher-student relationships and children's working memory performance

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Mariëtte Huizinga – Vrije Universiteit Amsterdam, Amsterdam, The Netherlands
Dieter Baeyens – KU Leuven, Leuven, Belgium

Theoretical background

Working memory (WM), the ability to temporarily store, update and manipulate information, is fundamental for children's learning, school functioning and academic achievement. WM continues to develop throughout

preschool, childhood, and well into adolescence, with a particular developmental spurt between 6 and 9 years of age. However, WM fails to develop to its full potential if contextual stimulation is not adequately presented. Therefore, recent research has shifted the attention towards malleable environmental factors; more specifically, to the classroom environment as an important developmental context and teachers' role in promoting WM development (de Wilde et al., 2015).

Research questions

The first aim of this study is to investigate interrelations between teacher-student relationship (TSR) and children's WM. It is unclear which aspects of TSR (closeness, conflict, or dependency) best predict children's WM performance, and little is known regarding the bi-directional nature of this relationship. Based on studies by Nguyen et al. (2020) and Crosnoe et al. (2010), we hypothesise that 1) high levels of closeness will be associated with better WM, while 2) high levels of conflict – with poorer WM. Furthermore, based on research on behavioural problems associated with poor WM (de Wilde et al., 2015), we hypothesise that 3) children with poor WM will be more likely to develop conflictual relationships with their teachers.

The second aim of this study is to explore teacher and child characteristics, as well as environmental influences (parent/family characteristics) that might impact on the TSR and, in turn (or independently), on children's WM performance. We hypothesise 1) that the quality of the TSR will be affected by the child's gender (higher-quality relationship with girls; Rudasill & Rimm-Kaufman, 2009), 2) while the strength of the interrelation between the TSR and WM will yield larger effects in younger children (Diamond & Ling, 2016) and 3) in children with a poor parent-child relationship (Vandenbroucke et al., 2017).

Methods

53 girls and 57 boys (Mage = 9.20 years, SD = 1.79), their parents and class teachers participated in the study. We recruited teachers from regular primary education (first to sixth grade), and typically and atypically (ASD diagnosis/symptomatology) developing children, who fall between the ages of 6 to 12 years.

TSR was assessed from both students' (using the Young Children's Appraisals of Teacher Support (Y-CATS; Mantzicopoulos & Neuharth-Pritchett, 2003; Spilt et al., 2010)) for the younger age group, and the Student Perception of Affective Relationship with Teacher Scale (SPARTS; Koomen & Jellesma, 2015) for the older age group) and teachers' perspective (using the Student-Teacher Relationship Scale (STRS; Pianta, 2001; Koomen et al., 2012), providing a more reliable indication of the 'real' quality of the relationship and avoiding informant bias.

WM was assessed using a multi-method, multi-informant approach, which is deemed necessary to have a reliable and sensitive measurement since WM is a multi-component and dynamic construct (Huizinga et al., 2018). The Behaviour Rating Inventory of Executive Function (BRIEF-2; Gioia et al., 2015; Huizinga & Smidts, 2020) was administered to both teachers and parents. Corsi block tapping test (Corsi, 1973) was used to assess children's visuo-spatial WM, while the Digit Span subtest of the Wechsler Intelligence Scale for Children – Fifth Edition (WISC-V; Wechsler, 2014) was administered to assess children's verbal WM.

The data was collected in three waves throughout one academic year. Both parents and teachers completed the above-mentioned questionnaires. A virtual meeting with participating students was organised. The students were asked to fill in the Y-CATS or the SPARTS questionnaire, to complete the Corsi block-taping task, and the Digit Span forward and backward conditions.

Results

First analyses indicate an effect of TSR on children's WM, however, this association is mediated by the child-parent relationship quality. More specifically, teacher has a positive impact on children's WM performance, but only for those children with initially poorest relationship with their parent. Furthermore, analyses indicate that child characteristics, such as gender and age, were not significant predictors of TSR nor the association between constructs. To investigate the longitudinal bi-directional associations between children's WM and TSR, autoregressive cross-lagged analyses will be conducted within a structural equation modelling (SEM) framework. Path analyses will be used to analyse direct and indirect effects, by taking into account the parent-child relationship.

Interpretation of findings

Overall, TSR seems to affect children's WM. However, our current knowledge is limited regarding the bi-directional nature of the association between TSR and children's WM performance, and how these constructs affect each

other over time. In addition, this project explores teacher and child characteristics, as well as environmental influences that might have an impact on the TSR and, in turn (or independently), on WM performance. However, from our hypotheses, only one factor seems to play a role in our study –the strength of the interrelation between the TSR and WM yields larger effects in children with a poor parent-child relationship. More in-depth analysis of our data and further findings will be presented.

Using teacher-student interactions to support working memory problems in students: a thematic analysis

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Introduction

The ability to guide behaviour, thoughts and emotions, also referred to as executive functions (EFs), is proven to be essential for children's academical performance (e.g., Huizinga et al., 2018). From the three core EFs, working memory (WM) or the ability to temporally hold and process task-relevant information, has most consistently been associated to children's school success (e.g., Cragg & Gilmore, 2014). Because of the importance of WM for academic achievement, it is important to determine influencing factors that promote WM performance.

Development of WM is mainly driven by the maturation of the prefrontal cortex but also environmental factors play on important role. External stimulation, especially in periods of rapid growth such as primary school, can impact the WM development significantly (Huttenlocher, 2002; Vandenbroucke et al., 2018a). Although initial WM interventions lead to WM improvements, they often lacked durable and transferable effects (e.g., Diamond & Lee, 2011). As a result, recent programs started to intervene in settings where WM are daily used (e.g., classroom context) and aimed to create an optimal environment for WM development. As such, the quality of teacher-student interactions (TSI) became a central focus (Vandenbroucke et al., 2018b).

Aims and methods

Although an increasing number of studies indicate the importance of TSI for children's WM, it is unclear which specific TSI strategies impact WM the most. Beside, our understanding of underlying mechanisms is still limited. The current study takes the existing research a step forward by investigating (1) discrete TSI strategies used by primary school teachers to improve WM problems, (2) potential mechanisms through which TSI strategies may promote WM performance, and (3) child and context characteristics that influence the effect of TSI strategies to strengthen WM skills. Data were drawn from semi-structured interviews with 18 primary school teachers from Belgium and the Netherlands. To analyse our interviews, we used template analysis (King & Brooks, 2018).

Results

With respect to our first aim, results showed a wide range of specific TSI strategies used by teachers to support students with WM problems. All TSI tapped on one of the three TSI support dimensions of the Teaching Through Interactions framework (Hamre et al., 2013). On the domain of emotional support, teachers, e.g., used positive commination, acknowledged emotions and provided comfort. Regarding instructional support, teachers used, e.g., prompting, feedback, and modelling. On the domain of classroom organization, teachers, e.g., set clear behaviour expectations, used rewards, and implemented a variety of modalities.

With respect to our second aim, results showed several underlying mechanisms through which TSI may impact WM performance. Different TSI strategies were thought to provide challenging learning activities during which students can practice their WM skills. Next, teachers clarified that TSI strategies can stimulate WM-related behaviour through punishment and rewarding. Also, TSI strategies were used to improve well-being, and in turn, better WM performance in students. Additionally, different TSI strategies made students more engaged in activities that challenge their WM skills. Furthermore, several TSI strategies fulfilled students' need for autonomy, competency and connection. Fulfilling these needs made students more motivated to challenge their WM skills.

As to our final aim, we discussed child and context characteristics that may influence the effectiveness of TSI strategies to improve WM skills. On the teachers and classroom level, different factors were mentioned including teacher's experience, and distractions in the classroom. Next, teachers reported that characteristics of TSI

strategies (e.g., content) impact the effectiveness. On the individual student level, several characteristics of the home environment (e.g., SES) were thought to play a significant role. Furthermore, teachers mentioned cognitive, motivational and emotional preconditions including child's intelligence, interest and stress level. Finally, individual learning processes as well as child characteristics (e.g., diagnosis) were thought to influence the effectiveness.

Discussion

Teachers implemented a wide range of TSI strategies to support a student with WM problems. On the domain of emotional support, teachers used TSI strategies to create a positive classroom climate, act sensitive-responsive in the dyadic relationship, and pay attention to students' perspectives. With regard to instructional support, predominantly scaffolding was implemented and attention was paid to the way instructions were communicated. With respect to classroom organization, teachers used behaviour management, implemented effective learning formats, and reduced classroom chaos. Furthermore, results showed several underlying mechanisms through which TSI may impact WM performance. Teacher's answers referred to different theories including sociocultural theory (Vygotsky, 1978), operant conditioning (Skinner, 1953), attachment theory (Bowlby, 1969), and self-determination theory (Deci & Ryan, 1985). Finally, we discussed child and context characteristics that may influence the effectiveness of TSI strategies to improve WM skills. Factors referred to TSI characteristics, classroom characteristics, teacher characteristics, child characteristics and home environment characteristics.

It counts in every single lesson: associations between teacher-student interactions perceived from the student's perspective and their self-regulation at the lesson level

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Individuals engaging in SR manage their emotions and behaviour, exhibit inhibitory control, and focus their attention (e.g., McClelland & Cameron, 2011). Studies considering students' SR as a trait largely stable over time consistently emphasised the relevance of SR for academic outcomes (e.g., Duckworth et al., 2019). Accordingly, students with SR deficits were shown to be at risk for academic failure and to be diagnosed with special educational needs (SEN; Daley & Birchwood, 2010). Recent studies found SR to also vary within students from day to day and daily manifestations were shown to be associated with daily academic success (Blume et al., 2022).

The quality of teacher-student interactions (TSI), which can be differentiated into emotional (ES), organisational (OS), and constructive classroom support (CS; e.g., Downer et al., 2010), has been shown to be associated with students' trait SR. In particular, ES and OS have been shown to be positively associated with student SR from kindergarten age to secondary school level (Merritt et al., 2012; Pöysä et al., 2019; Rimm-Kaufman et al., 2009; Sankalaite et al., 2021), while CS did not benefit SR. TSI should therefore be expected to have the potential to shape students' SR, thereby reducing the risk of SEN being diagnosed. However, whether students' individually perceived TSI is associated with their SR is unclear to date as is whether associations are also evident within individuals at the level of individual lessons. Additionally, it yet to be determined whether the strength of these associations is influenced by the level of students' trait SR.

Based on intensive longitudinal data collected from students aged 11 to 13 years using daily diaries in relation to 15 lessons, the present study examined whether a) students' trait SR was associated with their SR in individual lessons, b) students' perceived ES, OS, and CS quality was associated with their SR at the lesson level, and c) students' trait SR moderated associations between students' perceived ES, OS, and CS quality and their SR at the lesson level.

Methods

64 students (Mage = 11.71 years, SD = 0.93), who were recruited via email calls and social media, reported about their trait SR (Blume et al., 2020) and demographics in a background questionnaire. 57 of them participated in a 15-day daily diary phase in which students informed each afternoon on their perceived TSI quality (Talić et al., 2022) and their SR (adapted from Blume et al., 2020) in the last lesson that day over 15 consecutive school days. Considering the multilevel structure of the data with daily assessments (Level 1) nested within students (Level 2), multilevel models using Bayesian estimators and with students' SR in individual lessons as the outcome variable were estimated. Predictors were included step by step, while only results of the full model including students' trait SR, their individual mean and daily ES, OS, and CS, and interactions between the latter two as predictors, will be reported here, and in detail only with respect to Level 1. Information with respect to the lesson level were centred on person means and individual mean scores over the study period were centred on grand means.

Results

Results of the full model indicated students' trait SR to be significantly associated with their SR in individual lessons (β = 0.54, 95% CI [0.32, 0.72]). Additionally, perceived ES (β = 0.18, 95% CI [0.05, 0.30]) and OS (β = 0.19, 95% CI [0.05, 0.32]), but not CS (β = -0.01, 95% CI [-0.06, 0.25]), were significantly associated with their SR at the lesson level. None of the interactions significantly predicted students' SR at the lesson level (βtrait SR x ES = -0.04, 95% CI [-0.21, 0.13], βtrait SR x OS = 0.02, 95% CI [-0.13, 0.17], βtrait SR x CS = 0.10, 95% CI [-0.06, 0.25]). Predictors accounted for 55.60% of the Level 1 variance in SR. Patterns of associations were largely the same for models including trait SR and predictors related to one TSI dimension only and in relation to Level 2.

Discussion

In line with earlier evidence, the present findings indicated students' trait SR to be positively associated with their SR at the lesson level (e.g., Blume et al., 2021). Students with poorer SR overall should therefore be expected to experience SR difficulties in individual lessons as well, highlighting the need for continuous support of their SR in class.

Furthermore, in line with previous observational studies considering the between-person perspective (cf., Sankalaite et al., 2021), the present findings showed that lessons with higher perceived ES and OS, but not CS, were also lessons with higher SR. Although future studies need to clarify causal relations, findings thereby indicate the relevance of students' perceived TSI in relation to their SR at the lesson level and could be understood to indicate that more consideration should be given to their perspectives in the future (e.g., student feedback to teachers). Additionally, they may be considered as indicative of the relevance of ES and OS to students' SR in individual lessons and thus of their potential for continuous support of individual student functioning in class.

Finally, the findings showed students' trait SR to be largely irrelevant for the strength of associations between TSI and SR at the lesson level. They thereby may be considered to corroborate the idea that high TSI should be considered equally important for the SR of all students.

Individual paper sessions

Prediction

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Longitudinal associations of motor skills, executive functions, and early numeracy in preschoolers

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Early numeracy is an important predictor for later academic performance (Duncan et al., 2007) and executive functions have been identified important for the development of early numeracy (Schmitt et al., 2017). Gaps in early numeracy have been observed already in preschool age children (Anders et al., 2012) and those with low performance have been shown to remain low-performing throughout their primary school years (Aubrey et al.,

2006). Therefore, it is vital to understand different determinants of early numeracy and executive functions, especially in low-performers, as it allows the planning and implementation of interventions that contribute to the development of these important skills.

Fundamental motor skills have been positively associated with executive functions (Cook et al., 2019) and early numeracy (Gashaj et al., 2019) and shown to predict later executive functions (Niederer et al., 2011) in preschoolers. In addition, poorer performance in mathematics have been linked with lower proficiency in fundamental motor skills in school-aged children (Westendorp et al., 2011). The relation between fundamental motor skills and cognitive functions have been explained through cognitive engagement required to execute complex motor movements, and the co-activation in the brain areas important for complex motor and cognitive tasks (i.e., cerebellum, basal ganglia and the prefrontal cortex; Best, 2010).

In school-aged children, executive functions have been found to mediate the cross-sectional association between fundamental motor skills (Syväoja, 2021) and mathematical skills. In preschoolers, Gashaj et al. (2019) reported that fundamental motor skills and executive functions were positively associated with early numeracy, but mediation effects were not tested. The aim of this study was to investigate how fundamental motor skills predicts executive functions and early numeracy over one year, and whether executive functions are mediating this association in preschoolers.

Data were collected in the ongoing research project where 281 children (Mage = 4.3, SD = 0.6) were followed for one year between the baseline and follow-up assessments. Three components of fundamental motor skills were measured: locomotor (e.g. jumping) and object control skills (e.g. throwing) using the TGMD-3 test (Ulrich, 2019) and stability skills (ability to control the body) using the jumping sideways and the balancing beam tasks from the KTK-test battery (Kiphard & Schilling, 2007), and the one-leg stance test from the M-ABC test battery (Peterman, 2009). Executive functions (inhibition, switching and working memory/updating) were measured using four computer-based tests (Lee et al., 2013). Early numeracy was measured using an early numeracy test (Van Luit et al., 2006).

Our preliminary analysis showed that better locomotor and stability skills at the baseline positively correlated with higher scores in working memory task ($r = .240$, $p < .001$ & $r = .182$, $p < .05$) and early numeracy test ($r = .140$, $p < .05$ & $r = .223$, $p < .01$) in one year later. Object control skills correlated positively only with working memory ($r = .138$, $p < .05$) measured one year later. Our findings suggests that practicing fundamental motor skills might be beneficial for working memory and early numeracy skills in preschoolers and possible target for interventions. In the SIG15 conference, we will present our results also focusing on children with low performance in early numeracy.

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In search of the cognitive profile of preschoolers at risk for dyslexia and ADHD

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Developmental dyslexia ('dyslexia') and attention-deficit hyperactivity disorder ('ADHD') co-occur frequently, as approximately 25-40% of children with dyslexia meet the criteria of ADHD. Children with a diagnosis of co-occurring dyslexia and ADHD have been found to show deficits related to dyslexia (i.e., phonological deficits), deficits related to ADHD (i.e., executive deficits and delay of gratification difficulties), as well as processing speed deficits. Compared to children with a single diagnosis, children of the double diagnosis group are often found to have more severe deficits. Because of the severity of their cognitive problems, and an increased risk of poor school performance, internalizing, and externalizing problems, early identification of these disorders is important. It is therefore key to acquire knowledge about predictors of these disorders, to identify young children at risk for developing co-occurring dyslexia and ADHD. However, up until now, young children (i.e., preschoolers) at risk for both dyslexia and ADHD are often neglected in research. We, therefore, believed that research at this point would benefit most from a full- factorial longitudinal study of preschoolers at risk for dyslexia and/or ADHD, beginning before reading instruction (preschool) and following them up from the starting phases of formal reading instruction (first grade) through the final stages of reading instruction (third grade).

The overall aim of this study was to compare the cognitive profile and development of a group of preschoolers (pre-reading) at risk for both dyslexia and ADHD (n = 47) to the profile of preschoolers at risk for dyslexia (n = 49) or ADHD (n = 39) and follow them up for 3 years. We compared these three preclinical groups to a group of average functioning preschoolers (n = 47). In October 2018, we screened 1091 children (520 boys and 571 girls). Based on earlier longitudinal studies in this research group, we categorized participants at risk for dyslexia when they performed below percentile 25 on the most consistently found cognitive predictors of dyslexia, i.e., phonological awareness, rapid automatic naming, or letter knowledge, but did not perform above percentile 50 on any of these measurements. Children were considered as at risk for ADHD when they scored above the clinical cut-off of the Preschool Behavior Questionnaire (PBQ), i.e., above norm score 16 on either the inattention, hyperactivity, or impulsivity scale, filled in by their parents. Additionally, their scores on the 3 cognitive predictors for dyslexia were above percentile 40. Children who scored above percentile 40 on all 3 pre-reading measures, but below 15 on the PBQ, were considered as controls for this study. Groups were matched on gender and had a nonverbal IQ of above 76.

All children were followed up longitudinally and tested at three points in time: in 3rd kindergarten (winter 2019), first (winter 2020) and third grade (ongoing data collection, to take place in winter 2022). They were assessed on several cognitive factors related to dyslexia (i.e., phonological skills), ADHD (i.e., executive functioning and delay of gratification), co-occurring dyslexia ADHD (i.e., processing speed), and academic achievement. Results revealed that children at risk for dyslexia (irrespective of ADHD status) showed phonological deficits in preschool and first grade. All children progressed in phonological skills from preschool to first grade, but those at risk for dyslexia (irrespective of ADHD status) did not reach the level of controls. Children at risk for ADHD showed executive deficits (only on verbal and visuospatial working memory), but only when they were also at risk for dyslexia.

They did not show delay of gratification problems. Processing speed deficits were only present in the groups at risk for dyslexia, again irrespective of ADHD status. Last, as expected, children from the dyslexia risk group (with or without ADHD risk) performed poorly on measures of academic achievement, i.e., reading and spelling. In short, the cognitive profile of children at risk for dyslexia did not differ from the cognitive profile of children at risk for dyslexia and ADHD. Analogously, neither did the cognitive profile of children at risk for ADHD versus those without risk. These results indicate that heterogeneity in these preclinical groups is too large to detect group differences. Currently, data of wave 3 (third grade) are being collected. Additionally, parents are filling out questionnaires on possible clinical diagnoses of each child. Retrospective analyses of the cognitive profile in these clinical diagnosis groups will also be presented at the conference. Given the lack of research on preschoolers with a risk for dyslexia and ADHD, this research is not only of clinical value but can also add to the existing body of scientific literature.

It takes a motivating village to teach a child: motivational resources as predictor of mathematical abilities over time

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Theoretical background & research questions

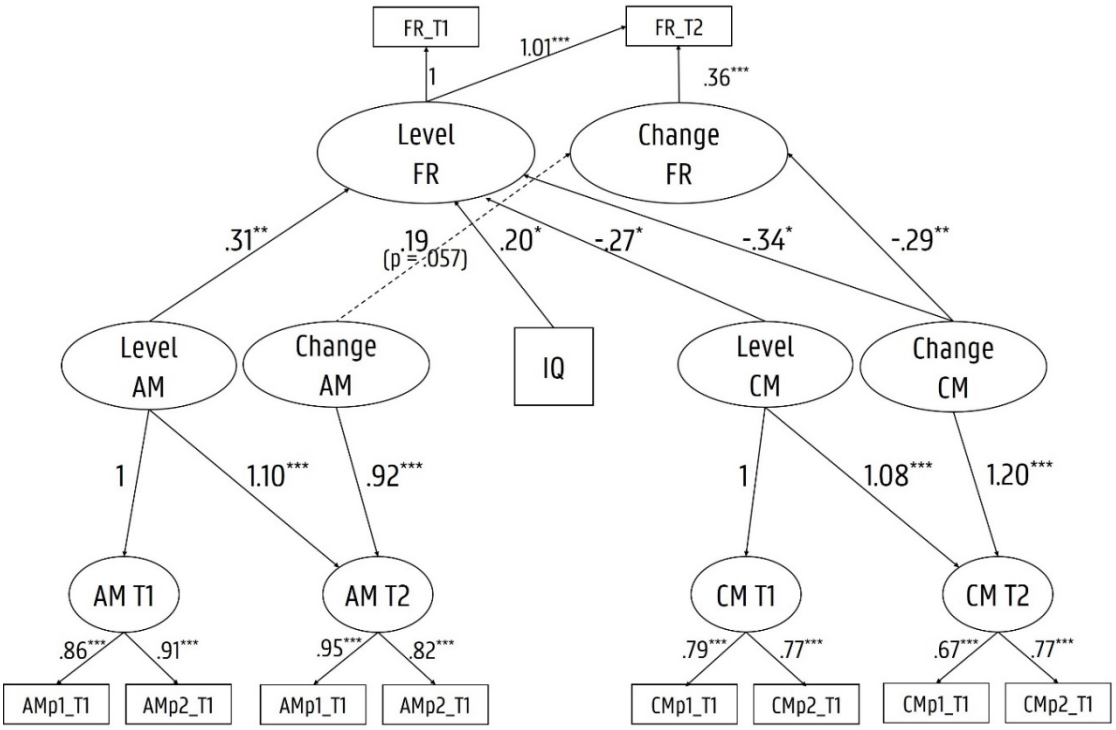
A lot of individual variability in mathematical abilities cannot be explained uniquely by intelligence (Grigorenko et al., 2019), an important, strong and robust predictor of mathematical achievement (Kriegbaum et al., 2018; Peng et al., 2019; Roth et al., 2015). Other factors must also play a role. Within the Opportunity-Propensity Model (Byrnes, 2020), distal, opportunity and propensity predictors are taken into account simultaneously in order to predict learning within a more holistic perspective. Intelligence can be classified as a propensity predictor, which are factors making children willing and/or able to take advantage of the given learning opportunities. Opportunity predictors are all factors in the home and/or school environment of the child that provide opportunities to learn (e.g., parent-child interaction, teachers' instruction). Finally, distal predictors are factors appearing early in life (e.g., SES) and explain why some people are offered more/better opportunities than others and/or have better propensity factors to take advantage of these opportunities. It was shown (e.g., Byrnes & Miller-Cotto, 2016) that propensity factors explain most of the variance in learning outcome. Therefore, we included motivation (Self-Determination Theory; Ryan & Deci, 2017) in addition to intelligence (both propensity factors) as predictor of mathematical abilities. Moreover, we examined the development of mathematical abilities over time. We focused on inter-individual change and also intra-individual change, which is perhaps more susceptible to motivational influences (Boncquet et al., 2020; Murayama et al., 2013). We had extra attention for children with special educational needs since possible differences between children with and without Mathematical Learning Disabilities (MLD) were examined. Previous studies show a positive association between autonomous motivation and mathematical abilities, but a negative or no association between controlled motivation and mathematical abilities (Li et al., 2018; Mouratidis et al., 2021). Studies investigating both motivation and intelligence show mixed results (e.g., Di Domenico & Fournier, 2015; Gagné & St Père, 2001; Weber et al., 2013), possibly related to methodology, e.g., type of task (Baten & Desoete, 2018) or focus on inter-individual change (e.g., Gagné & St Père, 2001). Therefore the current research question was: Do motivational resources predict intra-individual change beyond intelligence in fact retrieval abilities over time?

Methods

Sample: 104 children (28 male, 60 clinical diagnoses of MLD) participated. At the first time point (T1) children were spread across grade 3 (n = 16), grade 4 (n = 33), grade 5 (n = 41), and grade 6 (n = 6). The second time point (T2) was on average 369.28 (SD= 13.30) days later. Measures: The current study is part of a larger study, for which all tests were administered individually in the home or school environment in two sessions of circa 90 minutes per time point. Measures of interest for the current study were: Intelligence (T1): A short form of the Wechsler Intelligence Scale for Children – III – Dutch version (WISC-III-NL; Grégoire, 2000; Kort et al., 2005) was administered. Motivation (T1 and T2). Children filled out the Academic Self-Regulation Scale (Vansteenkiste et al., 2009) with 16 items (eight for autonomous and eight for controlled motivation) on a 5-point scale (1 = not at all; 5 = very much). Mathematical abilities: fact retrieval (T1 and T2). The Tempo Test Rekenen (de Vos, 2002) consists of 5 columns of exercises (addition, subtraction, multiplication, division, mix of operations) and children had 1 min. per column to complete as much exercises as possible. Statistical analysis: Change in fact retrieval ability over time was analysed with Latent Change Modeling in Mplus and Full Information Maximum Likelihood (FIML) estimation, controlling for grade at T1, gender, intelligence, and days between T1 & T2.

Results

The model yielded an acceptable fit with $\chi^2(49) = 97.30$, $p < .001$; CFI = .93; RMSEA = .10; SRMR = .08. The initial level of fact retrieval ability was significantly predicted by intelligence and the initial level of motivational resources (positive for autonomous motivation, negative for controlled motivation). Changes in fact retrieval ability over time was not predicted by intelligence. However, motivational resources added significant value to this prediction with an increase in controlled motivation between the two time points predicting a decrease in fact retrieval ability, and an increase in autonomous motivation between the two time points predicting an increase in fact retrieval ability (trend, $p = .057$). The results also indicated that the changes in fact retrieval ability over time were smaller for older than for younger children. More detailed results of the tested model and parameter estimates can be found in Figure 1.



Interpretation of findings

Changes in fact retrieval ability over time were influenced by changes in motivational resources (propensity factor). When children transformed from external to personally endorsed motives to engage in activities related to mathematics (internalization), they performed better on a mathematics test.

Extra information

By the time of the conference, we will also study differences between children with and without MLD and consider procedural calculation as outcome.

Validity and effectiveness of screening assessments within the Three-Tier Model: protocol for a systematic review and meta-analysis

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Theoretical background

Children who have challenges related to learning or behavior that make it difficult to follow universal teaching plans, often leave school with few qualifications. They are also more likely to drop out of school, become unemployed, have health problems, and be incarcerated (e.g., Aro, 2019). However, the educational context has the power to change lives. The three-tier model, which has been in use for several years in, for example, the US and Finland, has been recommended to tackle this diversity of learning challenges and special educational needs. The idea of this model was to provide earlier intervention and a more valid method of identification of difficulties than the discrepancy between IQ and academic achievement. A critical issue for the successful implementation of the three-tier model is correctly allocating children to tiered interventions of appropriate intensity. Screening and progress monitoring assessments are often used to detect need of extra support due to difficulties or delays in children's academic development at an early stage and used for subsequent placement in the different tiers. A variety of instruments have been used for this purpose, but it is unclear which of these assessments are valid in placing children in the different tiers. It is also unclear whether assessment leads to improved academic

achievement outcomes because the schools then give the children with difficulties more attention and better support. Although some narrative reviews (e.g., Stewart et al., 2007) on three-tiered models in general exist, systematic reviews on how to accurately place students in tiers through screening are lacking. The purpose of this systematic review is to evaluate the validity and effectiveness of screening and progress monitoring assessments within the three-tier model across academic achievement outcomes (i.e., overall academic, language, literacy, and mathematics).

Research questions

With this systematic review, we aim to answer the question of how valid and effective screening assessments within the three-tier model are. The specific research questions are: 1) What types of assessments in language, literacy, and mathematics have been used for placing children in the three-tier system in early childhood education and care (ECEC), or first and second grade in primary school, 2) Screening validity: a) Do these assessments accurately identify children for placement in the different tiers (screening sensitivity and specificity), b) To what extent do the assessments concurrently and predictively relate to children's academic achievement outcomes (validity), 3) Screening effect: Does screening and progress monitoring assessment in itself lead to improved academic achievement outcomes in primary or secondary school?

Methods

A systematic literature search of published English language articles and book chapters as well as grey literature (theses, conference proceedings, and abstracts) will be conducted in the following databases; PsycINFO (Ovid), ERIC & Academic Search Premier (EBSCO), Web of Science, and ProQuest Dissertations & Theses Global, and OpenGrey.eu.

Inclusion criteria are as follows: a) empirical and quantitative, b) direct screening assessment (language, literacy, or mathematics), c) classify screening assessment as a component of either a comprehensive three-tier model system or a specific tier of a three-tier model, d) sample of children screened in ECEC, first- or second-grade in primary school, e) for validity: report uncorrected bivariate correlations (or other statistical estimates that can be transformed to bivariate correlations), f) for screening effects: a target group that has received the screening and a control group that has not. The search syntax will include all words related to ("three tier") AND ("effect" OR "screen") AND ("child" OR "ECEC" OR "school"). EPPI-reviewer will be used for independent screening and data extraction. The quality of the studies will be assessed with Cochrane's risk of bias tool. The data will be investigated in two steps: First, descriptive analyses of all included studies (e.g., characteristics of the sample, screening instruments, type of outcomes) will be conducted. Second, given a sufficient number of primary studies, Excel and R will be used to synthesize quantitative data with a three-level random-effects modelling meta-analysis approach. Meta-regression will be used for moderator analyses. Publication bias will be examined through a funnel plot and Egger's test to statistically test whether the funnel plot was symmetrical (in case of asymmetry, PET-PEESE method will be used).

Results

As we will present the protocol for this review, there are no final results yet. However, we expect to be able to show some preliminary numbers on the results of the literature search.

Interpretation of findings

The findings of the study presented in the protocol will contribute to a better understanding of the use and value of screening and progress monitoring assessment for the placement of children within the three-tier system. It will provide an overview of what types of assessments have been used, how well these assessments fare in terms of sensitivity, specificity, and validity, and whether screening has a preventive effect for children at risk of poor academic achievement in school.

Learning problems 1

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How important is phonological awareness for children with reading and spelling difficulties?

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Children with reading and spelling difficulties who learn an alphabetic language must learn a considerable amount about letter- sound correspondences. In learning to read and spell phonological awareness is especially important for children with reading and spelling difficulties who need to take advantage of these abilities and use them as strategies for manipulating the sounds in words intentionally and thus overcome the difficulties they face in learning to read and spell. In the need for establishing more general theories about phonological awareness and literacy development, this study contributes the long-term relation of phonological awareness with literacy in Greek using stringent controls. The aim of this paper is to examine whether phonological awareness contributes unique variance to the longitudinal prediction of literacy in Greek after controlling for factors which affect reading and spelling and correlate with phonological awareness such as verbal intelligence and morphological awareness. This hypothesis was examined with Greek Cypriot children (N=404), aged 6 to 10, irrespective of any reading and spelling difficulties or special educational needs (SEN). Because there are no standardised measures of phonological and morphological awareness with Greek Cypriot children, measures of these factors were developed during the pilot study and their internal consistency was assessed.

With the larger sample, the measures were validated by examining their construct validity. To examine whether there is a specific connection between phonological awareness and later success in reading and spelling, after the appropriate controls, a set of three fixed-order multiple regression analyses was carried out. Results showed that after an interval of eight months and even after controlling for the estimation of verbal reasoning and morphological awareness, phonological awareness predicted children's performance in reading. Phonological awareness was found to predict spelling only after controlling for the estimation of verbal reasoning. Both theoretically and empirically, this study contributes the longitudinal relation between phonological awareness and literacy using stringent controls. Although studies have shown that phonological awareness is related to morphological awareness, to my knowledge no longitudinal studies in Greek have controlled for morphological awareness in the analysis. Overall, the children who scored very low in reading and spelling, scored also very low in phonological awareness. Therefore, instead of allowing children with reading and spelling difficulties to struggle by themselves in order to discover the role of phonology in literacy, and in order for literacy classrooms to be made inclusive, teachers are encouraged to make the connection between phonemes and literacy explicit.

Early numeracy in 3-4-years old children: measuring early numeracy and individual differences

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Early numeracy has got a lot of research attention in the last 15 years, but it has been focusing on children aged 5 and above while less is known about younger children. Typically in studies with preschool children age ranges between 3-5 which leaves it unresolved how numerical skills evolve in this quite "long" two-year period. In addition, there is a lack of valid tools to measure and understand individual differences in early numeracy in 3-

to 4-year-olds. There is also limited knowledge on the interrelatedness of these numerical skills. The main aim of this study was to investigate individual differences in early numeracy in 3-year-old (n=147) and 4-year-old (n=173) children. To accomplish that we first ensured the psychometric soundness of the Early Numeracy Test (ENT), originally developed for older children. Our results showed that numerical relational skills have developed in 3 year-olds, numerical relational and counting skills have developed 4-year-olds so that they can be reliably measured. In 3-year-old children the numerical relational skills were meaningfully related to both symbolic magnitude processing and language skills. Also in 4-year- olds both numerical relational and counting skills were related to symbolic magnitude processing and language skills. Related to family variables we found that in both age groups higher numerical relational skills were related to lesser number of children in the family, having Finnish as home language, higher family income, and higher parental educational level. In the 4-year-olds group higher counting skills were related to having Finnish as home language and higher parental educational level. When investigating the joint effect of the covariates on early numeracy skills in 4-year-olds group, only symbolic magnitude processing and language skills predicted numerical relational and counting skills. Our results showed that it is possible to use The Early Numeracy Test (ENT) to measure young children's early numeracy skills. We recommend to measure numerical relational skills in 3 years old, and numerical relational and counting skills in 4 years old.

Evaluating the effect of rich vocabulary instruction and retrieval practice on the classroom vocabulary skills of children with (developmental) language disorder

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Background

School-age students acquire approximately 3000 words per year mainly by using implicit learning strategies. The size and quality of vocabulary are by many researchers regarded as critical for the development of reading, listening comprehension and writing in populations both with and without developmental language disorder (DLD). However, for students with DLD, implicit word learning has proved to be a challenge, leading to limitations in vocabulary depth and breadth.

Here two types of interventions are compared. Retrieval Practice (RP) [1] with Rich Vocabulary Instruction RVI [2]. In RP, new words and definitions are introduced by the teacher and thereafter explicitly rehearsed through repeated retrievals, while RVI is characterized by learning through multiple exposures to the target word in various contexts

The general finding of RP as a potent method alongside recent findings concerning word learning for children with DLD guided the hypothesis that "practicing with RP would, to a greater extent, facilitate retrieval of target words than practicing with RVI (RP target words > RVI target words)"

Method

Participants: Data were collected from a mixed-aged class (grade 7 to 9). All participants had been diagnosed with DLD or Language Disorder (LD) by a speech-language pathologist and a psychologist as part of their application to the language unit.

Study design: A quasi-experimental counterbalanced within-subject design was used to evaluate the effect of RP and RVI, with learning Tier 2 vocabulary words as dependent measures. Learning was assessed with two tests 1-2 weeks prior to the intervention and at a posttest session one week after the intervention. A blinded procedure was used to guarantee that the test administrators were unaware of which words were targets and controls.

Intervention procedure: The study was carried out in the students' classrooms as part of their scheduled lessons in Swedish. Each instructional condition included eight lessons (40 min/lesson) distributed across four weeks and was carried out by two teachers (with a degree in special education). The target words were actively processed during instruction, while control words were only read aloud as part of the text at the beginning of the lesson but were left without further action.

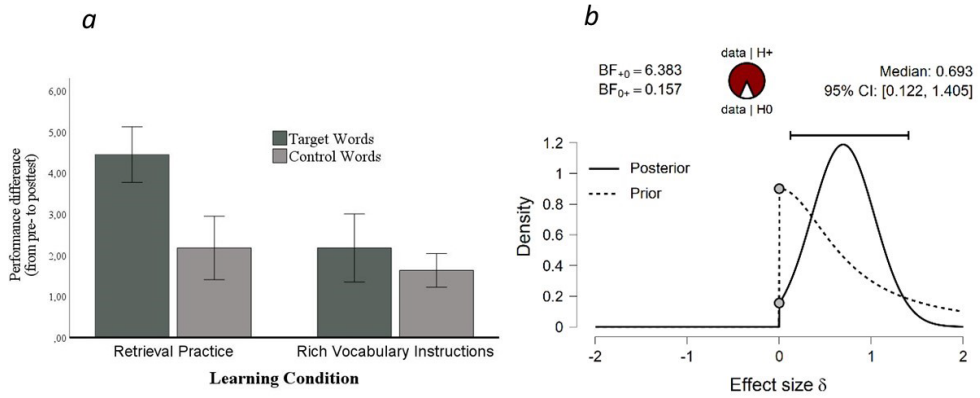
Pre- and posttest tasks: Twenty Tier 2 words were assessed (10 target and 10 control words) in each instructional condition, respectively. Multiple choice: Participants were presented orally and in writing with one word at a time and four alternative definitions. The students could respond orally or by pointing to the correct definition. Participants achieved one point for each correct response. The maximum score was 20 points (10 points for target and control words). Sentence completion task: The participants were asked to fill-in the missing word orally. Participants achieved one point for each correct response. The maximum score was 20 points (10 points for target and control words).

Statistical analyses: To improve the reliability and reduce the risk of false positives we employed Bayesian statistics using JASP (version 14) statistical software for analysis. The classification for reporting results for Bayesian statistics using JASP is for Bayes factor (BF) "weak," "moderate," and "strong." (1< BF < 3 = Weak evidence; 3 < BF < 10 = Moderate evidence; 10 < BF = Strong evidence) [3].

Results

Figure 1a shows the average change (composite score) in response pre- to posttest for retrieval practice and rich vocabulary instructions. Figure 1b shows the pie chart that visualizes the evidence for the hypothesis; RP target words > RVI target words. The red "slice" (the ratio of red) indicates the level of support (6.383 = moderate evidence)

Figure 1 (a & b). Change in response pre- from pre- to posttest for retrieval practice och rich vocabulary instructions (a). Bayesian statistics directed hypotheses RP target words > RVI target words (b).



Discussion

The findings indicate that RP is advantageous over RVI regarding vocabulary learning. It is interpreted as the cognitive processes induced by RP (i.e., creating and strengthening associations between word form and word meaning) reduce the cognitive demand associated with successful retrievals of verbal information [4]. The contextualization characterizing RVI, on the other hand, is arguably more cognitively demanding, and thus, fewer cognitive resources remain for processing the associations between word form and word meaning, a consequence that is particularly noticeable for individuals with DLD.

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Effectiveness of Cover, Copy, & Compare (CCC) on orthographic spelling rules in a transparent orthography: a randomized controlled trial (RCT) following Council for Exceptional Children (CEC) quality standard

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Introduction: Cover, Copy, & Compare (CCC) is an evidence based intervention for teaching academic skills (Joseph et al., 2012; Stocker & Kubina, 2017). To teach spelling, students read a word, memorize it, cover it with their hand or a sheet of paper, copy (spell) the word from their working memory, and then compare it with the correct spelling. Because English has a highly irregular orthography (Share, 2008), CCC is most often used to teach the spelling of irregular words. It is not surprising that students spell the trained words better (e.g., Erion et al., 2009), but it is not expected that they increase their spelling skills in untrained words. In more consistent transparent orthographies, most spellings follow certain orthographic rules. Thus we expect, however, that CCC can also be used in more transparent orthographies to teach not only the spelling of certain words but to train the underlying orthographic rule (Grünke, & Weber, 2015), which in turn should also increase the spelling skills even in untrained words as long as these words follow the same orthographic rule.

Method: In a randomized controlled trial, N = 185 third graders with poor orthographic spelling skills either trained spelling with CCC including an explicit orthographic rule instruction (experimental group) or trained inductive reasoning (control group) for four weeks. In three measurement points (pretest, posttest, and follow-up test), we assessed their spelling skills for untrained words (self-developed word list test), and in addition with a standardized spelling test (HSP3+). Spelling fun and spelling self-concept were assessed with a standardized questionnaire.

Results: After the training, students in the experimental group outperformed the control group in both our word list test ($F = 4.4$, $p = .038$, $d = .26$) and the standardized spelling test ($F = 6.9$, $p = .010$, $d = .28$). In the follow-up test, the effects in our word list test diminished ($F = 1.2$, $p = .280$, $d = .13$), while the effects in the standardized test remained stable ($F = 9.5$, $p = .002$, $d = .29$). Additionally, spelling self-concept ($F = 9.1$, $p = .003$, $d = .44$), but not spelling fun ($F = 0.0$, $p = .862$, $d = .11$) increased.

Discussion: CCC can be used in transparent orthographies to teach not only spelling but orthographic spelling rules. However, the effect sizes were quite small, maybe due to the short intervention period of four weeks. Contrary to our hypothesis, training effects did not last in untrained words that could be spelled with the trained spelling rules. However, it seems the intervention increased orthographic spelling skills in general.

Learning problems 2

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Do teachers change their performance expectations of a student, when the student is explicitly labeled as "learning disabled"? A randomized experimental study with regular and special education teachers

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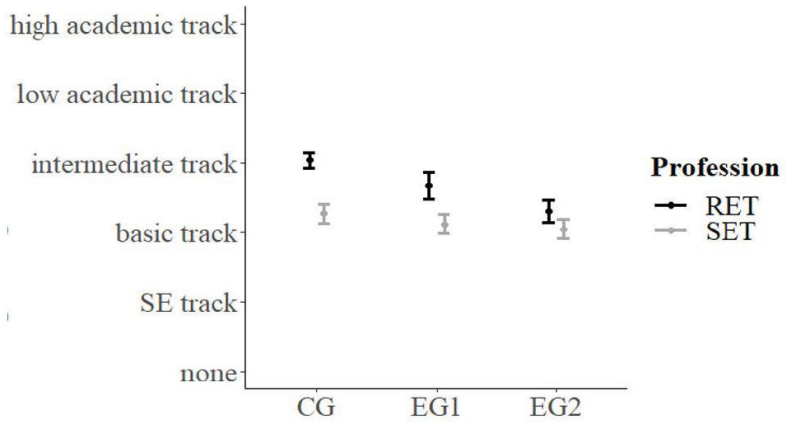
Numerous studies have shown that teachers' expectations do influence students' academic performance in a way that high expectations lead to better student performances than low expectations - an effect known as self-fulfilling prophecy (e.g. de et al., 2018; Gentrup et al., 2020; Papageorge et al., 2020; Ready & Wright, 2011; C. M. Rubie-Davies, 2007, 2010). Teachers' expectations are not only based on individual student characteristics (i.e. previous achievements or learning motivation) but can be biased for students from stigmatized groups (Jussim & Harber, 2005). Besides for minority students or for students from a low socio-economical background (e.g. Rubie-Davies et al., 2006; Tenenbaum & Ruck, 2007; Tobisch & Dresel, 2017), lower teacher expectations have also been found for the group of students with special educational needs. Previous research shows, that the label Learning Disability (LD) leads to lower teacher expectations in comparison to the expectations for non-labeled counterpart students (e.g. Clark, 1997; Woodcock & Vialle, 2010, 2011; Shifrer, 2013). Firstly, the aim of our study was to investigate whether the effects of the LD-Label also exist for the German Label Lernbehinderung (LB). An LB can be defined as school deficits such that: a. they cover at least two school years, b. affect several subjects, c. particularly Mathematics and German, d. do persist for several years, e. are not caused by sensory impairment, and f. are not the result of insufficient learning opportunities, but instead related to milder deficits in the general intelligence (Grünke & Grosche, 2014). Secondly we ask, if the effect of the LB-Label influences regular education teachers (RET) differently than special education teachers (SET). Thirdly, based on a recent finding, that a positive attitude towards inclusion can reduce negative label effects (Woodcock, 2020), we test, whether positive attitudes towards inclusion in school minimize possible negative effects of the LB-Label.

To answer our research question, RET and SET were randomly assigned either to the experimental (EG) or control group (CG). In both conditions, participants read the description of a student (named " L.") with major problems in Mathematics and German. In the EG, the child was additionally labelled as having an LB. Several variables on performance expectations were evaluated from the perspective of the class teacher. Following this questionnaire, participants performed a newly developed Single Target – Implicit Association Test (ST-IAT) on inclusion in schools to measure the implicit attitude towards the topic. We have collected about 85% of the required data and the remaining will be collected by April 2022.

First analyses show that the LB-label does influence teachers' performance expectation negatively: participants who read the vignette with the LB-label do expect a lower highest graduation level for labelled student and recommend a special school for secondary education more frequently than participants in the CG without label. Besides these two main effects of the the LB-Label, interactions with the profession were found: when a student is labelled, SET, compared to RET, foster less performance and academic goals for the student but more well-being and non-academic goals. Our analyses also showed main effects of the teacher profession: SET expect a lower graduation level and recommend a special school more frequently than RET. However, the influence of the implicit attitudes towards inclusion in school yielded unexpected findings: while in the condition without the LB-Label no relation between the implicit attitude to inclusion in school and the highest expected graduation was

found, the implicit attitude was a predictor for the graduation level in the condition with the LB-label: a positive implicit attitude towards inclusion predicts a lower expected graduation level. Additional analysis revealed that participants who read the description with the LB- label were significantly more likely to suspect that the fictive student has an LB.

Our results partly support previous findings of the negative influence of the LD-label on teachers' expectations for the LB-label. It is important to note, that most other studies exclusively focused on expectations, e.g. the probability to fail in the next exam or the highest expected graduation level. Likewise also in our study, these variables were subject to the negative influence of the label, partly for SET only. However, we also explored how these expectations translate into short term behaviour in class (e.g. amount and difficulty of tasks) and could not find a negative influence of the label. The effect that a positive attitude towards inclusion can reduce the negative effects of the label, cannot be supported with our study. An explanation may be that Woodcock (2020) used an explicit method to measure the attitude towards inclusion, while in this study an implit measure was used. There are several limitations to be considered: first, the data collection is not finished at this point, so the results may still be subject to change. Like with any other experimental study and vignette, the external validity of the results may not allow generalization to classroom behaviour of teachers. However, the results support previous studies showing that special education labels do influence teachers' expectations negatively and indicate that more awareness for this effect needs to arise.



Individual Differences in Complex Word Problem-Solving Among 4-year-old Preschoolers

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Word problem-solving skills are essential for later success in mathematics and in working-life. Especially complex word problems (i.e., contextualized problem tasks that may have multiple representations, a variety of mathematical domains and multiple answers) have the ability to foster combining and applying mathematical knowledge into real-world situations. Previous studies have implied that early numeracy and language skills contribute to word problem-solving performance among preschoolers. However, evidence concerning factors that contribute to word problem-solving skills among young children has been drawn based on cross-sectional and otherwise limited research (e.g., conceptualizing word problems as simple arithmetic prototype word problem tasks).

As complex word problem-solving skills are especially valuable for children's application of mathematical knowledge, fostering these skills is crucial. Considering the importance of early numeracy for mathematical development, and the importance of implementing support early on, we need to clarify the longitudinal associations between complex word problem-solving skills and factors related to them among preschool-aged children. Consequently, this study investigated which factors (i.e., numerical relational, counting, and expressive and receptive language skills, letter knowledge, and rapid automatized naming) contribute to individual differences in complex word problem-solving skills over one year among 4-year-olds.

Participants were 175 4-year-old children (MAge = 4.55, SD = 0.28) from which 83 were boys and 91 girls. Children were from 16 different preschools. In the first time point, children's numerical relational and counting skills were measured by a standardized Early Numeracy Test (numerical relational skills α = .795 and counting skills α = .836; Van Luit et al., 2006) and expressive and receptive language skills with items from a screening test called 'LENE'

(i.e., Preschool-aged children's neurological evaluation; Valtonen & Mustonen, 2007; α = .827). Single items adopted from LUKIVA (Puolakanaho et al., 2011) were used to measure letter knowledge and rapid automatized naming (RAN) with objects. In the second time point complex word problem-solving skills were measured using a 21-item interview-based measure (α = .817) that was developed based on previous research on young children's word problem-solving. All assessments were conducted individually in a separate room in the children's own preschools during regular preschool hours.

First, confirmatory factor analysis (CFA) was used to investigate the factor structure of the word problem-solving measure. Second, by means of a multivariate path analysis, counting, numerical relational and expressive and receptive language skills, letter knowledge, and rapid automatized naming at time point 1 were included as predictors of arithmetic and non-arithmetic complex word problem-solving at time point 2, one year later. Maximum likelihood estimation with robust standard errors (MLR) was used for the path analysis. A non-significant chi-square value and values greater than .90 for CFI and TLI and smaller than .08 for RMSEA are considered as representing adequate model fit. Statistical analyses were conducted using the Mplus 8.6 version.

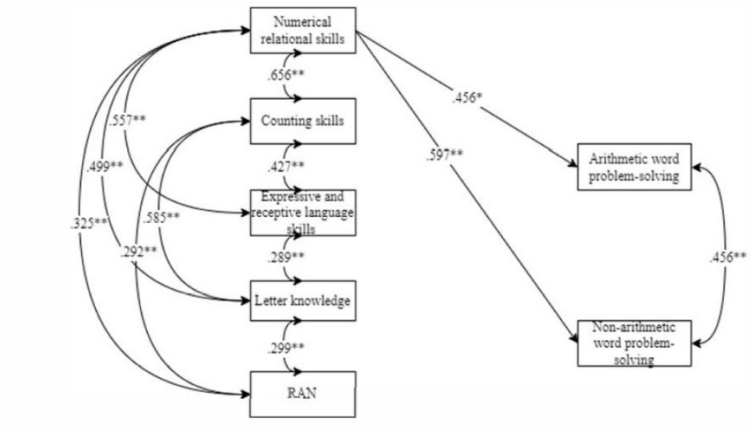
CFA confirmed that the complex word problem-solving measure represented both arithmetic and non-arithmetic complex word problem-solving, $\chi 2 = 202.195$ (135), $p < .001$, CFI = .947, TLI = .940, and RMSEA = .060. Results of the path analysis revealed that numerical relational skills was the only significant predictor of both arithmetic and non-arithmetic complex word problem-solving. Significant paths and correlations are presented in Figure 1. The path model was saturated as the model had no degrees of freedom and model fit could not be calculated. We ran the model with only the significant paths indicated in Figure 1 which yielded a good model fit, $\chi 2 = 9.542$ (8), $p = .299$; CFI = .996; TLI = .989; and RMSEA = .034. The model explained 34% of variance in arithmetic word problem-solving and 60% of variance in non-arithmetic word problem-solving.

The current study indicated that numerical relational skills serve as the only predictor of individual differences in complex word problem-solving skills among 4-year-old preschooler's over one year. As numerical relational skills are seen as a foundational skill among preschoolers' mathematical knowledge it is not surprising that these skills emerge as the most important predictor of problem-solving skills. Moreover, numerical relational skills are expected to encompass both numerical and language skills as numerical relational skills require linguistic understanding (e.g., understanding of 'more', 'less' and 'bigger'). It is thus plausible that numerical relational skills cover much of the variance of other related skills such as language skills.

Results of the present study highlight the importance of fostering numerical relational skills in order to influence individual differences in 4-year-olds' complex problem-solving skills.

Figure 1

Significant paths and correlations of the path model



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Arithmetic fluency and basic number skills in identifying students at risk for mathematical learning disabilities

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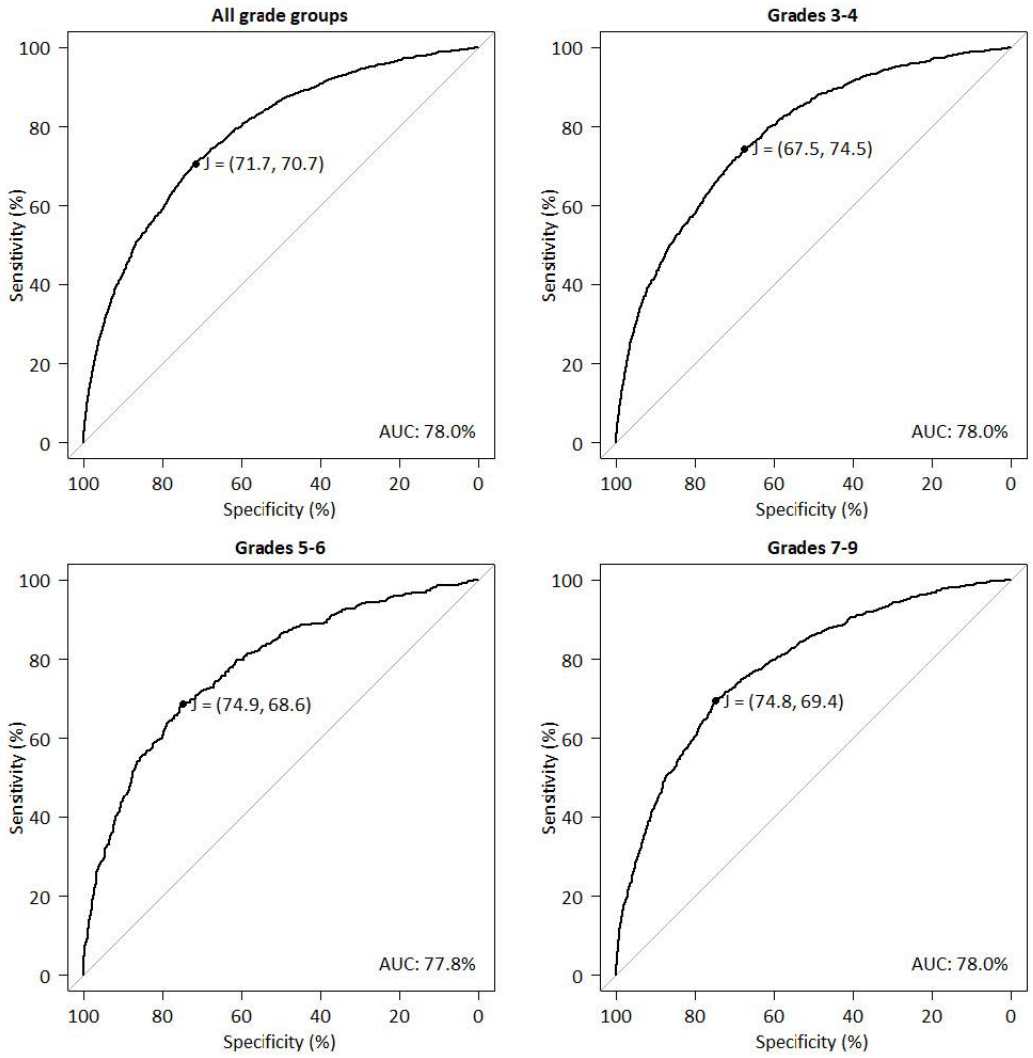
Numerical skills are important in modern society in order to use, interpret and communicate mathematical information. Previous research on numerical skills has emphasized arithmetical fluency and basic number skills as key aspects in the foundation for later mathematical learning (Li et al., 2018). Weak basic numerical skills has been shown to be a core deficit in mathematical learning disabilities (MLD) (De Smedt et al., 2013). Arithmetic fluency (e.g., speed and accuracy in simple addition and subtraction) has commonly been used as a measurement for identifying children at risk for MLD. However, basic number skills (e.g., non-symbolic and symbolic number comparison) is pointed out as key component in mathematical learning and suggested to be used in measures identifying students at risk for MLD (Schneider et al., 2016). However, its ability to differentiate students with and without MLD in different age groups is not yet clear.

This study investigated the relationship between arithmetic fluency and basic number skills in identifying students at risk for MLD, more precisely if the students' performances in the basic number skills tasks could be used to classify the students to low and not- low performers based on their performances in the arithmetic fluency tasks and whether the classification ability of basic number skills differed between the grade groups. We conducted a cross-sectional study of children from 3rd to 9th grade and investigated to what extent number processing skills predict the classification of MLD based on arithmetic fluency.

Participants were 18,405 students from third to ninth grade in Finland, from both Finnish speaking (n = 16,814) and Swedish speaking (n = 1,591) schools. Students were from seven different grade levels (Grade 3: n = 5,622; Grade 4: n = 4,550; Grade 5: n = 1,661; Grade 6: n = 1,552; Grade 7: n = 3,839; Grade 8: n = 818; Grade 9: n = 363). Student's basic numerical skills were assessed with a computerized, online dyscalculia test battery FUNA-DB aimed for screening mathematical learning disabilities (Räsänen et al., 2021). FUNA-DB consisted of six sets of tasks: Number Comparison (F1.1), Digit Dot Matching (F1.2), Number Series (F2.1), Single-digit Addition (F3.1), Single-digit Subtraction (F3.2) and Multi-digit Addition and Subtraction (F3.3). The assessment was administered by the teachers during one lesson during the regular school hours. Students logged in on the online educational platform ViLLE (Laakso et al., 2018) on their computers or tablets. Students were able to proceed in their own pace and with further instructions from the teachers.

First, we verified the two-dimensional structure of the FUNA-DB dyscalculia test battery aimed for screening MLD. Second, we secured that the two-dimensional structure was invariant across language groups, gender, and grade levels. Third, we investigated if the students' performances in the basic number skills tasks could be used to classify the students to low and not- low performers based on their performances in the arithmetic fluency tasks and whether the classification ability of basic number skills differed between the grade groups of 3rd-4th grade students, 5th-6th grade students and 7th-9th grade students. The analyses were conducted with the R (version 4.0.5) and Mplus (version 8.6) statistical software.

Confirmatory factor analysis supported a two-factor structure of the test battery, with basic number skills and arithmetic fluency as the two factors ($\chi^2(8) = 1242.041$, $p < .001$; CFI = .985; TLI = .972; RMSEA = .092). The two-factor structure was invariant across language groups, age groups and grade levels. Receiver operating characteristics (ROC) curve analysis and the area under the curve (AUC) values were utilized to examine the specificity and sensitivity of the test battery. The ROC curve and the AUC values indicated that basic number skills are fair classifier of low performers in arithmetic fluency in all the grade levels (Figure 1). These results will be presented and further discussed at the EARLI SIG15 Conference 2022.



Note. Number of 3rd-4th graders = 10,172; number of 5th-6th graders = 3,213; number of 7th-9th graders = 5,020; total *N* = 18,405. AUC = area under the curve. J = the coordinates of the optimal cut-off value based on the maximal Youden's index: *J* = max{sensitivity + specificity – 100}.

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Hellstrand et al. (2022). *Arithmetic Fluency and Basic Number Skills in Identifying Students at Risk for Mathematical Learning Disabilities.*

Neuromyths about special educational needs: a cross-cultural comparison

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Neuromyths are commonly held misconceptions about the brain believed by both the general public and educators. Examples of educational neuromyths include the idea that people use only 10 per cent of their brains, or that students have visual, auditory or kinaesthetic "learning styles". While much research has investigated the prevalence of myths about the typically developing brain (Torrijos-Muelas et al., 2021), less attention has been devoted to the pervasiveness of neuromyths about neurodevelopmental disorders, which have the potential to exacerbate stigma (Corrigan & Watson, 2002).

In this talk I will discuss the findings from our latest survey study about what common myths are still endorsed in education and the general populations (see Gini et al. 2021), as well as new data that compares the endorsement of neuromyths in Spain, Colombia, Egypt, Chili and Saudi Arabia. I will also present data about how endorsement of neuromyths relates to stigma and teacher practices. Finally, I will discuss the impact of our latest neuromyths awareness campaign comparing data from different countries (including UK, Chili and Egypt).
Together these studies will provide greater insight into the impact of societal trends and cultures on the endorsement of neuromyths related to special educational needs and relationships to stigma.

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Behaviour & socio-emotional problems

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Practices of significant support that work and challenge professionals in early childhood education and care

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In Finland, new early childhood education and care (ECEC) curriculum was launched in February 2022. The child's support in ECEC follows the Finnish basic education support tiers (general, intensified, and special support). The core curriculum and renewed legislation in ECEC emphasizes collaboration between professionals and parents. Children with strong, extensive, or significant support needs most often receive special support especially in basic education. There are however sometimes need for significant support in other tiers as well. The practices in relation to significant support vary a lot particularly in ECEC. The concept of 'significant support needs' refers to children with severe or multiple disabilities, significant cognitive difficulties, intellectual disability, including

physical or sensory impairment or autism spectrum disorder or severe psychological problems. In addition, it may refer to children who have a strong need for support or a particularly high risk of being excluded from mainstream education. Multidisciplinary and interprofessional collaboration are emphasized, and thus significant support should be provided in all tiers of the support system based on the child's needs (Äikäs & Pesonen, 2022).

In this study, we examined the existing practices regarding significant support in the context of Finnish ECEC. We also describe the practices that challenge the professionals in the ECEC interprofessional teamwork in supporting the child with significant support needs. The research questions are: 1. How ECEC professionals describe the practices that work and are functional in relation to significant support? 2. What challenge the ECEC professionals in implementing the support?

The data were collected with the Method of Empathy Based Stories (MEBS) from the ECEC professionals who participated in nationwide in-service training project in 2021. The participants were asked to write a description of their potential actions, thoughts, and feelings after reading one of the two frame stories (well-functioning and unsuccessful support) in relation to organizing support of a child with significant support needs and in particularly a child with intellectual disability and autism. The descriptions were collected using online survey platform that randomly chose either a positive or a negative frame story for a participant. The data consisted of positive stories (N=47) and negative stories (N=57). Stories are currently being analyzed using inductive content analysis, discursive positioning analysis and narrative methods.

The preliminary findings show that when a child's support works and is well-functioning, ECEC professionals illustrate the understanding of inclusion as well as cohesion and belonging as a fundamental value of support. Working in peer group is an important part of the support that the professionals reinforce. Working with the whole group of children and organizing the support for the whole group is described as a method. Augmentative and alternative communication (AAC), signs, symbols and pictures are mentioned most often as specific means and methods, in addition to structured and predicted schedule and flexible grouping. The child's strengths and individuality are emphasized. Competence of professionals, one's own competence as well as the competence of other adults, and knowledge or received sufficient training are also meaningful in practices that work.

When the situation was experienced unsuccessful and support un-functioning, writer's own individual work and responsibility of overcoming the challenges was emphasized. Also asking consultation or advice was experienced as means of support.
Intensifying collaboration more widely with interprofessional team was experienced meaningful. Concentrating on the whole groups operations was highlighted. Own feelings were described more specific and more often than in the positive descriptions.

As a finding, the distinguished differences in the stories are that in the negative stories the writers more often position themselves individually as the main responsible of organizing the support whereas in the positive stories the actors work as interprofessional team with a more collective responsibility. The effective support is described where working collaboratively together plays a meaningful part and the need to expand the network is often describe especially when the support is not working. The conclusion is that when the situation of the child is experienced challenging the responsibility lies on the professional alone when organizing particularly significant support, and when the situation is experienced positively it includes lot of collaboration. Teamwork as well as and multidisciplinary and interprofessional collaboration should therefore be enhanced in the trainings and practices of ECEC.

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Math anxiety, arithmetic fluency and number processing: gender and grade level differences

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Theoretical background

The negative relationship between math anxiety (MA) and math performance is well established (Namkung et al., 2019). There is also some evidence that number processing and MA are related (Maloney et al., 2011). One view is that impaired number processing increases negative feelings about math while other studies have found number processing to mediate the relationship between MA and performance. Finally, some studies have not found any relationship between number processing and MA.

MA also seem to be more common in older students compared to younger students and in girls compared to boys. However, longitudinal studies with elementary school students have usually found a stable or even decreasing trend in MA while studies with older students have found a stable or increasing trend in MA. Among older students, girls seem to experience more MA (Lau et al., 2022) while the results are less clear among younger students. The aim of the current study was to investigate the relationship between MA and both arithmetic fluency and number processing across grades 3 to 9. We set the following research questions:

- How is MA related to (a) arithmetic fluency and (b) number processing across grades 3 to 9?
- Are there grade level differences in MA?
- Are there gender differences in MA?
- Is there an interaction effect grade level x gender on MA?

Methods

Participants and procedure. The sample consisted of 7,320 students in grades 3 to 9 from Western Finland. The teachers conducted the computerized measures with their students during ordinary lessons. The students participated anonymously and no personal information other than their gender and grade level was collected.

Measures. MA was measured with an adaptation of the modified version of the Abbreviated Math Anxiety Scale (mAMAS) (Carey et al., 2017). The scale consisted of 12 items measuring anxiety (e.g., How nervous do you feel when taking a math test) in Learning, Evaluation and Social situations in math on a five-point Likert type scale ranging from excited (0) to very anxious (4).

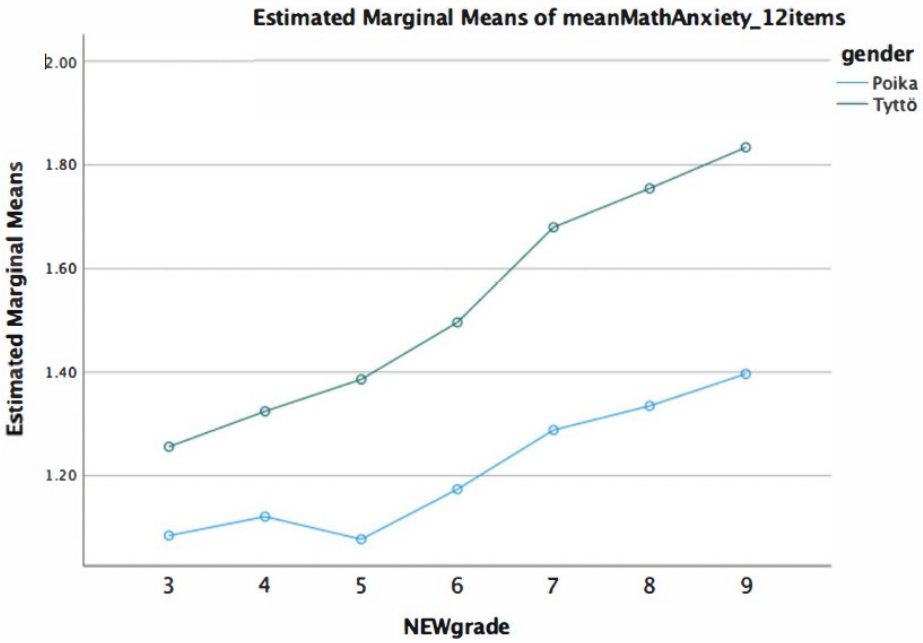
Arithmetic Fluency and Number Processing was measured with the digital Functional Numeracy Assessment – Dyscalculia Battery (FUNA-DB) (Räsänen et al., 2021). The scale consists of six tasks measuring number processing (NP) and arithmetic fluency (AF): number comparison (NP), digit-dot matching (NP), number series (AF), single-digit addition (AF), single-digit subtraction (AF) and calculation fluency (AF). The teachers were given word-by-word instructions on how to conduct the assessments. After login the pupils were able to proceed in their own speed with the tasks without further instructions from the teacher or other interruptions. Each task started with instructions and had a practice task with 4–5 practice items before that actual task.

Preliminary Results

The preliminary analyses were conducted with the number comparison task (NP) and the calculation fluency task (AF). At the EARLI SIG15 Conference we will present results based on the complete FUNA-DB using structural equation modeling. How is MA related to (a) arithmetic fluency and (b) number processing across grades 3 to 9? Overall, the associations were stronger between MA and arithmetic fluency than between MA and number processing.

To answer RQ2-RQ4 a two-way ANOVA was specified with MA as the dependent variable and grade level and gender as independent variables. There was a significant main effect of grade level indicating that older students reported higher levels of MA, $F(6, 7306) = 69.23$, $p < .001$, $\eta_p^2 = .054$ (RQ2). Overall, girls reported higher levels of math anxiety compared to boys, $F(1, 7306) = 424.14$, $p < .001$, $\eta_p^2 = .055$ (RQ3). Finally, we found a small grade level x gender interaction on MA, $F(6, 7306) = 6.00$, $p < .001$, $\eta_p^2 = .005$ (RQ4). The gender difference in math anxiety seem to increase as a function of grade level (Figure 1).

Figure 1
Gender Differences in Math Anxiety by Grade Level
Note. Poika = Boy; Tyttö = Girl



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The effects of brief cognitive-behavioral interventions on state math anxiety and math performance

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Theoretical background

Mathematics Anxiety (MA) is defined as „[...] a feeling of tension and anxiety that interferes with the manipulation of numbers and the solving of mathematical problems in [...] ordinary life and academic situations" (Richardson & Suinn, 1972, p.551). MA is linked with poor math performance (Hembree, 1990; Ma, 1999). MA may cause poor performance due to the negative impact of anxiety on working memory resources and attentional control, as stated in Attentional Control Theory (Ashcraft & Krause, 2007; Eysenck et al., 2007). Additionally, a maladaptive interpretation of physiological arousal as a sign of probable failure can enhance feelings of anxiety and may influence the extent to which MA impacts performance (Mattarella-Micke et al., 2011). Hence, different brief and easy to implement interventions aimed at reducing state-MA and its impact on performance have been studied in the past years (Ramirez et al., 2018). Promising approaches are mindful focused breathing aimed at reducing the current physiological arousal (Brunyé et al., 2013) and cognitive reappraisal of physiological arousal by educating the participants about the potential performance benefits of heightened arousal (Jamieson et al., 2016). Bosch et al. (2021) examined the effects of expressive writing, focused breathing and cognitive reappraisal on state math anxiety and math performance in an online study.

They found an anxiety reducing effect of focused breathing and a math performance enhancing effect of cognitive reappraisal on college students (Bosch et al., in preparation). Nonetheless, the results regarding the effectiveness of these brief interventions are inconsistent (Ganley et al., 2021) and further research is needed.

Research Question & Hypotheses

This study aims to further scrutinize the effects of different physiological arousal interventions on state-MA as well as math performance in university students. To achieve that, three brief interventions aimed at (a) reducing the current physiological arousal with a focused breathing exercise, (b) cognitive reappraisal of physiological arousal, and (c) combination of intervention (a) and (b) are tested against a control condition in an experimental design.

Based on previously presented literature we hypothesized

- an anxiety-diminishing effect of the focused breathing intervention (a),
- a performance-enhancing effect of the cognitive reappraisal intervention (b) and
- both anxiety-diminishing and performance-enhancing effects of the combined intervention (c).
- Effects 1.-3. are stronger in participants with high trait MA.

Methods

Participants (N = 160) were recruited during teacher training classes and from psychology students at the University of Potsdam, Germany. The procedure obtained ethical approval from the ethics commission of the university. Students received a link to an online platform, got a briefing and gave informed consent. Thereafter, age, gender, affiliation, study subject and prior math performance were assessed. Afterwards, trait math anxiety (AMAS; Hopko et al., 2003) was assessed and an example math task was shown. Prior to the first run of math tasks, state math anxiety (Englert et al., 2011) was assessed (anticipated; pre-test). Then, the first run of math tasks was carried out. Afterwards, state math anxiety was assessed again (retrospective; pre-test), followed by the experimental manipulation (a) focused breathing exercise, (b) cognitive reappraisal, (c) combination or the control intervention with a duration of 8 minutes each). After finishing the intervention, a second run of all measures and tasks was administered: hence, state math anxiety (anticipated; post-test) was assessed first. Then, the second run of math tasks was presented, once again followed by the state math anxiety questionnaire (retrospective; post-test). In the end, several questions concerning participants' compliance were presented and a debriefing was given to the participants.

Results and Interpretation of Findings

To explore hypothesis 1 to 4, hierarchical linear regression models will be calculated with anticipated anxiety, retrospective anxiety and math performance as respective criterion variables. Respective first models will include measurement time (MT; 0 pre/ 1 post) and experimental condition (dummy variables; control group as reference condition) as well as their interaction as predictors. In respective second models, trait math anxiety as well as all interactions with previous predictors will further be included in the statistical model. The data analysis is in progress and the results of this study will be presented and discussed as part of the presentation.

Shy, but orally engaged? Exploring contextual factors that influence shy students' hand raising

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Theoretical background

Characteristic of shy students is their passive silent behavior in the classroom (Evans, 2010). Given the important role of oral participation within student learning and achievement (Rocca, 2010), this causes them to miss important learning opportunities and may explain their poorer school attainments, even though they are no less intelligent (Hughes & Coplan, 2010). However, not much is known among either practitioners or researchers about how to help shy students participate orally (Nyborg et al., 2020). This was the starting point of the present study examining factors which may promote shy students' hand raising as a precursor of students' oral participation.

Research questions

Taken together findings and suggestions from literature, we expected shy students' higher levels of hand raising to be associated with several contextual factors (i.e., better class climate, better student-teacher relationships, less cold calling, longer teacher wait time, smaller class size, and school subject).

Methods

We tested these expectations in a sample of 204 students (54 % girls; Mage = 11.85, SDage = 1.05) and using three main data sources: (1) Students self-reports (i.e., trait shyness, class climate, student-teacher relationships) were collected using validated, commonly used instruments, (2) during a regular school week, teachers' wait time and cold calling were measured through observations, (3) while student hand raising was assessed through behavioral measurements using an accelerometry gadget. In total, 116 lessons in 7 different subjects were observed resulting in a final sample of 1833 lessons distributed over all students.

Results

Linear mixed models revealed that student-teacher relationship and wait time positively and class size negatively predicted hand raising in all students (i.e., significant main effects). Contradictory to our assumptions, shy students did not particularly benefit from better student-teacher relationships or smaller classes (i.e., non-significant interaction effects). Even more surprising, we found negative interaction effects for wait time and class climate. In other words, shy students were less likely to raise their hands the better the class climate and the longer the average wait time. Moreover, shy students raised their hands less in natural sciences. All models accounted for nested data structures (i.e., lessons nested in students).

Interpretation of Findings

Shy students tend to contribute only when they are absolutely sure that their answer is correct (Mundelsee & Jurkowski, 2021). Results suggest that this comes particularly into play in natural sciences and when the teacher waits longer to call on the first student. In natural sciences, students are generally asked more closed-ended questions (i.e., there is only one correct answer) than in social sciences. Therefore, raising one's hand in a natural science may be a decision with more at stake and, thus, more dependent on a secure self-concept (Böheim et al., 2020). Similarly, a longer wait time possibly increases the shy students' uncertainty about their answer, making them less likely to raise their hand. This may explain why shy students raise their hand less in natural sciences and when wait time is longer. Regarding the class climate, shy students in warm climate classrooms may be accepted by their peers in their role as quiet students. In turn, peer acceptance may buffer the negative consequences of shy students lower oral participation rates, turning them into silent but cognitively and emotionally engaged students, who perform well academically (Schnitzler et al., 2021). The findings call into question whether shy students in warm climate classes must necessarily have high oral participation rates.

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Special eduational needs

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The I of students in different educational settings: a systematic literature review of the self-concept of students with ID or SEBD

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Self-concept has gained more research interest recently, partly due to the framework of social participation (Koster et al., 2009). In this framework (social)self-concept of students with special educational needs (SEN) is defined as a key component for social participation. The importance of a positive self-concept has been demonstrated in numerous studies (e.g. Gupta & Thapliyal, 2015; Marsh,2007) and is associated with prosocial behavior, higher academic achievement and well-being. Although students with SEN are increasingly included in mainstream education nowadays, many students with SEN are educated in special school settings. Of these students, many have either an intellectual disability (ID) or are students with social, emotional and behavioural difficulties (SEBD). According to Festinger's Social Comparison Theory (1954) the self-concept is formed through social comparison with significant peers. Therefore, attending either inclusive or special education plays an important role in the development of self-concept.

Research into the self-concept of students with ID or SEBD has shown ambiguous results (e.g., Avramidis, 2013; Pijl & Frostad, 2010) and most studies do not differentiate between students with ID or SEBD or between different dimensions of self-concept (Harter, 2012). Furthermore, a comprehensive overview taking into account different educational settings in relation to self- concept is lacking. Therefore, it is unclear whether differences between self-concept of students with ID or SEBD and their typically developing (TD) peers exist, and whether or not different educational settings play a role. This review aimed to bridge this gap in knowledge.

Research questions

This systematic review aimed to answer the following research questions: (1) Which dimensions of self-concept have been studied in students with ID or SEBD? (2) How does the self-concept of students with ID or SEBD compare to their TD peers? (3) What is known about the self-concept of students with ID or SEBD across different educational settings? (4) Which variables are related to the self-concept of students with ID or SEBD?

Method

A comprehensive and systematic search was conducted in October 2019 across multiple databases (ERIC, PsycINFO, MEDLINE and SocINDEX) for the timeframe of 2000 till 2019. The keywords that were used in the literature search were chosen based on the Person, Intervention and Outcome (PICO) model. Studies were included if: (1) Self-reported outcomes related to (dimensions of) the self-concept of children or adolescents (aged 6-18) were reported; 2)1]The study focused on students with ID and/or SEBD; (2) The students were educated in a mainstream or inclusive school setting or in a special education school setting.

The selection procedure accessing eligibility of the studies was conducted following the PRISMA-P guidelines in three consecutive phases. Interrater reliability ranged between 92% – 99.2% (κ = .60 - .83). The initial search resulted in 2,855 articles of which 15 articles were deemed eligible and were included in the review. During data-extraction effect sizes were extracted or calculated (Lenhard & Lenhard, 2016).

Results

Twentysix different dimensions of self-concept were derived from the selected studies. Scholastic competence, physical appearance, global self-worth and social acceptance were most frequently included. The majority of studies comparing self-concept of students with ID or SEBD with TD students found more negative results for students with ID or SEBD. Statistical evidence showed these differences were non-significant, with the exception of more negative outcomes for students with SEBD or ID on athletic competence, social and academic self-concept. Students with ID or SEBD reported mostly neutral scores on the self-concept dimensions. Physical appearance and social self- concept were most positively assessed. Scholastic competence showed mixed results. Students attending special education reported most positive scores overall, however, limitations of the study inhibit further conclusions about the influence of school setting on self-concept. Gender, age and type of disability are most frequently researched in relation to self-concept, but no direct relationship was found. The importance attributed to a certain domain was found to be positive related with self-concept.

Discussion

The focus on academic self-concept is still dominant in research, though there is a growing focus on the social self-concept. This finding is in accordance with Van Mieghem et al. (2020). Potential differences between the self-concept of students with ID and SEBD might be due to the discrepancy between the chronological and developmental age of students with ID, since the self- concept is often more positive at a younger developmental age (Crain, 1996; Harter, 2012). Self-concept findings of differences between students with ID or SEBD in inclusive or special educational settings are often inconclusive. This might be explained by the social comparison theory (Festinger, 1954), stating that self-concept is highly influenced by social comparisons to peers and the peer groups in inclusive or special education settings differ. Further interpretation of the results will be discussed during the presentation.

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School transitions during COVID-19: the effect on educational and psychosocial adjustment for children with neurodevelopmental disorders

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Going back to secondary school after school closures due to coronavirus (COVID-19) pandemic may be particularly challenging for children with neurodevelopmental disorders, including those with Autism Spectrum Disorder (ASD), Williams Syndrome (WS) and Down Syndrome (DS). Framed within Bronfenbrenner's model of human development, this study examined the effect of COVID-19 school closures and COVID-19 measures implemented in schools on the educational and psychosocial adjustment of 66 children with neurodevelopmental disorders (including 30 with ASD, 22 with DS and 14 with WS), recruited in the autumn term 2020. Their parents completed a number of standardised measures related to their children's anxiety and well-being, including worries related to their health, school and education, social life and safety of their family. The results showed that biggest worry for parents was their child's lack of social contact, and keeping the child entertained and work/ caring balance. Parents of children with WS and the children themselves were the most worried group especially around lack of social contact. Child interviews showed group differences with children with WS and DS reporting to be especially worried about losing friends. In measures of quality of life during the pandemic (KIDScreen) children with ASD were found to be scoring lower as a group when compared to children with WS and DS.

The results will be discussed in the light of the implications they have concerning meeting the support needs of children with neurodevelopmental disorders and their families during these critical circumstances.

Developmental trajectories of cognitive variables of deaf and blind students: differences between regular and special education

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Theoretical framework

Special education has historically been the solution to provide learning opportunities for students excluded from the school system. However, there has been a global trend to migrate from a special education system to an inclusive education system (Biermann & Powell, 2016). In Chile, there are two alternatives in the special education system to cater to students with Special Educational Needs (SEN). They can either study segregated in special schools or integrated into regular schools through school integration projects (PIE). Despite global efforts to implement inclusive education policies, the motivation seems more value-based than scientific. Research findings on students with special educational needs (SEN) are inconclusive, presenting both positive and negative outcomes of inclusive education (Blackorby, 2006; Lindsay, 2007; Kauffmann & Hallahan, 2011; Farrel, 2010).

Research questions

What is the performance trajectory of students with auditory disability (AD) and visual disability (VD) in segregated versus inclusive settings in cognitive, linguistic, mathematical and emotional performance? Are subgroup differences observed within each disability category?

Methods

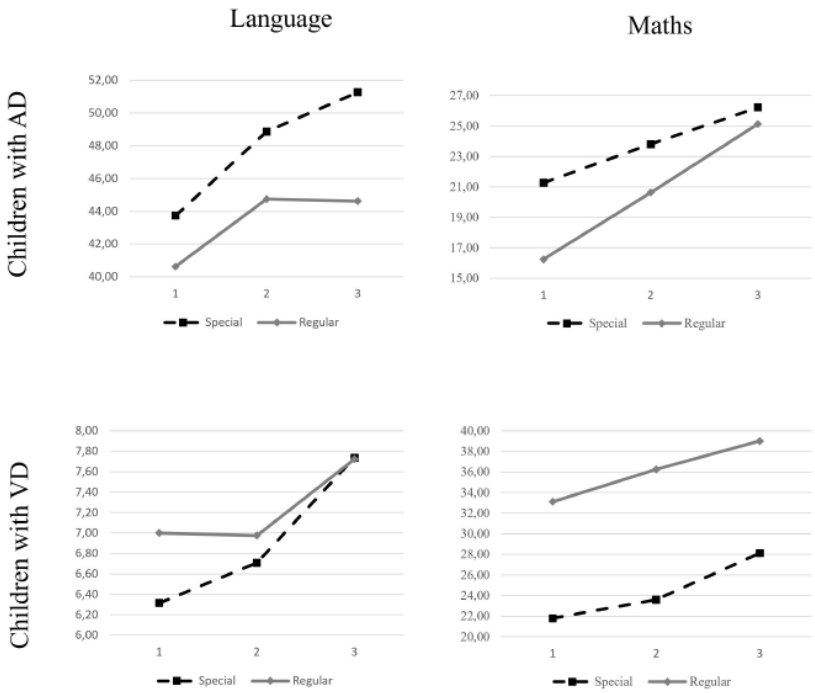
The initial sample included a total of 23 students with AD between the ages of 4.95 and 12.02 years old, and 29 with VD, ranging in age from 3.53 to 10.06 years old. A group attend to regular schools and the others to special schools.
Procedure: Cognitive skill development, precursors to reading, early mathematical skills, and emotional and behavioral problems were assessed. The first three variables were measured at three points along the initial educational trajectory. Emotional and behavioral problems were measured at two points in time, at the beginning and at the end of the research.
Data Analysis Model: To assess the differences between blind and deaf students attending special and regular schools, repeated-measures ANOVA was used with an inter-subject factor (regular or special school) and an intra-subject factor (different assessments over time). In all cases, the main effect of time was analyzed to determine

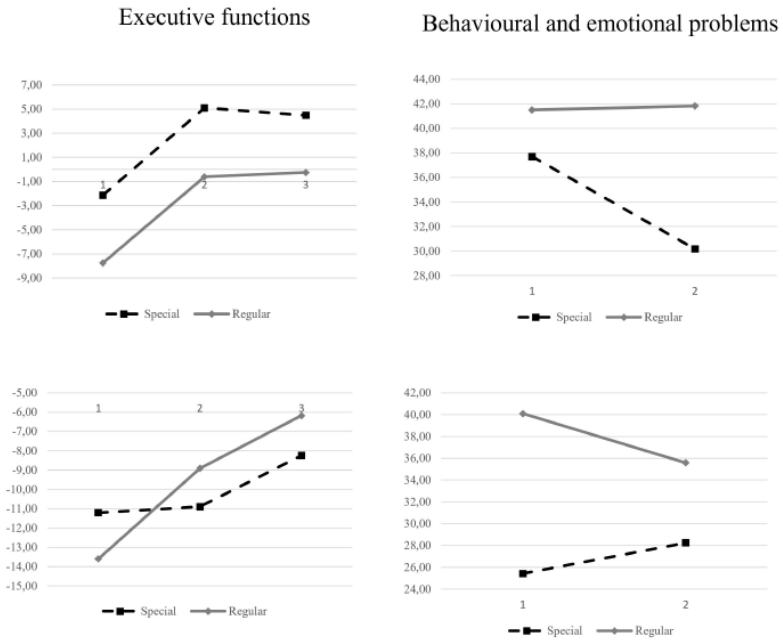
whether the progress of the groups over time was significant, the main impact of the group was also analyzed to determine whether the differences between the groups were significant, and finally, the interaction effect was analyzed to define whether differences between the groups could be observed over time.

Results

In the case AD pupils, a significant effect of time is only observed in the case of instructional areas, indicating that, in both vocabulary and mathematics, all pupils showed progress, regardless of the group they were in. However, in both cases, the results suggest that the performance of special school pupils is higher than that of mainstream pupils. As for the cognitive variables, only in the case of analogies was a significant effect of both time and group observed. This means that in addition to showing significant progress between time measures, the pupils showed significant differences according to the type of school they attend, these differences being in favor of pupils in the special school. For emotional and behavioral problems, a significant effect of time was only observed for externalizing problems, indicating that both groups reduced their externalizing problems over time. In none of the variables related to emotional and behavioral problems are significant differences observed at the group level. However, at the descriptive level, it is observed that students in the special school show a lower presence of internalizing, externalizing and global problems.

In the case of children with VD, it can be said that there is an effect of time in all cognitive variables, which shows that, regardless of the group, the students show progress in their learning. Only in the case of mathematics can we observe a significant group effect, which indicates that there are important differences throughout the entire assessment period between the members of both groups. The results indicate that students in regular schools perform better than students attending special schools. Regarding the presence of emotional and behavioral problems, no significant changes were observed in the period between assessments for either group. However, it is important to highlight that, although the differences are not significant between the groups, in this case the advantage is for the students in the special school, who show a lower presence of emotional and behavioral problems.





Conclusions

The present article shows an important effort to help the understanding of the learning process of students with SEN, in particular with AD and VD, in the context of regular schools with School Integration Program (PIE) and Special Schools (SS). The results presented show that in the case of students with AD, in most of the assessments, students who attend Special Schools obtain better results. In the case of cognitive assessment, the results are less consistent. It is important to note that, for both AD and VD students, in many cases the differences are not significant and decrease over time. Although the results are not conclusive, this article shows that students' performance depends on both the disability they have and the educational system they attend. These differences may be due to the educational tools that teachers have when educating students with diverse needs.

Inclusion re-framing diagnosis – (S)EN for ALL?

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Theoretical Background

Inclusive approaches to education are nowadays also addressing the issues of diagnostics. One of the main dilemmas of inclusive education (Norwich 2007), that of labelling, is being re-addressed through different approaches. Various countries have applied divergent takes and seem to have implemented different models or compiled knowledge for the development of tools or trials (Sanches-Ferreira et al. 2013). One of the main points of orientation is derived from experiences applying the International Classification of Functioning Disability and Health (ICF) (World Health Organization 2001). These imply moving beyond a clear-cut focus on medical aspects but rather also taking into account contextual factors such as environmental and personal factors (Maxwell et al. 2018). By implementing inclusive policies based on the ICF, the fundamental aim is to overcome an exclusively individual-centered and deficit-oriented perspective.

Research questions

To what extent does a genuinely inclusive take on diagnostics imply a shift from an individual to a whole classroom approach?

Methods

In the course of an international Erasmus+ research project, I AM, a participatory approach is applied in order to develop an Inclusive Assessment Map – a well-proven, tested, and evaluated tool that aims to improve

participation of all students in school. I AM presents practical support to a range of professionals to implement necessary adaptations to the educational environment of students. Therefore, several discussions with stakeholders within the educational system are being conducted in order to identify their multiple and various needs. Additionally, challenges that might arise when working with I AM are being identified in order to develop an applicable tool that is as useful and eligible for field actors as possible. In a pre-test, stakeholders from different countries were already invited to assess the tool and to give feedback on its practicability. Alongside this feedback and recurring discussions with the project partners, the I AM tool is constantly being revised and optimized.

Results

The first results have drawn attention to the fact that teachers highlight that they always work with individuals. Therefore, they emphasize that the individual-centered perspective cannot be completely overcome by any means. Rather, it is necessary to overcome the purely individual focus in order to take contextual factors more into account in educational considerations. By focusing on the class as a whole throughout diagnostic processes without neglecting the individual student, this is aimed to be achieved.

Interpretation of findings: The findings from this pre-test will be used to continuously improve and adapt the Inclusive Assessment Map according to the needs of various stakeholders. In general, feedback from different people who are part of the educational system is essential in order to make the tool as practicable and appealing as possible. Especially, as a wide range of professionals and actors are involved in educational processes and as all have their own views and backgrounds, dealing with these manifold and partly diverging perspectives is crucial.

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Executive functioning

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How preterm birth and social burdens of the family are affecting on children`s executive functions? A longitudinal intervention study

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Cognitive development is process involving complex interaction between biological and environmental factors. Studies have demonstrated associations between socioeconomic status (SES), as measured by maternal education, and poorer cognitive development, language skills, and academic achievement. Hence, preterm children from families with higher SES develop fewer problems later in life than children from low SES families (Benavente-Fernandez et al, 2019). Children born prematurely are biologically immature and there is growing consensus that they are at risk of executive deficits and developmental difficulties (Blasco et al, 2020). Executive functions (EF) is umbrella term for heterogeneous, higher-order cognitive processes that are important for active regulation of thought, emotion and adaptive behavior (Miyake et al, 2000). EF is very sensitive to environmental factors including negative ones such as poverty and positive ones such as sensitive parenting (Valcan et al,2018).

ZEPPELIN is Swiss longitudinal intervention study (RCT). It aims to study weather early support during first three years has positive impacts on children's development and parents show improved parenting practices in families with social burdens (N=248 families, 261 children). Further, it will be studied if early support enhances educational opportunities. The family with social burdens needs support with early care and education of their child. Risk factors like limited social support, financial distress, unemployment or family difficulties make start of parenthood challenging. Bronfenbrenner's process-person-context-time model forms theoretical framework and as intervention Parents as Teachers (PAT) program is used (https://parentsasteachers.org).

Methods: The aim of this study is to describe EF and cognitive development of preterm and early term children during 0-3 years in families having social burdens. The other aim is to study intervention effects of PAT program. The study is based on ZEPPELIN 0-3 where participants (N=93) are withdrawn. 34% were born preterm or early term which is more than Swiss average. Premature births have been defined as children born very preterm (Gestational Weeks < 27), preterm (GW 27-33), late preterm (GW 34-36) and early term (GW 37–38). During first three years there were four measurement points. Main method for this study is Bayley Scales of Infant and Toddler Development (BSID-III,2005) which is individually administered instrument, designed to evaluate developmental functioning. It quantifies cognitive, language and motor skills in children. Generally, there is a lack of EF measurements for toddlers and situation is even more complicated with preterm children.

We used conclusions from previous studies (Blasco et al, 2020; Lowe et al, 2009a) and hypothesized that BSID-III contains items with EF components (attention, inhibition, working memory, plan/organize, cognitive flexibility). Intervention: Families were randomly assigned to intervention group, IG (N=132) receiving the intervention (PAT)

and control group, CG (N=116) with no intervention. PAT parent-training program aims to increase knowledge of early childhood development and improvement of parental practices. It also aims early detections of developmental delays and health issues, and prevention of child abuse and neglect. Families in IG received at-home support starting one month after the birth, continuing up to child's third birthday. Trained parent educators made home visits (N= 53 families in preterm study) every two to three weeks for three years. Group meetings which aimed at building social connections were held monthly at family centers. CG in preterm study consist of 36 families.

Preliminary results: It was possible to extrapolate EF components from BSID-III in longitudinal manner. Preliminary analyses have shown a trend that social burdens of family have more effects on EF development than status of preterm birth. However, final analyses will be conducted during spring 2022. This study is retrospective. Previous studies of ZEPPELIN 0-3 have shown that PAT intervention was effective and provided long-lasting developmental support for children (Schaub et al., 2019; Neuhauser, 2018). Prevalence of preterm children has increased rapidly as well as better survival rates. There is a need to study their cognitive development.

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A close-up of kindergarten children with low executive functions: behaviour problems, socioeconomic status, and teacher-child relationships

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Background: Education plays a major part in the outcome of peoples' lives. It not only influences their future but also plays a role in bridging inequalities between different layers of society. Various aspects are found to play a role in children's lifelong achievement (Belsky et al., 2020). Firstly, the child's socioeconomic status (SES), as often measured by native language and maternal education level, is often linked to poorer school success (Agirdag & Ceulemans, 2020), whereby children of low SES families are found to have delays in executive functions (Kellens, Dieusaert, in prep).

A second factor that plays a major role in children's lifelong achievement is the executive functions (EF). EF consist of three main components: Working memory (WM), inhibition, and cognitive flexibility (Diamond, 2013). Current research shows that EF in kindergarten are linked to future school success (Vandenbroucke et al., 2017, 2018; Finn et al., 2017), whereby deficits in EF negatively impact school success, social development, cognitive development, and classroom adjustment (Diamond, 2013; Sankalaite et al., 2021). Within this context, children of low SES are often found to have weaker EF with the deficit remaining over time (Lawson et al., 2018; Rosen et al., 2020). Concerning the interconnectedness of EF, SES, and achievement, an important factor has often been omitted in educational research, namely, the teacher-child relationship (Goble et al., 2021; Vandenbroucke et al., 2018). Teacher-child factors play a significant part in EF development (Cumming et al., 2020; Sankalaite et al., 2021). Research looking specifically at the dyadic (one- on-one) level of TCR hints that children with low EF and/or also low SES, have less positive relationships (i.e., less closeness, more conflict and dependency) with their teachers

(de Wilde et al., 2016; Hackman et al., 2015; McKinnon et al., 2018), which negatively impacts school readiness and success (McKinnon et al., 2018).

Research goal: In general, the research on TCR and EF is scarce, more so, research that combines different methods to measure these constructs. When researching EF, it is recommended to use both rating scales and performance-based measures (Cumming et al., 2020; Sarsour et al., 2011).

Moreover, research using both explicit and implicit measuring techniques to describe TCR for young children with lagging EF skills is, to the best of our knowledge, non-existent. Our study tries to fill this gap by gaining insight into the specific profile of low EF children by looking at EF, TCR, SES, behavioural problems, and classroom participation through various informants and measurements. Gaining insight into the specific profile of low EF pupils in kindergarten is vital, as this population is often the target of EF intervention programs aimed at lessening the achievement gap, and as such, deep knowledge of this population is needed to maximise these interventions.

Methods: Within this multi-informant multi-method study, 39 preschool teachers and 307 children and their parents from 8 preschools were recruited. These schools had an average rate of 41,1% (26,2%-70,5%) of children with low SES backgrounds. Ten students were selected for each class. EF measurements consisted of both the Behavior Rating Inventory of Executive Functioning - Preschool version (BRIEF-P; van der Heijden et al., 2013; $\alpha \geq .77$), filled out by teachers, and EF-tasks. The EF- tasks consisted of the following activities: Corsi Block Span and Backwards Corsi Span (Corsi, 1972), Knock-Tap (Korkman et al., 1998), and the Tower Task (Smith-Donald et al., 2007). The validity of these tests has been proven through multiple preschool studies (Bassett et al., 2012; Sulik et al., 2015; Vandenbroucke et al., 2016). Classroom adjustment was measured through the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; van Widenfelt et al., 2003; $\alpha \geq .73$) and the Teacher Rating Scale of School Adjustment (TRSSA; Birch & Ladd, 1997, subscales Independent Classroom Participation and Cooperative Participation), both filled out by the teachers. For the teacher-child relationship quality, our study looks at all 3 dimensions of the TCR: closeness, conflict, and dependency (Pianta, 2001) using the Dutch validated version of the Student-Teacher Relationship Scale (STRS; Koomen et al., 2007; Pianta, 2001; $\alpha \geq .75$) as an explicit measure. Additionally, we conducted teacher relationship interviews (TRI; Pianta, 1999; Spilt & Koomen, 2010), as an implicit measure of the TCR , where we looked at the affect scales. Finally, the SES of the children is measured by home language and maternal education level.

Results: Preliminary results indicated that children with low EF more often had foreign home languages and mothers with a lower educational level compared to their non-low EF peers. Moreover, teachers are reporting more behavioural and emotional problems for their pupils with low EF. Concerning the TCR, we see that relationships between teachers and children with low EF show more conflict, more dependency, and less closeness than the general population norm. However, the narrative interviews with the teacher did not yield any significant evidence for more maladaptive relationships. The overall data will be analysed more thoroughly, incorporating the data of the TRSSA, which has not been analysed yet. Note that the multilevel data structure is also taken into account during analysis.

A school-based intervention on attention and executive functions: a case series pilot study

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Theoretical background

The purpose of this study was to examine the effect of a school-based behavioural and skills training intervention for children with attention and executive function (EF) difficulties, combined with a collaborative consultation model for classroom teachers. Because transfer of skills between settings can be a challenge additional support for the classroom teacher should improve the effectiveness of any intervention. School staff also need immediate feedback on the effectiveness of the provided support in order to adjust accordingly (DuPaul et al., 2011).

Research questions

In this study, children were provided with an intervention that combines behavioural and cognitive methods, and has previously been found effective in improving children's cognitive control. The intervention consists of 20 small-group training sessions outside the classroom (Paananen et al., 2018). For this study, in addition to the training sessions, the classroom teachers participated in three systematic collaborative consultation sessions with the intervention providers, with the aim of planning, implementing and evaluating suitable models for support in the classroom. The aim was to investigate the immediacy and trend of any intervention effect and to test the usability of an intensive repeated measures tool to evaluate the effects.

Method

Data were collected during two school years at four different schools. Four children of ages 8-10 participated in the first cohort, on which the preliminary results in this abstract are based. Seven more are enrolled in ongoing data collection. Inclusion criteria for participants were symptoms of inattention and/or executive functions deficits to such a degree that it negatively affects school routines and learning situations. Intervention providers were school personnel trained in implementing the intervention. Intervention providers and classroom teachers participated in one training session, and three actual consultations at each school during the intervention. Children's behaviour was assessed using Direct Behaviour Rating Single-Item Scales (DBR) targeting academic engagement (AE), disruptive behaviour (DB), and respectful behaviour (RB) (Chafouleas, 2011). For comparison, pre- and post-measurements were collected using a teacher evaluation of children's difficulties with attention and EF (ATTEX; Klenberg et al., 2010). Repeated and frequent measures, i.e. a single-subject AB study designs, of the progress of the same subject over time were undertaken during a baseline phase and an intervention phase. In order to assess changes in level and trend, data was analysed using both visual analysis and calculations of phase contrasts and within phase trends using Tau-U (Brossart et al., 2014).

Results

The visual analysis did not show clear improvement on any of the scales, however the Tau-U omnibus effect size estimate suggested that statistically significant improvements in behaviour were obtained overall for DB (Tau = -.40, $p < .05$). No improvement was detected in AE or RB. In the ATTEX teacher evaluation, all subjects showed decreases of difficulties from pre- to post-measurements (- 26 % in mean problem score). Detailed results, including interobserver agreement and trend effects, will be presented at the conference after ongoing analyses and data collection is finished.

Interpretation of findings

The pre- and post- measurements using the ATTEX-scale showed a quite large decrease in difficulties overall, however the DBR-scale showed only modest improvement in DB. It is possible that the DBR-scale was not sensitive to change in behaviour due to the nature of the behaviour descriptions. Modifying the descriptions to better suit the targeted behaviours might make the scale more sensitive to detect improvements in EF.
In general, the DBR-tool seemed to work quite well, in the sense that school personnel were able to evaluate children's behaviour during lessons. This indicates that the tool, with proper care taken to describing the behaviours to be observed, could be used for evaluating interventions in schools. Due to the nature of the data in the first cohort, we were not able to separately study the effect of the collaborative consultation, but a stricter phasing of the data collection in the second cohort should make this possible. This issue, as well as trend effects and interrater agreement, will be presented and discussed at the conference.

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The effects of motor skill and physical activity interventions on cognitive and academic skills in children with special educational needs: a systematic review

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Children's fundamental motor skills, cognitive skills, and academic skills have been found to be developmentally related in preschool-aged children (Diamond 2000). In recent decades, studies examining the effects of fundamental motor skills and physical activity interventions on cognitive skills have increased rapidly (Pesce et al., 2021). A recent systematic review demonstrated the positive effects of fundamental motor skills and physical activity interventions on preschoolers' cognitive and academic skills in typically developing children (Jylänki et al., 2022). However, the quality of the studies as well as the effects of fundamental motor skills and physical activity interventions on children with special educational needs have not been previously reviewed. Considering that children with special educational needs are at risk for developing more severe problems in their academic skills later on, it is highly important to investigate what types of interventions seem to be most effective for supporting children's cognitive and academic skills at an early age. Systematically reviewing such literature might be particularly important, as the majority of previous intervention studies in typically developing children have shown rather weak quality (e.g., lacking appropriate power; Jylänki et al., 2022).

Thus, this systematic review aimed to investigate the methodological quality and the effects of fundamental motor skills and physical activity interventions on cognitive and academic skills in 3- to 7-year-old children with special educational needs. The review was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) statement. A literature search was carried out in April 2020 (updated in January 2022) using seven electronic databases including ERIC, Scopus, Web of Science, PsycINFO, CINAHL, PubMed & SPORTDiscus. The methodological quality of the studies was assessed with the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool. A total of 22 studies met the inclusion criteria, representing children with learning difficulties (n = 7; e.g., high risk of ADHD), learning disabilities (n = 5; e.g., autism spectrum disorder), physical disabilities (n = 2; e.g., cerebral palsy), and at risk for learning difficulties due to family background (n = 8; e.g., low socioeconomic status). According to preliminary analyses, 17 of the 22 studies (77%) demonstrated significant effects of the intervention on children's cognitive and academic skills. Two of the included 22 studies displayed a strong methodological quality, while 19 were considered methodologically weak. Cohen's d effect size calculations and post-hoc power analyses will be conducted for the included studies, and the results will be presented at the EARLI SIG15 conference in August 2022. These results will provide valuable information for developing intervention programs for children with special educational needs.

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Teacher's inclusive practices

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Determinants for primary school teachers' inclusive practices in heterogenous classes

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Theoretical background

To comply with the ratification of the UN-Convention on the Rights of People with Disabilities, it is a crucial request to reconsider teachers' professional competencies and personal qualifications for the implementation of inclusive education. In recent years, studies applied the "Theory of Planned Behaviour" (Ajzen, 1991) to examine determinants for teachers' practices in inclusive education. It has been investigated if teachers' practices in heterogenous classrooms can be explained by their behavioural intentions for inclusive teaching. Further, it has been explored if teachers' behavioural intentions are predicted by their attitudes towards inclusion, their perceived social norms (e.g., principals' expectations), and their self-efficacy beliefs. Until now, the "Theory of Planned Behaviour" has only been confirmed to some extent concerning inclusive education and the existing results are inconsistent. Some studies indicate that teachers' attitudes, self-efficacy beliefs, and perceived social norms predict their behavioural intentions (Yan & Zin, 2014), others did not find such effects (Malak, Sharma, & Deppeler, 2018). Studies also demonstrate that teachers' behavioural intentions and self-efficacy beliefs explain their inclusive practices (Yan & Sin, 2014). Overall, additional research is required to clarify determinants for teachers' inclusive practices in heterogenous classes.

Research questions

(1) Teachers' inclusive practices can be significantly predicted by their behavioural intentions and their self-efficacy beliefs.
(2) Teachers' behavioural intentions can be significantly predicted by their attitudes towards inclusion, their perceived principals' expectations, and their self-efficacy beliefs.

Methods

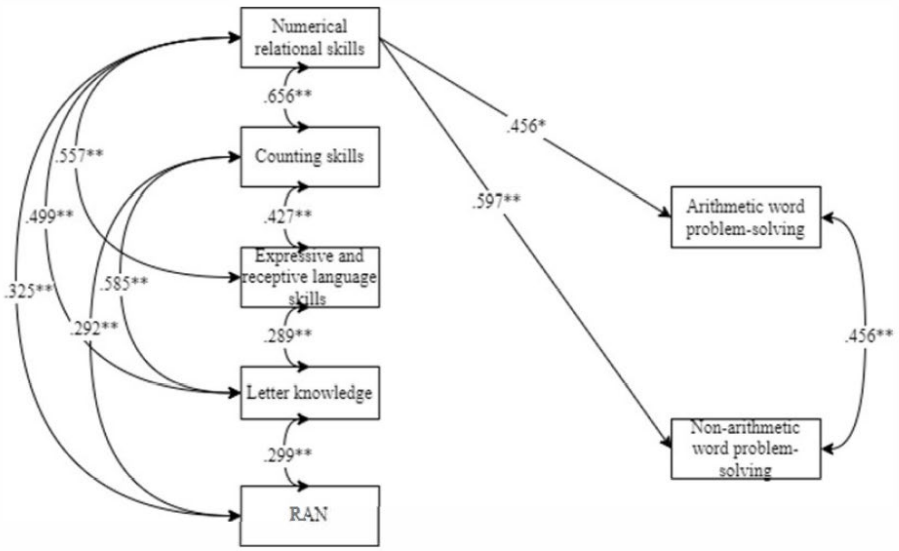
N=290 primary school teachers completed a questionnaire on their attitudes towards inclusion (5 items, e.g., "In the classroom, learning conditions of all children should be taken into account."; M=4.58, SD=0.54, α=.86; self-developed), principals' expectations (4 items, e.g., "My principal expects that I encourage all children to take part in social activities in the class."; M=4.46, SD=0.54, α=.78; Mahat, 2008), self-efficacy beliefs (8 items, e.g., "Can you realize the following activities better on your own or in cooperation with another teacher? – Adapting learning tasks to children's needs."; M=4.49, SD=0.59, α=.87; Skaalvik & Skaalvik, 2007), behavioural intentions (5 items, e.g., "Imagine that a child in your class has problems in literacy and numeracy. – I would consider the child's individual needs while planning and implementing my lessons."; M=4.26, SD=0.63, α=.83; Roy, Guay, & Valois, 2013), and inclusive practices (5 items, e.g., "How often do you use these practices? – All children get different forms of learning tasks on the same topic that correspond to their individual learning abilities."; M=3.63, SD=0.70, α=.83; Wertheim & Leyser, 2002). Teachers rated their agreements on five-point Likert scales.

Results and interpretation of the findings

The results of a structural model (figure 1) partly confirm hypothesis H1. Whereas teachers' inclusive practices in heterogenous classes can be significantly predicted by their behavioural intentions with a variance explanation of 28%, they cannot be predicted by their self-efficacy beliefs. Further, our findings support hypothesis H2. Thus, teachers' behavioural intentions can be significantly predicted by their attitudes towards inclusion, their perceived principals' expectations, and their self-efficacy beliefs with a variance explanation of 33%.
Overall, our investigation contributes to clarify the role of teachers' personal determinants (attitudes, self-efficacy beliefs), their perceived principals' expectations, and their behavioural intentions for their inclusive practices in heterogenous classrooms. However, in future long-term studies, relationships between teachers' personal determinants, their behavioural intentions, and their inclusive practices should be examined in terms of cause and effect.

Figure 1

Significant paths and correlations of the path model



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Leadership in inclusive ECEC cultures

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Inclusion and inclusive education have been the central aims of educational policies globally since the Salamanca Statement (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 1994). These global educational agendas aim to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all students regardless of gender, ethnic background, abilities, or disabilities. The official understanding of inclusion in Finnish compulsory education is also based on these agendas, the law (Basic Education Act 628/1998; Student Welfare Act 624/2010), and the National Core Curriculum for Basic Education (FNAE 2016). Early childhood education and care (ECEC) is currently in the process of renewing the law and curriculum to ensure the realization of inclusion from the early years on. Children have already been entitled to support before it will be enacted on August 1st, 2022. Still, with the renewal, the policies will further define the levels and forms of support and how it is provided in the criteria according to the three-tier support model.

Previous studies in schools indicate that school leaders play a significant role in creating and fostering a culture of inclusiveness and developing and implementing inclusion practices (Esposito et al., 2019). Promoting well-functioning inclusive practices may decrease teacher burnout, increase teacher retention, and more time devoted to actual teaching and learning (Esposito et al., 2019). From a leadership perspective, inclusion can be approached through the idea of an inclusive ECEC community, in which every voice counts, and everyone is respected and valued. These kinds of communities form working environments that embrace diversity regarding, for example, culture, worldview, gender, socio-economic background, and ability. Consequently, this implies a community where all members are learners. Every actor (teachers, social pedagogues, childcarers, children, parents, ECEC leaders, and other caretakers) engages in, feels responsible for, contributes to, and is supported in individual and collective learning processes. These organizations require inclusive leadership distributed to all actors and appeal to each actor to take responsibility for and contribute to the common goals. (See Charalampous & Papademetriou, 2019; Rayner, 2009; Ryan, 2007).

This research examines how the Early childhood education and care (ECEC) center leaders see inclusion and leadership in an inclusive educational context. Further, we aim to clarify the attitudes and beliefs of ECEC leaders towards inclusive education and examine what actions and procedures promote effective implementation of the inclusion principle.

We aim to get answers to the following research questions: (1) What are the constituents of inclusion in ECEC centers, constructed through the discourses of leaders? (2) How do leaders describe the aspects of leadership in an inclusive ECEC center? (3) What are the attitudes and beliefs of ECEC leaders towards inclusive education? (4) How do the pre-school and ECEC leaders describe the potential and problematic aspects of inclusive education? (5) According to the leaders, what are the means for implementing inclusion effectively through leadership?

We will collect the data in May 2022 from one municipality participating in the Finnish Ministry of Education and Culture funded the Right to Learn program (2020-2023). The program aims to secure an equal start for learning by improving quality and equality in ECEC and comprehensive school education. We will employ the focus group method, which seeks to awaken participants to look at the phenomenon from different perspectives and provide information on barriers to change and novel solutions (Heikka, 2014). Focus groups will consist of three to four ECEC leaders meeting to discuss inclusion-related claims under the guidance of two researchers. The participant will discuss their perceptions and various dimensions (Wibeck et al., 2007). When the conversation fades, the researchers will only follow the discussion and move to the following claim. The method's purpose is to bring out attitudes towards the theme at hand. The attitude is understood as a person's inner construction and as capable of describing the relationship between an individual and the social dimension.

We will analyze the data by employing data-based and theory-driven content analysis (e.g., Cohen, Manion & Morrison, 2007). The preliminary results will be presented and discussed at the conference.

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Investigating the Intentions and practices of teachers regarding inclusive education: an application of the Theory of Planned Behavior

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Theoretical background: The Theory of Planned Behaviour arose from the Theory of Reasoned Action (Fishbein et al., 1980). The Theory of Planned Behaviour states that an individual's behaviour can be predicted by the individual's intention to execute the behaviour (Ajzen, 1991). Intentions refer to people's desire to engage and use energy to enact a certain behaviour. Attitudes, subjective norms, and perceived behavioural control all have an impact on an individual's intention. Ajzen described the attitude as an individual's emotional tendency to enact or not enact a behaviour; the subjective norm as how important individuals in society perceive the behaviour; and perceived behavioural control as an individual's perceived ability to execute the behaviour. As a general rule, the more positive attitude, subjective norm, and higher perceived behavioural control, the greater an individual's intention to engage in behaviour (Ajzen, 2012). Perceived behavioural control is also assumed to influence actual behaviour not just directly, but also indirectly through intention. In this study, teachers' perceptions of teaching in an inclusive environment represent their "attitudes". Perceived school support teachers receive via collaboration with school administration and the school community represents "subjective norms". Teachers' self-efficacy in teaching students with SEN in regular classrooms represents their "perceived behavioural control". Teachers' willingness to implement inclusive practices in the own classroom represents their "behavioural intentions". Teachers' inclusive practices behaviours reflect actual behaviour (Figure 1).

Previous studies on teachers' attitudes towards inclusive education and on teachers' self-efficacy have been carried out all around the world (Savolainen et al., 2020; Yada et al., 2018). They have found connections between these two constructs. Even though there are numerous representations of factors associated with teacher performance in the field of inclusive education, very few efforts have been made to establish a structural understanding of those variables within a reasonable theoretical framework that may provide prediction and clarification of teachers' intentions and actual inclusive behaviors (Yan & Sin, 2014). This project will investigate the extent to which TPB can predict and explain teachers' intentions and actual inclusive behaviors by examining all TPB variables in primary and secondary schools in Finland towards inclusive education. The research questions were:

What factors predict teachers' intentions to implement inclusive education in Finland?

Based on previous findings (Ahmmed et al., 2014; Emmers et al., 2020), the first hypothesis was formulated. H1: Teachers' intention to educate in inclusive classrooms can be predicted from teachers' attitudes towards inclusion, teachers' self-efficacy for inclusive practices, and teachers' perceived school support for inclusive education.

1. What factors predict teachers' actual inclusive behavior in Finland?

Based on previous findings (MacFarlane & Woolfson, 2013; Savolainen et al., 2020), the second hypothesis was formulated. H2: Teachers' actual inclusive behavior can be predicted from teachers' self-efficacy for inclusive practices and teachers' intentions to educate in inclusive classrooms.

2. Is the relationship between teachers' actual inclusive behavior and teachers' attitudes towards inclusion, teachers' self-efficacy for inclusive practices, and teachers' perceived school support for inclusive education mediated by teachers' intentions to educate in inclusive classrooms?
Based on previous findings (Ajzen, 2019; Yan & Sin, 2014), the third hypothesis was formulated.
H3: The effects of teachers' attitudes towards inclusion, teachers' self-efficacy for inclusive practices, and teachers' perceived school support for inclusive education on their behavior in inclusive classrooms are mediated by their intentions to educate in inclusive classrooms.

Methods: The cross-sectional data will be collected from Finnish teachers from primary and secondary schools using questionnaires. Firstly, the Finnish versions of "The Sentiments, Attitudes, and Concerns about Inclusive Education Revised (SACIE-R) Scale" and "Teacher Efficacy for Inclusive Practices (TEIP) Scale" will be used to measure teachers' attitudes and self- efficacy towards inclusive education (Savolainen et al., 2012). Secondly, "Perceived School Support for Inclusive Education (PSSIE)" will be used to measure teachers' perceived school support (i.e., subjective norms) (Ahmmed, 2013). Thirdly, "Intention to Teach in an Inclusive Classroom Scale (ITICS)" and "Inclusive Practices Scale (IPS)" will be used to measure teachers' intentions to teach in an inclusive classroom (Sharma & Jacobs, 2016) and to measure teachers' inclusive behaviors (Sharma et al., 2021).

Results and interpretation of findings: Some studies found that inclusive education benefits students with SEN in terms of equal or better educational and social outcomes (Rujis & Peetsma, 2009), while others found benefits in terms of social skills and tolerance toward classmates with SEN (Kalambouka et al., 2007). Research that includes all TPB variables will be useful to understand how teachers' motivation to implement inclusive education (i.e., behavioral intention) and actual inclusive behaviors affect students with SEN (Sharma & Mannan, 2015).

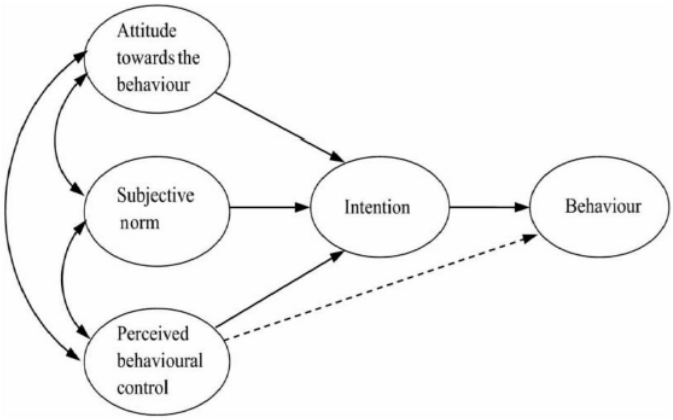

FIGURE 1. Theory of Planned Behavior (Ajzen, 1991)

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Teacher competencies in promoting social emotional learning

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Students with emotional and behavioural difficulties (EBD) have overall fewer educational opportunities and are more at risk of developing behavioural and social impairments than their peers (Durlak et al., 2011). For students with EBD it is difficult to meet school requirements and teachers' expectations for social and learning behaviour in class (Bethell et al., 2012). They report a lower social integration in class, less acceptance by their teachers and less well-being than their peers (Blumenthal & Blumenthal, 2021). Furthermore, children and adolescents with special educational needs in this area are perceived as more aggressive and are more likely to be rejected by their peers (Gest et al., 2014; Hendrickx et al., 2016). In addition, teachers find these students' disruptive behaviour in class challenging (Weiss et al., 2020). Difficulties in meeting requirements and expectations in class are associated with EBD students' shortcomings in social emotional skills (Durlak et al., 2011).

Social emotional learning can be seen as the process of acquiring competencies to recognise and manage one's own and other's emotions, to establish positive relationships or to manage conflicts, in sum, to gain social emotional skills (Singh & Duraiappah, 2020). Indeed, promoting social emotional learning needs to be a prominent aspect in teaching students with EBD. For example, teachers can support social emotional learning by instructing peer interactions or functioning as a role model in how to shape relationships (Gest et al., 2014; Hendrickx et al., 2016). In latest research, approaches are made to describe teachers' competencies to promote social emotional learning (Jennings & Greenberg, 2009).

The aim of the study was to investigate which competencies and skills teachers' employ in shaping student-teacher and student- student-relationships, thereby supporting EBD students' social emotional learning. 13 guided interviews were conducted with experienced teachers. The transcribed interviews were submitted to a qualitative content analysis with deductive-inductive categories (Kuckartz, 2018).

Resulting main categories were "conception of relationship", "teaching strategies" and "social learning goals". For "conception of relationship" meaning units were coded in which teachers referred to goals for social interaction such as respect or trust. "Teaching strategies" were coded when a reference to pedagogical strategies aiming at social emotional learning was made. "Social learning goals" involved meaning units mentioning desired or undesired social behaviour both individually and class wide. Analyses revealed that the teaching strategies and social learning goals were related to the conception of relationship. For example, one

teacher refers to reliability as a key aspect in shaping relationships and emphasises that her relationship to the student is not jeopardised by conflicts or necessary sanctions to maintain opportunities for social emotional learning. The results suggest that teachers' knowledge on teaching strategies and social learning goals are not independent but are related to each other and to the conception of relationship as well.

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School level and beyond

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Effects of the composition of pre-service teacher teams on primary school students' competencies in (non-)inclusive science lessons

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Theoretical background

Since the ratification of the United Nations Convention on the Rights of Persons with Disabilities, there are numerous questions concerning the implementation of inclusive learning processes in schools. In particular, collaboration such as team-teaching processes of primary school teachers and special needs teachers is regarded as an important prerequisite for students' successful learning processes in inclusive primary schools (European

Agency for Development in Special Needs Education, 2012). Following Ferguson and Wilson (2011), team-teaching in inclusive classrooms occurs if two or more teachers equally manage learning processes and assume the responsibility for all students. Teachers' successful collaboration in inclusive primary education is influenced by various prerequisites. For instance, it could be shown that teachers' collaboration in class is combined with specific difficulties, such as their responsibilities and role-clarities (e.g., Stefanidis & Strogilos, 2015). Teachers consider cooperative working as little avail, if essential structures are missing and if personal relationships in teams are perceived as difficult (e.g., Arndt & Werning, 2013). Currently, the role of teachers' positive mutual relationships for their successful collaboration in class is under-researched. Arndt and Werning (2013) assume that teachers' positive mutual relationships are one of the most important conditions of successful collaborative teaching in (non-)inclusive schools.

Research Questions

Against this theoretical background, we examine if primary school students who were taught by pre-service teachers in freely selected teams have a significant knowledge growth in comparison to primary school students who were taught by pre-service teachers in not freely selected teams. On the basis of our study, we investigate the role of teachers' personal relationships in team- teaching for students' learning processes in regular and in inclusive primary school science lessons.

Method

In our study, N=142 pre-service primary school teachers and pre-service special needs teachers in the 'Master of Education'-program from a university in Germany (North Rhine-Westphalia) participated in our study. Students' average age was approximately 24 years. Additionally, N=804 third and fourth grade primary school students were taught in regular science lessons by the pre-service primary school teachers and the pre-service special needs teachers. The primary school students came from 71 learning groups of 35 primary schools. In 20 learning groups, there were primary school students with special educational needs. The pre-service teachers participated in a training to acquire competencies concerning their collaboration in inclusive education. Afterwards, they were assigned to one of our study groups. Half of the pre-service teachers could choose their tandem partner. The other half was assigned in pairs randomly. The pre-service teachers planned in tandems science lessons on the subject 'renewable energies' and taught groups of students over a period of three lessons. On the basis of a pre- and post-test, we investigated primary school students' competence development. In detail, the primary school students were asked to fill in science knowledge tests on 'renewable energies'.

Results and interpretation of the findings

Primary school students from both study groups benefit from the science lessons concerning their knowledge about renewable energies. However, the students who were taught by pre-service teachers in freely selected teams have a significant knowledge growth in the test on the subject 'renewable energies' compared to the students who were taught by pre-service teachers in not freely selected teams. If the type of setting (inclusive versus non-inclusive) is included in the analysis as a covariate, it becomes evident that it does not influence the students' development of their knowledge about renewable energies from measurement point 1 to measurement point 2. This means, the effect is present whether or not the students participated in inclusive or regular learning groups. Overall, the results of our study give indications that the well-considered composition of teams who plan lessons and teach in inclusive and in non-inclusive classrooms is an important prerequisite for students' competencies. Therefore, our findings underline the role of positive mutual relationships for successful team-teaching processes in inclusive and regular primary school classrooms.

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Learning to co-teach: a systematic review

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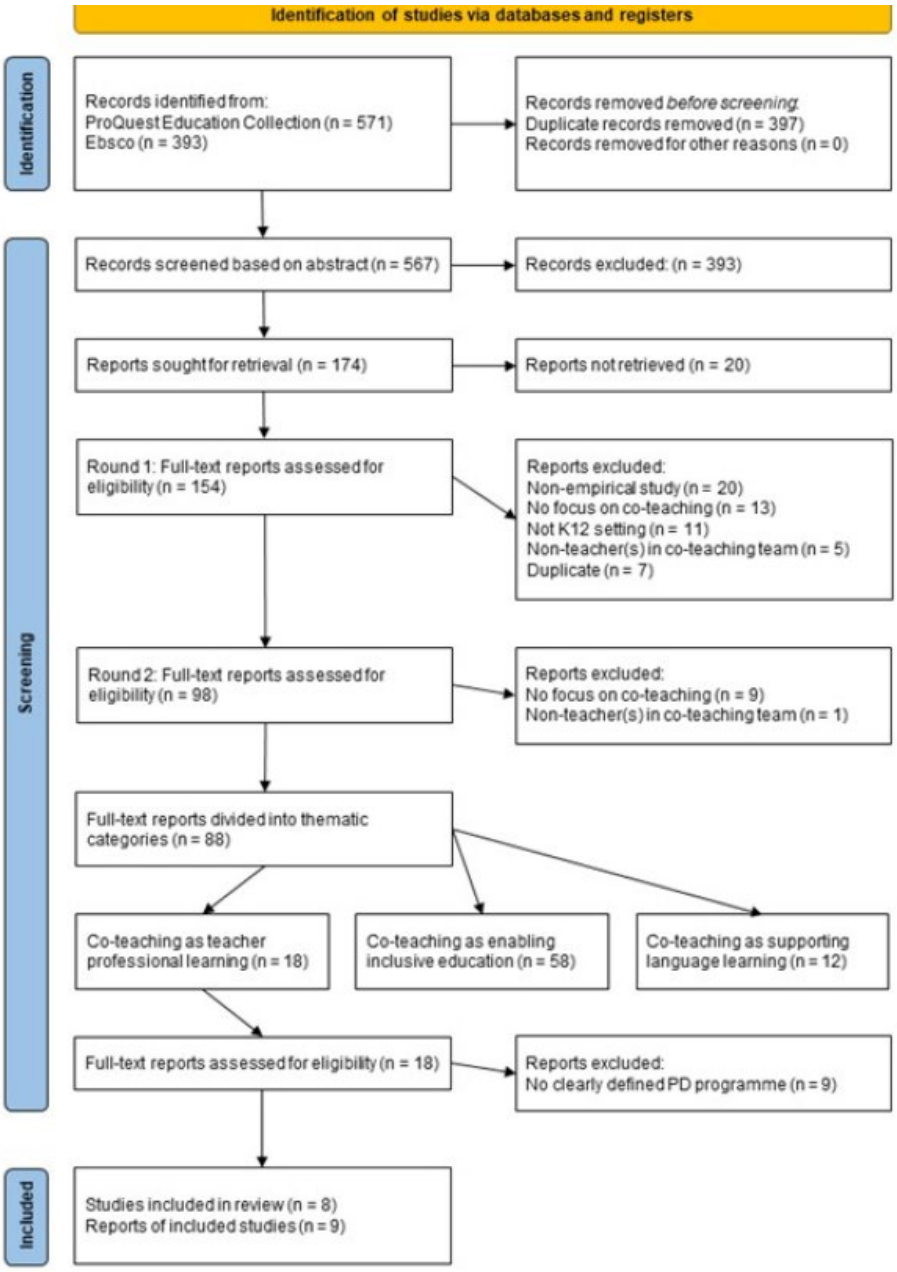
Since the seminal article on co-teaching models by Friend and Cook (1995), co-teaching has taken root in both classrooms and research. Co-teaching is widely examined at all levels of education from kindergarten to higher education, covering various subject areas and several research fields such as coaching and co-teaching as a tool of teacher training (e.g., Allen et al.,, 2014; Guise et al., 2017). Co-teaching is generally defined as a collaborative practice in which two or more teachers plan, teach and evaluate together a group of learners (e.g. Fluijt et al., 2016; Sileo, 2011). Moreover, as most of the literature on co-teaching draws from inclusive education, it is defined particularly as a practice between a special education teacher and a general education teacher, yet it can be practiced between any two teachers (e.g. Härkki et al., 2021). In our understanding, co-teaching is a multifaceted practice based on teachers' shared vision and responsibilities concerning teaching and learning for all students (Fluijt et al., 2016).

Much of the existing oeuvre of research has focused primarily on co-teaching models, and the trend has resulted in the prevailing understanding of the most common model in classrooms being the simplest one, that is, one-teach one assist (Iacono et al., 2021). However, while several reasons probably explain the situation, relatively little is known about how teachers learn to co- teach.

In this review, we investigated the relationship of co-teaching and teacher learning in more detail. We decided to limit the scope of our investigation to literature focusing on co-teaching between at least two qualified teachers in K-12 education and chose to look at the studies reporting Professional development related to co-teaching. Professional development programmes were chosen as the focus of this review because teacher professional development inherently contains the premise of goal-oriented teacher learning, aimed at changes in teachers' thinking and/or practice.

We used PRISMA systematic review protocol to analyse articles on K-12 co-teaching published in years 2009–2018. The study started with screening the abstracts of 567 research articles and after having gone through each step of the study selection process (see Figure 1) we ended up with nine research articles that were selected for detailed analysis. Our results indicated that in analysed articles the linkage between co-teaching and teacher learning remained shallow in general. Many of the programmes embodied a narrow understanding of co-teaching, and elements of co-teaching were not efficiently used to support teacher learning. Moreover, due to the great variation in the programmes regarding concepts, methods, and co-teaching practices it is challenging to draw reliable conclusions about the impact of such programmes on teacher learning.

We conclude that in future studies on co-teaching and teacher learning, a microanalytical approach to co-teachers' communication during classes, breaks and planning sessions would provide detailed information about the process of their on- going professional learning. This would further increase our understanding of the factors promoting and hindering effective job- embedded teacher learning. This setting might also let researchers distinguish the process of learning from each other from the process of learning together and shed light on the relationship between the two. Moreover, when planning for professional development programmes on co-teaching, a deeper understanding of teacher learning as well as co-teaching might enhance teachers' joint knowledge construction.



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Parental involvement interventions in the education of children with special educational needs: a scoping and systematic review

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Seminal and recent literature continue to support the idea that parental involvement and engagement in their children's education and meaningful school partnerships are an important contributor to a child's educational outcomes (Epstein, 1991; Goodall & Montgomery, 2014). Despite extensive literature on the significance of meaningful interactions between the parent, child, and school, there is still a lack of research literature on parental involvement interventions for parents of students with special educational needs (SEN). This study systematically reviewed research that has examined the impact of parental involvement interventions for this demographic and highlights the quality and potential gaps within this area of research. The following research questions were addressed: (1) What types of interventions, strategies or training programmes were considered effective in achieving the desired outcomes? (2) What special educational need/s was the intervention directed towards? (3) What methodological characteristics were utilised for the interventions? (4) What is the theoretical framework underpinning the intervention?

A scoping review was conducted to synthesis the evidence base, the scoping review aimed to identify research that was conducted on parental involvement interventions for parents of children with SEN. The review highlighted the various studies that have been conducted, the methodological approaches utilised and gaps within this area of research. Should the scoping review identify sufficient research literature a systematic review will be conducted.

The population for this review focused on parental involvement interventions targeted at parents of children with SEN aged 4 – 18. All interventions that focused on parental involvement for parents of children with SEN were included. This included both individual and group-based interventions based in any setting and delivered in any manner. The review also included studies with qualitative, quantitative research designs and those that may or may not have included a control group. Studies that have implemented parental involvement interventions that have impacted educational outcomes for students with SEN, including academic (school attainment, cognitive ability), behavioural (self-efficacy, truancy, attendance, school behaviour) and wellbeing outcomes (anxiety, stress, depression, sleep) were also included. Both published literature and grey literature were searched utilising the following databases: Educational Resource Information Centre (ERIC), PsychINFO, Scopus, Web of Science, ProQuest,Google Scholar, Opengrey, Open Science Framework Prints, PsychExtra, DERA and OpenDOAR.

We are currently still finalising the results from this review.

This study evaluated the parental involvement interventions implemented and the impact the interventions have had on children's outcomes. Findings from this review will inform a future intervention for parental involvement for parents of children with SEN.

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Frequency, direction, and timing of school transfers between different school settings for students with special educational needs

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Theoretical background

There is great variability in how countries around the world provide support for students with special educational needs (SEN; Anastasiou & Keller, 2014). Even though a one-track system is promoted by many researchers as the best way to implement the United Nations' Convention on the Rights of Persons with Disabilities to foster full inclusion (e.g., Ferguson, 2008) many countries have systems with multiple types of school settings for students with SEN (Bajrami, 2017; Ferguson, 2008). Research suggests that school transfers can be generally challenging for students (Galton & McLellan, 2018; Rumberger, 2015) and students with SEN might be specifically vulnerable in this regard (e.g., Harris & Nowland, 2020). However, research on transfers between different school settings for students with SEN is scarce so that often even basic statistical information on school setting changes is lacking. Research questions: The current study investigates the frequency, direction, and timing of school transfers between different settings for students with SEN for the case of Switzerland: (1) What are the frequencies and directions of transfers between different school settings where students with SEN are taught? (2) At which grade levels do students transfer between different school settings attended by students with SEN?

Method

Administrative census data of students in obligatory school in Switzerland from 2014 to 2018 was analysed using the statistics software R (R Core Team, 2014). Three main school settings were differentiated: Mainstream setting (inclusion), separated setting (special classes in mainstream schools) and segregated setting (special schools). Separated settings included: (a) introductory special classes to support the transition to primary school, (b) special classes for foreign language students who moved to Switzerland not speaking the local language, and (c) special classes for moderate SEN. Frequencies and directions of transfers between the five settings were determined between each school year. Timing was investigated by determining the grades at which transfers between mainstream and separated or segregated settings happened.

Results

On average 1.27 % of all students in obligatory school in Switzerland transferred between the different school settings for students with SEN every year. Transfers between mainstream and separated settings were more frequent than transfers between mainstream and segregated settings, even though there were less students in separated (1.42 % of all students) than in segregated settings (1.81 %). Patterns of transfers varied for the different settings: Between mainstream and introductory special classes, similar numbers of students transferred in both directions. For special classes for foreign language students, there were only transfers to mainstream settings. More students transferred from mainstream settings to special classes for moderate SEN than in the other direction. A similar pattern was found for segregated settings. Transfers between the different separated and segregated settings were rare.

Students typically transferred from mainstream settings to introductory special classes after kindergarten. Transfers from special classes for foreign language students to mainstream settings were more likely in higher grades. Transfers between mainstream settings and special classes for moderate SEN peaked between grade 6 and 7, which falls in the transition period from primary to secondary school. Transfers between mainstream and segregated settings showed a similar timing pattern, albeit less pronounced.

Conclusions

The results show that transfers between different school settings attended by students with SEN occur rather frequently and peak at specific times of the school career. Further research is needed to determine the impact of the different transfers on students with SEN and on potential support guaranteeing the smoothest transitions possible.

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Interventions

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Effective teaching for students with special educational needs (SEN) and the influencing role of classroom context: a scoping review

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Theoretical background

A central factor contributing to students' academic, social and behavioral development, especially for students with SEN, is effective teaching. Recent studies have shown that both students' educational needs and classroom context play a crucial role in how and to what extent certain teaching behaviors are effective [e.g., 1]. Therefore, research on effective teaching tailored to students with SEN taught in various classroom contexts - such as inclusive, resource or special education classrooms - is extremely important to ensure high-quality teaching. However, students with SEN are often neglected in current research [2] and a teacher effectiveness model specifically tailored to SEN education and the classroom contexts of students with SEN is still lacking. The present study aims to contribute to the underdeveloped research field of effective SEN education by using a widely supported generic framework in regular education, namely the Great Teaching Toolkit (GTT) [3]. The GTT outlines effective teaching at two levels. A first level specifies four broad dimensions representing: (1) understanding the content; (2) creating a supportive environment; (3) maximizing opportunities to learn; and (4) activating hard thinking. At a second level, 17 more specific teaching elements are detailed within each dimension.

Research Questions

This review answers three main questions: (1) What are study characteristics of existing research on effective teaching behaviors for students with SEN? (2) What effective teaching behaviors for students with SEN emerge from the teacher effectiveness literature? (2a) What teaching behaviors are currently being studied in the literature?

(2b) What is the effectiveness of these teaching behaviors? (3) How does effective teaching for students with SEN differ between classroom contexts, i.e., inclusive, resource or special education classrooms? (3a) What effective teaching behaviors are studied in different classroom contexts? (3b) How does the effectiveness of teaching behaviors for students with SEN vary according to classroom context?

Methods

A scoping review methodology is adopted following the Joanna Briggs Institute (JBI) guidelines. Based on four central concepts (i.e., SEN, classroom context, teachers and effectiveness), a database-specific string was developed and entered in four databases, including one field-specific database (ERIC OVID) and three general databases (SCOPUS, Web of Science and ProQuest Central). A three-stage selection process was carried out based on predefined in- and exclusion criteria (see Figure 1). Descriptive analyses were performed on the data and results were graphed.

Results & Interpretation of findings

Ultimately, 85 studies were included in the review, of which 21 examined effective teaching behaviors for reading comprehension, 63 for social-emotional outcomes and one study examined both types of student outcomes. Preliminary results for research questions 1, 2a and 3a indicate significant gaps in the literature on effective SEN teaching. An examination of study characteristics showed that the vast majority (n=64) of studies examined students with learning disabilities and/or emotional or behavioural disorders. In contrast, only 18 studies examined students with autism spectrum disorder and 14 examined students with intellectual disabilities. Moreover, most studies were conducted in inclusive classrooms (n=37) compared to special classrooms (n=9) or resource rooms (n=18). Seven studies examined students with SEN in more than one type of classroom context and in 14 studies the classroom context was not explicitly specified. Regarding GTT dimensions, dimension 4 was studied most frequently (n=56), followed by dimension 3 (n=51) and dimension 2 (n=37). Dimension 1 was examined in only a few studies (n=4). Remarkably, differences in teaching behaviors can be found depending on the studied student outcome: reading comprehension (RC) or social-emotional outcomes (SEO). For example, all RC studies (n=22) examined at least one dimension 4 teaching element, while this was only the case for 35 out of 64 SEO studies. For dimension 3, the opposite is true: six RC studies included teaching elements from this dimension, compared to 46 SEO studies. Comparing studied teaching behaviors by classroom context revealed notable differences. Studies conducted in inclusive classrooms focused almost equally on GTT dimensions 2,3 and/or 4 while nearly all studies conducted in special classrooms focused on dimension 3. Studies conducted in resource rooms focused mainly on dimension 4. Interesting conclusions can be drawn from these preliminary findings; however, the data will be examined in greater detail, and implications will be drawn accordingly.

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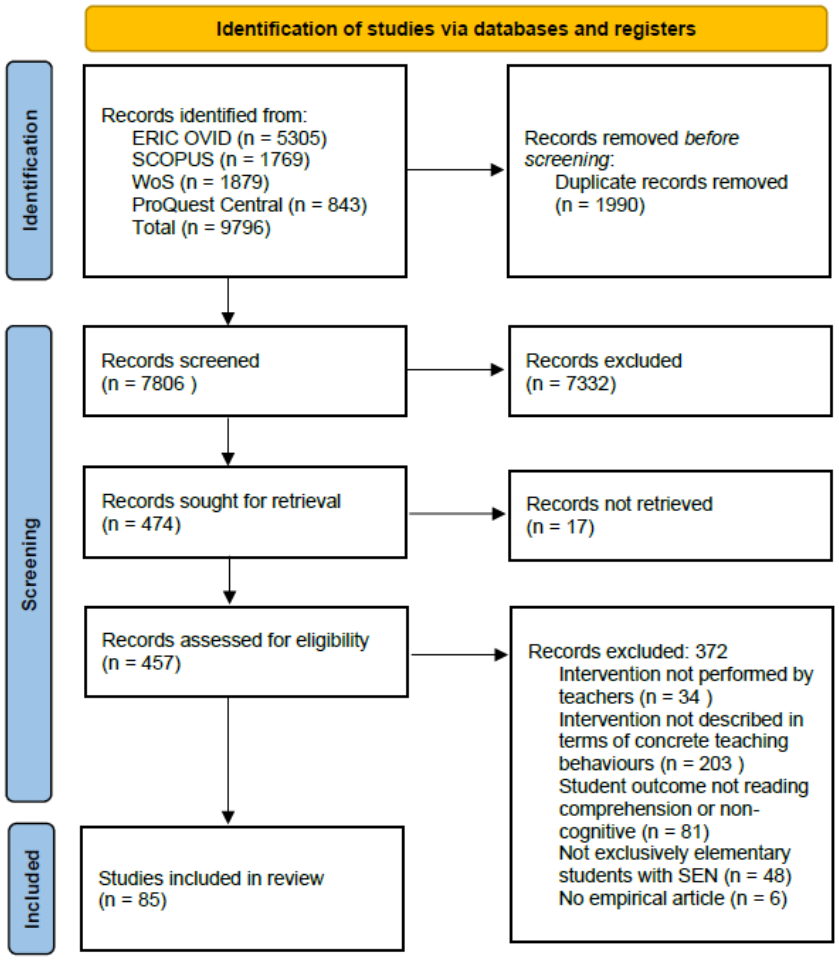
PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



Promoting reading skills and self-efficacy through scenic play

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Lucas Deutzmann – University of Potsdam, Potsdam, Germany

A theater project with seventh graders at the transition to lower secondary school from primary school after one year with Covid is an important event for students. A joint prevention project on bullying can create an inclusive learning culture (Booth & Ainscow, 2002). With its strong action orientation, a play is particularly suited in inclusive learning settings to promote literacy and grow community through the common learning object. School studies show that students exhibit barriers to educational progression when they lack literacy skills. At this point, our study aims to address the following questions and meet the need for research from L1 didactics in inclusive learning groups.

(I) Which reading skills (reading speed and comprehension) do the participating students show in reading literary texts at the beginning and at the end of the theater project compared to the control group (no treatment)?
(II) What is the level of general self-efficacy expectations before and after participation in the theater project?
(III) How can participating students receive individual support and language development within a theater project?
(IV) How do participating students evaluate social interaction from their perspective within the theater project?

We hypothesize that reading speed, literary reading comprehension, and self-efficacy expectations are fostered by a theater project among participating students. In addition, we examine whether the theater project is evaluated positively by the students in the context of social interaction. To answer this, we have designed a longitudinal quasi-experimental field study in the 7th grade (n= 53) at one middle school, which was conducted once a week by a future teacher tandem from mid-August until the end of October 2021 in a pilot study. While the intervention group participated in a theater course, the control groups participated in sports or art courses. The test instruments are a standardized reading test to determine reading speed and literary reading comprehension, and a standardized questionnaire to test the self-efficacy expectations at three measurement points. Although the intervention group is very small, positive developments are emerging in reading speed, reading comprehension, and self-efficacy expectations. These first results can be presented and discussed at the conference.

Let's play! The impact of an intervention on the social play interactions of kindergarten students with disabilities

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Establishing social relationships with peers is a major developmental task in early childhood. Children form social relationships through positive interactions with peers. Unfortunately, establishing social relationships is not obvious for all young children.

Children with disabilities have fewer interactions than their typically developing peers (Avramidis et al., 2018; Chen et al., 2019; Koster et al., 2010), and more often play alone than with others (Hestenes & Carroll, 2000; Kasari et al., 2011; Okagaki et al., 1998; Yu et al., 2015). Without interventions, children with disabilities might miss out on social play opportunities where they can practice and enhance their social skills, leading to lifelong difficulties with social relationships (Howe & Leach, 2018; Van Geert & Steenbeek, 2005).
Several authors have suggested that promoting contact between students with and without disabilities is of importance to improve voluntary interactions between students with and without disabilities, and proposed cooperative learning as a suitable method to promote peer interactions (e.g., Mamas & Avramidis, 2013; Pinto et al., 2019; Rademaker et al., 2020). Yet, the effectiveness of cooperative learning on social interactions and peer relations for students with disabilities remains unclear. While positive effects of cooperative learning on peer relations of typically developing students have been established in research (Roseth et al., 2008; Tolmie et al., 2010; Van Ryzin & Roseth, 2018), the results for students with disabilities are mixed. While some studies suggest that cooperative learning is not always effective for students with disabilities (see review by O'Connor & Jenkins, 2013), various other studies indicate positive effects of cooperative learning on the social interactions and acceptance of students with disabilities (e.g., André et al., 2011; Capodieci et al., 2019; Dugan et al., 1995; Klang et al., 2020). Though, the current evidence appears to be limited to interactions within structured school activities, while voluntary social interactions during play are much more indicative of the establishment of social relations. Furthermore,, the current evidence appears to be limited to middle childhood and up, while cooperative learning also has great potential for early intervention and prevention in preschool and kindergarten (Battistich & Watson, 2003).

By analysing the patterns of social and non-social play via detailed observations, this study aims to provide clarity regarding the generalisability of the positive effects of cooperative learning to voluntary social interactions in play and the effects of cooperative learning on the social interactions of young students with disabilities. Research question: What are the short-term and long-term effects of a class-wide cooperative learning intervention combined with an intervention component on the proportion of social and non-social play of kindergarten students with disabilities?

A quasi-experimental study with three repeated measurements was conducted to assess the effect of a class-wide intervention on the social play of kindergarten students with disabilities (N = 21). The experimental group received a class-wide educational intervention that combined cooperative learning groups to promote contact with storybook reading and guided discussions to increase students' knowledge about disabilities and eliminate possible misconceptions. The control group followed the regular curriculum.

The play of the participants was observed twice at each measurement during a 10-minute live observation during free play in class and at the playground. Codes included non-social play (uninvolved, solitary play, onlooker behaviour, and parallel play), social play, and interactions with the teacher. The proportion of time spent in social and non-social play was calculated and compared across the groups and over time. Hereto, three change scores (T2-T1, T3-T1, and T3-T2) were computed which were compared across the groups using three separate Mann Whithney U tests.
The results indicate no effect of the intervention of social play in favour of the experimental group. In the presentation, we will further discuss the results and reflect on the findings. For some participants, their proportion of social play showed an erratic progression. Considering 20 minutes only constitute a fraction of the social interactions kindergarten students might have in one school day, it could be that the observations were not representative. In the presentation, we will therefore also discuss teachers' views on the social validity of the intervention. In addition, in both the experimental and the control group, some participants already showed high social participation rates in their play during pretest. This might have caused a ceiling effect.

Constructing individual interventions for pupils with behavior problems in Finland: to whom support is provided and how school personnel evaluate social validity of the support?

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Mika Paananen – University of Jyväskylä, Jyväskylä, Finland

Theoretical background

The objective in Finnish basic education is that pupils with disabilities, including pupils with behavioral problems participate in mainstream education and mostly in ordinary classrooms. In multitiered behavioral support interventions on Tier 1 consist of school-wide methods for preventing behavioral difficulties. On secondary level interventions are targeted for individual pupils who do not respond to universal level supports and may be at-risk for developing severe behavioral difficulties. In an inclusive school setting, educators need to have the necessary skills to identify pupils with a need for behavioral support and methods for providing intensive individual support.

Check in Check out (CICO) is a research-based individual, proactive and preventative support that includes several key components. CICO support is based on the behavioral theory and the principles of applied behavior analysis. During the CICO support pupils receive added adult time during the daily check-in and check-out meetings, systematic behavioral feedback from teachers, data collection for progress monitoring, and guardian feedback component (see Figure 1).

According to the previous research CICO support has been implemented primarily with pupils without disabilities. The Finnish application of CICO support includes an individual behavior assessment process and, therefore, it can be potentially applied also with pupils with more severe behavioral problems. However, there is no knowledge yet as to whom in Finland CICO support is being provided and is it used mainly as a preventive method?

Research questions

Following research question were answered: (1) Who are the pupils that receive CICO support in Finnish PBS schools? (i) What is the gender and grade level distribution of pupils in CICO support? (ii) What is the proportion of pupils in CICO support who have been identified as having specific needs of individual pedagogical support? (iii) What is the proportion of pupils in CICO support who have been diagnosed by health services as having a behavior related disability? (2) What is the level of social validity of the CICO support in Finnish PBS schools and does social validity vary according to pupils' grade level or identified specific educational need or behavior related diagnosis? Preliminary results of the effectiveness of CICO is also discussed.

Methods

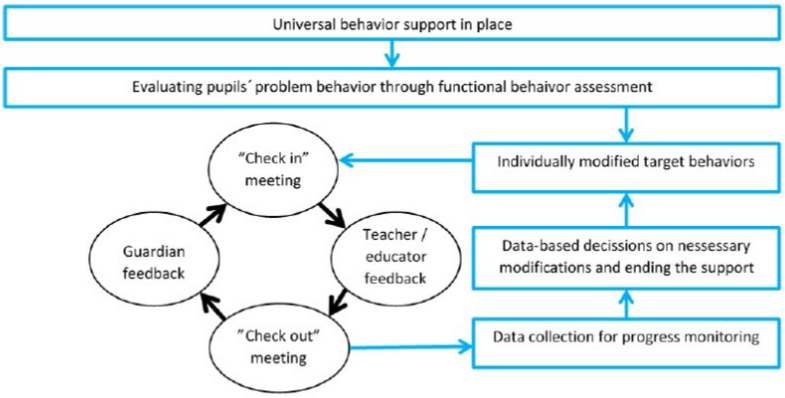
Altogether, 11 schools, 51 pupils and their teachers participated study. CICO support was provided for pupils that had problems in complying with behavioral expectations set by schools and problems in behavior affected their learning. Duration of the support period ranged from 5 to 10 weeks. The social validity of the support was assessed with a questionnaire containing five items that examined the feasibility and experienced effectiveness. Using Univariate ANOVA we tested differences in social validity ratings between groups with or without pedagogical support plan and with or without neuropsychiatric disability.

Results, and interpretation of findings

In schools attending the study, CICO support was offered in all grade levels of the primary school but mostly for boys (88.2 %). A high proportion of pupils had a pedagogical support plan (64.6 %). In addition, 35.4 % had a neuropsychiatric diagnosis. Although the results did not show statistically significant differences in the overall social validity of CICO support, experienced effectiveness was higher for pupils without pedagogical support plans (ηp^2 = 0.08). The results revealed that CICO support was not used mainly as early preventive support as two-thirds of pupils attending CICO support had a pedagogical support plan already before CICO support was started, furthermore one third had neuropsychiatric disability identified by health services. As the results suggest that experienced effectiveness can be lower among pupils with a pedagogical support plan, learning and behavioral problems may have a negative reciprocal interaction. Therefore, it is recommended that behavioral support should be started earlier and should be combined with practices of executive skills, aiming to support both positive school behavior and learning and academic outcomes. The data concerning outcomes and effectiveness of the CICO support will be fully available at the end of May and will be presented and discussed at the conference.

Figure 1

CICO support process in Finnish schools



Secondary education

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The role of parents' support on career choice and early career development of young people with special educational needs: results of secondary analyses and first experiences with an intervention project

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Theoretical background

Transition from school to employment is usually a challenge for young people with special educational needs (SEN). There has been a lot of effort to support these young people during this period in Switzerland (Hofmann & Schellenberg, 2019). Nevertheless professional support – especially from school and teachers – is important, also parents play a crucial role: Social cognitive career theorists (Lent et al., 2000) argue that support of those "significant others" (as parents are) may facilitate goal-setting and achievement by serving as a filter that distills perceptions of structural barriers and may offer information how to cope with it. They can also help to reinterpret difficult situations and thus protect self-esteem of their youngsters (Kracke & Noack, 2005; Piko & Hamvai, 2010; Rogers et al., 2018). Accordingly it has been shown that parents' support influences career expectations and reduces self-devaluation during transition period (Neuenschwander et al., 2007; Neuenschwander et al., 2018) and has significant effects on work salience (Diemer, 2007). Additionally it seems important to distinguish between father's and mother's support, because there is some evidence of different support functions (Dietrich & Kracke, 2009).

Aim and Research questions

The aim of the presentation is twofold: We plan to show results of a secondary analyses of data from two longitudinal studies: We conducted these analyses to know more about the role of different support sources. Our research questions here is: What is the role of family support compared to others support sources (school, teachers, others)? What kind of support matches the needs of the youngsters with SEN?
The results - complemented by additional specific research literature and evaluations - were the basis for developing an intervention project to support parents and their youngsters with SEN during this period of transition. The aim of this project (called "FLÜGGE") is to strengthen parents' competences, to encourage them to take over their role while also supporting the autonomy of their youngsters. Furthermore it is intended to facilitate the dialogue between parents and youngsters about the ongoing career choice. Questions here are: Which other intervention projects contain important elements that have to be considered for planning our intervention? What are the first experiences and feedbacks of parents and youngsters that participate at the project "FLÜGGE"?

Methods

The database of the secondary analyses are two longitudinal studies that took part between 2007 and 2019 in Switzerland. Both studies surveyed young people who were already in their apprenticeship and reported about their career choice and transition in retrospective. At the beginning of the training apprentices were filled out written questionnaires in their vocational school classes (First study: N= 628; second study; N=788). The questionnaire contained (among others) questions about career choice, support from parents, teachers and others. Data was collected in the French- and German-speaking parts of Switzerland in four sectors of the Federal VET Certificate and the so-called "practical training".

Secondly we developed an intervention project with the aim to support families during this transition process. We based this program on our own research (Hofmann & Müller, 2017; Hofmann & Schellenberg, 2015; Schellenberg & Hofmann, 2016) and supplemented evidence and experiences from other similar programs for families with adolescents e.g. the PACTS-Program (Bedson & Perkins, 2006), Triple-P (Cina et al., 2006) or the FUN-Program from Germany (Thimm, 2013).

Finally our FLÜGGE-Program is constituted of four meetings, each with a special focus: The first meeting is about the vocational system/professional support, goals and interests of the youngsters/expectations of the parents. The second meeting aims to activate support networks, the third helps to develop strategies to explore the world of labour. The last meeting focuses on coping with difficulties while also activating resources for the upcoming transition. The program is supported by the "EGBG" (Eidgenössisches Büro für die Gleichstellung von Menschen mit Behinderungen) and is evaluated in a qualitative matter. First interviews with the participants were conducted before starting and participants give feedback after every meeting and more in deep at the end of the program.

First Results

First we will present some results from our secondary analyses that underline the importance of mothers' and fathers' support as expected. Ongoing further analyses show direct effects of mother's support and "buffer" effects for father's support on positive attitudes towards life in this period of transition. Secondly we will give a short overview of similar programs and then present first results of our ongoing intervention study. Our interviews (at the beginning) give an insight into how families handle the situation, questions that arise and show how families talk about vocational interests and choices. First feedbacks after the meetings show the need of parents to discuss problems with peers and share their sorrows and hopes for the future of their children.

Co-producing a feasible intervention for promoting successful schooling for adolescents with multiple risk-factors – bridging the practice research gap by involving multiple stakeholders

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Heidi Selenius – Stockholm University, Stockholm, Sweden

Efforts to promote successful schooling for adolescents with multiple risk factors are often delivered in a complex context involving multiple stakeholders such as school, social services and child psychiatry. Interventions that are sustainable in such a multifaceted practice require an approach that initially focusses on efficacy rather than effectiveness (Chen, 2010). Successful interventions are likely to benefit from involving "the real world" at a very early stage. We present the process of the first phase of co-developing implementation and evaluation of an intervention in a long-term goal-oriented collaboration with practice for adolescents with ADHD diagnoses/symptoms, anti-social behavior and school-problems. The model this project has followed in this first phase constituted by a circular process where researcher and practitioners together repeat the steps of 1) Identify the problem – 2) Gather data – 3) Interpret data – 4) Act on evidence – 5) Evaluate results – 6) Formulate next steps. It took two 'loops' repeating these steps until a feasible intervention was identified.

Loop one:
1. The first step was an evaluation initiated by social-service in a Swedish major city where the identified problem was a general concern of that adolescents with anti-social behavior was not followed up after having contact with social services.
2.and 3) Data was gathered and interpreted together with practice and one of the main findings was that adolescents that were assessed as not being at severe risk of future criminality often had severe school problems that was missed out as assessment focused mainly on criminality and severe psychiatric problems. Acting on evidence assessment procedures were revised.
4. The evaluation of these new assessment routines confirmed the high rates of school-related problems (62%) but also revealed high numbers of ADHD symptoms (49%) as well as ADHD diagnosis (36%) also for those who had not severe anti-social behavior.
5. Based on the results from the previous evaluation and the documentation from the revised assessment

procedure the next step formulated was to further explore how the educational needs in this group could be met.

Loop two:
1. The second loop started with identifying the problem as a lack of knowledge about what possibilities social-services had to offer support targeting the school-problems for adolescent clients.
2. Social workers specialized on adolescents with anti-social behavior were interviewed about the school situation of their clients, the role of ADHD diagnoses/symptoms and what possibilities they had to give school-oriented support to their clients.
3. Interview-results were presented and discussed with the interviewed practitioners and heads of units confirming a high prevalence of ADHD diagnoses/symptoms. Also, homework and working independently in projects was expressed to be particularly challenging and that this was reinforced by not having parents that had the resources to support their children as well as often living in overcrowded flats. What was also expressed was a clear request for research to contribute with something "that works" and is feasible.
4. The research literature was reviewed for an evidence-based intervention that would be fit to the need that practice had formulated identifying Homework, Organization, and Planning Skills (HOPS, Langberg et al. 2018) as such an intervention. The HOPS intervention teaches organization and time-management skills and how to apply such skills in order to complete homework, prepare for test and finalize projects. It has been developed for adolescents with ADHD and found to be effective in several randomized trials (e.g., Langberg et al., 2018).
5. The HOPS was discussed together with practice both in terms of the needs it targeted as well as its feasibility. Practice found the intervention as appropriate both in terms of the needs of the adolescents as well as feasible to implement in their organization.
6. The next step was the decision to apply for funding. The main goal for the funded project was to adapt and evaluate the HOPS for this particular group in a Swedish context.

Beginning of 2022 the project was funded by Swedish Research Council for Health, Working Life and Welfare. In autumn 2022 the second phase of the project will start in which HOPS for Swedish social services will be developed by following the 10 steps of the Getting To Outcomes® toolkit (Chinman et al., 2004). This toolkit has been developed in order to help communities to plan, implement and evaluate prevention programs. At this stage the main focus will be on involving the adolescents and their "village", i.e., their parents, schools, local youth center, etc. in order to develop a sustainable and effective intervention for improving homework and organizational skills in order to promote successful schooling for this multi-factor risk group of adolescents.

Change and stability in adolescents' expectancy-value-cost profiles in mathematics - associations with achievement, aspirations, and well-being

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Considering ongoing declines in STEM participation in many countries, it seems important to gain a deeper understanding of the factors influencing students' decision-making processes regarding their future education and occupation. The expectancy-value theory (Wigfield & Eccles, 2000), implies that the values (i.e., utility, attainment, intrinsic value, and cost) students hold and how they view their competence are crucial when making such decisions. Most previous studies have focused solely on the positive value beliefs, despite perceived cost from engaging in a task have been considered important for enhancing our understanding of why students might lower their aspirations or opt out of pursuing a goal (Jiang et al., 2018). Also, considering current negative trends in adolescents' well-being and motivation, it seems important to investigate, not only how students' domain-specific expectancy-, value-, and cost perspectives might be related to relevant educational outcomes, but also, how they might be linked to broader aspects of students' well-being.

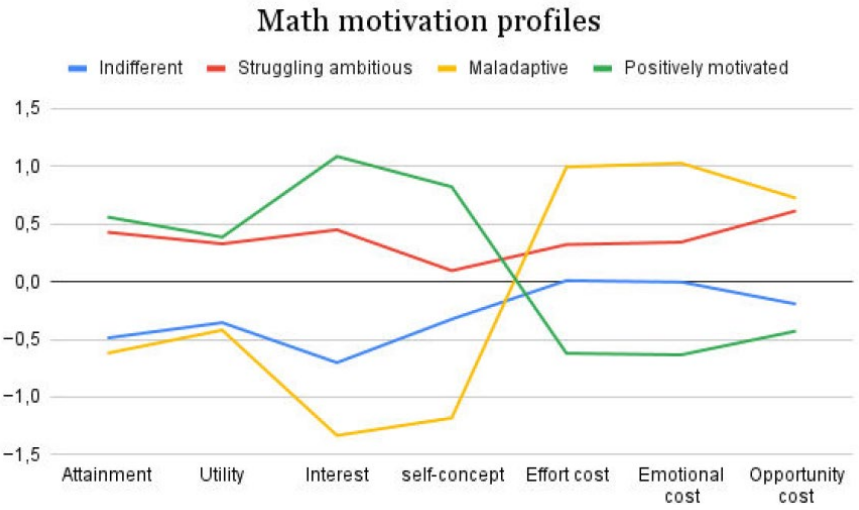
Consequently, the aim of this study was to 1) investigate what kinds of motivational profiles in mathematics can be found among adolescents, 2) how stable such profiles are within the last year of comprehensive school, and 3) how different profiles are related to relevant educational outcomes (mathematics performance and educational aspirations) and to negative aspects of students' well-being related to schoolwork (school burnout) and their lives in general (depressive symptoms).

Method

Finnish students from five lower secondary schools (N = 508) were followed across grades 7–9 (2016–2019). Students completed self-report measures of expectancy-, (self-concept), value- (interest, attainment value, utility value), and cost (emotional-, effort-, and opportunity cost) components at the beginning and end of 9th grade. At the end of 9th grade, students also completed a standardized mathematics test and measurements of school burnout, depressive symptoms, and educational aspirations. Latent profile analyses (LPA) were used to determine the best fitting profile solution at each time point. A two-wave latent transition analysis was then used to examine stability in and transitions between the profiles within 9th grade. Preliminary analyses regarding differences in gender, educational outcomes, and well-being will be presented using ANOVAs and chi-square tests. Eventually, predictors and outcomes will be examined within the mixture model.

Results

LPAs revealed that a four-profile solution fitted the data best (Figure 1). The profiles were named Positively motivated (high expectancy and value beliefs, low costs, T1: 34%/ T2: 32%), Struggling ambitious (high expectancy and value beliefs, high costs, T1: 25%/T2: 25%), Indifferent (low expectancy and value-beliefs, low costs, T1: 22%/T2: 21%), and Maladaptive (low expectancy and value-beliefs, high costs 19%/22%).
Transition probabilities indicated that the profiles were relatively stable: 80% of students displayed a stable profile over time. Some changes were observed between measurement points with relatively high transition probabilities as well. Significant transitions were from Positively motivated to Struggling ambitious (.10), from Struggling ambitious to Positively motivated (.19) and Indifferent (.16), from Indifferent to Maladaptive (.13), and from Maladaptive to Indifferent (.27). There were significantly more girls in the Maladaptive profile, whereas boys were slightly overrepresented in the Positively motivated group.
Students in the Positively motivated and Struggling ambitious profiles had higher educational aspirations compared to students in the Maladaptive and Indifferent groups, and Positively motivated students performed significantly better than all other groups in mathematics, followed by students in the Struggling ambitious group. Students in the Indifferent and Maladaptive groups performed equally low.
Furthermore, students in the Maladaptive profile reported the highest levels of school burnout, followed by students in the Struggling ambitious and Indifferent groups. However, students in the Maladaptive and Struggling ambitious profiles had equally high levels of depressive symptoms, while Indifferent and Positively motivated students reported equally low depressive symptoms.
Overall, the findings demonstrate that students hold various patterns of motivational beliefs in math and that these are quite stable within 9th grade. For many, positive motivational patterns seem to go hand in hand with low costs, high aspirations and performance, and positive well-being. However, some struggle with the required effort and emotional costs associated with math, despite having relatively positive value beliefs, aspirations, and performance. Math-related costs may spill over to other domains as well, as Struggling ambitious students experienced rather elevated levels of school burnout and depressive symptoms as well. However, for others (Indifferent), the emotional strain might only be perceived within the school context, and may not transfer to their lives outside of school.



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Task distribution between general and special education teachers – What are the roles of special education teachers in inclusive secondary schools?

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Carmen Zurbriggen – University of Luxembourg, Luxemburg, Luxemburg
Janine Schledjewski – University of Wuppertal, Wuppertal, Germany
Michael Grosche – University of Wuppertal, Wuppertal, Germany

Theoretical background and research questions

Although studies show that SETs perform many different tasks, they still remain primarily responsible for students with special educational needs (SEN) by teaching them for example in self-contained classrooms, while collaboration and co-teaching are less frequently realized (e. g. Conderman & Katsiyannis, 2002; Suter & Giangreco, 2009; Takala et al., 2009; Wasburn- Moses, 2005). However, these studies investigate the responsibilities for individual tasks, while it remains unclear whether SETs potentially occupy different roles consisting of different responsibilities. Furthermore, their work is influenced for example by available time or workload (e. g. Suter & Giangreco, 2009; Takala et al., 2009) and by working alongside general education teachers (GETs). Tasks need to be distributed between them, which can cause conflicts and role ambiguity, for example when GETs and SETs perceive their responsibilities differently (e. g. Fennick & Liddy, 2001; Hang & Rabren, 2009). Yet, little research has been conducted on the distribution of tasks between SETs and GETs. Based on these considerations, we address the following research questions: (1) Can different types of task distribution be identified between SETs and GETs on the basis of the responsibilities for different tasks, and which roles of SETs can be descriptively derived from these types? (2) Do SETs and GETs perceive the distribution of tasks differently? (3) Do the types of task distribution differ in the amount of time SETs spend in schools and the amount of classes in which they work?

Methods

The data were derived from the research project 'Inclusion in secondary schools in Germany'. For the present study a subsample of n = 640 teachers, including 529 regular and 111 special education teachers, was generated, who completed a questionnaire on task distribution. They reported on a five-point scale how they perceive the distribution of responsibility for different tasks (1 = only special education teachers, 2 = rather special education teachers, 3 = both equally, 4 = rather regular education teachers, 5 = only regular education teachers). In the analysis, eight different tasks were included. We performed latent class analysis (LCA) to identify different types of task distribution (question 1). LCA is a person-oriented analysis procedure that is used to identify subgroups of individuals with similar response behavior (Collins & Lanza, 2010). In order to answer the second research question, we conducted a multiple-group LCA. Models were selected on different information criteria indices and by performing likelihood ratio tests.

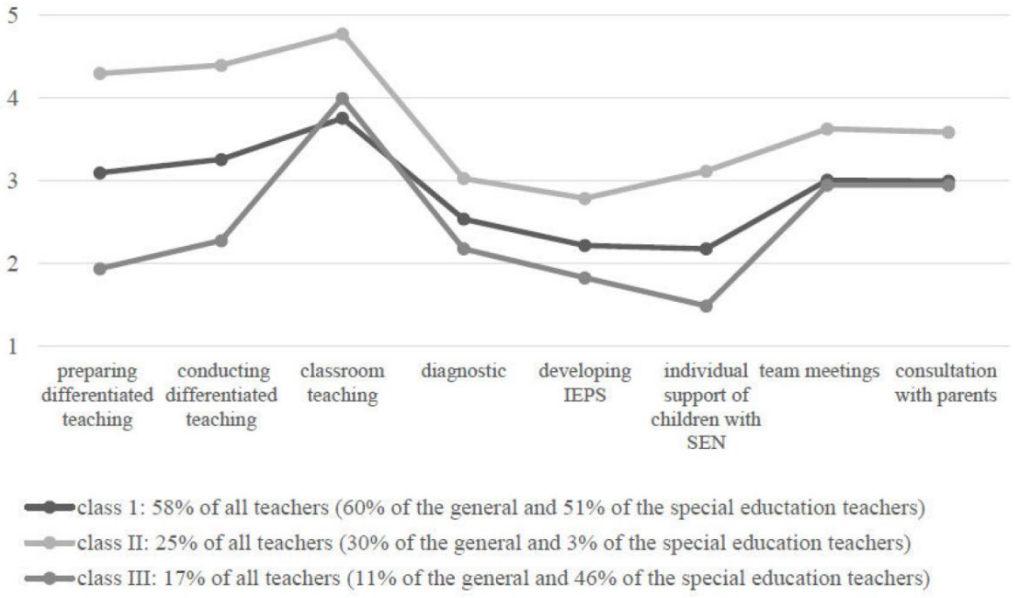
Results

The results indicate three different types of task distribution which to some extend are perceived differently by SETs and GETs. More than half of them agree that they are equally responsible for most of the tasks, showing only marginal teacher-specific responsibilities (class 1). However, the other two classes are rather contrasting: While mostly GETs report that they are responsible for differentiated teaching but share responsibility for diagnostic and individual teaching (class 2), predominantly SETs see themselves responsible for differentiated teaching, diagnostic and individual teaching (class 3). However, some similarities could also be found. In all three classes SETs and GETs share the responsibility for collaboration and consulting with parents, while GETs are responsible for classroom teaching. The different types indicate different roles for SETs. While in class 1, for example, their role can be seen as equal to the role of GETs, in class 3 their work can be best described as a specialized teacher. In class 2, however, the role of SETs is reduced to a shared responsibility merely for

diagnostic tasks and individual teaching. Further analysis of variance show that the identified types do not differ in the amount of time SETs spend in schools and the amount of classes in which they work.

Figure 1: Three different types of task distributions of general and special education teachers

Discussion



On the one hand, our results partly support previous findings according to which SETs remain primarily responsible for students who need specialized support. However, this specialized responsibility keeps the distinction between students without and with SEN and therefore could prevent the full inclusion of the latter students, especially when pullout models dominate individual teaching methods (e. g. Takala et al., 2009). On the other hand, we found that the majority of the SETs and GETs feel equally responsible for all tasks. This could accompany previous findings of SETs, who fulfill a broad range of tasks. Surprisingly, we could not find any differences in the identified types concerning the amount of time SETs spend in schools and the amount of classes in which they work, suggesting that school conditions are less important for the role of SETs. Limitations of our study will be discussed (e.g., tasks, unbalanced groups, and setting effects). Further research needs to be conducted on the effects of the different roles of SETs on students with SEN and SETs themselves.

Poster presentations

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Word decoding development and individual variation in deaf and hard-of-hearing children

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Theoretical background

Learning to read depends largely on spoken language. For children who are deaf or hard-of-hearing, access to spoken language is at least limited. Indeed, many studies have shown that the reading ability of DHH children often significantly lags behind compared to hearing peers (e.g., Antia et al., 2020; Harris et al., 2017; Wauters et al., 2006). In kindergarten, DHH and hearing children achieve similar scores for early word decoding. However, in first grade word decoding scores of DHH children start lagging behind (Antia et al., 2020). For hearing children, word decoding is related to earlier phonological awareness, letter knowledge, rapid naming, and verbal short-term memory (Caravolas et al., 2012; Landerl et al. 2019; Melby-Lervåg et al., 2012). DHH children often have less developed phonological awareness and verbal short-term memory (Harris et al., 2013; Johnson & Goswami, 2010; Nittrouer et al., 2014), though letter knowledge and rapid naming are age-appropriate (Ambrose et al., 2012; Nittrouer et al., 2012). So far, it has not been investigated?? to what extent these precursor measures are related to word decoding development in DHH children, and to what extent this is similar to hearing children. In the present study, we therefore investigated the following research questions: (1) How do DHH and hearing children differ in precursor measures and word decoding development in the first six months of reading instruction? (2) To what extent can word decoding development of DHH children be predicted by precursor measures for reading (phonological awareness, letter knowledge, rapid naming, and verbal short-term memory) and does this differ for DHH and hearing children?

Methods

DHH children (n = 25; Mage = 6;4) and hearing children (n = 41; Mage = 5;10) participated from kindergarten to first grade. The DHH children all used some form of hearing amplification. The precursors phonological awareness, letter knowledge, rapid naming and verbal short-term memory were measured in kindergarten, prior to the start of formal reading instruction. Word decoding development was measured with three consecutive curriculum embedded word decoding tasks during the first six months of first grade. The word decoding tasks included all taught grapheme-phoneme correspondences, meaning that with every task the set of grapheme-phoneme correspondences increased. All word decoding tasks comprised of 40 monosyllabic words, which had to be read aloud as accurately and quickly as possible within one minute.

Results

Preliminary results show that, concerning the first research question, the hearing children scored higher on phonological awareness ($U = 151$, $p < .001$) and verbal short-term memory ($U = 58$, $p < .001$) than the DHH children. No differences between groups were found on letter knowledge ($U = 408$, $p = .17$) and rapid naming, $t(64) = 1.06$, $p = .29$. Both DHH and hearing children increased in word decoding scores, and groups did not differ on these scores. As for the second research question, the scores on the first word decoding task were predicted by kindergarten rapid naming in both groups and by phonological awareness only in the hearing group. The second word decoding task was predicted by letter knowledge, rapid naming and scores on the first word decoding task. There were no significant interactions between precursor measures and group. The final word decoding task was only predicted by scores on the second word decoding task.

Conclusion

Differences between the groups were found on phonological awareness and verbal short-term memory. However, despite hearing difficulties, DHH children achieve similar mean scores on letter knowledge, rapid naming, and word decoding to hearing children, although there was a considerable amount of individual variation in the DHH group.

Executive functioning and bilingual speech as precursors of vocabulary in bilingual children at risk of DLD

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A robust vocabulary is critical to a child's school achievement (Hemphill & Tivnan, 2008). However, already before entering school, many children with developmental language disorder (DLD) have difficulties acquiring words (Kapa & Erikson, 2020). This is, amongst others, due to poorer executive functioning (e.g., attending to speech and language) and speech skills (e.g., discriminating between minimally different sounds in words; Ziegler et al., 2005). Additionally, many children with DLD are bilinguals, learning the school language as a second language (L2) besides their first language (L1) at home. Yet how EF and bilingual speech skills affect L2 vocabulary in bilingual children with DLD is not yet fully understood. Different than DLD, bilingualism has been associated with more advantaged EF skills (Blom & Boerma, 2017), which, according to theory, may emerge due the need to inhibit L1 knowledge when using L2 (Adesope et al., 2010). At the same time, bilinguals with typical language development (TD) may leverage L1 knowledge in acquiring L2 vocabulary (Verhoeven, 2007), but the extent to which bilingual children with DLD are able to do so is unclear. Therefore, the present study examined the roles of EF and L1 in emergent vocabulary skills of bilingual preschoolers with DLD. We addressed two research questions: (1) To what extent do EF, L1 and L2 speech perception and production, and vocabulary skills differ between monolingual and bilingual preschoolers with and without DLD? (2) What are the effects of EF abilities and L1 and L2 speech abilities on L2 receptive vocabulary of bilingual preschoolers with DLD?

To answer these questions, we compared results of 35 bilingual 3-to-5-year-olds indicated to have DLD to 35 bilingual children with TD, 64 monolingual children indicated to have DLD, and 65 monolingual children with TD. Children were tested individually on EF (selective attention using a visual search task; phonological working memory using a nonword repetition task), speech (speech perception using a auditory discrimination task; speech production using a picture naming task), and receptive vocabulary (using a picture identification task). Speech and vocabulary tasks were assessed in Dutch, and only for bilingual children, also in L1 Turkish and Polish.

To answer the first research question, several between subjects analyses were conducted. As regards EF, we found only main effects of group, indicating that children with DLD scored lower than children with TD. Regarding Dutch speech and vocabulary, monolingual children with DLD scored lower than monolingual children with TD, but there were no significant differences for bilingual children with DLD versus TD. Regarding L1 speech and vocabulary, the DLD bilingual group did score below the TD bilingual group.

To answer the second research question, we will include results from ongoing analyses using mixed effects modelling. Preliminary results from linear regression analyses indicated that bilingual children with higher phonological working memory and lower L1 vocabulary scores often had higher scores for L2 Dutch vocabulary. Furthermore, speech production skills were related to L2 Dutch vocabulary scores in both groups, but differently between groups. In the TD group, better L2 Dutch speech production skills were related to better L2 Dutch vocabulary, whereas in the DLD group, better L1 speech production skills were related to better L2 Dutch vocabulary.

Our findings confirm that DLD in bilingual children can be harder to identify when looking only at L2 skills, but EF and L1 skills can be of added value in distinguishing learners with TD from learners with DLD. For bilingual preschoolers, it may be helpful to enhance phonological working memory and speech production skills when stimulating emergent L2 vocabulary skills.
Interestingly, it seem to be speech skills in the language that children find relatively more difficult (i.e., L2 Dutch for TD children and L1 Turkish/Polish for DLD children) that are of predictive value to emergent L2 vocabulary.

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Factors of powerful math education visualized in Flemish elementary school

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Mathematics is a skill that is often used in both the school context and in everyday life. So math and therefore also math education is important. Therefore, it is crucial for teachers to have insight in which factors have been shown to positively affect the children's math achievement, so that they can work 'evidence-based' in their classrooms. Informing teachers is crucial, but also creating awareness about what these teachers in this regard already realize on a daily basis - without sometimes even not being aware of it themselves – can be worthwhile, to enhance these teachers' confidence and to, this way, inspire colleagues. In this practice- oriented research project, the aim was to improve this awareness and to inspire elementary school teachers by means of visualizing good existing practices of teachers regarding the evidence-based factors of powerful math education.

First, we meta-reviewed the literature to summarize all evidence-based 'influenceable' factors (i.e. in which the teacher can intervene) positively contributing to math achievement. Hereto, we departed from the meta-review by Hickendorff et al. (2017), and extended this review, using the same method, for the period 2017-2020.

Second, based on this complete framework of possible influencing factors positively affecting math achievement, we developed an online questionnaire asking teachers if and how often they applied these 'factors or practices' in their daily math practice. This online, intensive questionnaire was sent out to all Flemish schools. There were 114 respondents (84 teachers, 15 principals, 11 care teachers, 8 care coordinators and 2 support staff). Afterwards, all participants who indicated that they could be contacted, were invited for an online meeting with one of the researchers. In this meeting, named 'quick scan', an number of questions were asked to gain more insight into their answers. The answers to the questionnaire and the additional information obtained from the quick scan were taken into consideration for the selection of the schools where observing and filming would take place.

In a third step, because of the feasibility of the project ,we focused on the ten factors with the largest effect sizes mentioned in the meta-reviews. Math lessons were observed and filmed in 14 schools. Teachers were interviewed to explain what can be seen in the film fragments and why they choose to work that way. All video film fragments were coded based on these ten factors independently by two researchers.

The framework and observation data will be used to create a website illustrating those factors in the daily Flemish math education practice, supplemented with extra information/literature tips and practical tips for teachers suggesting how they could realize this in their classroom.

At this stage, we are still visiting schools in order to film the math lessons. By the time of the poster presentation, the website will be online.

Word meaning structure in relation to theory of mind and executive functioning in children with developmental language disorder: a multiple case study

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Theoretical background

Some of these difficulties may be related to impairments in executive functioning (EF) and theory of mind (ToM). Vissers et al. (2020) theorized that both the EF and ToM problems in children with DLD can be accounted for in terms of self-directed speech. In addition, Camminga et al. (2021) suggested that the potential contributions of self-directed speech to EF and ToM are constrained by the level of word meaning structure (WMS; i.e., the elements and interrelations between the units of word meaning). Higher levels of WMS are, due to hierarchical links between words, more indirectly related to sensory experience. This results in a greater ability to represent phenomena that are not directly observable, which may benefit both EF and ToM.

Research question

This study aims at answering two research questions: (1) What is the level of word meaning structure of children with and without DLD? (2) Is the level of word meaning structure in children with and without DLD related to EF, ToM?

Methods

A multiple case study was conducted with two boys and four girls with DLD aged 9 to 12 with known socio-emotional problems. They were matched with peer controls. WMS was measured dynamically using an adapted version of the word meaning structure test (Toomela et al., 2020). EF was measured with the zoo map test from the behavioral rating inventory for dysexecutive functioning (BADS-c; Emslie et al., 2003). ToM was measured with the ToM test and the Frith-Happé animations (Abell et al., 2000). Parents filled in three questionnaires, namely the behavioral rating inventory for executive function (BRIEF; Gioia & Isquith, 2004) to measure everyday EF, the Bermond-Vorst Alexithymia Questionnaire for emotion awareness (Bermond & Vorst, 1996), and the child-behavior checklist for socio-emotional functioning (Verhulst et al., 1996). Finally, anamneses were conducted to attain case history information as well as observations of socio-emotional functioning, EF and ToM.

Results

Case descriptions were formulated based on the outcomes of the tests, questionnaires and anamneses. The cases reveal the heterogeneity strengths and difficulties of the different children with DLD in WMS, EF, ToM and socio-emotional functioning. In addition, preliminary results show children with DLD to vary widely in their WMS scores. In general, those who scored higher on WMS performed better on the EF (see Figure 1) and ToM tasks, but there were cases of relatively intact WMS coupled with poor EF or ToM. During the SIG meeting, the comparison with the control group will also be made. This data is currently being collected.

Interpretation of findings

These findings indicate that WMS may be related to both EF and ToM. Whether WMS could be an explanatory factor in explaining EF and ToM difficulties in children with DLD is a question for future research. In addition, the cases of intact WMS despite poor EF and/or ToM indicate that future research studying the rel tionship of WMS to EF and ToM should take into account whether language is actively employed during task performance.

Neighborhood conditions in a Swedish context: reliability and validity of virtual systematic social observation with Google Street View

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Contextual resources are important for the positive development of children and youth. Growing up in socio-economically vulnerable neighborhoods has been associated with, for instance, children´s health outcomes (Brzoska & Razum, 2015), social behavior (Odgers et al., 2009) and school achievement (Leventhal & Brooks-Gunn, 2000). However, the role of physical neighborhood characteristics, like safety, orderliness and well-kept buildings, and their importance to child development is understudied (Christian et al., 2015; Villanueva et al., 2016).

Assessment of the physical environment has been made through, often subjective, in-person observation and coding of contextual conditions (Clarke et al., 2010; Mooney et al., 2014). With support of recent digital geographical tools such as Google Street View (GSV), Systematic Social Observation (SSO) can to a large extent be performed from a distance and with fewer resources than in person observations. Virtual SSO is considered to be a reliable and cost-effective method to study neighborhood conditions (Bader et al., 2017; Brunton-Smith, 2018; Odgers et al., 2012), and has previously been used in the United States and United Kingdom. However, this method has not yet been used in Sweden - a context which may be expected to differ from those previously studied using SSO.

Sweden is a social welfare state, with a social and political fabric that aims to support the rights of children and families to thrive under the best living conditions that are practically possible. Yet, there are variations in contextual factors within contemporary Swedish neighborhoods that are not well studied nor understood. Given the need to understand how contextual conditions relate to children's learning and development, e.g., their socio-emotional competence, new tools that can measure contextual conditions, and that are culturally relevant and rooted in Swedish neighborhoods are needed. Thus, the study aim was to determine if virtual SSO is a reliable and valid method that may provide assessment of meaningful neighborhood contextual factors that are relevant and reflective of life in a Swedish context.

In study 1, two raters performed in-person and virtual data collection with the same assessment protocol, in the same 24 neighborhoods within four postal code areas. The research question was to establish if the in-person and GSV could be reliable indicators across raters, and if the GSV and in-person data collection were comparable in this sample of Swedish suburban neighborhoods. On an item level, we analyzed inter-rater reliability with Fleiss Kappa, Intra Class Correlation (ICC) and percentage of agreement, and used Pearson correlations to estimate concurrent validity across methods. Results showed high consistency between raters (on in person and GSV items) and high consistency across methods, on the included items. GSV was thus regarded as a method that was comparable with in-person data collection, and possible to use as an index of neighborhood conditions in this Swedish context. Thereafter, at the scale level, we developed virtual SSO scales for neighborhood contextual conditions. Scales for Physical Decay, Neighborhood Dangerousness and Physical Disorder, proved to be reliable, with high consistency across methods, and high internal consistency (Cronbach's alpha). In study 2, we wanted to establish if the virtual SSO measures developed in Study 1, could

be linked to levels of income in the same Swedish neighborhoods that were rated using the GSV method and scales. Virtual data collection using GSV was performed by two raters, for a total of 137 neighborhoods (the 24 neighborhoods in Study 1 were included) in 22 postal code areas. We estimated internal consistency (Cronbach's alpha) for virtual SSO measures in this larger sample, and results showed that scales for Physical Decay and Neighborhood Dangerousness had high internal consistency. Concurrent validity was estimated through correlation between virtual SSO ratings of neighborhoods aggregated to postal code level, and level of household income of all residents at postal code level. An independent t-test revealed that mean values of scales for observed Physical Decay, Neighborhood Dangerousness and a single item measuring signs of garbage or litter in the streets were significantly higher in low-income areas than in high-income areas. We conclude that virtual SSO with GSV is a reliable and valid measure of several key objective neighborhood contextual conditions and that the GSV scales distinguish between postal code areas that have residents with high or low income.

Neighborhood contextual conditions have been difficult to measure objectively and reliably, and the nature of measures have limited the ability to capture the actual contextual conditions in children's daily life. Virtual SSO is an observational tool that offers a possibility to objectively assess not only neighborhood physical conditions, but also provide information about neighborhood assets and contextual factors critical for academic achievement as well as socio-emotional development. This could, in turn, contribute to a deeper understanding of how Specific contextual factors influence children´s potential for learning and development, especially for children in most need.

Dynamic assessment of arithmetic abilities: potentials for educational planning in school

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Theoretical background

In recent years inclusive education has become a fundamental goal of educational policy. A crucial aspect in the successful implementation of inclusive education represents teachers competencies to adapt their teaching methods and goals to the diverse student's prerequisites and needs. Here, different diagnostic approaches are applied by teachers to gain the necessary insights into student's profiles and to prevent a mismatch between instructional methods and student's needs. At the same time, the current state of diagnostic tools (especially traditional assessment) is often criticized for not providing adequate insights into the instructional needs of students. Here, dynamic testing (DT) might depict an alternative to the traditional testing. In DT, feedback and prompts/hints are systematically integrated into the testing process (Resing, 2013; Sternberg & Grigorenko, 2002). DT aims at a) a valid assessment of the levels of performance, b) learning potentials, and c) needs for instruction of a student(e.g. Bosma et al., 2012; Haywood & Lidz, 2007). By gaining insights into the student's response to different levels of provided support during testing (e.g. the dimension of the specific prompts), practitioners and researchers might derive recommendations concerning instructional needs. So far, the existing body of research in dynamic testing mainly focused on cognitive abilities. Only few studies applied dynamic testing in the context of domain-specific processes (e.g. Cho et al., 2014; Fuchs et al., 2008). At the same time, domain-specific insights into student's potentials and needs for support seem to be of particular relevance for teachers in practice. This submission aims at providing insights into an ongoing project, that applies dynamic testing of arithmetic competencies in primary schools. We aim to develop a dynamic test that captures arithmetic abilities (addition and subtraction). Subsequently teachers are trained in DT and aresupposted to develop an educational plan for the students. In this regard, we try to examine the usefulness of the newly developed DT by answering the following research questions: (1) Can we identify advantages of DT in arithmetics compared to traditional testing when it comes to educational planning (scope, content and differentiation)? (2) How do teacher characteristics (attitudes, epistemological beliefs and qualification) moderate the (perceived) usefulness of DT for educational planning? (3) How do students characteristics and cognitive abilities moderate the usefulness of DT for educational planning?

Method

To address our RQs, we decided to follow a three-step approach. In a first step, we will develop a DT addressing arithmetic abilities. In a second step, we will apply a quasi-experimental design and assign teachers to three different conditions. In these conditions, 30 teachers are either trained in our DT approach (Group 1), in traditional testing (Group 2) or receive no specific training (Control), resulting in a total N = 90 teachers. After training, those teachers are asked to develop educational plans for a total of three students from their class

each, who were identified as low-achieving in mathematics (N = 270 students). In a final step, the resulting educational plans are analyzed focusing on the scope, content, and differentiation of the instructional recommendations. Additionally, we will relate those results with variables on teacher as well as student level.

Results and Discussion

This submission depicts work in progress. We will therefore present the current state of the project and provide insights into the first version of the developed DT.

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Predictors of learning in children at elevated likelihood for autism spectrum disorder and the association with self-concept

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Background

Siblings of children with autism spectrum disorder (ASD) are at elevated likelihood (EL) to be diagnosed with a developmental- or learning disorder, or to experience emotional difficulties (Constantino et al., 2010; Jokiranta-Olkoniemi et al., 2016; Lichtenstein et al., 2010; Miller et al., 2016; Ozonoff et al., 2011; Shephard et al., 2017). As such, EL-siblings could merit from extra monitoring, e.g. within the classroom where they spend a lot of time. Scientific evidence on their cognitive development, scholastic skills, and related emotional outcomes, as well as information on the link between these variables, could offer tools to teachers to consciously and adequately deal with the vulnerabilities of these children. However, to date, research within this field remains limited. Objectives (1) To examine whether full scale intelligence quotient (FSIQ), working memory (WM), group (EL-children versus children at typical likelihood (TL) for ASD), ASD characteristics, other diagnoses, and/or interactions between these variables can predict reading- or math test scores. (2) To investigate the link between scholastic skills and self-concept.

Method

From 2008 to 2014, 53 EL- and 32 TL-children were followed up from 7 to 36 months old. Of the 83 families we were able to reach again, 80% participated in a follow-up moment at school-age (9-16 years) from 2019 to 2021. After removing participants with missing data, a final school-aged sample of 39 EL-siblings (19 girls; mean age=11.98 years, sd=.30, mean FSIQ=103.54, sd=11.96) and 23 TL-children (8 girls, mean age=13.77 years, sd=.09, mean FSIQ=107.48, sd=12.00) was defined. 11 EL- siblings (28%) received a best-estimate research diagnosis of ASD at age 3 and/or had a clinical diagnosis at follow-up. The WISC-V intelligence test, two reading tests (One-Minute Test and Klepel) and a math test (Speed Test Arithmetic; STA) were administered. Furthermore, a questionnaire on self-concept (CBSK/CBSA) was filled out by the children.

Results

Due to a significant age difference between the TL- and EL-group (p<.001), separate analyses for the children in primary (17 EL-siblings) versus secondary (22 EL-siblings and 23 TL-children) education were performed.

Mean age was comparable for the EL- and TL-children in secondary education (respectively 13.34 and 13.77 years; t(26.132) =1.585, p=.125). The EL-siblings achieved lower scores in terms of WM (EL-siblings 101.68, sdEL-siblings 11.29; TL-children 109.22, sdTL-children 10.23; t(43)=2.349, p=.023) and the STA (EL-siblings 108.64, sdEL-siblings 26.90; TL-children 131.35, sdTL-children 20.00; t(43)=3.224, p=.002), while their parents reported more ASD-symptoms on the SRS-2 (EL-siblings 59.33, sdEL-siblings 18.77; TL-children 48.95, sdTL-children 8.57; t(27.704)=-2.315, p=.028). No difference in reading skills and FSIQ was observed. After Bonferroni correction for multiple testing, only the difference on the STA remained significant.

To predict reading- and math performance, regression analyses were performed using FSIQ, WM, group, ASD characteristics, other diagnoses and two interactions (group-FSIQ and group-WM) as predictors. The model for reading performance was significant (F(7, 35)=4.400, p=.001), explaining 46.8% of the variance, with significant ' s for FSIQ and the interaction with group (=.525, t=2.987, p=.005). The model for math performance proved to be significant too (F(7, 35)=9.632, p<.001), with significant ' s for group (=-.362, t=-3.289, p=.002) and WM (=.422, t=2.773, p=.009), explaining 65.8% of the variation in math scores. Given the rather low number of children in primary education in the sample, an explorative correlation analysis was carried out instead of a regression. No predictors were associated with math results, while WM showed a significant link with performance on the reading tests (r(17)=.64, p=.006).

Second, associations between scholastic skills and self-concept were investigated. This was done separately for children who filled out the CBSK (-12 years; 18 EL-siblings) versus the CBSA (+12 years; 21 EL-siblings and 23 TL-children). In neither of the groups correlations between the reading- and math scores on the one hand and global self-worth on the other hand were found. The same conclusion applies for the association with scholastic self-esteem in the group -12 years (this subscale was excluded in the +12 years group as internal consistency was too low; Chronbach' s =.596). Group comparison revealed a significant difference in global self-worth in favor of the EL-group (U=154.500, z=-2.120, p=.034).

Interpretation

The EL-group scored significantly lower on math and global self-worth in secondary education. Marginally significant differences in favor of the TL-group were also observed in terms of ASD-symptoms and WM. A link between scholastic skills and self-concept could not be established. FSIQ was predictive for reading in secondary education, and interacted with group: higher IQ has more positive effect on reading performance in EL-siblings than in TL-children. While in secondary education better WM was predictive for better math scores (as was belonging to the TL-group), WM was associated with better reading performance in primary education. It should be noted that the sample was rather small (especially in primary education) and had average cognitive abilities, which might limit the generalizability of the results. Further research is necessary.

A digital reading intervention to enhance implicit learning of prepositions in children with Developmental Language Disorder

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Theoretical background

While most children seem to acquire language with ease, children with Developmental Language Disorder (DLD) experience severe difficulties with language acquisition. It has been proposed that children with DLD have so much difficulties acquiring language because of an implicit learning deficit. The current study investigates whether we can boost implicit learning of locative prepositions in children with DLD using a digital reading intervention. We decided to focus on locative prepositions because Dutch speech therapists often report young children with DLD have difficulties with prepositions, but we know very little about preposition understanding in Dutch children with and without DLD.

Research questions

The study consists of two parts. In the first part we investigate how Dutch children with and without DLD weigh semantic (animacy) and structural (word order) information in their interpretation of locative prepositional phrases. In the second part we investigate whether we can boost implicit learning of prepositional phrases in children with DLD using a digital reading intervention. Reading is considered an excellent tool for implicit language learning.

Methods

Study 1: 35 children with DLD between 4;10 and 6;3 years (Mean age = 5;4) participated in the study. Data collection for the typically developing (TD) children is ongoing but so far we have data for 22 TD children (Mean age = 5;8 years). We measured children's understanding of locative prepositional phrases using a picture-matching test. Children heard an utterance (e.g., The mouse is above the table) and were then asked to select the picture that matched the sentence out of two possible pictures. The test consisted of 32 items and assessed children's knowledge of four different locative prepositions: above, under, before and after. The 32 utterances were divided over four conditions and only in condition 1 (Figure 1) the semantic cue (animacy) can be used to arrive at the correct sentence interpretation. The structural cue (word order) leads to a correct interpretation in all four conditions.

Study 2: Following the pretest, the children with DLD participated in the digital reading intervention. The intervention consisted of three sessions and a post-test. We developed a digital storytelling application in which a Bear and a Mouse play hide and seek. We decided to create a novel story rather than to work with an existing eBook to have control over the number of times and the contexts in which each of the four target prepositions (above, under, before and after) occurred. The digital story consisted of smaller episodes during which a pre-recorded female voice read the story to the children. There were two different versions of the application. In both versions, children heard the exact same story, but children in the visual-enhanced group were given a story with addition zoom features as compared to the control (non-visual-enhanced) group. In the visual-enhanced version, the picture zoomed in every second time a preposition was named.

Preliminary results

Study 1: Our preliminary results show that TD children score on average 3 times higher on the preposition test than children with DLD (Figure 1A; estimate log odds = -1.1; estimate odds = 3.1; p = 2.7·10-6; 95% CI odds = [1.9; 4.6]). In both groups we observe effects of condition: children score highest in condition 1 and lowest in condition 2. Remarkably, children with DLD score below chance in condition 2 (probability correct = .35, with chance being .50. Estimate log odds = -0.64, estimate probability correct = .35, p = .001, 95% CI probability correct [.23; .48]).

Study 2: We find no evidence that children with DLD score higher on the preposition test after the digital reading intervention than before, nor that the children in the visual-enhanced group benefited more from the intervention than the children in the non-visual-enhanced group (Figure 1B).

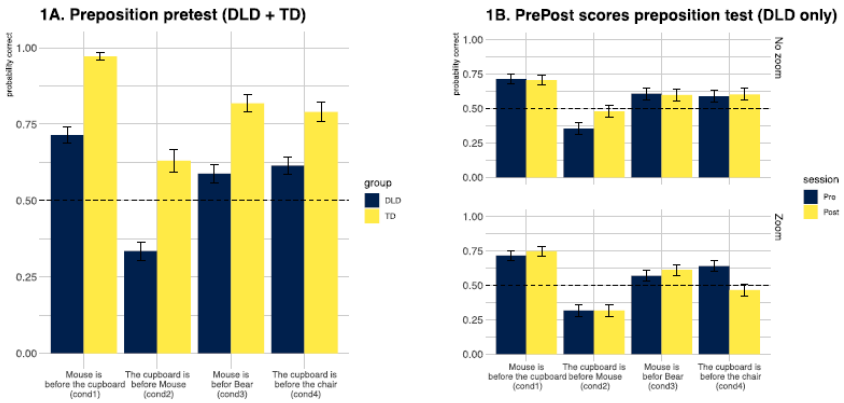

Figure 1. A: Probability correct on the preposition pretest split by participant group and condition. B:Probability correct on the preposition before the intervention (pre) and after the intervention (post) split by condition and version (with or without zoom function).

Interpretation of the findings

Our preliminary results suggest Dutch children with DLD have persistent difficulties understanding locative prepositional phrases. They score lower on a preposition test than their TD peers and we find no evidence that increased and visual-enhanced exposure to locative prepositional phrases during a three-week intervention improves their understanding of the phrases. Interestingly, both groups of children weigh semantic information (animacy) over structural information (word order) in their interpretation of the phrases. This bias towards the semantic cue is even stronger in children with DLD as compared to their typically developing peers.

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Fair debating and argumentative writing in grade nine with all students

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One of the key objectives of inclusive didactics of writing is to enable all students in lower secondary education to gain access to educational qualifications by teaching literacy skills and thereby achieve educational equity (OECD, 2013). Therefore, it is important to support all students during high quality lessons with binal differences tasks, and especially the ones with weaknesses in writing and debating, in order to enable them to participate in a professional, cultural, and political context through those competences. The teaching and research project Fair Debating and Argumentative Writing is a twelve-week, controlled, quasi-experimental intervention study implemented in grade nine at six schools, and 300 participants in total. The interventions comprise two series of lessons, debating in a peer group (treatment D) and cooperative argumentative writing (treatment E). The research question is how the writing competence of the participating students develop in the course of the two treatments. We will also analyse the text quality of struggling writers to research their effort in this project. In this context, the study investigates the mutual influence of debating competence on the one hand and writing competence on the other in inclusive settings. In the first stage (11/2021-04/2022) the project will be piloted, evaluated, and adapted. The innovative character of this study is, in addition to the inclusive teaching practice, the collection of reading and writing processes as a progression diagnosis using the digital survey platform Gorilla.sc. Reading and writing skills are assessed using reading and writing tasks from selected intermediate secondary school exams of the past ten years. All student texts are double-rated on Likert scale quantitatively. These results of the text quality, and the text length are compared between the four measurement points and the intervention and control groups. At the conference, we will present and discuss the first results of this pilot study.

Tele-assessment of Executive Functions in children with Specific Learning Disorders: shading light in a complex profile play

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Executive Functions (EF) are high cognitive processes, relevant for learning and adaptation, frequently altered in children with Specific Learning Disorders (SLD). Currently, the studies that investigated EF alteration in SLD varied for the models and measures used and rarely provided a global EF profile considering the different EF components.

The present study was aimed to describe the general EF profile in SLD children by deepening the characteristics across different EF components and measures. A web platform for the tele-assessment of Inhibition (Go/No-Go task), Interference control (single rule Flanker task), Shifting (mixed rules Flanker task) and Updating in working memory (N-back task), was used to investigate the EF profile of 57 children diagnosed with SLD in comparison to 114 typically developing (TD) children, matched for sex and age.

The results showed that although measures of Updating at low load in memory discriminated between SLD and TD more than the other EF measures, SLD performed worse than TD in all tasks tapping the main EF components regardless of stimulus types and conditions. Furtherly, analysis of performances within each task suggested that some differences between SLD and TD could be mediated by more basic skills in stimuli elaboration and response selection. The results help in understanding the complex profile of EF alterations in children with SLD.

Influence of face masks on speech perception and speaker's face exploration: the case of deaf students

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The improvement in speech perception provided by hearing the voice and seeing the face of the speaker compared to when we only hear the voice could be lost when using face masks making it difficult to understand language. Some students with special educational needs, in particular, those with hearing deficits may struggle to understand the teacher during classes when they use face masks. Transparent masks have appeared in an attempt to ameliorate the effect that opaque masks have on speech perception, however, the way listeners understand speech with transparent masks is barely unknown. Altought the mandatory use of face masks in school is disappearing, studying this phenomenon can be useful to design solutions for future pandemics forcing to the return of facemasks. In this talk, we will present the results (correct answers and eye movements on the face of the speaker) of a study on auditory-visual integration during the perception of speech with and without different types of face masks comparing a group of adults who were deaf or hard of hearing and a group of adults with typical hearing. Results would discussed with regards to theories of audiovisual perception of speech and to implications for education.

The effectiveness of Feuerstein's Instrumental Enrichment Programme: a systematic review

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Background

Feuerstein's Instrumental Enrichment (FIE) programme is designed to improve cognitive functions thus raising academic achievement and improving related behaviours, especially for those with special educational needs. The evidence as to the effectiveness of FIE is mixed and therefore a systematic review was undertaken to present an updated evaluation of the existing research and the efficacy of FIE.

Methods and procedures

In total 57 studies from 55 papers were identified via the search process of a systematic review following PRISMA guidance. The protocol of which was preregistered: https://osf.io/g9x5b.

Results

Overall, the most beneficial effect was found in the cognitive domain, both on general cognitive ability and cognitive specific measures such as reasoning and spatial abilities with effects ranging from small to substantial. The effects of FIE on academic achievement and affective measures was less pronounced and more inconsistent. Mathematical ability proved more susceptible to improvement than other academic areas, whilst impulsivity was substantially reduced in a number of studies. However, several methodological issues were identified in the body of research that made it difficult to fully evaluate both the effectiveness of FIE and the determination of moderator variables.

Conclusion

FIE appears to be effective to raise cognitive abilities. However, there is a need for more robust research to fully determine its effect on academic achievement and affective domains. We will discuss improvements for intervention research for pupils with special educational needs.

Developmental trajectories of executive functions in blind, deaf and typically developing children

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Theoretical background

Executive Functions (EF) are those psychological processes that allow us to plan and monitor our actions in order to achieve our goals. They involve the ability to consciously control our thoughts, actions and emotions (Zelazo & Müller, 2011). It has been suggested that students with visual and hearing impairment show differences in performance on tasks that assess executive functions. They show lower performance than typically developing children (Heyl & Hintermair, 2015; Hintermair, 2013). Although there is some controversy in this regard (Bathelt et al., 2018; Hauser et al., 2008). While these differences have been studied, there is little information on the developmental trajectories of executive functions. The relevance of studying the developmental trajectories of various functions in children with disabilities is fundamental to have information regarding the dynamics of change that certain groups present (Annaz et al., 2008). For this, it is necessary to have a base trajectory, corresponding to typical development, which allows us to establish the points at which children with disabilities deviate or not from these trajectories.

Research questions: (1) What is the development of executive functions of typically developing children and children with a sensory impairment? (2) Are there differences in the developmental trajectories of typically developing children and children with a sensory impairment?

Methods

A group of 192 boys and girls were assessed. 75 males and 65 females were typically developing; 15 males and 14 females were blind or low vision, and 17 males and 6 females were deaf or low hearing. The overall average age of the children at the start of the research was 6.13 years. The typically developing group had an average age of 5.62 years at the first measurement, the group of children who were blind or had low vision had an average age of 6.9 years, and the group of children who were deaf or hard of hearing had an average age of 7.93 years. The main inclusion criterion was to be at the beginning of the reading acquisition process. The Cat-Dog test of the Yellow Red battery (Rosas et al., 2020) was used. The visual version of the test was used to trace the trajectory of children with hearing impairment. In the case of children with visual impairment, the acoustic version was used. Both versions of the test were used to map the trajectories of typically developing children. Previous studies have defined that both versions allow the assessment of executive functions, but the level of difficulty is higher in the case of the hearing test (Santa-Cruz & Holhberg, 2019). Three measurements of executive functions were carried out, the first when the children were finishing the first year of preschool education, the second approximately six months later, when they were starting the first year of basic education, and the third approximately six months later. A growth curve model (Mirman, 2014) and then various ANOVAs were used to determine the groups in which the main differences are found to analyze the data. Due to attrition, multivariate imputation was performed using chained equations (Mice program).

Results

When comparing the trajectories of children with AD, we can observe significant differences concerning TD children at the intercept level ($x2= 10.236$, $p=.001$) but not concerning growth rates ($x2=1.867$, $p=.172$), which indicates that although the development of executive functions is even for both groups, their starting points present significant differences. This can be seen in Figure 1. DA children start with an average score of 6.177 points lower than TD children (Intercept=1.020), and the growth rate is 2.967 points every six months for DA children and 4.084 points for TD children. In the case of DV children, there are no significant differences concerning the base performance of TD children neither in the intercept ($x2= 3.331$, $p=.068$) nor in the slope ($x2= 0.822$, $p=.365$). Even though there are no significant differences, it can be observed that the DV group has a slightly higher increase than the DT group. The results can be seen in figure 1. The DV children start with an average score of 2.599 points less than the TD children (Intercept=10.510), and the growth rate is 1.510 points every six months for the DV children and 0.971 points for the TD children.

Interpretation of findings

This research aimed to describe the developmental trajectories of the executive functions of children with AD and TD about the baseline performance of a group of TD children and to determine whether there were differences between the groups. The results indicate that children with TD and those with AD present similar trajectories to those manifested by TD children. However, the starting point raised by the group of children with AD is significantly lower than the baseline presented by the TD children. This coincides with the results observed by Hintermair (2013), who describes that children with AD present a lower development of executive functions and conflicts with what is described by Hauser et al. (2008), who state that there are no such differences. In the case of children with DV, something similar happens, as shown by our results; Bathelt et al. (2018) state that there are no differences in the performance of children with DV and TD; however, our results are in contrast with those described by Heyl & Hintermair (2015), who state that there are.