Which methods, contents and implementation factors are appropriate and effective for school-based peer relationship programmes for 9 to 12-year-olds?

by

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ABSTRACT

Peer relationships are crucial for children's social-emotional development, and mental wellbeing, especially in the context of the school transition, around the age of 9 to 12. However, few programmes focus on positive peer relationships during this period. Therefore, the aims of this research concerned the exploration of (a) intervention strategies to promote peer relationships in the context of the primary-secondary school transition and (b) methodological approaches to engage children in intervention development. In the context of this research, a novel peer relationship programme was developed. This thesis presents all stages of the development process, including a review of existing peer relationship programmes (Chapter 2), a participatory development process to engage children in the development (Chapter 3, and 4) and an evaluation and implementation of the novel programme in the school context (Chapter 5). The presented findings demonstrate the importance of adapting participatory methodology to context factors and the stakeholders' needs to achieve involvement in important decisions. Based on this participatory development process, the novel peer relationship programme focused on social-emotional skills and classroom climate. While the evaluation partly supported the proposed effect mechanisms of social-emotional skills increases on peer relationship increases, these effect mechanisms seemed to apply particularly to children with skills deficits. The need to explore other effect mechanisms on peer relationships and consider challenges of participatory research are discussed in Chapter 6. Overall, however, this research provides a strong rationale for implementing universal, school-based programmes during the period of school transition to facilitate peer relationships.

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List of Publications

Chapter 2 of this thesis has been published as a paper in *Adolescent Research Review*.

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Chapter 3 of this thesis has been submitted as a paper and a revision of the first submitted manuscript is currently under review at the *International Journal of Qualitative Methods*.

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Chapter 5 of this thesis has been submitted as a paper and is currently under review at the *Journal of Youth and Adolescence*.

Pollak I., Stiehl K.A.M., Birchwood J., Schrank B., Zechner K.A., Wiesner C., and Woodcock K.A. (2023) Promoting peer connectedness through social-emotional learning: Evaluating the intervention effect mechanisms and implementation factors of a social-emotional learning programme for 9 to 12-year-olds [Manuscript submitted for publication].

Authors' contributions are detailed in the appendices, specifically Appendix 2.4 concerning Chapter 2, Appendix 3.5 concerning Chapter 3 and Appendix 5.2 concerning Chapter 5.

Chapter 4 of this thesis has been drafted specifically for this thesis to detail the development of the peer relationship programme, which is evaluated in Chapter 5. It has, however, been written in a paper format to prepare it for potential submission to a suitable journal in the future.

Based on this research, a novel social-emotional learning programme with focus on peer relationships was developed for first year secondary school students:

Pollak, I.* & Stiehl, K. A.M.* (2021). You, Me, and the Little Monsters: Learning programme for social-emotional wellbeing school. Teacher Manual. [in preparation for publication]

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Mittmann, G., Woodcock, K., Dörfler, S., Krammer, I., **Pollak, I.**, & Schrank, B. (2022). "TikTok is my life and snapchat is my ventricle": A mixed-methods study on the role of online communication tools for friendships in early adolescents. *Journal of Early Adolescence 42*(2). https://doi.org/10.1177/02724316211020368

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CHAPTER 1

General Introduction

The aim of this chapter is to introduce relevant concepts regarding the topic of peer relationships and intervention research. The literature discussed in this chapter aims to provide an introduction to the research aims and a frame for the presented research studies and published parts of this thesis.

Peer Relationships as a Social Context of Adolescent Development

With the onset of adolescence, structural reorganisation and increased connectivity of key brain regions lead to gradual improvement of cognitive control and heightened sensitivity to emotions (Jansen & Kiefer, 2020). Specifically complex social cognitive abilities, such as abilities linked to theory of mind, or social emotions (e.g., embarrassment or guilt), which are inherently linked to the representation of other people's state of mind, continue to develop throughout adolescence (Blakemore & Mills, 2014). At the same time, adolescence is linked to profound changes in the social environment (related to the school transition) that bring about new situations, require more autonomy, and provide options for experimentation (Jansen & Kiefer, 2020). The combination of these brain developments and changes in social contexts makes adolescence a time of specific sensitivity to social environmental cues (Blakemore & Mills, 2014). While cognitive abilities related to decision-making or cognitive control are gradually maturing during adolescence, emotional triggers are particularly salient and influence adolescents' behaviours (Casey et al., 2008; Jansen & Kiefer, 2020). Additionally, adolescence has been described as a period of heightened sensitivity but lowered specificity in conditioning learning, thus adolescents might be quick to learn new associations, especially linked to social rewards, but they tend to overgeneralise these associations (Towner et al., 2023).

It has been suggested that described concentrated developments and advances in learning, particularly related to decision making in social contexts, are partly responsible for adolescence

being a particularly vulnerable period (Blakemore & Mills, 2014; Towner et al., 2023). This vulnerability becomes evident in heightened risk-taking behaviours (Blakemore & Mills, 2014), an increase in perceived loneliness (Wong et al., 2018) and the onset of most mental health disorders during adolescence, with 48.8% of individuals with mental health problems reporting an onset before the age of 18 and 34.6% before the age of 14 (Solmi et al., 2022). With peer relationships becoming more salient due to a focus on the social environment, and peer influence increasing during adolescence (Blakemore & Mills, 2014), the described vulnerabilities associated with adolescence are linked to peer experiences. Increased risk-taking, which has been argued to be essential for learning experiences, has been found to be linked to peer's presence (Blakemore & Mills, 2014). While increases in loneliness are thought to be linked to the described neurological developments and social sensitivity mechanisms (Wong et al., 2018), loneliness is associated with negative mental health outcomes (Leigh-Hunt et al., 2017) and both, loneliness and depressive symptoms are impacted by friendship experiences (Schwartz-Mette et al., 2020).

Peer's importance for adolescent development is also integrated in developmental theories. Vygotsky's (1978) sociocultural perspective proposed social experiences as the driver of cognitive development and Sullivan's (1953) interpersonal theory of psychiatry proposed that during adolescence, peer relationships slowly replace parent relationships to become the central relationships. The social-emotional development tasks during adolescence concern (i) independence from parents, (ii) identity formation, (iii) identification with peers, and (iv) establishment of romantic relationships and sexuality (Hazen et al., 2008). Greater autonomy from parents, leads to increased focus on peers as the environmental backdrop of development and learning experiences (Jansen & Kiefer, 2020), with peer attachment being more influential for adolescent social-emotional development than parent attachment (Laible 2007).

Additionally, peer attachment has been found to be positively associated with the development of key relational identity aspects (Meeus et al. 2002; Nawarz, 2011; Rageliene, 2016).

Peer Relationships and Friendships

Generally, peer relationships can be described as "interactions, both positive and negative, with same-aged mates" (Naylor, 2011, p. 1075). Due to individual development and changes in the social context, peer relationships become more salient during adolescence and the complexity level of the peer network increases (Brown & Larson, 2009). Some of these peer relationships will become friendships, typically characterised by closeness, reciprocity of the relationship (Arnett & Jensen 2012) and similarity, which is a result of the selection process and reciprocal influence (Brown & Larson, 2009). Friendships have been described as a "relationship between two individuals, characterised by support, time, intimacy, trust, affection, and the ability to manage conflict" (Roach 2019, p.330). When selecting friendship groups, adolescents become aware of their peer status and reputation in the network (Brown & Larson, 2009). Thus, a differentiation and nuanced discussion of aspects of peer and friendship competence has been advocated (Flannery & Smith, 2017).

With a focus on the school context, this research aimed to address general peer relationships in the classroom context, thus the umbrella terms peer relationships and peers will be used throughout to refer to similar-aged individuals of the same community (Arnett & Jensen 2012). As some of these peer relationships (in the classroom context) will be friendships, evidence regarding specific friendship characteristics might also be reported. A nuanced discussion of different aspects and a clear differentiation of the terminology of friendships and peer relationships is intended across this thesis.

Establishing Peer Relationships

A prerequisite for the formation of positive peer relationships and friendships is propinquity, which refers to proximity or closeness of children necessary for getting to know each other (van Hoogdalem et al., 2012). However, propinquity can also be influenced by active choices as to whom children select to spend time with. In early childhood, propinquity options have been found to be close to chance, while older children make active choices resulting in propinquity options significantly above chance (Liberman & Shaw, 2019). Young children's friendships are driven by similarity, specifically in gender, but also age and play activities and to some degree by familiarity of peers (van Hoogdalem et al., 2012). However, by the age of six, children have been found to care more about loyalty and propinquity than similarity (Liberman & Shaw, 2019).

The competence to build new relationships steadily increases from age 10 to 15 for both genders, although girls seem to increase more and then experience a slight decrease from age 15 to 18 (Ross et al., 2019). Social-emotional competences, which further develop throughout adolescence (Blakemore & Mills, 2014), are particularly relevant for friendship formation, with emotional support and prosocial behaviours impacting friendship quality and conflict resolution abilities impacting friendship stability (Flannery & Smith, 2017). While early adolescents have been found to establish friendships with peers similar in aggressive or prosocial behaviours (Shin et al., 2019), classroom norms have been found to impact these processes, with prosocial behaviour being particularly important for friendship selection in prosocial classrooms and less important in aggressive classrooms (Laninga-Wijnen et al., 2020). Established peer relationships then foster similarity, either as a result of the selection process or due to reciprocal influence (Bowker et al., 2010; Shin et al., 2019). Interestingly, relationship quality skills have been found to develop differently in boys and girls, with girls showing a steep increase from

early- to mid-adolescence, followed by a decrease until late adolescence and boys showing a decrease from early- to mid-adolescence and a later increase (Ross et al., 2019).

A focus on the classroom context (as in the case of this thesis) highlights the need to consider heterogeneous peer experiences of children with special needs. For neurodiverse[1] children, inclusion in mainstream classrooms offers propinquity to neurotypical peers, however the extent of acceptance and befriending relies on neurotypical peers' understanding and acceptance of divergent (social) behaviours (Dean et al., 2020). A diagnosis of Attention Deficit/Hyperactivity Disorder (ADHD) has been associated with difficulties in establishing friendships (Diendorfer et al., 2021), and children with a diagnosis of Autism Spectrum Disorder (ASD) have been found to report fewer and shorter friendships overall (Petrina et al., 2014). Additionally, children with a diagnosis of ADHD, ASD, or Intellectual Disability (ID) have been found to report friendship quality characteristics different from neurotypical peers or generally lower levels of friendship quality (Heiman, 2005; Petrina et al., 2014; Tipton et al., 2013). Children with a diagnosis ASD often seem to befriend children with a diagnosis of disabilities (Petrina et al., 2014), in part because forming mixed-friendships can be difficult for neurodiverse children (Dean et al., 2020; Kasari et al., 2016). Thus, neurodiverse children are at particular risk for experiencing loneliness and poor emotional wellbeing associated with poor peer relationship quality (Y. Chang et al., 2019). However, negative peer relationship quality, specifically level of conflict, has not been found to differ between a neurodiverse population

[1] The term neurodiversity refers to the diversity of neurological patterns, and is commonly used in the context of ASD, ADHD or ID. As Chapter 2 will discuss studies which have assessed or reported clinical diagnoses of ASD, ADHD or other conditions, the term clinical population will be used in Chapter 2. The other studies reported in this thesis, however, have not assessed clinical diagnoses. Therefore, the broad term neurodiverse will be used in other chapters, as some children in the heterogeneous classroom samples might have symptoms associated with neurological or developmental conditions.

and neurotypical peers (Heiman, 2005; Petrina et al., 2014; Tipton et al., 2013). This implies that a focus on improving positive peer relationship quality would be desirable.

Long-Term Outcomes Associated With Peer Relationships

Due to reciprocity and equal power balances, peer relationships provide a unique context to practice and develop social-emotional skills, prosocial behaviour and empathy (Laible, 2007), with particular importance of the wider peer network in the school environment (Eccles & Roeser, 2011). This relationship of social-emotional development and peer relationships is most likely bi-directional, as being perceived as prosocial is crucial for friendship formation over the elementary-secondary school transition (Bowker et al., 2010), while classroom interactions influence individual social behaviours (Busching & Krahé, 2020). Peer pressure for antisocial behaviours has been associated with individual problem behaviours (Farrell et al., 2017), while changes in classroom norms seem to be related to the development of individual prosocial behaviours, implying that the social context impacts adolescents' motivation to act in a prosocial manner (Laninga-Wijnen et al., 2018).

Thus, it is not surprising that peer experiences during adolescence, both negative and positive, have long-lasting consequences on mental health symptoms (Schwartz-Mette et al., 2020). Associations can be traced well into adulthood, as being unhappy with classmates and spending spare time alone at age 16 has been related to internalizing symptoms at age 30 and 42 (Landstedt et al., 2015). Additionally, associations with physiological health outcomes have been found, as peer relationships in childhood impact long-term immune profiles (Scott & Manczak, 2021) and loneliness and social isolation seem to be related to cardiovascular disease, general poor health and early mortality (Leigh-Hunt et al., 2017).

Adolescence seems to be a particularly sensitive period for the onset of social-emotional disorders, including social anxiety, eating disorders, depression and generalised anxiety disorder, all of which have been partly attributed to peer relationships, peer acceptance, peer support and peer influence alongside pubertal changes and increased emotional experience (Rapee et al., 2019). It was argued that bi-directional associations between mental health problems, such as depressive symptoms, and peer relationships exist (Brendgen & Poulin, 2018; Platt et al., 2013), which are exacerbated during adolescence due to a heightened focus on social context (Blakemore & Mills, 2014). It has further been hypothesised that higher prevalence of social-emotional disorders in girls is linked to girls' heightened value of peer acceptance and relationships (Rapee et al., 2019).

However, positive peer relationships have the potential to alter negative trajectories, as positive effects of social support on depressive symptoms have been found for both genders, with particularly strong effects of peer group support (Rueger et al., 2016). Individual, positive friendships appear to moderate the negative effects of victimization on wellbeing (Cuadros & Berger, 2016) and minimise effects of withdrawal on developmental trajectories of depression (Bukowski et al., 2010). Peer relationships also seem to function as a protective factor before the onset of symptoms, with the presence of a friend protecting against the impact of negative experience (Adams et al., 2011). Furthermore, being with peers after experiencing a stressor has been linked to lower levels of sadness, worry and jealousy compared to being alone or with family (Uink et al., 2017).

The Impact of the School Transition and Changing Social Contexts

The school transition from primary to secondary school triggers profound changes in children's social context and happens in many countries at the start of adolescence (Jansen & Kiefer,

2020). With the transition to secondary school, a decline in student wellbeing and perceived school climate has been reported in multiple European countries (Coelho et al., 2020; Eder, 2007; Tobia et al., 2019), indicating that this transition entails some stressors and requires a phase of adaptation to the new environment (Rice et al., 2011). Students' transition concerns and experiences can have long-lasting effects on self-esteem, depression and social behaviours (West et al., 2010). Specifically, friendship loss is a major fear associated with the school transition (Bagnall et al., 2020; Rice et al., 2011) and indeed, 73% of children have reported changes in their friendships over the first year of secondary school (Ng-Knight et al., 2019). Thus, the social context and relationship aspects are central to children's immediate transition experiences (Jindal-Snape et al., 2020), while academic factors become relevant later on (Jindal-Snape & Cantali, 2019). However, schools focus mostly on academic aspects of the transition, even though social-emotional aspects are more relevant to students (van Rens et al., 2018) and the loss or maintenance of friendship has been associated with mental health outcomes such as conduct problems (Ng-Knight et al., 2019).

However, many children also focus on new opportunities related to the transition, such as broadening the peer network or new responsibilities (Jindal-Snape et al., 2020; van Rens et al., 2018). Indeed, for the majority of children, the reported concerns have been found to diminish over the course of the first secondary school year (Jindal-Snape & Cantali, 2019; Rice et al., 2011). The psychological adjustment to the new environment has been found to be predicted by perceived connectedness (Gillison et al., 2008). Having friends in the new school seems vital to alleviate loneliness, create a feeling of safety and protect against stress factors associated with the changing social environment (Heinsch et al., 2020). However, associations between wellbeing and peer relationships in school have been found to be bi-directional with perceived closeness predicting wellbeing and wellbeing predicting closeness to peers (Kiuru et al., 2020).

Thus, schools could support the transition by targeted efforts to facilitate students' emotional wellbeing and their management of peer relationship changes (Bagnall et al., 2020). It has been argued that more emotion-focused interventions are needed to address a potential mismatch between children's transition worries and their emotional skills to cope with these worries (Bagnall et al., 2021). The first year of secondary school has been identified as a suitable period for school staff to support children in managing their new social environment and establishing their peer groups (Keay et al., 2015).

Adolescent Development Programmes and a Lack of Focus on Peer Relationships

There are various intervention efforts and support programmes for positive adolescent development (Tolan et al., 2016). There are programmes targeting specific areas, such as the school transition (Bagnall, 2020), social-emotional learning (Taylor et al., 2017; Wigelsworth et al., 2022), or mental health prevention (Das et al., 2016; Fenwick-Smith et al., 2018). Other programmes take more general approaches, such as positive youth development (Curran & Wexler, 2017), or mindfulness trainings (Sapthiang et al., 2019) aiming to improve young people's general positive outlook and resilience. Following a classic differentiation between intervention approaches (Gordon, 1983), which is still widely used (Greenberg et al., 2017; January et al., 2011), most of these approaches are *universal preventive* approaches, implemented before the onset of any problems or symptoms and targeted at the population level. In contrast, *selective intervention* approaches are implemented for at-risk populations with first sings of symptoms and *indicated intervention* approaches are implemented for a clinical population after the onset of a disorder (Gordon, 1983; January et al., 2011)[2]. There are a variety

[2] Although this differentiation between prevention programmes, selective interventions, and indicated interventions will be used throughout this thesis to distinguish between different approaches, the term intervention

of *selective interventions* aiming to address adolescents' peer problems, such as bullying and victimisation interventions (da Silva et al., 2018). Additionally, there is a number of *indicated interventions* for children with clinical diagnosis of ASD or ADHD aiming to improve these children's social skills, relationships and help manage symptoms (Morris et al., 2021; Wolstencroft et al., 2018). Usually, selective or indicated interventions are employed when (peer) problems already exist and thus often focus on negative peer relationships aspects, i.e. address existing problems and prevent them from deteriorating (January et al., 2011).

However, none of the beforementioned universal, preventive approaches specifically focuses on peer relationship aspects. Thus, a positive, preventive focus on peer relationships seems to be lacking, even though facilitating positive classroom relationships has been suggested as one potential key practice to improve children's mental health (Atkins et al., 2017). Upon comparing frameworks for positive adolescent development, it has been pointed out that they all include two universal positive development characteristics: (i) emotional and behavioural management strategies and (ii) positive mutual engagement with other people (Tolan et al., 2016). Thus, positive peer engagement and social-emotional skills seem to be important for most prevention programmes, even though an explicit focus on peer relationships is often lacking.

Social-emotional skills, the other positive development aspect consistently addressed in adolescent development programmes (Tolan et al., 2016), are extensively discussed in intervention research (Durlak et al., 2022) – in contrast to peer relationships. Based on the Collaborative for Academic, Social, and Emotional Learning's (CASEL) framework, social and emotional learning (SEL) focuses on self-awareness, self-management, social awareness,

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will be used as umbrella term when referring to *any* support programme or to programmes, which might combine aspects of different approaches.

relationship skills and decision-making (Borowski, 2019). Thus, SEL has been proposed as an approach to foster children's mental health in school contexts, alongside crisis intervention, specific school services (e.g. counselling) and a systems approach to transforming schools into a safe and nurturing environment (Roeser & Eccles, 2014). SEL has been discussed as a means to improve peer relationships as an aspect of class climate (Suldo et al., 2013) or prevent negative effects of bullying (Brendgen & Poulin, 2018). However, bi-directional effects are likely, as peers' instrumental and emotional support has been found to be vital for overcoming challenges and achieving learning effects in educational programmes (Orson et al., 2020). Additionally, friendship characteristics, such as homophily and propinquity, have been discussed as reasons for superior effectiveness of a social-skills programme for a group of children with ASD compared to a classroom-based programme including neurotypical peers (Kasari et al., 2016). Thus, addressing peer relationships explicitly alongside social-emotional skills seems highly relevant, particularly considering the bi-directional links between improvements in peer relationships and social-emotional skills (Bowker et al., 2010; Busching & Krahé, 2020).

Educational settings, such as schools, have been proposed as an ideal place for prevention efforts due to their educational influence and access to high-risk groups (Jorm, 2012) and the potential for long-term, sustainable implementation at the population level (Greenberg et al., 2017; Wagner et al., 2017). Through teacher-led implementation, support programmes can be particularly cost-efficient (Domitrovich et al., 2017) and have been found to be more effective as compared to external deliverers (Durlak et al., 2011). While such large-scale universal prevention efforts in the school context would offer substantial benefits at a community or population level, the benefit for each and every student might actually be much smaller, which has been described as the prevention paradox (Greenberg et al., 2017). On the contrary, children

with existing peer problems, such as children affected by bullying or children with a diagnosis of ASD and related social behaviour symptoms, need targeted or indicated intervention efforts (Kasari et al., 2016; Kelly et al., 2020), which might offer little benefit to the whole community (Greenberg et al., 2017). The consequence of this paradox is the need to explore a range of potential support strategies, including universal preventions on a classroom level, targeted interventions for at-risk students and indicated interventions for groups of children with existing problems (Greenberg et al., 2017).

Theoretical Underpinning of Adolescent Development Programmes

Existing social-emotional learning programmes are based on a variety of different psychological theories. These include cognitive-behavioural theory, brain development theories, temperament theory, multi-sensory theory, or Vygotsky's socio-cultural theory (Aksoy & Gresham, 2020). Important developmental theories, such as Piaget's constructivist perspective (1952), Bandura's social learning theory (1977), and Vygotsky's socio-cultural perspective (1978) have long shaped social-emotional learning programmes by framing children's developmental levels and emphasising the impact of thought patterns on children's behaviour (Aksoy & Gresham, 2020). In the context of the presented research, Piaget's developmental theory framed this research's understanding of children's cognitive developmental stage, i.e., the concrete operational stage between ages 7 and 11, during which children's abstract abilities are not yet fully developed (1969). Therefore, both collaborative development activities as well as programme activities had to provide explicit examples and stimuli to allow children to fully understand the (research) questions and engage in discussions. Considering Vygotsky's and Bandura's learning theories, the social (classroom) context was central to any skills training aims. In line with this, important concepts, such as emotion

regulation, were expected to require some form of modelling (e.g., in stories) and in interaction with peers.

This particular research project was conducted in the context of the primary secondary school transition, which has been conceptualised as non-linear and ongoing process requiring not only educational adjustment, but also social and psychological adaptation (Jindal-Snape & Cantali, 2019). This is reflected in Jindal-Snape's multiple and multi-dimensional transitions theory (Jindal-Snape, 2016), which describes this non-linear process and emphasises that children experience multiple transitions simultaneously in various domains. Therefore, a development effort concerning a novel peer relationship programme for the context of the school transition had to consider emotional aspects (e.g., communicating emotions or emotion regulation), social aspects (e.g., making new friends) as well as educational aspects (e.g., a suitable classroom atmosphere, worries concerning academic requirements) and appreciate that children could be excited and worried about these factors at the same time. This notion regarding the simultaneous discussion of worries and opportunities was connected to the stage-environmental-fit theory's proposition that decreases in motivation and behaviour changes in early secondary school might be related to insufficient support and preparation in the school context (Eccles, et al. 1993). Therefore, this research aimed to explore both, children's individual social-emotional skills to cope with challenges related to the transition as well as contextual factors related to the classroom climate to find an appropriate fit between skills and environmental demands.

Intervention Development

The complexity of behaviours targeted by an intervention as well as the amount of involved target groups, target variables, and their variability substantially impact the complexity of an intervention (Craig et al., 2019). A school-based, teacher-delivered intervention targeting a

variety of relationship skills and classroom dynamics is thus a very complex intervention. Specific guidelines have been developed to support intervention development and evaluation and to address complexity appropriately (Craig et al., 2019; Skivington et al., 2021) by carefully considering certain aspects in the development process: (i) the theoretical causal change model of the intervention, (ii) implementation aspects that might impede effectiveness, (iii) the variability of outcomes on lower levels that could reflect effects on higher levels, (iv) a range of outcomes, and (v) adaptation options to account for contextual differences.

The UK Medical Research Council (MRC) guidance has suggested four phases of intervention research: intervention development, feasibility testing, evaluation and implementation (Skivington et al., 2021). The consideration of context factors and economic factors, engagement of stakeholders, identification of uncertainties, and refinement of programme theory and intervention strategies should be part of each stage (Skivington et al., 2021). Before the evaluation, three in-depth stages have been proposed: (i) identifying the evidence base by systematically reviewing literature, (ii) identifying or developing appropriate theory by outlining what changes are expected and how they will be achieved, and (iii) modelling the intervention process by undertaking small-scale pre-evaluations (P. Craig et al. 2019). In more detail, the development of public health interventions (Wight et al., 2015) was proposed in six steps: (i) understanding and defining the issue as well as its likely causes, in order to (ii) identify which causal factors or factors related to the context have (the greatest) potential to change and (iii) how to achieve this change. It was emphasised that programme theories are ideally rooted in behaviour change theories (National Institute for Health and Clinical Excellence, 2007; Wight et al., 2015). Next, (iv) an implementation plan should be developed and (v) feasibility should be tested on a small scale to refine content and structural aspects (e.g., intervention structure, training, delivery) and maximise acceptability before (vi) conducting a trial or survey

to collect evidence of the intervention's effectiveness (Wight et al., 2015). Best practice for intervention evaluation is a "carefully phased approach", which includes a set of pilot phases to evaluate specific aspects, which might need further adaptation, before implementing a tentative, exploratory evaluation and a full definite evaluation of the entire intervention (P. Craig et al., 2019).

Participatory Involvement of Children in Research

The role of children in research has undergone profound shifts over the past decades, evolving from the past century's dominant perspective of children as components of broad research areas (e.g., education) or merely as research subjects (Barker & Weller, 2003). Two particular developments on theory and policy levels are commonly referred to as introducing a change in children's role (Kim, 2016): the "new social study of childhood" has introduced a new sociological research interest regarding children's lives, and the 1989 United Nations Convention on Children's Rights (UNICEF, 1989) has reinforced the recognition of children's rights, including article 12 on the right to "express those views freely in all matters affecting the child" (UNICEF, 1989, p.5). Thus, the past decades have seen an increase in guidelines and policies emphasising the importance of an active role of children in areas that affect children. This has been particularly relevant in the field of educational policies, dating back to a 1996 World Health Organisation (WHO) guideline encouraging the involvement of children in decision making regarding their mental health and social needs (World Health Organization. Regional Office for the Western Pacific, 1996). An active role of children in school policies is encouraged in the UK National Institute for Health and Clinical Excellence (NICE) guidance as well as in the Ofstead school inspection framework (National Institute for Health and Care Excellence (NICE), 2009; Ofsted, 2019).

However, a review of health research has found that less than 1% of studies focusing on 12-18-year-olds actually involved young people in advisory roles (Sellars et al., 2021). Examples of participatory involvement of younger children is even more scarce. Although there are existing guidelines on involving children in research, examples mostly concern adolescents above the age of 12 (Hawkins et al., 2017; Müssener et al., 2020) and even reviews focus on adolescents (Reed et al., 2021).

Research Gap

There are many existing programmes aiming to support adolescent development and wellbeing focusing on social-emotional learning, mental health, or positive psychology – to just name a few (Fenwick-Smith et al., 2018; Tolan et al., 2016; Wigelsworth et al., 2022). The role of peers in learning effects of such support programmes has been recognised (Orson et al., 2020) and existing frameworks for positive adolescent development seem to address positive, mutual engagement with others (Tolan et al., 2016), emphasising the importance of positive peer relationships. However, so far, peer relationships have not been researched and addressed as a potential central focus of positive, preventive adolescent support programmes. Currently, most research on peer relationship programmes is focused on peer *problems* as compared to preventive efforts aiming to facilitate positive peer relationships.

Additionally, the period between childhood and adolescence is under-represented in research on support programmes (Milton et al., 2021), although early adolescence is a crucial period, as neurological developments (Blakemore & Mills, 2014) and heightened social vulnerability (Towner et al., 2023) coincide with profound changes in children's social environment related to the primary-secondary school transition (Eccles & Roeser, 2011; Jansen & Kiefer, 2020). This period combines an ideal opportunity for interventions due early adolescents'

developmental stage (Jansen & Kiefer, 2020) and the impact of transition periods on people's reflection of their behaviours (National Institute for Health and Care Excellence (NICE), 2007). Thus, more attention should be given to this period (Mascia et al., 2023), especially regarding potential social-emotional support programmes (Bagnall et al., 2020).

While the inclusion of children as active stakeholders in research efforts has been established over the last decades (Kim, 2016), less than 1% of empirical youth-focused health research has actually included young people (Sellars et al., 2021). Examples of participatory engagement of children are even rarer, although a variety of school policy guidelines encourage the active participation of children (National Institute for Health and Clinical Excellence, 2009; Ofsted, 2019). However, few studies have explored children's active role in intervention efforts (van Rens et al., 2018).

The Present Research

The research presented in this thesis is based upon the notion that peer relationships provide an essential context for adolescent development (Blakemore & Mills, 2014; Eccles & Roeser, 2011), and supporting positive peer relationships is a promising prevention strategy due to its strong associations with outcomes on mental health (Leigh-Hunt et al., 2017) and identity development (Ragelienė, 2016) and their potential to buffer against negative experience (Adams et al., 2011). This thesis aims to address the described research gaps by adopting an explicit focus on positive peer relationships and discussing the development and evaluation process of a peer relationship programme for the school context. Based on existing intervention development guidelines (Craig et al., 2019; Wight et al., 2015) as well as frameworks for participatory involvement of young people in such development efforts (Hagen et al., 2012), this research aimed to explore (a) how children's peer relationships can be supported in the

school context, i.e. which potential intervention strategies seem relevant, particularly around the transition period from primary to secondary school and (b) which methodological approaches are suitable for engaging children in such research efforts and intervention efforts.

The structure of this thesis follows intervention development guidelines (Craig et al., 2019; Skivington et al., 2021; Wight et al., 2015), describing all stages of the intervention research process including the development, feasibility testing, evaluation and (pilot) implementation (Skivington et al., 2021). The first development steps including (i) understanding the issue and its likely causes, (ii) identifying causal and contextual factors with potential to change and (iii) potential change mechanisms (Wight et al., 2015), were simultaneously addressed in a systematic literature review (Chapter 2) and a large qualitative study in schools (Chapter 3). To reflect the research aims of assessing potential intervention strategies as well as methodological considerations, Chapter 2 and 3 will discuss both, content and methods aspects. Next, to prepare for the feasibility testing stage (Skivington et al., 2021), an (iv) implementation plan was developed and (v) feasibility was tested iteratively (Wight et al., 2015) in small scale participatory studies to refine intervention aspects and maximise acceptability (Chapter 4). Chapter 4 will discuss the overall methodological intervention development approach in more detail and provide examples of insights gained concerning relevant intervention strategies and methods. The stages of evaluation and (pilot) implementation in schools (Skivington et al., 2021) were combined and a (vi) large-scale evaluation trial (Wight et al., 2015) was conducted to assess preliminary evidence regarding intervention effectiveness, which will be presented in Chapter 5. In Chapter 6, the development process and presented findings will be discussed.

The Context of the Austrian School Transition

To address a particularly vulnerable period, this research is conducted in the context of the primary-secondary school transition in Austria and therefore focuses on peer relationships of 9- to 12-year-olds. In Austria, where this research was conducted, children enter primary school at the age of 6. Primary school spans four years, thus the school transition to secondary school typically happens around the age of 10 in Austria, and therefore one or even two years earlier compared to many other countries (e.g., UK, France, Australia). While the literature review spanned a wider age group to capture all relevant support programmes, the empirical work focused on 9 to 12-year-olds to cover the extended transition period. As the boundaries between childhood and adolescence are blurred, and the beginning of adolescence has broadly been defined between 10 to 12 years (APA Dictionary of Psychology), the terms (late) childhood and early adolescence will be used to refer to this age period.

After primary school, Austrian children transition either to a comprehensive school or a lower grammar school. The main difference between these school types concerns the typical continuation from lower grammar school to higher grammar school, with the aim to achieve a grammar school diploma qualifying for university, while comprehensive school ends after year 5 and students transition to either vocational trainings, higher grammar school or other school types (e.g., with focus on technical or business subjects). Admission to grammar schools largely depends on students' grades in year 4 of primary school. However, the percentage of students enrolling in each school type varies by location, as comprehensive schools are more common in rural areas, while grammar schools are mostly located in urban areas. Therefore, students in rural areas commonly attend local comprehensive schools and later transition to higher grammar schools.

Epistemology and Methodology

This research was conducted with a multi-methods approach and thus drew on different methodologies and philosophical views, as proposing one singular philosophical stance might be inaccurate and counterproductive (Maxwell, 2022). While the philosophical stance of positivism, postulating that objective assessment of phenomena is achievable (Maxwell, 2022), continues to influence quantitative approaches and thus influenced the study design of the evaluation study (Chapter 5), this research (specifically the qualitative research, the participatory research approach, and general reflections on this research) was generally embedded in a critical realist philosophy. There are many nuances and differentiations within the broader philosophical view of critical realism. It is here understood as merging the concept of ontological realism, assuming that "real" phenomena exist separate from theories, and epistemological constructivism, assuming that our knowledge of these phenomena is constructed in interaction with the world and our participants (Maxwell, 2022)[3]. Critical realism is often described as an advancement of realism as it assumes that a "true reality" exists, but that this reality cannot be objectively described in research, and researchers cannot generalise findings beyond a reality described by their participants (Coyle, 2016). In relation to this research, this means, that the researchers understand presented findings to be related to a reality

[3] Generally, the qualitative research process and the researchers' understanding of their research has been described as shaped by three concepts; ontology, epistemology and methodology (Denzin & Lincoln, 2011). Ontology describes assumptions concerning reality, while epistemology describes assumptions regarding knowledge and knowledge creation (Coyle, 2016). As both concepts refer to linked philosophical assumptions and shape the philosophical viewpoint framing the research, they are usually discussed simultaneously. The philosophical viewpoint is, in turn, often linked to adopted methodology, which describes the set-up of a research project and chosen methods (Coyle, 2016).

of friendship experiences in the school context. At the same time, researchers were aware that presented findings were socially constructed in conversations between children and researchers, thus findings cannot be proposed as absolutely objective (Willig, 2008).

Beyond this general philosophical understanding, however, aspects of an empirist, hypethetico-deductivist approach were dominant in the systematic literature review (Chapter 2) as well as the quantitative evaluation study (Chapter 5), as both studies were striving for objectivity and neutrality in testing theory-based hypotheses (Coyle, 2016). The systematic literature review (Chapter 2) followed PRISMA guidelines (Liberati et al., 2009; Page et al., 2021) and understood reported findings as representative of children's actual peer experiences. The evaluation study (Chapter 5) followed the MRC guidance (Skivington et al., 2021) regarding development and evaluation of interventions and adopted a non-randomised waitlist control design with pre-post and follow-up assessment. This empirical research assumed that objective changes in skills and feelings are present and can be assessed through the measurements used at pre-, post- and follow-up assessments, thus holding realist assumptions (Coyle, 2016). However, the researchers are aware that observations and measurements cannot produce objective facts about the complex behaviours and feelings of human beings. Thus, implications and shortcomings of this research design and measurements as well as potential biases are discussed.

The comparison of qualitative methods (Chapter 3), and the presentation of the participatory development (Chapter 4) were conducted with a different understanding of knowledge creation and a different methodology. This qualitative research was embedded in a participatory development process, thus participants were perceived as active contributors to this research rather than research subjects (Montreuil et al., 2021; Reed et al., 2021). It has been argued, that participatory research justifies a separate participatory epistemology with a focus on

overcoming power dynamics (Pincock & Jones, 2020), and empowering and emancipating children to become protagonists in the research process (Kellett, 2010). While this research aimed to reduce power imbalances between children and adults as much as possible, the pre-defined research aims (as required for funding proposals) and specific research questions did not fully allow children to set their own agendas and lead the research process. Thus, the research activities were understood as *participatory methodology* rather than full participatory approaches (Montreuil et al., 2021) with corresponding epistemology (Pincock & Jones, 2020). Instead, participatory *methodology* was used to engage children and elicit their authentic voices (Spyrou, 2011) while researchers held a critical-realist assumption that findings regarding friendship experiences reflect participants' "reality", which is however socially constructed in research-child interactions and cannot be generalised or understood as objective (Coyle, 2016; Willig, 2013).

Thesis Outline

Considering intervention development guidelines accounting for stakeholder involvement (Hagen et al., 2012) and epistemological deliberations, a mixed-methods approach was adopted including both quantitative and qualitative methodology. As suggested for participatory intervention development, empirical research and participatory methodology aimed to complement each other (Hagen et al., 2012). In the following, a brief overview of each chapter and methodological considerations will be provided.

Chapter 2: A Systematic Review of Peer Relationship Programmes

In Chapter 2, a literature review of existing support programmes for children and early adolescents aiming to facilitate peer relationships is presented. This review aimed to prepare for the intervention development, by defining and positioning current intervention strategies

(Hagen et al., 2012). Specifically, peer relationship outcomes, other programme effects and employed methods were discussed to understand malleable peer relationship variables and change mechanisms (Wight et al., 2015). In line with the aim to review strategies for universal, preventive efforts as well as targeted and indicated intervention strategies (Greenberg et al., 2017), all types of support programmes were included. This chapter was published as a paper in *Adolescent Research Review* (see Pollak, et al. 2022).

Chapter 3: A Comparison of Four Qualitative Methods

In Chapter 3, a large-scale qualitative study is presented, which aimed to collect children's perspectives on (i) the issue of peer relationships in school, (ii) related causal and contextual factors and (iii) potential change mechanisms (Wight et al., 2015). As working with children between 9 and 12 years of age is associated with specific methodological requirements to account for their cognitive and social development levels (Fargas-Malet et al., 2010), quantitative measures such as questionnaires are inappropriate (Mellor & Moore, 2014). Thus, more open, creative methods have been suggested (Fails et al., 2012) to allow children to share their authentic views (Spyrou, 2011) and empowering them to take a leading role in the research process to counterbalance power dynamics as much as possible (Benninger & Savahl, 2017). Therefore, a qualitative research workshop was developed. A bespoke thematic analysis combining elements of deductive framework analysis (Goldsmith, 2021) and inductive thematic analysis (Braun & Clarke, 2006) was used to analyse results of four qualitative methods and compare them regarding their suitability to collect relevant information in early intervention development stages. This chapter was submitted and is currently under review at the *International Journal of Qualitative Methods*.

Chapter 4: Participatory Intervention Development With Children in the School Setting

In Chapter 4, the participatory development process with particular focus of the iterative feasibility testing (Wight et al., 2015) of the peer relationship programme is presented. This chapter aims to provide an overview and holistic picture of the participatory development process adopted in this research. The process followed a tradition of partnership intervention development approaches (O'Cathain, Croot, Duncan, et al., 2019) with particular consideration of children's involvement in decision-making through collaborative problem setting and problem solving (Reed et al., 2021). The presented findings are mostly focusing on qualitative data, while integrating some quantitative assessment of children's perception of the intervention at different stages. In line with the epistemological viewpoint of critical realism, researchers are, however, aware of their role in shaping this research process (Coyle, 2016) and limits of participatory development with children (Montreuil et al., 2021) are discussed.

Chapter 5: Evaluating a Social-Emotional Learning Programme for 9 to 12-Year-Olds

In Chapter 5, a quantitative evaluation study of the developed peer relationship programme following a pre-post-follow-up design with waitlist control group is presented. The stages of evaluation and implementation (Skivington et al., 2021) are discussed simultaneously throughout this chapter as the programme was implemented by teachers in the school-context to maximise ecological validity and explore implementation factors (Domitrovich et al., 2008). In addition to the assessment of intervention outcomes on social-emotional skills, classroom climate, peer connectedness and happiness in the classroom, a proposed intervention effect model is analysed to better understand intervention effect mechanisms (Domitrovich et al., 2017). This chapter was submitted and is currently under review at the *Journal of Youth and Adolescence*.

Chapter 6: General Discussion

In Chapter 6, findings regarding peer relationships and methodological insights gained over the development process will be discussed.

Integration in the Wider D.O.T. Research Project

The research presented in this thesis was part of a wider research project (the D.O.T. project, "Die offene Tür"), which focused on the development of digital and school-based interventions to facilitate peer connectedness at the time of school transition. While the main research site was in Austria (where the project was funded and supported by Ludwig Boltzmann Society, Vienna, and Karl Landsteiner University, Krems), the University of Birmingham and the Instituto Superior Técnico, University of Lisbon were collaboration partners. As part of the D.O.T. project, five digital interventions were developed, each lead by one Ph.D. student. These digital components focused on (a) personal emotion regulation, (b) interpersonal emotion regulation, (c) classroom climate with a particular focus on needs of children of parents with a mental illness and (d) a digital hub to connect children via social-emotional online games and (e) digital stories to discuss transition-related experiences. In addition – and complementary to – these digital components, the research project aimed to develop a classroom-based learning programme to facilitate peer relationships in the school context. The research presented in this thesis concerns this classroom-based learning programme.

Due to the described distribution of different focus points to different intervention approaches, in-depth discussions of emotion regulation, classroom climate and school-transition aspects were covered in other research outputs (i.e., papers and Ph.D. theses), while this thesis focused on the methodological and conceptual development as well as the evaluation of a novel peer relationship programme. Specifically early project stages (i.e., the first round of qualitative

workshops – see Chapter 3) informed all project components and thus resulted in four separate analyses informing different project components. These analyses were reported in separate publications concerning children's peer relationships (Krammer et al., 2023), perspectives on school transition (Stiehl et al., 2023), online communication and media (Mittmann et al., 2022), as well as an a comparative analysis concerning appropriate methodology for school-based research (presented in this thesis in Chapter 3). As it became clear over the course of the development, that the digital stories regarding school transition would seamlessly integrate into the school-based learning programme, these two components were combined, resulting in a joint evaluation of the learning programme and integrated stories. Therefore, the evaluation as presented in Chapter 5 focused specifically on peer relationships in the classroom, classroom climate, social-emotional skills, and happiness, while aspects concerning the school transition (e.g., worries concerning the transition, bullying experiences) and aspects related to the digital stories specifically (e.g., perspective taking) were covered in a separate analysis and respective publication (manuscript in preparation).

Main Findings and Implications of Chapter 1

Peer relationships provide a crucial background for adolescent development, particularly regarding social-emotional development (Busching & Krahé, 2020; Laible, 2007), identity development (Ragelienė, 2016), mental health factors (Brendgen & Poulin, 2018; Rapee et al., 2019) and physical health (Schwartz-Mette et al., 2020). Therefore, it is not surprising that most existing frameworks and approaches for adolescent support programmes include aspects targeting positive engagement with others, i.e. positive peer relationships (Tolan et al., 2016). However, there is currently a lack of *positive* peer relationship programmes. This research aimed to address this by assessing methods and contents appropriate for peer relationship programmes and developing a novel, positive peer programme for the school context. In a first step, a systematic review was conducted to summarise existing evidence regarding contents, methods, and target domains of existing peer relationship programmes.

CHAPTER 2

A Systematic Review of Intervention Programs Promoting Peer Relationships Among Children and Adolescents: Methods and Targets used in Effective Programs

Presented in its published format.

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Abstract

Children's peer relationships are crucial for their social-emotional development, mental and physical health. To identify effective strategies to facilitate peer relationships among 8 to 14-year-olds, a systematic review of intervention programs[4] was conducted. Electronic databases ERIC, EMBASE, MEDLINE, PsycINFO, Cochrane Collection Library and grey literature sources were searched for intervention studies with general or clinical populations published between 2000 and 2020. Interventions had to assess quantity or quality of peer relationships as an outcome measure, thus focusing on helping children to establish more positive relationships or improving their self-reported relationship quality. Sixty-five papers were identified and grouped into universal prevention programs, selective interventions for typically developing children and indicated interventions for children with clinical diagnosis. Prevention programs and interventions for typically developing children facilitated peer relationships by targeting mental wellbeing and self-concepts. Clinical interventions focused on social-emotional skills, symptoms and peer behaviors. Successful programs showed a close alignment of methods and targeted program effects. Practitioners should also be aware of realistic goals for each population. Programs for a general population showed potential to decrease loneliness, whereas clinical populations showed high increases in play dates, peer acceptance and sociometric status.

[4] As this chapter is presented in its published format, it follows American English spelling, as was requested by the journal. Apart from this chapter, this thesis follows British English spelling.

Keywords: Peer relationships, intervention programs, children and adolescents, mental health, social and emotional learning

Introduction

Peer relationships and friendships play an important role in children's development, particularly around the transition from childhood to adolescence (Brown & Larson, 2009). Peer experiences are linked to young people's physiological health (Leigh-Hunt et al., 2017), mental health (Schwartz-Mette et al., 2020), socioemotional development (Laible, 2007) and identity development (Nawaz, 2011). While social-emotional learning (Greenberg et al., 2017), young people's personality development (Ofsted, 2019) and mental health (National Institute for Health and Care Excellence (NICE), 2008) are increasing priorities of the education system, the role of peer relationship programs has so far been neglected in the literature. This review aims to fill this gap in the literature by synthesizing existing evidence on the effectiveness of programs aiming to facilitate peer relationships and to translate this evidence into advice for best-practice intervention development and implementation.

Indices of Peer Relationships and Their Long-Term Outcomes

Peer relationships are defined as "interactions, both positive and negative, with same-aged mates", which are becoming ever more complex over the course of adolescence (Naylor, 2011, p. 1075). Friendships specifically are defined as a "relationship between two individuals characterised by support, time, intimacy, trust, affection, and the ability to manage conflict" (Roach, 2019, p. 330). Thus, "peers" is a more general term for individuals, typically close in age, within the same social network or community, while only some peer relationships are considered friendships, which are typically closer, mutual relationships (Arnett, 2010). Although there is considerable heterogeneity regarding the use of this terminology (Flannery & Smith, 2017), research suggests that all types of peer experiences are fundamental for developmental trajectories.

Peer experiences in childhood and adolescence have been recognised as crucial since Vygotsky's (1978) sociocultural perspective, postulating cognitive development as guided by social experiences. Indeed, increased social sensitivity during adolescence (Blakemore & Mills, 2014), is thought to interact with neurological development in social-emotional (Casey et al., 2008) and cognitive domains (Blakemore, 2012). Peer relationships provide a unique context to practice socioemotional skills, due to inherent reciprocity and equal power balances (Liable, 2007). Peer attachment surpasses even parent attachment in its effects on adolescent's social-emotional development (Laible, 2007) and was found to be positively associated with identity development (Ragelienė, 2016). The consequences of poor peer relationship quality (Schwartz-Mette et al., 2020), loneliness and social isolation (Leigh-Hunt et al., 2017) can manifest in negative long-term mental health outcomes (e.g. depression, anxiety, self-harm or suicide intention). Mental health problems are both associated with (Husky et al., 2020) and exacerbated (Brendgen & Poulin, 2018) by negative peer relationships in school (e.g., victimization) – associations which can be traced into adulthood (Copeland et al., 2013) and even old age (Hu, 2021). Even regarding physiological health, loneliness and social isolation are linked to poorer general wellbeing, cardiovascular disease, and mortality (Leigh-Hunt et al., 2017). Furthermore, peer relationships in childhood seem to play a role in acute and long-term immune profiles (Scott & Manczak, 2021).

Existing Support Programs and Their Shortcomings

For a long time, researchers and health care providers have been calling for early interventions to foster children's mental health (Enns et al., 2016) and counteract developmental risk factors (Conroy & Brown, 2004). A considerable body of literature focuses on social-emotional learning (Taylor et al., 2017), mental health programs (Das et al., 2016) and school-based interventions (Shackleton et al., 2016), However, research points towards strong

interdependencies between peer relationships and social-emotional learning and mental health (Orson et al., 2020). Indeed, peer relationships in school are a major determinant of student's life satisfaction (Suldo et al., 2013) and most important source of support (Bagnall et al., 2020). Negative peer experiences appear to be counterbalanced by the presence of one friend (Adams et al., 2011) and positive friendship quality (Cuadros & Berger, 2016). Thus fostering children's peer relationships in its own right has been identified as an important objective to advance public health (Atkins et al., 2017). However, to this date little effort has been made to systematically collect existing evidence regarding peer relationship programs.

Additionally, there seems to be a lack of focus on the crucial transition period from childhood to adolescence. While a vast amount of literature focuses on early years, the period of late childhood and early adolescence, between the age of 8 and 14, is often overlooked in intervention literature (Milton et al., 2021). This is despite the fact that effectiveness of preventive efforts were found to peak during important developmental transition periods (January et al., 2011) – such as early adolescence. This lacking focus on early adolescence is problematic, as it constitutes a critical period for social-emotional development (Casey et al., 2008) and the onset of many mental health disorders (Merikangas et al., 2010) with 50% of lifetime mental health disorders developing before the age of fourteen (Kessler et al., 2005).

Furthermore, existing evidence regarding the effectiveness of support programs for children is not consistent. While some reviews of primary prevention programs provide evidence for overall effectiveness (Cheney et al., 2014; Mason-Jones et al., 2012), other reviews point towards limited effectiveness of programs (January et al., 2011; Mackenzie & Williams, 2018). These mixed results have been attributed to heterogeneity of target populations, settings and implementation factors (de Leeuw et al., 2020), underlining the importance of a close examination of intervention contents, context variables, and target populations in order to

design developmentally and contextually appropriate and effective intervention programs. As the best intervention approach is likely to be dependent on the target group's specific needs, available resources and context factors, more comprehensive overviews of existing approaches are needed (Gutman & Schoon, 2015).

Current Study

Although the importance of peer relationships, specifically from middle childhood to early adolescence (8-14), is evident from presented literature, to the authors' knowledge, there is no systematic examination of existing psychoeducational support programs to facilitate peer relationships. To provide a comprehensive overview of existing programs and their outcomes, the analysis of this review aimed to answer general review questions such as "what works, for whom, and in what circumstances" (Popay et al., 2006, p.19). The first research question concerned an overview of existing programs and contextual factors to clarify which circumstances (program duration, age groups, population etc.) further program effects in all peer relationship programs. The second research question addressed differential program set-ups and effects for specific target populations, to specify "what works for whom" (Popay et al., 2006, p.19). The analysis will focus on what typical programs for each target population look like (i.e., methods, intended program effects and peer relationship outcomes), if specific methods and intended program effects are related to better peer relationship outcomes for each of the respective target populations, and which peer relationship outcomes (i.e., different indices of peer relationships) are addressed and improved for each target population. Since this is the first narrative review with a specific focus on peer relationship interventions, broad inclusion criteria were established to provide a comprehensive overview of targeted interventions and their outcomes, and establish a sound foundation for future research efforts and implementation in practice.

Methods

Database Search

A structured protocol for this review was registered on the PROSPERO database (reference CRD42018111227). A systematic search was conducted on the electronic databases Education Resources Information Center (ERIC), EMBASE, MEDLINE, PsycINFO and Cochrane Collection Library as well as on the grey literature sources OSF Preprints and OpenGrey. The search for this and another systematic review on the determinants of peer relationships (Mitic et al., 2021) was conducted simultaneously with broadly defined terms to include both, intervention and empirical studies. For a detailed description of the search strategy see Online Resource 2.1[5]. Primary search terms used in all the above databases comprised a set of terms relating to the population of children and adolescents (e.g., 'child*', 'adoles*', 'teenage*') and a set of terms referring to peer relationships (e.g., 'social relation(s)', 'social connection(s)', 'belongingness', 'friendship(s)', 'peer relation(s)'). Terms for intervention were not included at this stage, instead intervention studies were identified within the process of title screening. Papers published in a scientific journal in English, German, Spanish, Portuguese, Italian, Hebrew, Croatian or Serbian with available English abstract were considered for inclusion. Additionally, a secondary search of relevant literature reviews, identified during the database search, as well as hand searches of reference lists and cited references of included papers, were

[5] In keeping with the wording of the published paper, the term online resource was not changed, but in the context of this thesis this term refers to the Appendices 2.1-2.3. To add clarification, the chapter number (2) was added to the numbering of the online resource/appendix (2.1 instead of 1).

conducted (see Figure 2.1[6]). Included were all studies published or updated after 2000 to ensure applicability and transferability of intervention techniques and results into today's context.

The search was updated in June 2020 with the original (population and peer relationship) terms and additionally defined intervention terms (e.g., 'prevention*', 'intervention*' 'program*', 'training*'). Intervention terms were selected from standard intervention terms and terms used in papers previously identified for inclusion. Some terms appear quite general but were deliberately included to identify as many intervention papers as possible (in line with the original broad search).

Inclusion and Exclusion Criteria

Eligible for inclusion were both prevention and intervention programs for children aged between 8 and 14 years, including general population samples, at-risk and high-functioning clinical sample. Case studies were excluded to allow for group level analyses. Biases attributed to non-randomized trails or inappropriate randomization concealment were found to be unpredictable and an a-priori exclusion has been discouraged (Gluud, 2006). Thus, this review included uncontrolled trials as well as controlled trials with randomized control, waitlist control, or "school-as-usual" control group as comparator. Studies had to report on outcome data collected with a full-scale or sub-scale measure of peer relationships with available reliability and/or validity information. During the screening process, several studies that focused on populations in precarious or adverse life circumstances were identified, including

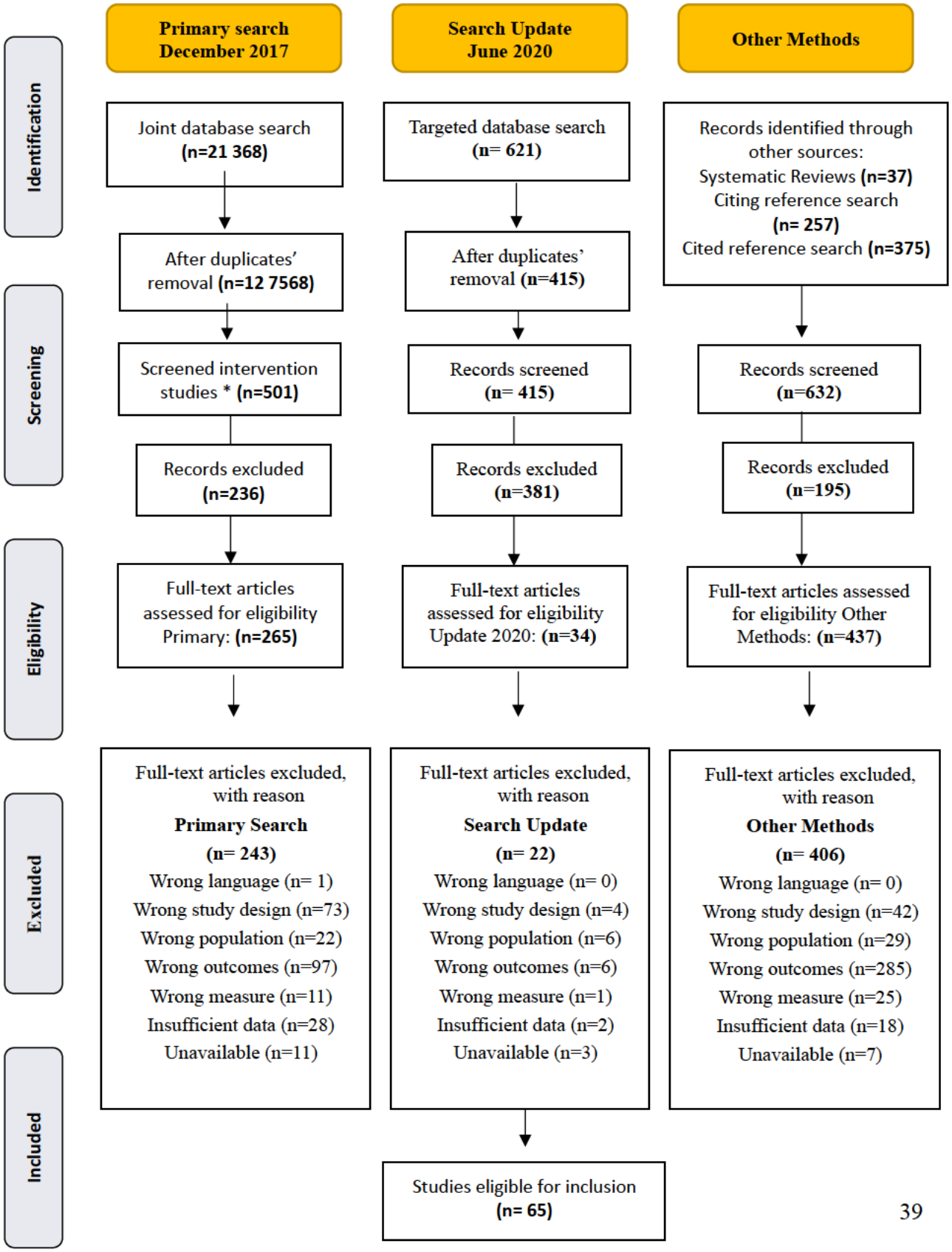
[6] In order to keep the general numbering of figures and tables aligned with the numbering in the published paper, the number of the chapter was added to the figure and table numbers (2.1) instead of changing the numbers to consecutively run through this thesis.

refugees, delinquent or homeless populations and populations with a serious physical illness (e.g., cerebral palsy, cancer). These studies were delivered in specific formats and/or settings that would demand a bespoke analysis and specific contextual understanding of ecology around the interventions. Due to very specific needs and targeted intervention strategies for these populations, such studies were excluded.

Although different indices of peer relationships and friendships have been discussed as separate constructs (Schwartz-Mette et al., 2020), heterogeneity of research findings has been attributed to heterogeneity of measurements and constructs across peer relationship domains (Schacter et al., 2021). However, research on various peer relationship indices and its short- and long-term associations suggests that all indices are important for general developmental trajectories. This heterogeneity in peer relationship definitions and the aim to synthesize all existing evidence, led to a broad operationalization of peer relationships as subjective feeling regarding quality and quantity aspects of relationships with peers. Thus, self-report measures of peer relationship quality (e.g., intimacy, closeness of friendship questionnaires) and quantity (e.g., perceived popularity or acceptance questionnaires) were eligible for inclusion. Social connectedness to peers was considered a quality aspect reflecting a feeling of belonging (Haslam et al., 2015), and loneliness was regarded as an indicator of a lack of relationship quality or quantity. Additionally, sociometric measures, which ask each group member to provide peer nominations or ratings, were understood as group-based self-report of relationships. Although an individual's sociometric rating is derived from their peers' ratings, this was understood as adequate report of young people's peer relationships on a group level. However, behavioral measures, observational measures and measures concerning contextual aspects or adult connectedness (e.g., school connectedness, community connectedness) were excluded.

Figure 2.1

PRISMA Flow Diagram Depicting Study Inclusion Process



Quality Appraisal of Included Studies

The Revised Cochrane risk-of-bias tool for randomized trials (RoB 2) (Higgins et al., 2019) was chosen to assess the methodological quality of included studies. The Cochrane ROB rating was conducted by two trained reviewers independently for 20 (25%) papers. Disagreement between reviewers was resolved through discussion. With Cohen's Kappa = .64 reliability between reviewers being moderate (McHugh, 2012). The remaining papers were assessed by one reviewer.

It has been argued that some reviews are likely to benefit from an additional quality appraisal seeking to review specific differences between studies, which might be more informative concerning review specific questions (Gough, 2007). The nature of school-based interventions and the inclusion criteria for this review lead to very similar ratings for all included studies. For example, many papers were considered high risk regarding implementation fidelity, which reflects the fact that Cochrane focuses on clinical interventions, while this review assessed social interventions, which are more flexible. Therefore, an additional author-derived quality of evidence rating was carried out, based on Cochrane domains considered crucial for methodological quality with potential to impact intervention effects. Points awarded in this author-derived rating system were adjusted to better reflect differences between included studies. The author-derived rating was subdivided into (A) quality of evidence and the (B) level of evidence (for detailed description see Online Resource 2.2). Categories included in the (A) *quality of evidence rating* were (i) study design, (ii) randomization procedure, (iii) implementation fidelity, and (iv) missing data. Each category was rated with 0 points representing low quality, 1 point for medium quality and 2 points for high quality. A summary score between a minimum of 0 and a maximum of 8 points was created and transferred into percentages of achieved quality (e.g. 4 points would equal 50%).

The (B) *level of evidence rating* comprised (i) between group significance (if applicable), (ii) effect sizes, (iii) follow-up evidence (if applicable) and (iv) sample size. Including all these indices increased the validity of the effectiveness estimates as positive evidence was weighted against negative evidence, while absent evidence (e.g., due to lacking of follow-up data) was not impacting the rating negatively. For example, a significant between-group effect alongside low within-group effect sizes (indicating a drop in the control group) are suggesting an intervention was effective in preventing a drop in connectedness – which would be plausible as adolescence is often characterized as a time of heightened social sensitivity and loneliness (Wong et al., 2018). Similarly, significant follow-up effects after low pre-post effects are a promising sign of the intervention's effectiveness in the long-run as friendships take a while to consolidate and more time spent together has a positive effect on the relationship by establishing shared meanings and behaviors (van Hoogdalem et al., 2012). A summary score between a minimum of -3 and a maximum of 8 points was calculated. For a detailed description of the tool see Online Resource 2.2. As this review's aim was to discuss all existing evidence, no studies were excluded due to low quality and/or low evidence ratings. All studies were used to describe characteristics of existing interventions. However, some of the presented analyses regarding effectiveness of methods and program effects are focused on studies with positive evidence only.

Data Extraction and Data Analysis

To address the first research question regarding general effectiveness trends, data was extracted about intervention aims, setting, duration, target population, target age group, other intended program effects (operationalized as other measures), intervention methods and peer relationship measures. Additionally, study quality information as well as results were extracted as described above in study quality and level of evidence rating. For papers with missing information on

peer relationship outcomes (e.g., missing effect sizes), or papers failing to provide a detailed description of intervention components, the authors were contacted. Authors who did not reply to the first email were contacted again about a month after the initial request was sent. If missing information regarding outcomes could not be obtained, the paper was excluded from further analysis.

To address the second research question 'what works for *whom'*, differences in program structure concerning different target populations were explored. Following a long tradition of differentiation between prevention approaches (Gordon, 1983), programs were grouped into (i) universal prevention (or intervention) targeting the entire population before the manifestation of symptoms, (ii) selective intervention targeting at-risk populations showing first signs of existing symptoms and (iii) indicated intervention describing intervention efforts after the unfolding of illness (January et al., 2011). Based on this classification, the present review differentiates (i) "preventive programs" for the general population, (ii) "selective intervention" programs for typically developing children, with identified problems that put them at risk for developing mental health problems, and (iii) indicated "clinical intervention" programs for children with a clinical diagnosis targeting behavioral and emotional problems associated with the respective diagnosis. Each program type was first described regarding (a) measures used to assess peer relationships, (b) other program effects (i.e., significantly improved skills and psychological variables) and (c) didactic and practical methods used during implementation. Secondly, effectiveness trends (based on level of evidence ratings) of methods and targets were explored.

Peer Relationship Outcomes

Measures were grouped into five categories, which the authors believe represent distinct aspects of relationships. After consideration of scale descriptions and sample items, measures were grouped into (i) sociometric measures, providing an index retrieved from *peer report* of likability or friendship nominations, (ii) friendship quality measures, assessing *quality* aspects of specific relationships to one or more particular friend(s), (iii) perceived popularity or acceptance measures, assessing self-reports of *quantitative* popularity, (iv) loneliness or social connectedness measures, assessing the subjective feeling of *social belonging* and (v) the autism-specific *Quality of Play Questionnaire*, asking children with ASD diagnosis to report the number of recent play dates and/or their perceived level of conflict at these play dates.

Positive Program Effects

Grouping of program effects followed an existing categorization of determinants of peer relationships (Mitic et al., 2021), which was adapted to fit the empirical data found in the presently included papers. Identified program effects included (i) emotion regulation and coping, (ii) social skills, (iii) self-concept and self-beliefs, (iv) ASD/ADHD symptoms, (v) anxiety, (vi) depression, (vii) internalizing / externalizing problems, (viii) behavior towards peers, (ix) general wellbeing, (x) family factors, (xi) victimization, (xii) academic factors, and (xiii) school connectedness. The present review only reports on significantly improved effects, as it was assumed that only positive effects could be linked to improved peer relationships.

Methodological Components

Methodological program components were derived during data extraction and iteratively refined to result in a comprehensive list of differential and specific didactic methods. Identified methodological components comprised (i) collaborative tasks, (ii) group discussion, (iii)

individual tasks/ self-awareness training (any task that was carried out by participants individually and with the intention to reflect/focus on concepts individually e.g. working on self-esteem, mindfulness, drawing activities), (iv) context for interaction (only used if this was the explicit aim of the intervention: games/breakfast), (v) didactic content delivery, (vi) active practice in group (e.g. role play, practice abilities), (vii) homework, (viii) parental involvement, (ix) implicit reinforcement of behaviors (any kind of implemented system or strategies that guide children's behaviors throughout the duration of the intervention, e.g. token system or systematic praise) or (x) mentorship.

Results

Overview of Included Studies

Sixty-five studies were identified for inclusion (see Figure 2.1). Included studies were published between 2000 and 2020. The study designs included 39 (60 %) randomized controlled trials, 14 (21.5 %) non-randomized controlled trials, and 12 (18.5 %) uncontrolled trials. Four studies were follow-up studies on included studies and were regarded as valuable evidence to supplement the level of evidence rating and the synthesis of outcome trends on the corresponding original studies but were not included in the main analyses. A further four papers featured two intervention programs respectively and presented results in comparison to the other intervention as well as to a separate control group. While study characteristics are presented for each paper, these programs were weighted and discussed separately as two entities in the analyses of program components. See Table 1 in Online Resource 2.3 for an overview of included studies.

Most studies were conducted in the US (25 studies, equaling 38.5%), followed by nine studies from the UK (13.8 %), five studies from the Netherlands (7.7%) and four studies each from

Israel and Australia (6.2 % each). Two studies were conducted in Hong Kong, China, South Korea, and Japan respectively (3.1% each) and one study each was conducted in Sweden, Iceland, Belgium, Italy, Spain, Slovenia, Brazil, Chile, Lebanon, and Canada. Study setting varied between programs. Thirty-four studies (52.3%) were conducted in the school context. 31 studies (47.7%) were conducted in community and social care settings. Some studies report on clinical intervention aspects, e.g., conducted by health care professionals, but in community setting or in a hospital setting but implemented by researchers. Thus, a clear distinction between clinical and community settings could not be drawn. Regarding population, 40 studies (61.5 %) were conducted with the general population with or without behavioral issues but without clinical diagnosis. 18 studies were conducted (27.6 %) with children with an autism spectrum disorder (ASD) diagnosis, four studies (6.1%) with children with an attention deficit hyperactivity (ADHD) diagnosis, two studies (3.1 %) with mixed clinical and general population and one study (1.5%) with children with an anxiety disorder diagnosis. The final sample comprised of 25 prevention programs, 14 selective intervention programs for typically developing children, and 22 intervention programs for children with a clinical diagnosis.

Quality Appraisal

The Cochrane risk of bias assessment found a majority of studies to be of poor quality (86.4%). Seven papers (8.6%) were rated as raising some concerns and only four papers (4.9%) were rated as high quality. These findings reflect the necessity of a more differentiated rating system for studies with a different context compared to the clinical one. The author-derived quality of evidence rating provided a more nuanced picture, with studies spanning the full range of a minimum 0% quality percentage points to the maximum of 100% percentage points. The mean quality rating was at 37.88%, with a majority of 42 studies (64.6%) receiving a rating between

25% and 75% of quality. A total of 15 studies were rated below 25% of quality and 4 studied achieved a quality rating above 75%, with 2 studies achieving a maximum rating of 100%.

General Overview of Effectiveness Results

The following results are reported for 61 included studies with data from four respective follow-up studies contributing the level of evidence rating. Effect sizes, which were calculated in Cohen's *d* for all studies, were found to be between $d = -.42$ and $d = 1.91$, with $M = .47$ and $SD = .44$. Out of 49 studies that had a control group, 29 studies (59,2%) found significant intervention effects as compared to the control group. For 27 studies, some form of follow-up data was obtained, for five of those studies follow-up data was added from four separately published follow-up studies. 20 of those (74,1%) showed that effects were maintained over the follow-up period. The range of the author-derived effectiveness ratings was broad, from -3 points to 7 points (just below the maximum of 8), with a $M = 2.59$, and $SD = 2.51$.

Effects of Study Quality

A high significant correlation between effect sizes and author-derived level of evidence ratings was found ($r(59)= 0.67$, $p < .001$). However, neither indicator was found to be significantly correlated with the author-derived study quality rating. Interestingly, however, the non-significant correlation coefficient of effect size and quality was negative ($r(59) = -0.11$, $p = .395$), indicating higher effect sizes for lower quality studies. On the contrary, the non-significant correlation coefficient of the comprehensive level of evidence rating and study quality was positive ($r(59) = 0.17$, $p = .193$). Thus, a high level of evidence rating, which comprised effects sizes, between-group and follow-up data, correlated with high quality, indicating a bias when looking at effect sizes only.

Effects of Program Duration

Program duration was operationalized in two ways; (i) program length in weeks and (ii) total hours spent on program activities. The programs were implemented over a period of between 2 weeks and 2 years, with a mean program length of 17 weeks (*SD* = 20). Total time spent on program activities was between 1.5 hours and 84 hours, with a mean of 17 hours (*SD* = 15.4). Prevention programs seemed to be conducted over longer periods of time (*M* = 18 weeks, min= 2 weeks, max =112 weeks) with less intensity (*M*=14.6h, min=1.5h, max = 64h). Similarly, selective interventions were often conducted over longer periods of time (*M*= 18 weeks, min= 6 weeks, max = 112 weeks) with less daily/weekly allocated program hours (*M* = 11.5h, min=3.3h, max=30h). Clinical interventions, on the contrary, tended to have a higher duration intensity with more program hours (*M*=22.1h, min=4h, max= 84h) over shorter periods of time (*M*= 15 weeks, min=5 weeks, max=56 weeks). Neither effect size in Cohen's *d* nor author-derived level of evidence ratings were found to be significantly correlated with program length or hours spent on program activities. However, a marginally significant negative correlation between level of evidence ratings and total time spent on program activities was found ($r(56) = -.24$, $p = .072$).

Effects of Age

A medium significant correlation between mean age of participants and effect size (Cohen's *d*) was found for the total sample ($r(43) = 0.35$, $p = .019$), indicating a trend of increased effects with older age groups. Separating program types, there was a significant correlation between mean age and effect size for intervention programs ($r(26) = 0.51$, $p = .005$), but not for prevention programs. However, looking at the author-derived level of evidence ratings, no significant correlation between mean age and effectiveness was found ($r(43) = 0.24$, $p = .107$).

Still, a trend of higher effectiveness of prevention programs in younger age groups was found to be evident in both effect size and level of evidence indicators (see Figures 2.2 and 2.3).

Figure 2.2

Clustered Boxplot of Effect Size by Age Cluster by Intervention Level

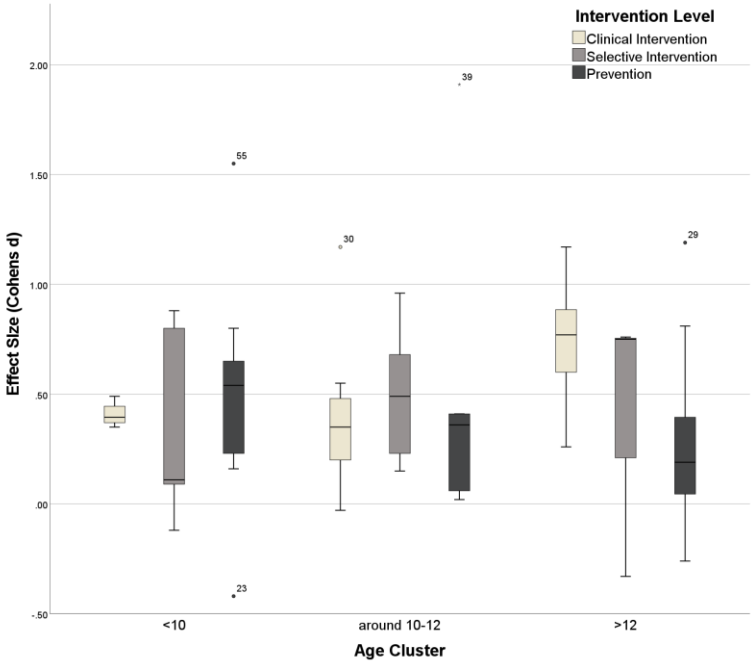
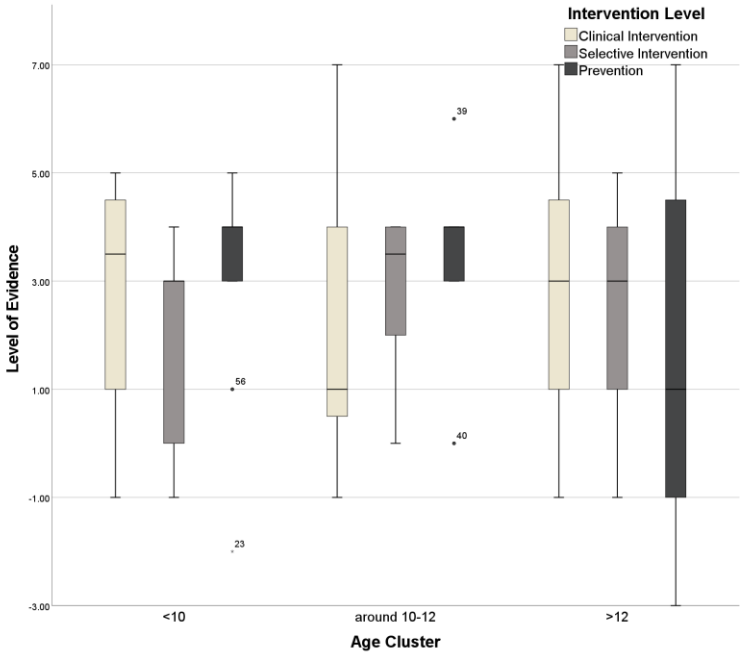


Figure 2.3

Clustered Boxplot of Level of Evidence by Age Cluster by Intervention Level



Effects of Intervention Type

Effect sizes on their own appeared to evidence a small advantage for clinical interventions (*M* = 0.57, *SD* = 0.34) compared to selective interventions (*M* = 0.42, *SD* = 0.41) and prevention studies (*M* = 0.41, *SD* = 0.513). However, this advantage did not appear to be maintained in the more comprehensive author-derived level of evidence rating (see Figures 2.4 and 2.5). Prevention studies received highest quality ratings (*M*= 43%, *SD* = 28,2%), followed by clinical interventions (*M*= 36,9%, *SD* = 21,3%) and trailed by selective interventions (*M*= 30,4%, *SD* = 32,4%) (see Figure 2.6).

Figure 2.4

Boxplot of Effect Size by Intervention Level

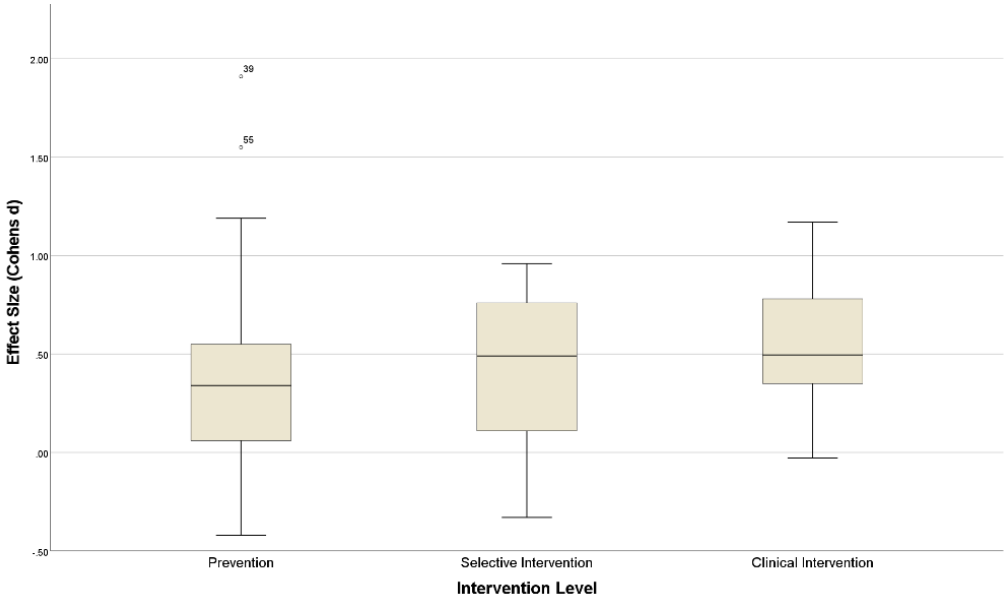


Figure 2.5

Boxplot of Level of Evidence by Intervention Level

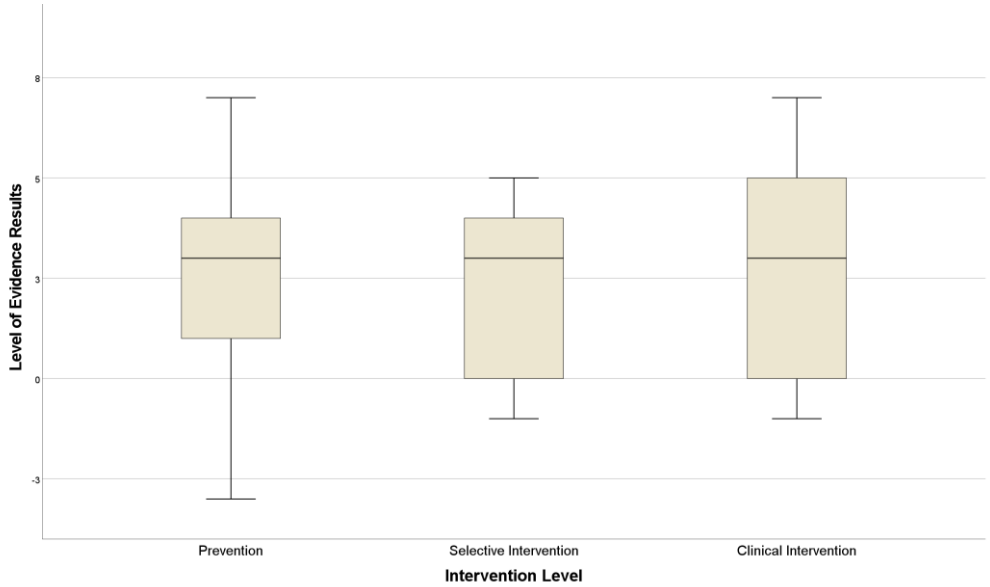
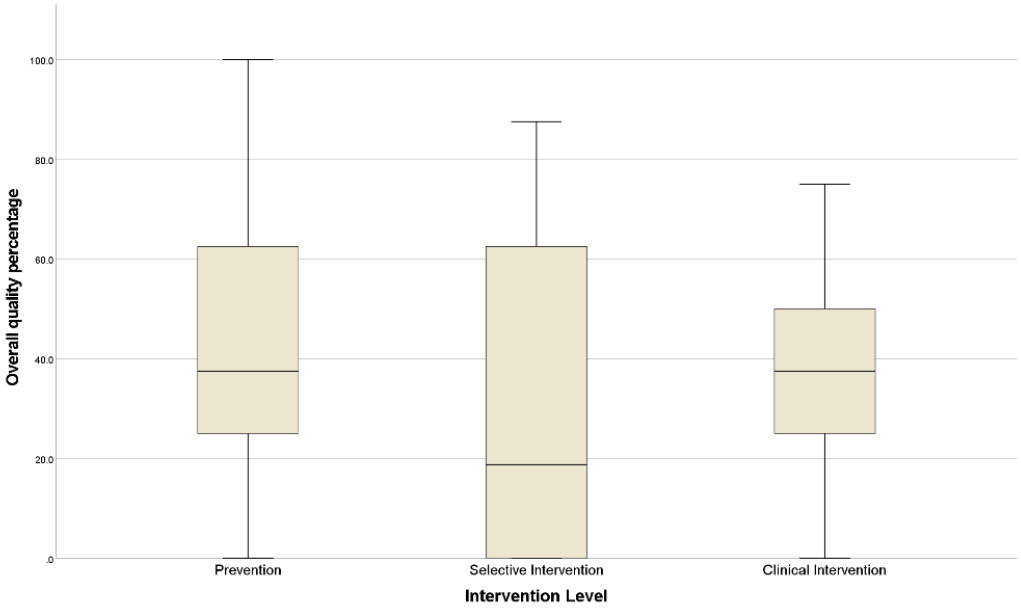


Figure 2.6

Boxplot of Level of Quality by Intervention Level



The following in-depth analyses of each intervention type's effectiveness trends will rely on the author-derived level of evidence ratings, as the authors believe this combined appreciation of effect size, between group effects, follow-up effects and sample size provided better insights into actual effectiveness trends than any one indicator alone. In the following, each intervention type will be discussed separately to provide an overview of peer relationship outcomes, other positive program effects and methodological components employed by the program.

Prevention Programs

Twenty-five papers reported on prevention programs, targeting typically developing children without any emotional or behavioral problems. Mean program length was 18 weeks (*SD* = 23) and 15.1 hours (*SD*=13.4) and mean age of participating children was 11.72 years. Most programs were conducted in a school-setting (72%). Mean program quality was 43% (*SD* =28.2) and mean effectiveness rating was 2.64 (*SD* = 2.78).

Peer Relationship Outcomes of Prevention Programs

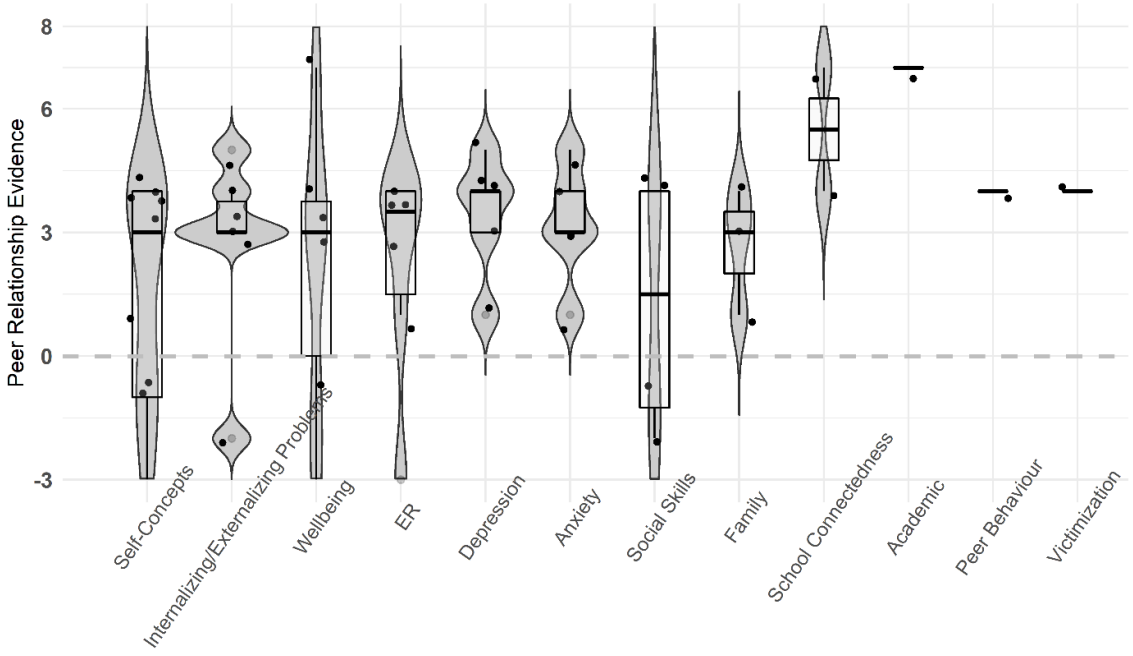
A majority of prevention programs (56%) measured outcomes using peer acceptance or popularity measures. Reported effectiveness of these programs on acceptance or popularity was moderate (see Online Resource 2.3, Table 2). The highest mean effectiveness ratings (3.75) were reported by programs assessing loneliness or connectedness. Friendship quality measures had moderate effectiveness ratings, but promising follow-up trends. However, friendship quality and loneliness results need to be interpreted with caution due to the small number of studies.

Positive Effects of Prevention Programs

Many preventive peer relationship programs had positive effects on psychological wellbeing and mental health factors such as self-concepts, internalizing/ externalizing problems, wellbeing, emotion regulation, depression and anxiety (see Online Resource 2.3, Table 3). Especially depression and anxiety were associated with high level of evidence (mean rating of 3) regarding program effects on peer relationships. This is evident from the violin plot in Figure 2.7, with the anxiety and depression violin being entirely in the positive spectrum of peer relationship evidence. This means, all studies improving anxiety and depression also yield strong positive effects on peer relationships. Figure 2.7 shows that most studies improving self-concepts, internalizing/ externalizing problems, and emotion regulation were in the upper range of the evidence scale, and thus associated with strong peer relationship evidence. This was not the case with social skills and wellbeing factors, as evident in long equally thin violins across the whole peer relationship evidence scale.

Figure 2.7

Positive Effects of Prevention Programs



Note: Violins provide information about the distribution of studies achieving respective positive effects across the spectrum of peer relationship evidence (rated between -3 and 8). Dots represent individual studies and box-plot diagrams represent descriptive statistics for each target effect.

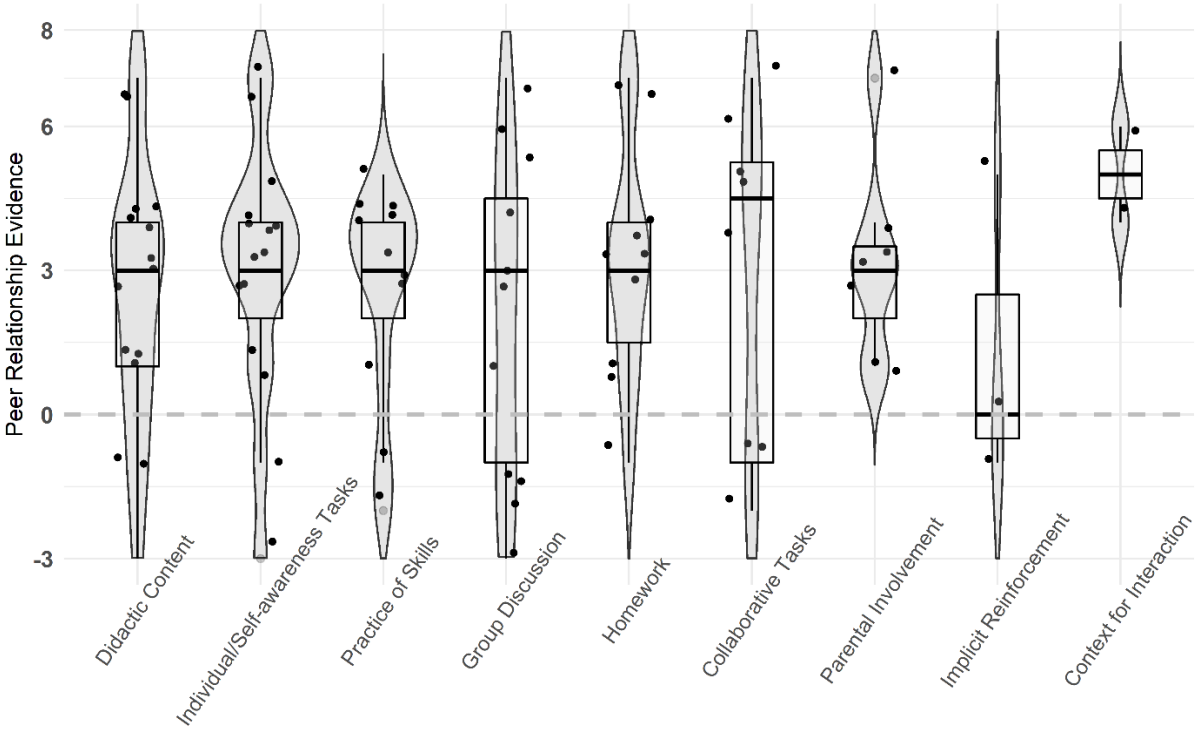
Methods of Prevention Programs

Methods used in prevention programs varied. Didactic content delivery and individual/self-awareness tasks were each present in 60% of prevention programs. Practice of skills, group discussions, and homework were each used in 40-44% of programs. As can be seen in Figure 2.8, a majority of studies with didactic content, individual / self-awareness tasks, active practice, homework and parental involvement was in the upper range of evidence, thus associated with strong positive peer relationship evidence. Although present in few studies, highest and most

consistent effectiveness ratings were found for parental involvement (mean rating = 3, Cohen's *d*= .54), with all studies in the positive evidence range. Didactic content delivery, individual / self-awareness tasks and practice of skills were associated with strong positive effects in 80%-86% of programs and a mean rating of between 2 and 3. As evident in long, equally wide violins, collaborative tasks and group discussion components were associated with varied evidence, although their mean peer relationship evidence ratings of 3 (Cohen's *d*=.45) and 2 (Cohen's *d*=.28) respectively, were similarly strong compared to other methodological components.

Figure 2.8

Methods Used by Prevention Programs



Note: Violins provide information about the distribution of studies employing the respective methodological component across the spectrum of peer relationship evidence (rated between -3 and 8). Dots represent individual studies and box-plot diagrams represent descriptive statistics for each method.

Patterns of Methods and Positive Effects of Prevention Programs

A majority of prevention programs used multiple methodological components in combination. Thus, additional examination of combinations of methodological components, positive target effects and peer relationship evidence were analyzed (see Online Resource 2.3, Table 4). Number of methodological components was not correlated with effectiveness ratings ($r(25) = 0.06$, $p = .76$), neither was number of positive target effects ($r(24) = -0.02$, $p = .93$).

The two most prevalent methodological components of prevention programs, didactic content delivery and individual / self-awareness tasks, were used in combination by 80% of programs. Programs using both methods had a mean effectiveness rating of 2.75. This combination was frequently paired with homework and parental involvement, both of which were almost exclusively associated with strong positive evidence. All of the prevention programs employing these four components had strong positive effectiveness ratings (M = 3.14). This combination of methods was frequently associated with positive effects on self-concepts and health factors (anxiety, depression or internalizing/externalizing problems). A slightly different pattern is identified regarding prevention programs with behavioral focus, that is positive effects on emotion regulation and social skills. These programs were only associated with high levels of peer relationships evidence when conducted with the methodological component active practice of skills.

Selective Intervention Programs for Typically Developing Children

A total of 14 papers reported on selective intervention programs for typically developing children. One of these papers presented two separate intervention programs in comparison to each other. Thus, the following section will report on 15 programs. Children participating in these interventions were selected based on different behavioral or emotional risk factors, such as bullying, social skills deficits, anxiety, loneliness, suicide risk, or general behavioral problems. Mean age of participating children was 9.87 years (*SD*=1.99). Mean program length was 18 weeks (*SD*=27.5 weeks), with a mean of 11.50 hours (*SD*=8.21h). A majority of programs (64.3%) was conducted in the school-setting. Mean evidence rating of these programs was 2.07 (*SD*=2.25) and mean quality rating was 30.83% (*SD*=31.29).

Peer Relationship Outcomes of Selective Intervention Programs

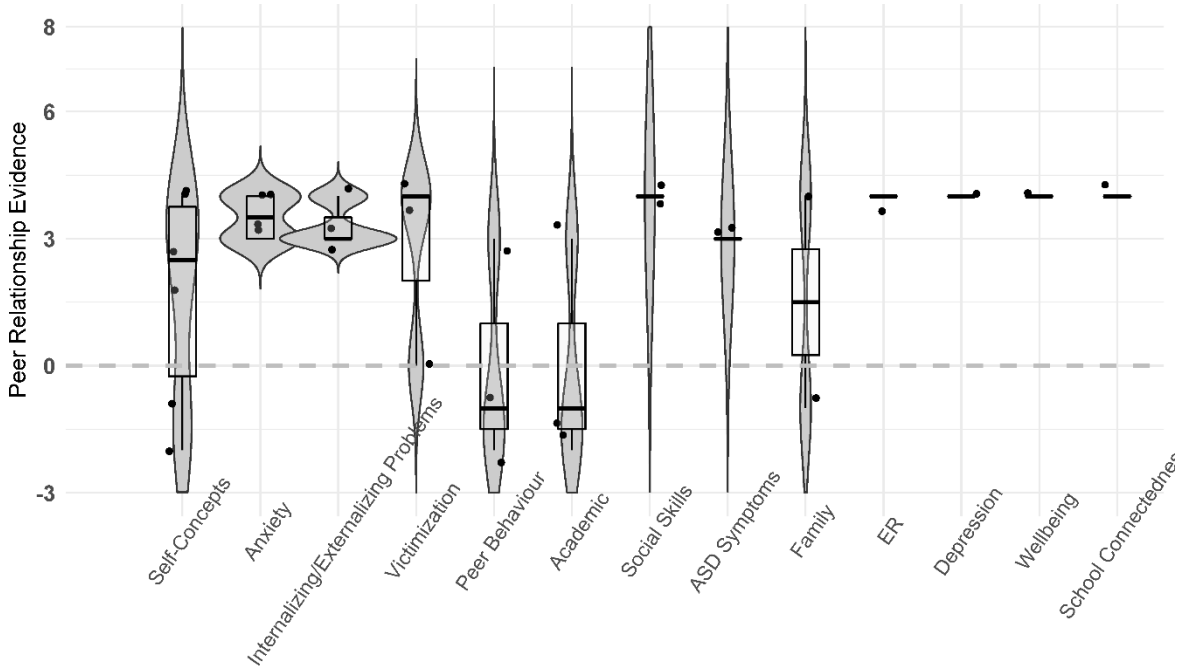
Selective interventions used fewer outcome measures, compared to other programs. A majority of selective interventions used peer-focused measures, such as sociometrics or peer acceptance/ popularity measures. Both outcomes yield moderate effectiveness scores (see Online Resource 2.3, Table 5), however, for both measures, available follow-up data pointed towards maintenance of results. Although fewer studies measured outcomes with loneliness or connectedness measures, these seemed to yield better results (mean evidence = 4) and were associated with higher study quality.

Positive Effects of Selective Intervention Programs

Many selective interventions had positive effects on self-concepts, anxiety, internalizing/externalizing problems, victimization, peer behaviors and academic factors. Especially, self-concepts, anxiety, internalizing/externalizing problems and victimization had high mean level of evidence ratings (see Online Resource 2.3, Table 6). However, as evident from the violins with two bubbles in Figure 2.9, self-concepts, peer behaviors, victimization and academic factors were associated with mixed effects on peer relationships. Anxiety and internalizing/externalizing problems, on the contrary, were consistently associated with positive effects on peer relationships.

Figure 2.9

Positive Effects of Selective Intervention Programs



Note. Violins provide information about the distribution of studies achieving respective positive effects across the spectrum of peer relationship evidence (rated between -3 and 8). Dots represent individual studies and box-plot diagrams represent descriptive statistics for each target effect.

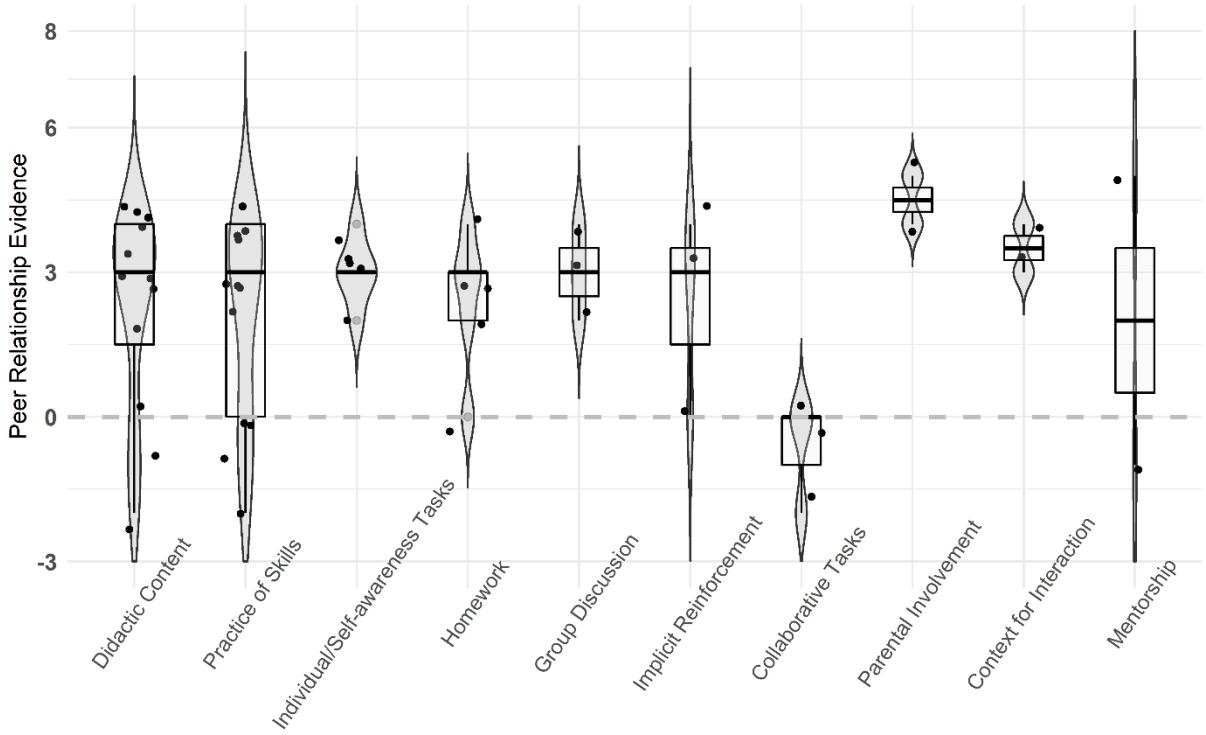
Methods of Selective Intervention Programs

A majority of selective interventions (80%) used didactic content delivery or practice of skills as methodological components. A third of programs used homework or individual/self-awareness tasks and 20% of programs used group discussions, collaborative tasks or implicit reinforcements of behaviors to achieve program goals. As can be seen in Figure 2.10, didactic content and practice of skills were associated with strong evidence ratings in the majority of cases (75% and 67% respectively) and both had a mean evidence rating of 2 (Cohen's *d*= .47 and .4 respectively). Individual/self-awareness tasks and group discussions were both in the upper range of the scale, which implies they were consistently associated with strong evidence

(mean ratings =3, Cohen's *d*= .52 and .81 respectively). Using homework also seemed to be effective (mean rating of 2, Cohen's *d*= .56). Although present in fewer programs, parental involvement and providing context for interaction also seemed promising for achieving high effects (mean ratings of 5 and 4, Cohen's *d*= .72 and .88 respectively).

Figure 2.10

Methods Used by Selective Intervention Programs



Note. Each violin provides information about the distribution of studies employing the respective methodological component across the spectrum of peer relationship evidence (rated between -3 and 8). Dots represent individual studies and individual box-plot diagrams represent descriptive statistics for each method.

Patterns of Methods and Positive Effects of Selective Intervention Programs

For selective interventions, no significant correlation between the effectiveness on peer relationships and number of methodological components (r(15) = 0.266, p = .33) or number of positive effects (r(15) = 0.149, p = .59) was found. However, clear patterns of frequent

combinations of methodological components were identified (see Online Resource 2.3, Table 7). The majority of selective interventions (73%) used a combination of didactic content delivery and active practice in group. Only two programs used one of these components without the other. The combination of these components seems universal for selective interventions, regardless of positive effects on other variables and effectiveness on peer relationships. Generally, more effective programs combined active practice and content delivery with either individual/self-awareness tasks, discussions or parental involvement, while less effective programs combined active practice and content delivery with collaborative tasks. Although the most effective program focused on mentoring, trends or conclusions might be inferred with care, since one of the least effective programs also focused on mentoring.

Indicated Intervention Programs for Children with Clinical Diagnosis

Twenty-two papers reported on indicated interventions for children with clinical diagnosis. Three of these papers reported two separate interventions, thus a total of 25 clinical intervention programs will be compared. The majority of clinical diagnoses concerned autism spectrum disorder (ASD) (18 programs), while four programs focused on attention deficit hyperactivity disorder (ADHD), two programs on mixed populations and one program on anxiety disorder. Mean program length was 15 weeks (*SD*=9.94) with a mean of 22.15 hours spent on program activities. Participating children had a mean age of 12.12 years (*SD*=2.39) and the majority of programs was conducted in a community or social care setting (72%). Mean level of evidence ratings were 2.56 (*SD*=2.45) and mean quality rating was 37% (*SD*=20.25).

Peer Relationship Outcomes of Clinical Intervention Programs

Clinical interventions used a variety of measures to assess peer relationship outcomes. The ASD-specific Quality of Play Questionnaire was frequently used and associated with the

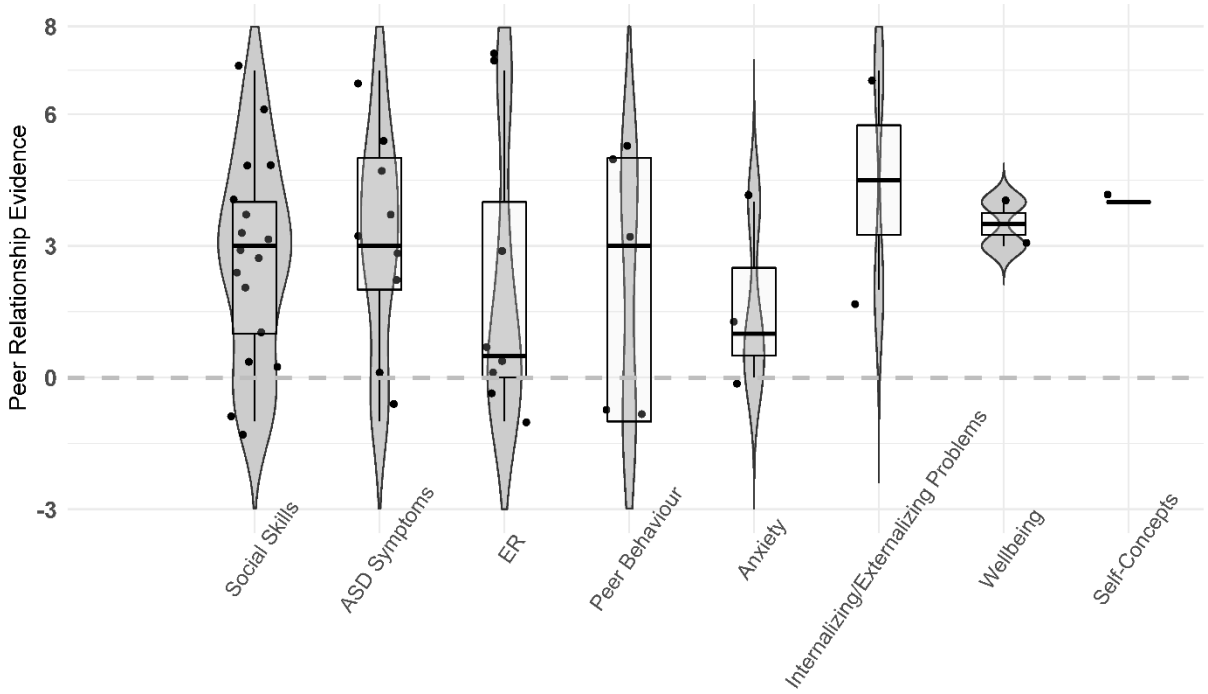
highest mean strength of evidence rating of 3.22 (see Online Resource 2.3, Table 8). Other clinical interventions positively impacted subjective peer acceptance/popularity and sociometric ratings (mean evidence of 2.38 and 2.4 respectively). The interventions' impact on loneliness/connectedness was smaller with a mean strength of evidence rating of 1.33. In contrast to these positive results, effects on friendship quality were sparse, if present at all. With effect sizes between -.15 and -11, and only one program improving over a control, mean strength of evidence rating was -1, pointing to non-existent effects.

Positive Effects of Clinical Intervention Programs

Overall, clinical intervention programs seemed to have positive effects on few specific target variables. Most clinical interventions improved social skills, ASD symptoms, emotion regulation and peer behaviors (see Online Resource 2.3, Table 9). Social skills and ASD symptoms were mostly associated with strong effects on peer relationships, as evident from the larger bubbles of the violins in the positive range of the evidence rating in Figure 2.11. Interpersonal variables emotion regulation and peer behaviors, as well as anxiety were not consistently related to strong evidence, as evident by longer violins and bubbles at the lower end of the peer relationship evidence scale.

Figure 2.11

Positive Effects of Clinical Intervention Programs



Note. Violins provide information about the distribution of studies achieving respective positive effects across the spectrum of peer relationship evidence (rated between -3 and 8). Dots represent individual studies and box-plot diagrams represent descriptive statistics for each target effect.

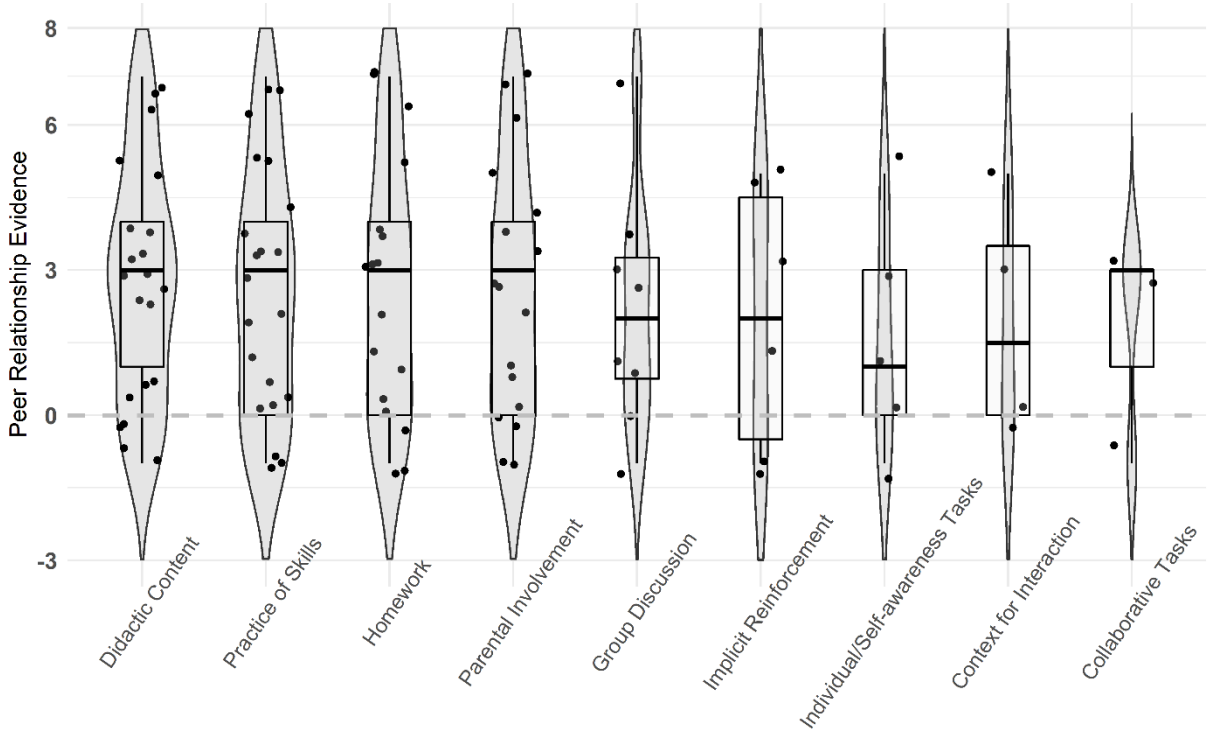
Methods of Clinical Intervention Programs

Most programs implemented didactic content or practice of skills (84%), involved parents or homework tasks (68%). Some programs used group discussions (32%), implicit reinforcement of behaviors (24%) or individual/self-awareness tasks (20%) to achieve program goals. No clear patterns regarding effectiveness of methodological intervention components emerged. Four components, namely didactic content, active practice, homework and parental involvement, were clearly most prevalent. Although all of them had mean peer relationship evidence ratings of 3 (Cohen's *d* between .63 and .65), evidence was spread across the scale as evident in long,

equally wide violins in Figure 2.12. Similarly, group discussions, implicit reinforcement, and individual/self-awareness tasks all achieved mean evidence ratings of 2 (Cohen's *d* between .45 and .63) but evidence was distributed across the scale.

Figure 2.12

Methods Used by Clinical Intervention Programs



Note. Each violin provides information about the distribution of studies employing the respective methodological component across the spectrum of peer relationship evidence (rated between -3 and 8). Dots represent individual studies and individual box-plot diagrams represent descriptive statistics for each method.

Patterns of Methods and Positive Effects of Clinical Intervention Programs

No significant correlation between effectiveness ratings on peer relationship outcomes and number of methodological components ($r(25) = -0.17$, $p = .41$) or number of positive effects ($r(23) = -0.07$, $p = .76$) was found. The majority of clinical interventions (68%) used a combination of didactic content delivery, practice of skills, homework and parental involvement

(see Online Resource 2.3, Table 10). At the same time, a majority of programs achieved positive effects on emotion regulation, social skills, ASD symptoms or behaviors towards others. This combination of specific methodological components and skills/behavior-based variables seems strongly interlinked. Indeed, those few programs yielding effects on variables other than social skills or emotion regulation were also employing different methods. However, no patterns regarding more or less efficient combinations of methods or targets could be identified. The described combinations were present in highly effective programs as well as less effective programs (ratings of up to 7 until -1).

Discussion

Although peer relationships are crucial for healthy social, emotional and physiological development of adolescents, a comprehensive review of the structure and effectiveness of existing peer relationship programs has so far been lacking. To guide intervention development and inform practitioners' choices, a comprehensive overview of existing programs and effective intervention strategies is needed. Therefore, this study aimed to explore which circumstances impact program effects on peer relationships, and which program types work for different target populations. Considerable heterogeneity was found between program types regarding methods, targeted effects, and peer relationship outcomes, highlighting the need for practitioners and intervention developers to align program characteristics with the target population's needs.

General Circumstances Impacting Program Effectiveness

Consistent with other reviews in the field (Durlak et al., 2011; January et al., 2011), effects of age were observed. A trend for preventive programs to be more effective for younger children was identified, which is in line with findings regarding elevated effectiveness of universal programs when introduced during an (early) developmentally significant period (January et al.,

2011). Clinical and selective interventions, however, showed a trend for higher effects in older children. Although other clinical intervention reviews found stronger effects for younger age groups, they also found interaction effects of age and other variables, such as the intervention period (Towle et al., 2020). Interventions usually set in when problems are already present and relevant. Social skills interventions have been understood to be particularly beneficial at the time of school transition as children are increasingly aware of the immanent importance of social skills to initiate positive peer interactions (January et al., 2011). This need might be elevated for a population with ASD or ADHD as behavioral or emotional difficulties are often associated with peer rejection (Perren et al., 2006). Children are likely to become more aware of these peer difficulties and their risk for rejection with increased age.

A negative correlation between time spent on program activities and level of evidence was found. This relationship is surprising as it appears contrary to expectations and findings of other reviews, which postulated larger effect sizes for longer and more intensive interventions (Wolstencroft et al., 2018). Indeed, clinical programs tended to have more program hours and higher effect sizes. Thus, this overall finding might be an artefact of few very long but unsuccessful programs.

Prevention Programs

Preventions had promising effects on self-concepts, internalizing/externalizing problems, depression, and anxiety. Specifically mental health factors, depression, and anxiety were consistently associated with improved peer relationships. As these variables were addressed simultaneously, no inferences regarding causal relationships or the direction of effects can be made. However, these findings suggest strong associations between mental health and social relationships, as found in other studies (Leigh-Hunt et al., 2017). Especially loneliness was

found to be strongly associated with mental health (Heinrich & Gullone, 2006) and have bi-directional links with depressive symptoms (Vanhalst et al., 2012). Preventive programs in this review were particularly effective in reducing loneliness compared to other peer relationship indices.

Additionally, this review's findings suggest a link between improved self-believes, mental health factors and peer relationships. Indeed, positive self-beliefs and identity factors are common target variables of mental health prevention programs (Enns et al., 2016). Low self-esteem was found to predict depression, partially mediated by rejection sensitivity, while rejection sensitivity and depression both accounted for increases in loneliness (Zhou et al., 2020). Low self-esteem and fear of negative evaluation have also been found to play a role in the maintenance of loneliness (Geukens et al., 2020). Thus, implementing peer relationship programs targeting self-believes and perceived loneliness appears to be a promising preventive approach to combat later mental health problems.

Child-centered interventions typically employ interactive methods similar to the methods identified in this review (Brigden et al., 2019; Voight & Nation, 2016). For prevention programs focusing on self-concepts and mental health factors, a combination of homework, parental involvement, didactic content and self-awareness was most prominent. Direct didactic input has been linked to improved cognitive impacts (Nelson et al., 2003), which are essential for improved self-concepts. Another set of prevention programs focused on emotion regulation and social skills. These programs had best effects on peer relationships when employing active skills practice in combination with content or self-awareness tasks. Similarly, other studies reported on the benefits of direct instruction for social-emotional skills promotion (Ashdown & Bernard, 2012). This highlights the importance of a nuanced alignment of methodological components and target variables.

Selective Intervention Programs for Typically Developing Children

Selective interventions targeted similar variables as prevention programs. Associations with high peer relationship effects were found for self-concepts, anxiety, internalizing/ externalizing problems and victimization. The additional focus on victimization is a result of the definition of intervention as a program targeting existing problems, which in the school context often concerned bullying and victimization. Social withdrawal in childhood has been found to predict later depression diagnosis, via a mediational pathway of adolescent peer problems (Katz et al., 2011). Thus, intervening during adolescence to improve existing peer problems seems to be a promising intervention strategy concerning mental health outcomes of at-risk children.

Many selective interventions employed sociometric measures, which assess children's social standing in the group through peer ratings. However, sociometric outcomes were only moderate, which might be explained by the relative stability of sociometric status, specifically rejection status (Jiang & Cillessen, 2005). As selective interventions focused on existing peer problems, it is likely that target children had been rejected by their peers, thus making intervention effects on sociometric standing more difficult to achieve. Loneliness was targeted in fewer studies, but yielded higher effects, similar to prevention programs. Given a similar focus on mental health factors and self-beliefs, these strong effects on loneliness are very plausible as discussed before. Considering findings regarding the mediational role of rejection sensitivity for depression outcomes and its bi-directional links with loneliness (Zhou et al., 2020), selective interventions bear potential to achieve long-term mental health effects by improving children's self-concepts and (social) anxiety, while simultaneously decreasing loneliness.

Although 73% of selective interventions employed a combination of didactic content and active practice, this combination was not necessarily associated with strong effects on peer relationships. A recent meta-analysis found that social skills interventions alone are not sufficient to reduce bullying (da Silva et al., 2018). The authors suggested that bullying as a group phenomenon needs to be addressed by interventions targeting group norms and group processes beyond individual social behaviors (da Silva et al., 2018). In line with these findings, peer relationship interventions for children with behavioral or emotional risk factors might need to go beyond content delivery and skills practice. Recently, beneficial effects of personality-targeting CBT interventions for high-risk victims were reported (Kelly et al., 2020), emphasizing the importance of self-beliefs. Indeed, this review found consistent associations between self-awareness tasks or group discussions and high peer relationship effects in selective interventions. Therefore, interventions for at-risk children might need to combine active practice of social skills (e.g., role-plays, group tasks) and self-awareness tasks.

Intervention Programs for Children With Clinical Diagnosis

Clinical interventions mainly improved peer relationships by simultaneously promoting social skills, ASD symptoms, emotion regulation and peer behaviors. As the clinical diagnoses of children in these studies were mainly ASD and ADHD, typical symptoms are often overlapping with peer problems and can be alleviated by social skills training, as found in other reviews (Wolstencroft et al., 2018). Most clinical interventions in this review employed a typical but also widely successful combination of didactic content delivery, active practice of skills, homework, and parental involvement. Other studies have found similar intervention set-ups for a clinical population with didactic content (Wolstencroft et al. 2018), practical social skills trainings (January et al. 2011), parental involvement (Brigden et al. 2019, Wolstencroft et al. 2018) and homework (Gardner & Gerdes, 2015). Gains in social skills were partially attributed

to gains in social knowledge (Gates et al., 2017), emphasizing the importance of combining content and practical abilities when promoting social skills (January et al. 2011).

Social skills interventions work on the premise of improving children's social behaviors and thereby increasing their social acceptance among peers (Laugeson et al., 2014). Indeed, this review found high effects for interventions targeting peer acceptance and sociometrics, suggesting potential of these interventions to change peer group dynamics. However, setting and group composition are important factors for effects on the group level and transfer of skills to other groups. Clinical interventions in this review were usually implemented in the community in form of training groups for children with ASD or ADHD. These groups offer children proximity and homophily (i.e. common characteristics) to their peers, two factors essential for the establishment of friendships (Kasari et al., 2016). However, positive intervention effects achieved within this particular group context might not be carried over to a classroom setting when it comes to friendships with typically developing peers (Kasari et al., 2016). In line with this, it has been argued that typically developing peers should be involved in clinical interventions through peer-mediated activities (Kasari et al., 2016) or by focusing on typically developing peers' acceptance of unusual behaviors (Mikami et al., 2005). However, stronger effects were found for social skills interventions as compared to typically developing peer-mediated interventions (Kasari et al., 2016). It has been suggested that delivering social skills interventions in the classroom context will increase effectiveness (Laugeson et al., 2014), as target children would simultaneously benefit from social skills trainings and proximity to their typically developing peers.

Although children with ADHD were not found to experience more loneliness or have less friendships, self-reported characteristics of a close friendship varied from typically developing children (Heiman, 2005). Children with ASD were found to report fewer friendships and be

selected fewer times as friend by their peers, while also reporting differences in friendship quality (Kasari et al., 2011). Thus, a clinical population appears to have different peer experiences (Diendorfer et al., 2021). Therefore, the quality of play questionnaire was included as specific measure accounting for different peer relationship experiences of the clinical population and avoiding an underrepresentation of this population in this review. This measure often achieved high effect sizes, which might have impacted the trends for higher effect sizes in clinical studies. Some reviews suggest a plausible connection between a target group more in need of support and higher effects (Pandey et al., 2018). However, a sub-domain of this measure concerned the number of play dates, which is highly sensitive to parental effort and intervention trainers' encouragement. Although high effects are reduced in the current review through the combined level of evidence rating, a confounding factor of unlikely high effect sizes might persist.

Implications for Practitioners and Intervention Development

Overall, intervention developers and practitioners should be clear about realistic peer relationship goals of their intervention efforts. This review showed that preventive programs and selective interventions targeting self-beliefs or mental health factors bear the potential to decrease loneliness. Programs for a clinical population targeting social skills bear the potential to increase number of play dates, perceived acceptance and sociometric status. However, contrary to intuitive expectations of peer relationship programs, friendship quality was not a prominent outcome and hardly improved. Especially strong peer relationships such as friendships, measured by quality aspects such as support, intimacy and trust (Roach, 2019) are far more complex and might take longer to develop. In contrast, peer acceptance, sociometrics and perceived loneliness largely depend on the amount of (successful) social interactions, which can be increased through social skills trainings or merely social exposure. Similarly, other

reviews found most social skills programs to improve interpersonal and emotional skills, while they hardly ever found direct effects on peer relationships (de Mooij et al., 2020). However, the present review found follow-up effects for friendship quality to be rather promising with maintained or even increased long-term effects. This it is noteworthy as increases in effect sizes after follow-up periods were rare among other measures and suggests that relationship quality might be a realistic long-term outcome and just takes longer to develop. Thus, realistic intervention efforts might concern children's perceived loneliness and acceptance by their peers through improved social skills and improved self-esteem. Over time more positive interactions might turn into actual friendships, which is however beyond the scope of a single intervention program.

For preventive efforts, both, group-level indices (sociometrics, acceptance) and individual indices (loneliness) seem to be feasible targets. Highest effects, however, were found for reducing loneliness when simultaneously increasing mental health factors and self-believes, which is supported by other studies (Geukens et al., 2020; Zhou et al., 2020). Thus, practitioners aiming to prevent relationship problems might want to focus on children's individual outlook and self-concept. Such a focus on mental health and self-concepts was found to benefit peer relationships (e.g., reducing loneliness) by implementing methods to support self-awareness and knowledge components. A focus on emotion regulation and skills, however, benefits peer relationships by actively training those skills in the group setting. Thus, a key finding regarding effectiveness was the importance of aligning methods and intervention targets.

Selective interventions were used to address peer problems and victimization, thus often targeting sociometrics and peer acceptance. However, practitioners should carefully consider which peer factors are feasible intervention targets. Peer's opinions (sociometrics, acceptance) were less likely to change as a result of the intervention, while loneliness was found to be more

malleable in the short-term. To interrupt trajectories from withdrawal to later mental health problems (Zhou et al., 2020), it seems therefore more promising for practitioners to address self-believes and mental health factors to simultaneously improve at-risk children's perceived loneliness. A combination of content delivery, practice of skills, self-awareness and group discussions seems suitable for these programs.

Most clinical interventions focused on social skills trainings to alleviate peer problems and manage ASD/ADHD symptoms. They successfully featured a combination of content delivery, active practice, homework, and parental involvement. While this focus on social skills positively impacted children's sociometric status and their play dates, no effects on friendship quality were found and effects on loneliness were mediocre. These findings somewhat contradict previous recommendations to focus on dyadic relationships when working with a clinical population (Gardner & Gerdes, 2015). Based on this review's findings, clinical populations are best supported by training their social skills in a group, allowing them to make new friends. Most clinical interventions are currently set in a community context, but transferring them in a classroom setting might allow for better transfer of skills and positive peer experiences with typically developing peers.

Practitioners should be aware of the importance of family support and at-home practice to ensure transfer and sustainability of skills, as evident from high peer relationship effects related to homework and parental involvement. While parental involvement was previously identified as important intervention component for clinical and at-risk populations (Brigden et al., 2019), this review's results suggest it is also crucial for preventive programs. In the context of children's peer relationships this importance might even be elevated considering the parents' roles in organizing and supporting play dates.

Limitations of This Review and Implications for Further Research

To the authors' knowledge, this review is the first systematic examination of peer relationship programs. However, this topic comes with some inherent limitations apparent in this study. Due to the wide variability of peer relationship indices and settings, considerable heterogeneity of studies emerged. Rather than limiting this review to a subgroup of existing programs, it aimed to provide an overview of programs in all settings and all populations. While this is regarded a strength of this study, it was therefore neither possible to conduct a meta-analysis nor to explore every possible line of interaction between program features and effects. Peer relationship indices, methods and program effects were chosen as main analysis targets as this information was thought to be most relevant for practitioners and intervention developers. Exploring more detailed associations, for example methods and age groups (Brigden et al., 2019), was beyond the scope of this review.

As a-priori exclusion of non-randomized trails has been discouraged (Gluud, 2006), this review included RCTs, CTs and uncontrolled trials. Randomization of intervention groups or the employment of a control group is sometimes difficult to achieve in the context of at-risk children in need of support or school settings with school personals' time restrictions and preferences for either group. However, uncontrolled trials are naturally disadvantaged. Due to the instability of relationships and pronounced loneliness during adolescence (Wong et al. 2018), an intervention program achieving some stability in peer relationships might actually be a successful program. However, this would only be evident compared to a control group showing drops or changes in relationships. Thus, uncontrolled studies failing to produce significant peer relationship improvements might not necessarily be unsuccessful.

A considerable limitation concerns the high percentage of poor-quality studies – a total of 86,4% of included papers – when assessed with the standardized Cochrane RoB 2 measure. This is very problematic as methodological aspects (which are usually assessed in ROB ratings) tend to be correlated with outcome indices (Cheung & Slavin, 2016). Low quality papers included in this review tended to produce higher effect sizes, a pattern previously reported (Mackenzie & Williams, 2018). To reduce this bias and to allow for careful appreciation of results of non-RCTs (Katikireddi et al., 2015), the Cochrane ROB 2 tool was adapted. The author-derived level of evidence rating allowed for a nuanced rating of existing evidence without downgrading studies without control group or follow-up. Higher effects as rated with this tool were better aligned with high study quality.

Missing information regarding program descriptions and program implementation was one of the biggest obstacles encountered and constitutes another limitation regarding the analysis of intervention contents and methods. For 57 of originally identified papers, authors had to be contacted for a description of program contents and implementation procedures as the paper did not provide sufficient detail. Only 26% of papers reported appropriate implementation fidelity checks, which is a common problem addressed in other reviews (Laugeson et al., 2014). Thus, for almost three quarters of included papers in this review it is unclear how successful and rigorous implementation was. Given that implementation is crucial for intervention effectiveness (Durlak & DuPre, 2008; Voight & Nation, 2016), this lack of reporting might bias the interpretation of results.

Poor reporting standards regarding implementation, analysis, or control groups and poor quality of studies are common problems regularly criticized within the field (Durlak et al., 2011; Mackenzie & Williams, 2018). Only a quarter of published intervention papers was found to provide information about factors promoting intervention effectiveness and only 5% discussed

economic factors (Premachandra & Lewis, 2021), which is highly problematic, as intervention research should aim at informing practitioners' use. Although intervention literature is popular in psychology and education, information on successful programs does not easily reach practitioners, resulting in few interventions being sustained (Durlak & DuPre, 2008). To increase the impact of intervention research and make research findings more applicable for practitioners and policy-makers, reporting of intervention strategies and implementation processes needs to be more rigorous. More rigorous reporting will also reduce potential bias and allow for more nuanced analyses. The more nuanced findings of the author-derived rating tool used in this study emphasize the importance of complex effectiveness evaluations in reviews in order to reduce bias in the interpretation of results.

Conclusion

Despite their potential to support healthy development and improve public health, peer relationship programs have so far been neglected in the literature. A comprehensive review of existing peer relationship programs was conducted to explore circumstances furthering program effectiveness and appropriate methods and targeted effects for different target populations. Intervention developers and practitioners need to put their target population's needs in the center of each intervention effort. For preventive efforts, peer relationships seem to improve alongside mental wellbeing and self-concepts, especially when starting at a young age. Intervention programs addressing peer problems or victimization have been shown to be most effectively addressing loneliness by focusing on metal wellbeing and self-concepts. Focusing on a clinical population, peer relationships were improved alongside social skills, emotion regulation and managing symptoms. Additionally, a close alignment of intervention methods and desired effects is essential, such as practical activities and homework to train emotion regulation and social skills or self-awareness tasks to address mental wellbeing. For further

clarification of implementation effects, future intervention studies should put more emphasis on rigorous reporting of intervention characteristics and methodological aspects. Heterogeneity of methodological quality and poor reporting standards are a major problem for efforts to synthesize findings within the heterogeneity of peer relationship programs.

Main Findings and Implications of Chapter 2

Preventive and selective intervention programmes were found to effectively target loneliness and connectedness, particularly in combination with a focus on mental wellbeing and self-concepts. Indicated intervention programmes successfully targeted an increase in play dates and perceived popularity or acceptance and peers' sociometric ratings. These programmes seemed to achieve positive effects by addressing social skills, emotion regulation and clinical symptoms. Overall, a close alignment between methods and target abilities appeared to be essential. To achieve such a close alignment, a thorough understanding of the target populations' abilities, needs and perspectives is vital (Hagen et al., 2012; Milton et al., 2021). Therefore, the systematic review of the evidence base was complemented with a large-scale study focused on stakeholder involvement (Hagen et al., 2012) to understand target children's experiences regarding peer relationships. To identify appropriate participatory methods for the involvement of children in intervention development, a comparison of four qualitative methods was conducted. Findings aimed to inform further stages of this intervention development process as well as guide other researchers with similar aims.

CHAPTER 3

Engaging Children in Intervention Development – A Comparison of Four Qualitative Methods and Their Suitability to Elicit Information Relevant for Early Intervention Development

Presented in the format submitted for publication.

Pollak I., Stiehl K.A.M., Schrank B., Birchwood J., Krammer I., Mitic M., Rogers J.C., and Woodcock K.A. (2022) Engaging children in intervention development – A comparison of four qualitative methods and their suitability to elicit information relevant for early intervention development [Manuscript submitted for publication]

Abstract

Stakeholder involvement in intervention development has become increasingly popular and is understood as crucial for successful implementation. However, methodological difficulties persist regarding the implementation of appropriate participatory methods to engage children and collect relevant information for intervention development. This paper discusses four creative, qualitative methods – a brainstorming task, an individual letter, a story-based task, and a focus group task – and compares their suitability to generate relevant information for early intervention development. These four methods were used in the early stages of a project aiming to develop a peer relationship intervention and were analysed using thematic analysis. Based on theoretical considerations, information categories (a) definition aspects, (b) context factors, and (c) change mechanisms were of interest, while (d) examples and experience and (e) additional information were identified as prevalent categories through inductive thematic analysis. Definition was a prevalent theme generated by the brainstorming task, although the sticky note format limited the depth of individual answers. The secret letter, which allowed children to share ideas privately, was found to be useful for generating more in-depth reflections on definitions and personal experiences. Stories and focus group discussions were found to be useful for generating varied context factors and change mechanisms, although stories also generated fictional elements and external solutions. Providing different qualitative methods and allowing children to choose how they prefer to communicate their thoughts proved important for collecting authentic, in-depth information.

Keywords: Arts Based Methods, Community Based Research, Focus Groups, Narrative, Methods in Qualitative Inquiry

Introduction

While health intervention development was theory-based for a long time, recent years have seen a shift to a new mindset focusing on participation (Palmer et al., 2019) as encouraged by funders and governments (Leask et al., 2019). The extent of stakeholder participation in research can be described as a continuum (Leask et al., 2019), which in the case of health care interventions ranges from basing interventions on the target population's views to involving stakeholders in decision-making (O'Cathain, Croot, Sworn, et al., 2019). Any type of stakeholder collaboration has been suggested to identify potential obstacles early on (Hagen et al., 2012), tailor interventions to the target group's needs (Milton et al., 2021), increase effectiveness of the development process (Leask et al., 2019), and support positive outcomes on community and individual levels (Singh et al., 2017). At the same time, the United Nations Convention on Children's Rights (UNICEF, 1989) and the "new social studies of childhood" shifted children's role from passive research subject to active stakeholders (Fargas-Malet et al., 2010). New guidelines and frameworks have been proposed for including children in research (Hawkins et al., 2017; National Institute for Health and Clinical Excellence, 2007). However, less than 1% of empirical adolescent research actually included children in any participatory or advisory roles and when they did it was mainly 12- to 18-year-olds (Sellars et al., 2021). Difficulties of including children in participatory *research approaches*, which actively involve stakeholder in all decisions (Montreuil et al., 2021), are well-documented, especially regarding children's voices and power (Bradbury-Jones et al., 2018). However, a first step would be to reflect on appropriate participatory *methods,* which aim to engage stakeholders in a particular data collection process (Montreuil et al., 2021), but could be used on the full continuum of stakeholder collaboration from collecting feedback to placing all control in stakeholder's hands (Leask et al., 2019).

Finding appropriate participatory methods to engage younger children and collect their perspectives while minimising bias poses substantial difficulties. Observations and measurements are ruled out as they frame children as the research object rather than active stakeholders (Barker & Weller, 2003). Additionally, children have difficulties with the abstract nature of questionnaires aiming to assess their true level of knowledge (Mellor & Moore, 2014). Traditional interview methods are prone to researcher inflicted bias due to power imbalances between child and adult researcher (Barker & Weller, 2003; Spyrou, 2011). Even for older age groups concerns have been raised about participants' ability to share their actual feelings (Bahn & Barratt-Pugh, 2013). To adequately involve children, a safe environment and trusting relationship needs to be established and the researcher's role needs to be shifted from leading the research to empowering the child and facilitating them to leading the research (Benninger & Savahl, 2017). More varied, open, experimental, and arts-based methods are suggested (Fails et al., 2012), allowing children to choose methods to introduce their lines of thoughts and lead the discussion (Fargas-Malet et al., 2010). Research efforts aiming to involve children as active stakeholders thus need to embrace qualitative methodology and go beyond traditional forms of interview and focus groups.

Methods suitable to inform early intervention development need to generate data to define how the problem occurs in children's lives (i.e. definition) and clarify how to achieve successful outcomes (i.e. intervention strategies) (Hagen et al., 2012). Thus, in-depth stakeholder collaboration is advised to (a) define the problem, (b) understand which malleable context factors promote positive changes, and (c) identify change mechanisms (i.e., possible intervention strategies) (Wight et al., 2015). However, there is currently a lack of guidance on suitable participatory methods to collect data relevant to these specific information categories in early intervention development stages. Thus, researchers regularly describe their

participatory development process as learning experience (Dykstra Steinbrenner et al., 2015), instead of being able to follow existing guidelines. To address this gap, the present study compared four qualitative methods on their suitability to engage children and elicit data relevant to information categories needed for early intervention development (i.e., definition of the problem, context factors and change mechanisms).

The Present Study

The present study was embedded in a wider research project with a focus on peer relationships in children aged 9 to 11. The long-term goal was to develop an intervention facilitating positive peer relationships in the context of middle school transition. In the first stage of this research, a qualitative research workshop was implemented in schools to understand children's perspectives regarding peer relationships and school transition. The unique set-up of this study, which engaged a large sample (n=506) of children in different qualitative methods on the same topic, allowed for a novel analysis and discussion of the nature of collected data. Specifically, this study aimed to assess the potential of four qualitative research methods - a brainstorming task, an individual letter, a story-based task, and a focus-group task – to engage children aged 9 to 11 and elicit information relevant for early intervention development. Methods were compared to address the research questions (a) how much detail and depth are generated for information categories relevant in intervention development (i.e., definition, context, change mechanism, experience) by each of the methods and (b) which advantages and challenges are posed by each method. Based on the theoretical guidelines presented above (Hagen et al., 2012; Wight et al., 2015), three information categories were of interest: definition aspects (i.e., core aspects of friendship), context factors (i.e., environmental aspects, circumstances or other people facilitating friendships), change mechanisms (i.e., strategies and sequences of action that lead to building and navigating friendships). As an additional category of interest, examples

and experiences were added, as these were prevalent in the data and they are likely to describe how context factors and change mechanisms come into effect in the target group's lives. This analysis aimed to guide researchers when choosing and implementing qualitative participatory methods with children in early stages of intervention development.

Study Design

Participants

In order to reach a large and diverse sample and allow all children to participate in this research, a two-hour research workshop was implemented in schools between October and December 2018. Ethical approval was obtained from the ethics committee at the Vienna University of Music and Performing Arts (EK-Nr. 10/2018). To reach the target age group of 9- to 11-year-old children, fourth-year primary school and first-year secondary school classes were recruited via the Lower Austrian Department of Education, networking events, and social media. The research workshop was conducted in 54 classes from 29 schools across Lower Austria. In some schools, multiple classes of the same year (e.g., two first-year secondary school classes) participated. Schools were selected to represent diverse backgrounds, with urban and rural areas, large and very small schools, and different socio-economic backgrounds. The full sample comprised 916 students from 22% primary schools, 71% secondary schools (including comprehensive secondary schools and grammar schools), and 7% special needs schools. Due to this study's focus on the detail and depth of collected information, it was deemed more appropriate to focus the analysis on a coherent subset of the sample to minimise age- or school-related bias and make the data more comparable. Thus, the presented analysis focused exclusively on data collected from 28 first-year classrooms of state-funded, comprehensive

secondary schools. The included sample comprised of 506 students with a mean age of 10.59 (*SD*=0.69) and a gender distribution of 50% boys and 45.8% girls (see Table 3.1).

Table 3.1

Socio-Demographic Information of Included Sample

Variable	N=506	Percentage
School area		
Urban area	228	45%
Rural area	278	55%
Gender		
Female	232	45.8%
Male	253	50%
Missing	21	4.2%
Age		
9	1	1.7%
10	249	49.2%
11	181	35.7%
12	54	10.7%
Missing	21	4.2%

Note. To make the data more comparable, only first-year classrooms of state-funded secondary schools were included in the sample. Information on age and gender were collected on individual questionnaires, which were not completed by all children, thus there is 4.2% of missing data in these categories.

The School-Based Research Workshop

The research workshop was developed by an international team of psychologists, psychiatrists, teachers, and arts practitioners and iteratively refined with stakeholders. This workshop employed participatory methods to work collaboratively with children as active stakeholders and establish a shared understanding of the importance and difficulties of peer relationships. Interactive activities such as brainstorming with sticky notes, elaboration with stimuli,

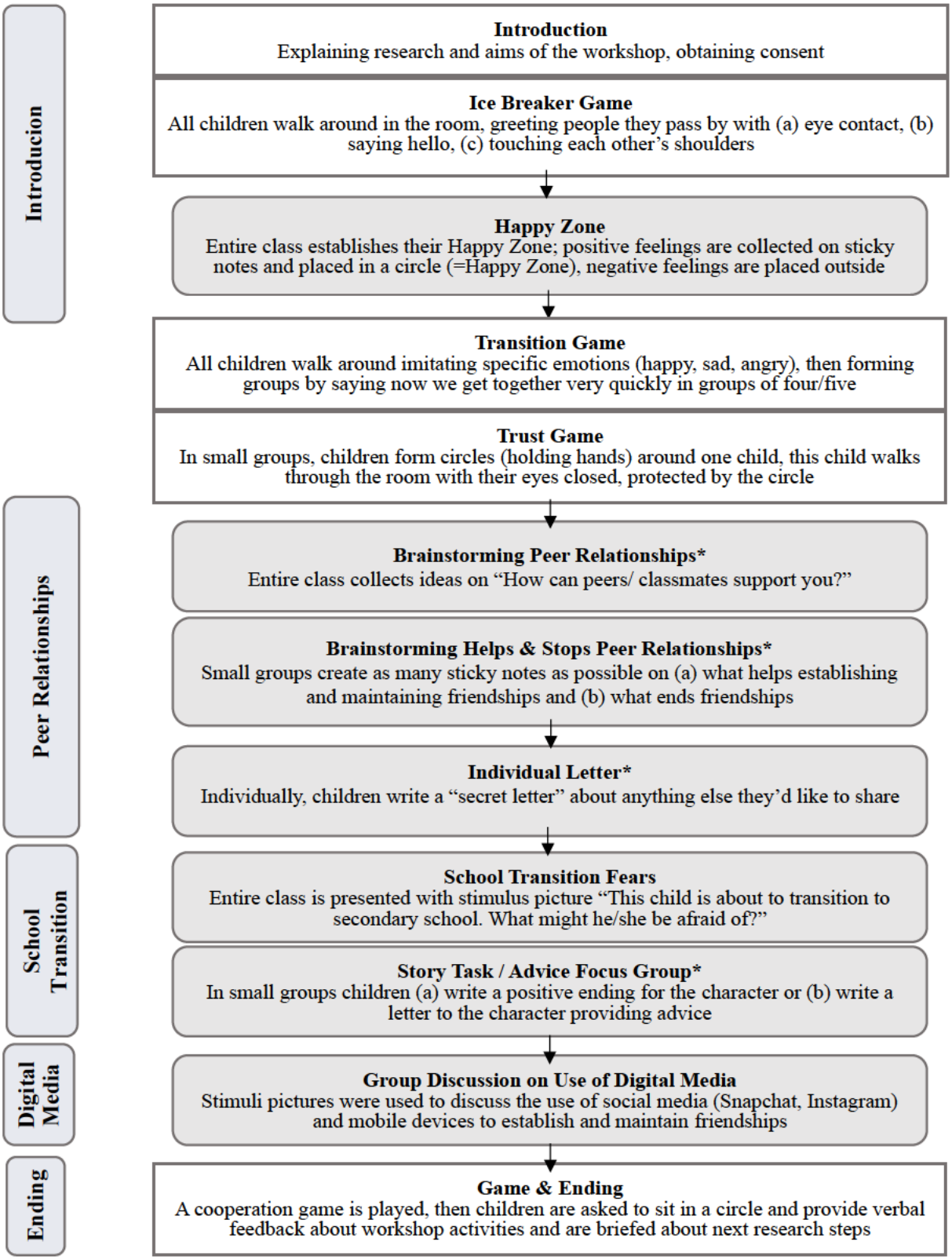
cooperative storytelling, group discussions, and individual letters were adapted from the literature (Fails et al., 2012; Halskov & Dalsgård, 2006; Walsh et al., 2011) Creative methods foster a comfortable atmosphere, dissolve communication barriers, and elicit children's authentic voices (Jackson Foster et al., 2018). Providing methods featuring different expression modes (e.g., verbal discussion, writing, drawing) was essential to give children control over their communication channel (Fargas-Malet et al., 2010). The workshop was pilot tested with two classes a month before the start of the study. Activities were adjusted to the research aims while being minimally distressing (e.g., talking about negative experiences). The workshop comprised seven research activities and additional game-based activities, used as transitions and activation (see Figure 3.1). To establish rapport and trust between researchers and children (Spyrou, 2011), an extended introduction with games and activities establishing the workshop's aims (creating a "Happy Zone") was incorporated. Throughout the implementation phase, coherence between research aims, implementation of activities (wording, data collection procedure), and quality of data was monitored and adjusted as needed (Morse et al., 2002).

Parents (or legal caregivers) received information sheets as well as child-friendly information sheets to be read to their child. If both the child and the parent were happy for the child to participate, parents were asked to provide written consent. At the beginning of the workshop, children were again informed about the aims and process of this research and were asked to provide additional verbal assent. Workshops were implemented by two workshop leaders (members of the research group) and up to four facilitators (students in psychology, music therapy, and pedagogy). To achieve maximum implementation fidelity, a written workshop manual was developed providing detailed activity descriptions and instructions (materials are available in a data repository on the open science framework platform OSF at https://osf.io/2u7r4/) and facilitators participated in trainings before and during the study

period. This paper discusses four methods implemented in the workshop which were similar regarding their research questions and thus allow for a comparison of the collected data.

Figure 3.1

Flowchart Workshop Structure



Note. Activities marked with asterisk were included in the presented analysis

Brainstorming with Sticky Notes

Brainstorming activities are typically used in early development stages to collaboratively collect a variety of ideas (Fails et al. 2012). Open tasks were found to elicit more *ideas*, while written and verbal activities elicited more specific *criteria* (Sluis-Thiescheffer et al., 2007). Thus, two related but slightly different brainstorming activities were implemented. First, children were asked to think of different ways their peers or classmates could support them. This open research question was posed to the whole group and children were encouraged to discuss each other's ideas (e.g., "Ok, you want to cheer up your friend, what could you do to cheer them up?"). Ideas were collected by the workshop leaders on a poster, and after ten minutes of discussion, children were handed sticky notes and pens to add further ideas themselves. Next, children received green and red sticky notes in small groups and were asked to collect positive and negative characteristics of peer relationships as a group and individually (green "What makes a friendship?", red "What stops you being friends with someone?"). In this analysis, data of both brainstorming tasks (i.e., Peer Relationships, Helps & Stops Peer Relationships) was combined, since collected data was similar and generated themes overlapped. To make the data more comparable, this analysis focused on positive aspects of friendships only.

The Secret Letter

An individual "secret letter" activity was included to allow children to (a) anonymously express thoughts and (b) give more introvert children, who might prefer not to discuss personal experiences in a group setting, an outlet (Barker & Weller, 2003). At this point, children were reminded of the previous questions around positive and negative aspects of peer relationships. A deliberately open question "Is there anything else you want us to know regarding your peer

experiences?" was posed, allowing children to structure their replies themselves (Bagnoli, 2009). To make this activity exciting, children were instructed to look for a quiet place in the classroom and let nobody else have a look at their secret letter. The finished letters were folded and returned to a crafted post box.

Finishing the Story

A set of cartoon pictures of children was presented, and a volunteer was asked to draw a card. After agreeing on a name for the fictional character, the workshop leader explained that this child was about to transition to secondary school and was quite anxious. Participants were now asked to brainstorm why this fictional character might feel nervous about their school transition. A scenario, which engaged participants and evoked comments (Bahn & Barratt-Pugh, 2013), was created aiming to instil a sense of ownership over the story in the children (Walsh et al., 2011) and provide a background for the following task. Children were then asked to gather in small groups and continue the character's story. They were encouraged to explore how fears could be overcome, what could happen to change the situation and who could help the character. The use of a fictional character allowed children to distance themselves from this potentially emotional situation and explore and discuss "extreme" feelings of a fictional, very anxious child (Blythe & Wright, 2006).

Focus Group Collecting Advice

The data collection process was continuously monitored and research activities were adapted as needed (Morse et al., 2002). For reasons presented in the discussion section, the Finishing the Story task was adapted and turned into an open focus group, collecting advice for the fictional character. Out of the presented workshop data, 40% of workshops included the story task, while 60% of workshops included the adapted focus group task. To create a focus group

setting, facilitators asked children to gather in small groups and jointly write a letter to the fictional character, giving advice regarding strategies to overcome fears and navigate the school transition. To facilitate discussion by shifting the focus from the child-researcher conversation to a conversation between the child and a character, using puppets has been suggested (Epstein et al., 2008). As puppets seemed too immature for the age group of 10-year-olds, they were asked to write a letter to a fictional character. Additionally, listing ideas and strategies can facilitate more elaborate discussion around strategies and possible intervention efforts (Colucci, 2007).

Data Analysis

Data was collected during the workshop on post-it notes, posters, and the blackboard. Additionally, workshop facilitators took notes on structured observation sheets. The data is available on the open science framework platform OSF at https://osf.io/avtw2/. While this paper will focus on research methods and discuss information categories, three separate reflexive thematic analyses or content analyses were conducted to analyse the data regarding (a) peer relationships (Krammer et al., 2023), (b) school transition (Stiehl et al., 2023) and (c) children's use of online devices (Mittmann et al., 2022).

Analytic Approach

Guided by this paper's aim of comparing four qualitative methods regarding their suitability to elicit information relevant for early intervention development, a bespoke thematic analysis was conducted, including elements from deductive framework approaches (Goldsmith, 2021) and inductive thematic analysis (Braun & Clarke, 2006). Data collected on hand-written notes was digitalised and electronic documents were analysed in the qualitative data analysis software QSR International's NVivo 12. Imported data took the form of clearly separated word chunks,

short sentences, or short cohesive narration or exchanges. After the first author familiarised herself with the data, a framework of pre-defined themes was created, based on goals of early intervention development stages defined in literature (i.e. definition, context, change mechanisms) (Hagen et al., 2012; Wight et al., 2015) and dominant themes generated from the data (i.e., examples and experience, additional information) (Goldsmith, 2021). Data was indexed using line-by-line coding on a semantic level to apply the framework to all the data (Goldsmith, 2021). Thus, each data point (word chunks, sentences) was linked (i.e., coded) to at least one of the pre-defined themes. Some data points might be linked to multiple pre-defined themes simultaneously, as information might refer to multiple themes (e.g., asking a teacher for help, who then encourages classmates to be kinder, would classify as change mechanism, but the teacher would simultaneously be a context factor). The first author created the framework and lead the indexing process but discussed each analysis step with the other authors.

The final framework included the themes (a) definition aspects, (b) context factors, and (c) change mechanisms, which were a-priori defined based on literature, and (d) examples and experience and (e) additional information, as generated from the data. Definition aspects (a) were defined as aspects important to build and maintain friendships, that is, pertaining to all accounts of values, benefits, expectations regarding friendships (e.g., “when they are there for you”). Context factors (b) were defined as external factors facilitating friendships, that is, environmental aspects, circumstances, or other people (e.g., school trips). Change mechanisms (c) were defined as strategies and sequences of action aiming to build and maintain friendships (e.g., daily phone calls to keep in touch). Examples and experiences (d) were defined as personal accounts using first person and mostly past tense to describe any situations relevant to friendship building and management (e.g., “I make friends when I join them in a game”). Additional information (e) was added to the framework to create a comprehensive picture of

the generated data, including information which might not be relevant for a friendship analysis (e.g., feedback on the workshop).

To further describe the data, a data-driven inductive approach was used (Braun & Clarke, 2006) to create sub-themes for each of the pre-defined themes. The first author completed a preliminary analysis and then discussed coding decisions, themes, and definitions with the other authors. An iterative process of identifying, structuring, and discussing sub-themes with the team of authors, following collaborative analysis procedures (Braun & Clarke, 2019), was implemented until a coherent structure of consistent, clearly defined and mutually exclusive sub-themes was created (Braun & Clarke, 2006). These inductive sub-themes aimed to further describe data within each of the pre-defined themes (e.g., context factors were further differentiated into events and places, personal circumstances, assets, and characteristics of other people) and thus had to be mutually exclusive. Sub-themes were numbered consistently (e.g., A1) across all four qualitative methods to facilitate their comparison across methods. For definition of sub-themes, see analysis tables in Appendices 3.1-3.4, column "interpretation" of the codes and "examples". In order to make comparisons across methods, Table 3.2 was created to summarise the data and variations in the pre-defined themes and inductively generated subthemes were examined (Goldsmith, 2021).

Epistemology and Researcher Positionality

The pre-defined research aims (as required for funding proposals) and predetermined methodological set-up of this research workshop did not allow children to set their own agenda. This is not fully in line with the specific participatory epistemology (Pincock & Jones, 2020) of research approaches aiming to empower and emancipate children (Kellett, 2010). However, to strike an appropriate balance between participatory research approaches and the important

research questions under consideration here, the researchers aimed to reduce power imbalances between children and adults as much as possible and perceived participants as active contributors. A critical realist viewpoint was adopted by the researchers. Researchers believe that the presented findings relate to a reality of friendship problems, trajectories, and strategies in the context of school transition. At the same time, researchers are aware that the researchers themselves had a role in constructing this knowledge (Coyle, 2016; Maxwell, 2022). As this knowledge was socially constructed in the interactions between researchers and children, the findings cannot be understood as absolutely objective (Willig, 2013). Researchers were mindful about their role and actively reflected on their interactions with children and their inevitable influences in an understanding that it cannot be avoided that their own biography shaped the research process (Denzin & Lincoln, 2011).

All authors and workshop facilitators are white, middle-class researchers with higher education degrees. The authors' backgrounds are in psychology, education, and psychiatry and all senior authors are experienced with qualitative research and intervention development. The first author, a female early career researcher with a psychology degree, was involved in workshop development and implementation, oversaw data collection, and conducted the data analysis. She has conducted a review of friendship interventions (Pollak et al., 2022) which informed deductively defined themes of the presented analysis. Inductively generated sub-themes are likely to have been influenced by the first author's experience of collecting data through discussion and interaction with participants. To achieve reflexivity of the research process, the authors reflected on their own input to the data generation process and discussed analysis and interpretation with authors, who were not involved in the workshop development and delivery (second and third author), to achieve a balanced perspective on the data. However, the authors' personal experience in implementing the described methods and their reflections on children's

behaviour and feedback to the methods, is considered a strength and adding to a comprehensive discussion of methodological aspects.

Results

While all of the pre-defined themes were generated for the story and focus group task, only four out of five themes were generated for the brainstorming and secret letter task. Regarding the inductively generated subthemes, there was some overlap between methods (see Table 3.2), emphasising similarities in generated data.

Table 3.2

Overview of Themes Generated for all Four Methods

Method	A) Definition of Friendship	B) Context Factors	C) Change Mechanisms	D)Examples/Experience	E) Additional Information
Brainstorming with Sticky Notes	**A1) Characteristics of Friendships** (getting along well) **A2) Values and Expected Benefits of Friendship** (being who you are)	**B1) Events** (school trips) **B2) Personal Circumstances** (living close to each other)	**C1) General Behaviours** (being nice / helping) **C2) Shared Activities** (cycling / ice cream) **C3) Identity Aspects** (being honest /shy)		**E1) Other Sources of Happiness** (cuddling with my cat/horse back riding)
Secret Letter	**A2) Values and Expected Benefits of Friendship** (everyone should be respected by others) **A3) Philosophical Reflections and Questions** (it takes time to become friends)		**C1) General Behaviours** (strategies, e.g. First: approach them, second: play or behaviours, e.g. say hello) **C3) Identity Aspects** (always being happy)	**D1) Self-disclosure About Own Friendships** (feelings and emotional experiences, e.g. I recently lost my best friend) **D2) Personal Strategy Use** (I make friends when I start playing with them) **D3) Self-disclosure about Worries and Problems Unrelated to Friendships** (stealing money)	**E2) Direct Messages** - to classmates (e.g. you are the best) - to researchers (e.g. Children ages 10-15 are easily embarrassed) **E3) Workshop Feedback** (what you are doing is great) **E4) Unrelated Comments** (how do you get white teeth – by eating apples)
Finishing the Story	**A2) Values and Expected Benefits of Friendship** (The more friends you have, the safer you feel) **A4) Long-Term Outcomes** (they stay friends forever) **A5) Implicit Expectations of Why Friendships Form** (Because new friend is the	**B1) Events and Places** (school trips, birthday parties) **B2) Personal Circumstance** (They have known each other forever) **B3) Assets** (PS4, new computer) **B4) Characteristics and Behaviours of Other People**	**C1) General Behaviours and Activities** (cheering someone up / have fun and talk to them) **C2) Shared Activities** (building a fort in the woods) **C3) Identity Aspects** (she is funny / good in sports)	**D4) Personal Experience of Making New Friends** (I met someone through a Playstation game, I followed them, we became friends.) **D5) Putting Oneself in Character's Situation** (I would go crazy if I was bullied. I'd ask my dad for help.)	**E5) External Solutions** - **Wishful Thinking** (A new girl joins class and defends him.) - **Fictional Elements** (He travels back in time to the summer break) - **Unrelated Solution** (Santa Clause comes to school) **E6) Discussion between Participants**

Method	A) Definition of Friendship	B) Context Factors	C) Change Mechanisms	D)Examples/Experience	E) Additional Information
	prettiest girl in class, everyone wants to be friends with her too)	(Parents, Teachers, Old Friends, Classmates)	**C4) Approach Others** (asking do you want to be my friend) **C5) Social Support and Help Seeking** (talk to the teacher) **C6) Cognitive Emotion Regulation Strategies** (tells himself "I'm the strongest")		
Focus Group Collecting Advice	**A2) Values and Expected Benefits of Friendship** (you need to stick together, than things will change) **A3) Philosophical Reflections** (e.g. The longer you are in the same class, the better you get along usually) **A5) Implicit Expectations of Why Friendships Form** (e.g. Wearing football shoes, everyone will like him, because it looks cool)	**B1) Events and Places** (e.g. making friends in Fortnite) **B4) Characteristics and Behaviours of Other People** (Parents, Teachers, Old Friends, Classmates)	**C1) General Behaviours** (helping) **C3) Identity Aspects** (be brave) **C4) Approach Others** (join in with some children and stay with them) **C5) Social Support and Help Seeking** (tell a teacher) **C6) Cognitive Strategies** (tell yourself you are brave) **C7) Avoiding Others** (Don't speak to the really mean children, that's too dangerous.) **C8) Confrontation** (You fight back.)	**D2) Personal Strategy Use** (I had three points written down: saying hello, asking about similarities, inviting to a play date. It does not always work 100%.) **D4) Personal Experience of Making New Friends** (I was also worried about the new school)	**E5) External Solutions** **- Wishful thinking** (changing school) **- Fictional elements** (poison bread) **E6) Discussion between Participants**

Brainstorming With Sticky Notes

Data collected on sticky notes mostly comprised of one to three keywords, mostly nouns or verbs. As the aim of this task was to collect ideas around the concept of friendship, most data points concerned behaviours, activities, and states that participants associated with an established friendship (see Table 3.2). The most common theme was (C) change mechanisms aiming to establish or maintain friendships. Three distinct sub-themes were generated including (C1) general behaviours (e.g., "being nice"), (C2) shared activities (e.g., "cycling"), and (C3) identity aspects (e.g., "being shy"). However, they could equally be described as (A) definition aspects of friendships (i.e., how does a friend behave towards you), as the keyword format of the data makes it impossible to know whether data points were concerning behaviours to make new friends (i.e., change mechanisms) or behaviours characterising established friendships (i.e., definition aspects). For ease of data presentation, they will be discussed as change mechanisms throughout. These three sub-themes were most common within brainstorming data. The theme of (A) definition aspects was less common and was further differentiated into sub-themes (A1) characteristics of friendships (e.g., "getting along well") and (A2) values and expected benefits of friendship (e.g., "be who you are – there is no point in pretending"). Additionally, some (B) context factors were mentioned, which contributed to the establishment and/or maintenance of friendships. Participants named (B1) events, such as school trips, and (B2) personal circumstances, such as having money or living close to each other. The theme of (D) experience was not linked to any data collected with brainstorming. However, for (E) additional information, the sub-theme (E1) other sources of happiness was generated (e.g., "cuddling with the cat").

The Secret Letter

Data collected with the Secret Letter ranged from few keywords or short sentences to longer accounts of specific thoughts or experiences. Due to this task's deliberately open instruction to write down "anything else you would like to tell us about your friendships", data covered strategies to make new friends, personal experiences of friendship, and definitions of friendship (see Table 3.2). The theme of (A) definition aspects was further differentiated into (A2) values and expected benefits of friendship and (A3) philosophical reflections and questions, such as "it takes time to make friends". The theme of (C) change mechanisms included sub-themes of (C1) general behaviours and (C3) identity aspects, similar to data collected in the brainstorming task. Experiences (D) were further differentiated into (D1) self-disclosure about own friendships (i.e., feelings, worries and difficult situations inflicted by friends), (D2) personal strategy use (i.e. participants reporting how they make friends), and (D3) self-disclosure about worries and problems unrelated to friendships (e.g. stealing money). Additionally, this task also elicited (E) additional information in the form of (E2) messages to classmates (e.g., "you are the best") and the researchers (e.g., "secret: Children ages 10-15 are easily embarrassed") or (E3) feedback regarding the workshop and its activities. Due to the task's open format, another sub-theme of (E4) unrelated comments was identified (e.g., "how do you get white teeth – by eating apples"). The open nature of this task also led to a lack of specific context factors (B).

Finishing the Story

Data collected in the Finishing the Story task took the form of short, full sentences describing how the fictional character navigates the school transition and tries to make new friends. All pre-defined themes were present, and various sub-themes were created, mirroring the variety of data collected with this task (see Table 3.2). Definition aspects (A) were differentiated into

sub-themes (A2) values and expected benefits of friendship, (A4) long-term outcomes, and (A5) implicit expectations of why friendships form. The theme of (B) context factors was multi-facetted, including sub-themes of (B1) events and places, (B2) personal circumstances, (B3) assets (e.g., PS4), and (B4) characteristics and behaviours of other people (e.g., parents, teachers, old friends, classmates). The theme of (C) change mechanisms was more common than in other tasks and more sub-themes were generated. Participants mentioned (C1) general behaviours, (C2) shared activities, and (C3) identity factors like they did in other tasks, but they also mentioned (C4) approaching others (e.g., "he asked if they want to be friends with him"), (C5) social support and help seeking behaviours (e.g., "talking to the teacher"), and (C6) cognitive (emotion regulation) strategies (e.g., "he tells himself 'I'm the strongest'"). The theme of (D) experience was less common but took two forms; (D4) personal experience of making new friends and (D2) participants putting themselves in the character's situation (e.g., "I'd go crazy, I'd ask my dad for help").

For additional information (E), two sub-themes were created. External solutions (E1), which might be seen as bridging context factors and strategies in their focus on external factors as solutions to the emotional or friendship problems. Accounts categorised as external solutions could be described as wishful thinking or easy solutions (e.g., lost friend returns to school, bullies are bullied themselves and apologise), and sometimes included fictional elements (e.g., lottery win, ninja fighters, time travel). Some events and situations were completely unrelated to friendships (e.g., Santa Clause coming to school), but made the character happy thus lifting stress and problems but are unlikely to resolve the friendship problems in the long-run. Although these accounts are solutions to the character's problems and provide insight into children's perceptions, none of these events can be strategically planned or controlled and were thus not categorised as change mechanisms relevant for intervention planning. The task also

elicited some form of (E2) discussion between participants regarding their preferred strategies and their beliefs.

Focus Group Collecting Advice

As this task aimed at eliciting group discussion on useful advice for a fictional character, collected data took the form of a list of suggestions presented in full sentences. As this task shared the same background story with the Finish the Story task, identified themes were similar, although differing in their main focal points (see Table 3.2).

The theme of (A) definition aspects concerned (A2) values and expected benefits of friendships (A3) philosophical reflections, and (A5) implicit expectations about why friendships form. Context factors (B) were differentiated into the very common sub-theme (B4) characteristics and behaviours of other people and the less common theme of (B1) events and places to make friends. The theme of (C) change mechanisms was the most multi-facetted in this task. Sub-themes included (C1) general behaviours, (C2) identity factors, (C4) approaching others, (C5) social support and help seeking, (C6) cognitive strategies, (C7) avoiding others, and (C8) confrontation. Accounts of (D) experience concerned (D2) personal strategy use and (D4) personal experience of making new friends. Within the theme of (E) additional information, (E6) discussion was a very common sub-theme, as the task allowed for more follow-up questions by researchers. External solutions (E5), including easy solutions/wishful thinking and fictional elements were less common.

Discussion

This paper aimed to compare four qualitative methods regarding their suitability to engage children aged 9 to 11 and produce specific, pre-defined information relevant for early

intervention development. Although all four methods were found to elicit data relevant to (almost) all pre-defined information categories, substantial differences emerged regarding the depth of the data as evident in data-driven sub-themes. In order to contrast results from each method, the following discussion will focus on each of the pre-defined information categories (see Table 3.3 for an overview of advantages and disadvantages of methods).

Table 3.3

Advantages and Disadvantages of Methods

Method	Aims	Data Format	Useful for	Advantages	Challenges
Brainstorming with Sticky Notes	Collecting as many ideas and thoughts as possible	Each reply usually consists of 1-3 short keywords	Definition aspects, context if explicitly stated in instructions	Generating many ideas, enabling all children to participate without speaking out in front of a group	Eliciting short keywords, hardly any context; especially younger children might be put off by writing tasks
Secret Letter - "Is there anything else you'd like to tell us about this topic?"	Providing space to elaborate on topics; useful to express ideas, opinions or experiences participants might not want to share with the whole group	Eliciting a wide range of different replies about experience, thoughts, worries, questions, statements	Personal experience and examples, any data that is explicitly asked for in instructions	Individual writing allows participants to focus on what is most important to them; secrecy ensures participants can express thoughts freely	Young children struggle with open questions and might be put off by writing tasks
Finishing a Story	Proving context in form of a specific situation promotes discussion of specific questions; facilitates children's imagination of abstract scenarios; allows to discuss "extreme" scenarios without personal background	Coherent stories about a given scenario featuring strategies and context factors	A variety of context factors and change mechanisms, implicit expectations, and definitions of the problem	Discussion between participants about possible strategies and influential context factors is elicited, researcher is present to ask further questions and note down ideas	Stories elicit fantastical elements that deviate from children's lived reality; by agreeing on one storyline, varying opinions might get lost
Focus Group - Giving Advice to a Fictional Character	Creating a background for an open group discussion on a specific question; discussing a fictional character allows participants to distance themselves	List of different strategies and experiences	Asking follow-up questions on the real-life importance of context factors and change mechanisms	Different strategies and influential context factors are collected; researcher is present to ask further questions and note down ideas	Some advice/comments are very general, thus researchers need to be present to ask questions and stir participant's discussion in desired direction

Definition

Discussing definition aspects is crucial in early intervention development to understand how the target group identifies the problem in their lives (Hagen et al., 2012). The sub-theme (A2) "values and expected benefits", referring the importance of friendships, was generated by all four methods, suggesting comments on why and how a topic is relevant can be elicited with a variety of methods. Apart from this, data on definition aspects differed widely.

The brainstorming task was intended to elicit (A1) "friendship characteristics" and mostly succeeded in doing so. However, the keyword-style of answers (due to sticky-note format) made it difficult to clearly differentiate between definitions of *established* friendships and strategies (i.e., change mechanisms) to *build* new friends. This link between definitions and strategies, however, is likely to hold true for other topics. Asking children about health problems, for example, is likely to produce characteristics of feeling unwell and behaviours to become better (e.g., staying in bed, drinking tea). However, this difference might not be profound in children's minds. Children seem more likely to describe actions and feelings they relate to a topic, rather than discussing abstract definitions. Indeed, abilities linked to abstract thinking, such as stimulus-independent thoughts, first develop around the age of 11 to 13 (Dumontheil, 2014).

The secret letter and focus group provided more room for lengthier (A3) "philosophical reflections", informing definitions by reflecting broadly on a topic and its context. At the same time, the focus group and the story elicited information about children's "*implicit* expectations" (A5) by focusing on a fictional character. Children talked about *why* friendships evolve, which equally expresses what is important in friendships. This process of using concrete examples and stimuli to elicit and discuss implicit believes and create a joint understanding of a certain

concept was previously used successfully with visual methods such as photography (Alexander et al., 2014).

Thus, researchers aiming to create joint definitions need to be aware of limitations of young children's abstract thinking abilities and anticipate discussing more concrete actions instead. Specific stimuli, such as a story, help eliciting associations and implicit expectations. If researchers aim to elicit individual reflections, the secret letter seems ideally suited, while a focus group task would allow for reflections and discussion between participants. The differences in definition aspects elicited by various methods (i.e., superficial characteristics vs. implicit believes) suggest that a combination of methods is needed to gather a rich, in-depth understanding of children's perceptions.

Context

Context factors are relevant for intervention development purposes as researchers need to identify which factors are malleable and provide options to bring about change (Wight et al., 2015). While it might be expected that context factors would always be addressed, this analysis made evident that methods for children need to explicitly ask for context factors and provide enough room for their discussion.

Context was not a common theme generated for the brainstorming task or the secret letter. Since both tasks posed questions on friendship characteristics, children focused on this and did not reflect on context. Indeed, children's ability to explicitly remember factors (i.e., explicitly state factors) is still developing throughout adolescence, even though they perform well on implicit memory tasks (i.e., knowing they have encountered something before) (Billingsley et al., 2002; Dumontheil, 2014). Thus, there seems to be a need to explicitly address certain categories of interest in brainstorming instructions. However, since brainstorming categories are typically

defined a-priori (Fails et al., 2012), this task might be well suited to collect different types of context factors, if explicitly stated in instructions.

Both the story-based task and the focus group produced a range of different context factors, including (B1) “events”, (B3) “assets”, and (B4) “characteristics of other people”. Naturally, telling a story requires a certain amount of context, such as places, events, and supporting characters. However, stories were also found to elicit a certain level of fictionality. When asked to expand on the real-life implications of certain context factors (e.g., other people) during the focus group, children would sometimes contradict earlier statements or say these factors are not important in their own lives. Increased discussion during the focus group facilitated a more nuanced picture of children’s perceptions regarding context factors. However, the focus group did not elicit as many or as detailed accounts of context factors as did the story task.

Researchers aiming to understand important and malleable context factors, need to explicitly ask for context factors in open brainstorming or writing tasks. Stories, however, seem ideal to elicit rich data about children’s perceptions of important context, without explicitly prompting (and potentially priming) certain factors. In order to understand their real-life importance for intervention efforts, combining a story-based task with open discussion seems useful.

Change Mechanisms

Change mechanisms provide information on how issues can be resolved from the target groups’ perspective and ideally translate into intervention strategies. The themes (C1) “general behaviours”, (C2) “activities”, and (C3) “identity factors” were generated from almost all methods. This illustrates that children of this age group are very focused on basic behavioural strategies (Stiehl et al., 2023). The use of cognitive regulation strategies is only fully developed between the ages of 9 to 11 (Pons et al., 2004) and metacognitive abilities to plan, execute, and

reflect on strategies develop between the age of 8 and 10 (Veenman et al., 2004). Nonetheless, the story-based task and the focus group elicited more specific strategies (e.g., cognitive strategies, help seeking, confrontation). Specific scenarios and rich context make it easier for children to imagine themselves in a situation (Chiasson & Gutwin, 2005) and discuss abstract topics, such as emotions (Bahman & Maffini, 2008). Combining a story-based task with a focus group seems promising to discuss change mechanisms, since children's metacognitive capacities are facilitated through discussions with adults (Garrison & Akyol, 2015; Lewis, 2017; Robson, 2016)

However, stories and focus groups also generated (E5) "external solutions" (i.e., external events and external people's behaviours), which cannot be targeted by an intervention. Storytelling seemed to prompt fictional storylines, similar to the ones on TV or in books, focusing on plot twists instead of realistic strategies to overcome real-life issues. While this illustrates children's enjoyment of *creating* a story (Fails et al., 2014), it emphasises the importance of linking stories with discussion about strategies they use themselves or perceive as realistic. It became clear during the focus group that children would sometimes suggest strategies for the fictional character but admit to not finding them helpful themselves. A focus group also allows for follow-up questions on personality or previous experience, allowing researchers to explore different perspectives and influencing factors. However, for all group tasks, it has to be kept in mind, that discussed ideas are products of the group dynamic, which should be considered in the analysis (Colucci, 2007).

For researchers aiming to discuss change mechanisms, a story-task providing situational context and a fictional character seems ideal. Additionally, focus groups allow researchers to support children's reflective abilities and explore real-life strategies beyond fictional story elements and "external solutions".

Experience and Examples

Exploring deeper layers of reflection about experiences sometimes is the primary aim of participatory studies. However this process might make children feel vulnerable, especially when they are in their peer groups (Pincock & Jones, 2020). Thus, the selection process of qualitative methods to discuss (sensitive) intervention topics with children, should carefully consider to what degree the discussion of personal experiences is intended and which safeguarding techniques can be implemented.

The brainstorming task did not produce any personal experiences or elaborate examples since there was no direct prompt. This makes it a safe task when avoiding personal accounts on sensitive topics. The secret letter elicited many personal accounts, differing in detail and volume as found for similar experience-focused writing tasks (e.g., dairies) (Barker & Weller, 2003). The opportunity to individually and anonymously express thoughts, which children might not want to share with a group or with the researchers directly (Barker & Weller, 2003), presents a chance to collect rich and impactful data. In this study for example, it was vital to include individual tasks, as it is difficult to express honest opinions about peer relationships or negative peer experiences within one's peer group. Additionally, children feeling less comfortable to participate in peer group activities were the potential target group of the intervention, thus their voices were in some ways the most important. Additionally, while leaving children alone with their reflections might be a safeguarding issue with some topics, collecting written notes on children's well-being can be used for safeguarding purposes. While the nature of a *secret* note does not allow researchers to directly identify individual children, it allows children to mention problems, which can then be dealt with on a group level. Especially in the school context, researchers are even obliged to share any concerning messages with teachers, who know their

students well and can decide to follow-up through classroom discussion or individual discussion with students who might be affected.

The story-based task elicited more specific accounts, such as (D4) “experience of making new friends” or examples of (D5) “putting oneself in the character’s situation”. As found when offering children to speak through puppets (Epstein et al., 2008), allowing children to express themselves through a fictional character, elicited specific experiences without having to speak in the first person. Thus, using game-based story tasks has been suggested previously if recounting personal stories might be too traumatic (Fargas-Malet et al., 2010). Additionally, a fictional character can be described with specific traits and problems, thus engaging participants in a discussion of possible solutions for a very specific target group (Blythe & Wright, 2006). Contrary, the focus group produced mostly personal information on (D4) “personal experience” and (D2) “personal strategy use”. This is likely to be an effect of the researcher’s presence and follow-up questions, as children are more likely to tell their own stories, when encouraged or prompted by open-ended questions and question-requests (Ponizovsky-Bergelson et al., 2019). However, the researcher’s presence allows for guidance to steer away from sensitive issues and providing active support when needed.

If researchers aim to collect personal experiences, individual writing tasks are vital to include the voices of shy or withdrawn children, which might even be the target group of some interventions. For sensitive topics, a fictional character is useful to allow children to distance themselves while discussing examples through the character.

Implementation Factors and Limitations of This Research

This analysis aimed to assess the suitability of four qualitative methods to elicit information relevant for early intervention development. The presented methods, however, were

deliberately chosen and adapted in an intervention development project with the purpose of generating data in pre-defined information categories. Thus, the authors had to continuously reflect on the potential impact of this study design on presented findings. To minimise potential bias and maximise transparency, credibility, reflexivity, and transferability (V. Williams et al., 2020), further reflections on the findings and interlinked implementation factors will be discussed.

Conducting a research workshop in schools was considered a strength of this research as it allowed children from all socioeconomic backgrounds to participate. However, research spaces evoke certain communication cultures (Barker & Weller, 2003), which was noticeable in the school context. Children struggled with open tasks as they seemed used to very precise instructions and are rarely asked to provide unprompted thoughts and reflections in written form. Therefore, the open question for the secret letter often had to be followed-up by more specific instructions and data regularly mirrored data of previous tasks. Children also seemed eager to provide "correct" answers, although follow-up questions in the focus group often revealed that they had not experienced suggested strategies as helpful. As emphasised in literature on research with children, expectation bias, social desirability, and acquiescence bias need to be considered (Fargas-Malet et al., 2010). This research workshop was started by stressing that the children themselves are the experts and efforts were made to ask follow-up questions about children's real experiences. Still, this bias seemed to persist. However, a change in children's behaviour and outspokenness with their "group facilitator" was noticed towards the end of the workshop, indicating a prolonged period of rapport building with later data collection might increase authenticity of results and minimise biases (Spyrou, 2011).

Additionally, it proved important to let children choose their communication outlet (Fargas-Malet et al., 2010). While individual writing tasks allow shy children to express thoughts

privately, some children struggled with language barriers and spelling insecurities and preferred researchers to write for them. Thus, group discussion was favoured by many children and the "individual" brainstorming resembled a group task. To ensure children were comfortable voicing their opinions, they were allowed to choose their peer group, as a trusted peer group facilitates children's outspokenness (Pincock & Jones, 2020). However, ideas and opinions elicited by group tasks – which the brainstorming, the story and the focus group were – are products of group dynamics rather than reflections of individual opinions (Colucci, 2007). In this study, this became evident as initial responses were regularly priming following responses. In the group brainstorming, the first answer provided by a child usually set the tone for the following answers by classmates. Some priming effects were even found across tasks. Some sub-themes kept reappearing in all methods and while these themes might just reflect the most prominent thoughts, patterns were likely influenced by priming effects, order of tasks, and wording. Thus, the order of activities is vital. While the secret letter generated more experiences than the previous tasks (brainstorming), it also generated a lot of repetitions of general behaviours which were the dominant data category of the previous task. While switching up the order of tasks is sometimes a useful way around this issue, it might as well be beneficial to wisely plan for priming effects when developing a research study. Using a secret letter task after a focus group, for example, could allow children to voice any disagreements with the group consensus and offer researchers a chance to compare group norms and individual thoughts.

As these methods were chosen and implemented with adult perspectives of what constitutes "child-friendly", researchers continuously reflected upon methods and adapted them to avoid restricting children's answers (Barker & Weller, 2003) – either due to implementation issues (e.g., written vs. verbal) or the nature of the question (e.g., leading or too abstract questions). Researchers tried to reduce power balances by reminding children they are the experts and

encouraging them to lead the direction of discussion. However, all methods were presented within a frame of research questions, thus constituting a participatory data collection approach. Presented methods can, however, be used on the continuum of participatory research, depending on the desired degree of participation. Implementation can be adapted to increase children's power by including them in decisions about research questions (e.g., not pre-defining the story background but letting children identify difficult situations themselves) and analysis (e.g., letting children order or rank the most important aspects generated in the brainstorming).

For future research, it would be interesting to control for child variables (e.g., gender or trait introversion) and analyse if certain methods are particularly suitable or engaging for a subgroup of participants. In the presented research, it was neither possible to control for a range of socio-demographic or psychological variables (due to the classroom format), nor was it intended as the workshop aimed to gather input from a group of diverse children. While projects on the development of universal preventive approaches will likely work with similarly diverse groups, intervention development for a particular target group would likely benefit from studies discussing the use of qualitative methods in particular subgroups (e.g., by socio-economic background or history of problem behaviours).

Lastly, it should be noted that transferability of presented results concerning the nature of data collected with specific methods is likely to be limited to similar intervention development efforts. Thus, this analysis should be understood as guide for other intervention developers rather than a generalised assessment of qualitative methods' characteristics, as qualitative methods such as focus groups or brainstorming can take various forms and be adapted for a multitude of purposes.

Conclusion

This paper aimed to discuss and compare four qualitative methods regarding their suitability to engage children and collect relevant information in early intervention development stages. A unique study design with a large sample of children involved in four participatory data collection methods on similar research questions, allowed for an innovative comparison of collected data. The presented analysis aims to guide researchers and practitioners on how to choose methods appropriate for child stakeholders and intervention development aims. For creating joint definitions with children, a brainstorming task supports rapid generation of general associations, while an individual writing activity provides room for lengthy reflections. A context-specific story task facilitates children's imagination and generates implicit expectations. When aiming to explore context factors, this should be explicitly stated in the instructions, as brainstorming and writing tasks are otherwise unlikely to address context. Although stories produce a range of context factors, pairing them with focus group discussions helps to clarify which factors children actually perceive as important in their lives. Similarly, for change mechanisms, stories help children to immerse themselves in hypothetical scenarios and generate a range of answers. Linking stories with focus group discussion is however beneficial as stories tend to facilitate fantastical elements or external solutions. As discussing personal experience might be sensitive, individual writing tasks are ideal to privately express thoughts. Stories can be used to allow children to distance themselves or explore difficult situations by speaking about characters. For implementation, implications of the setting and priming effects between methods need to be considered. When increasing children's involvement in the analysis and decision-making process, these participatory data collection methods are adaptable for full participatory research projects to engage children while simultaneously generating relevant information.

Main Findings and Implications of Chapter 3

The comparison of appropriate methods to engage children in intervention development highlighted the suitability of stories and focus group discussions, specifically when addressing context factors and change mechanisms. Particularly, focus groups were found to be suitable to elicit reflection on strategies and their practical relevance in children's lives while simultaneously touching upon children's experiences. These findings were integrated with methodological findings of the systematic review (Chapter 2) regarding the effectiveness of didactic content delivery and self-awareness tasks in preventive programmes. Specifically, stories about fictional characters were created and linked to didactic content concerning emotion regulation and conflict resolution in the classroom context. Open questions were integrated in these stories to elicit group discussions on consequences of strategies. By encouraging reflection of children's individual experiences and strategy preferences, self-awareness was integrated with these story tasks. This intervention development process will be discussed in more detail in Chapter 3, highlighting children's iterative involvement in decisions regarding intervention content and activities.

CHAPTER 4

Opportunities and Limitations of Participatory Research With Children in the School Setting. A Reflection on the Co-Production of a Peer Relationship Programme With 9- to 12-Year-Olds in the School Setting

Abstract

While participatory research has become more popular over the last years, there are many challenges associated with participatory involvement of children. The present research aimed to reflect on the purpose of participatory involvement of children in intervention development and address opportunities to adapt the participatory methodology to the community context and stakeholders‘ needs to enable meaningful participation. Specifically, this study engaged children aged 9 to 12 in an intervention development process with the aim to support peer relationships in the context of the primary-secondary school transition. Three stages of participatory involvement of children were conducted in the school context. Stage I involved 916 children and aimed to understand children's perspectives and involve them in decisions regarding the intervention's focus, Stage II involved about 300 children and aimed to define intervention content and activities and Stage III involved 40 children and aimed to pilot test and refine the prototype. During Stage I, it became clear that a focus on positive classroom climate and emotional support strategies seems necessary to address peer relationships. Stage II further clarified that emotional skills should be practiced in the context of everyday classroom situations and specific stories facilitate children's reflection. Stage III indicated positive reactions to the proposed intervention but highlighted the need to shorten stories and decrease a reliance on text. While children were involved in crucial decisions during each stage, challenges concerning power dynamics remained. Overall, this research highlighted the opportunity to adapt participatory methodology to the school-context and engage children age 9 to 12 in intervention development.

Introduction

Since the 1989 United Nations Convention on Children's Rights (UNICEF, 1989) and the introduction of the "new social study of childhood" children have obtained a central role in research on matters that concern children (Kim, 2016). Specifically, schools and educational policy makers are encouraged to involve children's voices (National Institute for Health and Care Excellence (NICE), 2009; Ofsted, 2019). At the same time, there is heightened recognition of the importance of supporting children's social-emotional and mental wellbeing in schools (National Institute for Health and Care Excellence (NICE), 2009; Ofsted, 2019). Schools in particular have been suggested as an ideal setting for universal prevention on a population level (Greenberg et al., 2017; Wagner et al., 2017), as they have the capability to reach and support *all* children at early stages in their lives (Enns et al., 2016), and school staff has been found to effectively deliver programmes (Durlak et al., 2011), which has additional cost-benefits (Domitrovich et al., 2017). For an intervention to be relevant, effective, and impactful, an intricate understanding of its target group's lived reality, their needs, issues and problems is indispensable (Hagen et al., 2012). Thus, development activities need to take place in the natural social context and facilitate involvement of crucial stakeholders (Reed et al., 2021). Therefore, examples and in-depth discussion of participatory involvement of children in intervention development are essential (Hawkins et al., 2017).

Intervention Development

While past intervention development efforts have been largely focused on effectiveness, new guidelines advise an additional focus on acceptability, implementation feasibility, transferability to other contexts, and cost-effectiveness (Skivington et al., 2021). It has been proposed to conceptualise intervention research in four phases: intervention development,

feasibility testing, evaluation, and implementation (Skivington et al., 2021). Within each phase, the same core components should be considered; engaging stakeholders, considering context factors, refining programme theory, identifying uncertainties, considering economic factors, and refining the intervention (Skivington et al., 2021).

A framework for the co-production of interventions (Hawkins et al., 2017) proposes very similar development steps as the UK Medical Research Council guidance (Craig et al., 2019) but adapted them to involve stakeholders throughout the process. Specifically, it was suggested to (i) integrate evidence review and stakeholder consultation, (ii) implement co-production in the form of iterative cycles of discussion and refinement of intervention contents, and (iii) prototype the intervention including testing sessions (Hawkins et al., 2017). For the development of public health interventions, six steps were suggested including (i) understanding the problem and its causes, (ii) identifying causal and contextual factors, and (iii) change mechanisms, (iv) developing an evaluation plan, (v) testing feasibility in small scale studies and (vi) implementing a larger trial for effectiveness evaluation (Wight et al., 2015). In an example of participatory development of a mental health intervention for adolescents (Hagen et al., 2012), the process included similar steps: (i) identifying and (ii) defining the problem, (iii) positioning an intervention strategy, (iv) developing intervention concepts, (v) creating an Intervention and (vi) evaluating the use of the intervention in its context. All six steps draw on both evidence base and stakeholder involvement (Hagen et al., 2012).

Current Perspectives in Participatory Research

There are various research approaches focusing on stakeholder engagement, including collaborative development (Milton et al., 2021), Participatory Design (Sander, 2021), Advisory Groups (Sellars et al., 2021), Public and Patient Involvement (Clark et al., 2021), and Action

Research (Hawkins et al., 2017; Ritterbusch et al., 2020). A taxonomy of intervention development approaches has summarised these approaches as “partnership” category, as all of them involve the target group in the decision processes and create equal power balances (O’Cathain, Croot, Sworn, et al., 2019). In current literature, there is some heterogeneity regarding the wording used to describe stakeholder engagement in such approaches, including ”co-production” (Reed et al., 2021), “co-creation” (Leask et al., 2019), “co-design” (Slattery et al., 2020) or “participatory design” (Hagen et al., 2012). While co-creation, which was initially used in consumer research, has been adopted in various fields (Galvagno & Dalli, 2014; Leask et al., 2019) co-production has been identified as a common umbrella term in the research context (Bradbury-Jones et al., 2018). Recently, a differentiation of terminology for distinct stages of the development process has been suggested with co-creation as an overarching term for stakeholder involvement in *all stages*, co-design as active participation in *early stages* of identifying and defining problems, and designing strategies, and co-production as passive engagement in *later stages*, such as the implementation of pre-defined strategies (Vargas et al., 2022).

To classify as a participatory approach, iterative involvement in key decision-making processes, specifically problem setting and solving, has been proposed as defining criteria (Reed et al., 2021). However, many studies seem to describe participatory research while actually not engaging children in decision processes (Montreuil et al., 2021). It has been criticised that a differentiation between involvement of children as “co-constructors of research” and research subjects is blurred as specific guidelines are lacking (Montreuil et al., 2021). However, empowering children and eliciting their authentic voices to achieve “real” participation is generally challenging (Bradbury-Jones et al., 2018). Therefore, participatory involvement in research can be understood as a continuum (Leask et al., 2019) and instead of striving for one,

correct approach, the variety of approaches should be valued, as it creates opportunities to tailor approaches to the research stage, community context and stakeholders' needs (Albert et al., 2023). For doing so, more detailed, practical examples and reflections on specific participatory approaches are needed to support other researchers in exploring participatory involvement practices that would be suitable for their research (Albert et al., 2023).

Challenges Regarding Participatory Involvement of Children

Existing guidelines on participatory intervention development and empirical research on participatory involvement of young people mainly focus on adolescents between the ages of 12 and 18 (Hawkins et al., 2017; Sellars et al., 2021). Even reviews on the topic have set their inclusion criteria to adolescents (Reed et al., 2021), while participatory involvement of younger children is rarely discussed. Age-related adjustments would, however, be crucial, as an adaptation of methods to children's cognitive and social-emotional development level is required (Fails et al., 2012) as well as considerable effort to establish rapport and trust (Spyrou, 2011) to create an experience that is enjoyable and meaningful to the child (Levy & Thompson, 2015). Collecting children's authentic voices can be difficult as methodological constraints, institutional contexts, and researchers' personal interpretation of meaning all affect children's participation (Spyrou, 2011). Researchers need to walk a fine line between taking an active role in facilitating children's participation and taking a passive role to allow children to self-direct the research process (James & Shaw, 2022). At the same time, researchers need to find a balance between child-appropriateness and robustness and rigor of the methodology (Levy & Thompson, 2015).

Additionally, many studies work with small stakeholder groups (Hawkins et al., 2017; Reed et al., 2021), often selected through staff or self-nominations (Reed et al., 2021), which is likely

to generate a homogeneous group of very motivated stakeholders. While this might facilitate the formation of strong relationships between researchers and stakeholders (Spyrou, 2011), selecting a subsample conflicts with the aim of empowering marginalised children (Fails et al., 2012; James & Shaw, 2022). Empowering *all* children to share their experiences and overcome marginalisation are common motivations to conduct participatory research (Bradbury-Jones et al., 2018). However, it has been critically discussed whether there are different values attached to participatory approaches, with tokenistic employment of participatory stakeholder engagement in contrast to a democratic aim of benefiting patients (O. Williams et al., 2020). This highlights the need to reflect on the purpose of participatory involvement (James & Shaw, 2022) and opportunities to adapt the process to the community context and stakeholders' needs (Albert et al., 2023) to create a meaningful experience for both researchers and children (Levy & Thompson, 2015).

Current Study

This paper aims to discuss the example of involving children aged 9 to 12 in the development of a school-based intervention to facilitate positive peer relationships with a particular focus on the primary-secondary school transition. In contrast to many other examples in the literature, this research focused on late childhood and early adolescence and thus required an adaptation of the methodology (Fails et al., 2012). Additionally, whole school classes were involved in the development process to reach a heterogeneous group of children, which in turn required an adaptation of conventional cycles of participatory involvement and methodology. The presented research concerns the first two stages of intervention research described in the MRC guidance: intervention development and feasibility testing (Skivington et al., 2021). This paper aims to present the iterative cycles of this intervention development process and reflect on the adaptation of participatory methodology to the target group's developmental level, and the

classroom context. Thereby, it aims to present a practical example that may help to inform other researchers' decisions, when considering participatory intervention development with children.

Three stages of participatory involvement were conducted. Similar to a children's delphi approach with the age group of 10 to 12 year-olds (Benninger & Savahl, 2017), the idea was to iteratively involve children in group discussions about intervention strategies and development decisions. As suggested for the co-production of school-based health interventions, students were involved in decision-making in terms of collaborative problem setting and problem solving (Reed et al., 2021). Specifically, Stage I aimed to integrate children's perspectives with the evidence base and involve them in decisions on intervention focus and strategies, Stage II aimed to discuss potential content and activities and refine those, and Stage III aimed to test and refine a prototype. Thus, children were involved in defining the problem, positioning, conceptualising and creating the intervention (Hagen et al., 2012).

Methods

As it is often the case in intervention development, the topic of interest had already been identified before the project start (Wight et al., 2015), through an open innovation public participation call (by Ludwig Boltzmann Society). There is rarely funding for early participatory involvement (Sellars et al., 2021), impeding true collaboration at the first stage of identifying the problem (Hagen et al., 2012). Peer relationships were chosen as the focus as they are vital for children's social-emotional development (Laible, 2007), long-term mental health (Schwartz-Mette et al., 2020) and buffer against negative experiences (Cuadros & Berger, 2016). The school transition is a time of particular friendship instability (Ng-Knight et al., 2019) and can be difficult for students (van Rens et al., 2018). Additionally, people tend to

reconsider their behaviours in times of transition (National Institute for Health and Care Excellence (NICE), 2007), which made the school transition ideal for this intervention effort.

The intervention was designed for the school context, as schools have been proposed as an ideal intervention setting (Greenberg et al., 2017; Wagner et al., 2017). Not only do schools have an educational purpose matching intervention aims at a community level (Jorm, 2012), children spend a large part of their time in school (Pooley et al., 2008) and via schools, researchers have the opportunity to reach children from a variety of backgrounds. The development activities were also conducted in the school setting as development activities have been advised to take place in the intervention context (Reed et al., 2021). The same advantages that make schools ideal intervention settings make them ideal development settings. This study included three stages of participatory involvement of children, which were based on guidelines for participatory development (Hagen et al., 2012; Hawkins et al., 2017; Skivington et al., 2021) but adapted to the stakeholders' needs, social context and research stage (Albert et al., 2023). The methodology implemented for each stage is outlined in the following.

This research was conducted with a critical realist philosophical stance, assuming that "real" associations between peer relationships and other factors exist, but that an understanding of these is socially constructed in interactions between researchers and children. Thus, researchers were mindful regarding their role in constructing this knowledge and their interpretation of the findings as not truly objective but specific to this group of participants and their social context. Ethical approval was obtained from three separate ethics committees for different project stages and locations: Vienna University of Music and Performing Arts (EK-Nr. 10/2018) for Stage I, Karl Landsteiner University in Krems, Austria (EK-Nr. 1021/2020) for Stage II and III and the University of Birmingham, UK for the respective activities in the UK (ERN_19-1520AP3).

Stage I – Defining the Intervention Aims and Potential Intervention Strategies

Stage I aimed to define the problem of peer relationships in the context of school transition and create some potential intervention strategies (i.e. positioning the intervention) (Hagen et al., 2012). A literature review was conducted to understand existing intervention approaches (Pollak et al., 2022). Simultaneously, stakeholder involvement aimed to establish the specific problems, context and change mechanisms regarding peer relationships from children's perspective. Stage I was conducted between October and December 2018. In 29 Austrian schools (22% fourth-year primary school classes, 71% first-year secondary school classes, 7% special needs schools), a total of 54 workshops were conducted including 916 students.

The workshop spanned two school lessons and employed participatory methods, such as brainstorming activities and story-based tasks to engage children in brainstorming about causal and contextual factors leading to peer relationship problems. A story about a fictional child's school transition was used as stimulus to discuss potential intervention strategies that could help children overcome peer problems and other problems during the transition period. A more detailed presentation of the workshop plan and implemented activities can be found in Chapter 2. The workshop materials as well as the data were published on the open science framework platform OSF (https://osf.io/2u7r4/ and https://osf.io/avtw2/). During the workshop, students were involved in limited forms of data structuring to prepare analyses and interpretation. After brainstorming factors that facilitate or impede peer relationships, children were asked to pick their group's five most important aspects. Apart from this, data analysis was researcher-led and fed into first strategy recommendations.

Stage II – Refinement of Intervention Strategies and Contents

In Stage II, iterative sets of workshops were planned with the aim of presenting children with specific stimuli (that could feed into the final intervention) and discussing strategies to (a) facilitate positive peer relationships and (b) cope with transition-related problems established in Stage I (Hawkins et al., 2017). Three one-hour workshops on classroom climate were conducted in January 2020 with three Austrian first year secondary school classes, including 46 students. One two-hour workshop on the topic of emotion regulation was conducted in February 2020 in a UK six grade primary school classroom, including 18 students. In the class climate workshop, children were asked to (a) brainstorm positive classroom and group dynamic aspects, (b) write individual notes about their class climate, and (c) collaboratively tell a story about a child trying to positively impact the class climate. The emotion regulation workshop comprised discussions of (a) differentiation of emotions and emotion recognition, (b) emotion regulation strategies, (c) interpersonal emotion regulation, and (e) how emotion regulation might be practiced in school (see workshop schedule in Appendix 4.1).

Due to school closures and access restrictions related to the COVID-19 pandemic following March 2020, the co-creation strategy for Stage II had to be adapted. Researchers developed activities to discuss intervention topics and strategies and asked teachers to implement and discuss these activities in their classrooms. This stage of co-creation was supported by the Austrian Citizen Science Award 2021, a national initiative advertising public engagement (of schools specifically) in research. Between April and June 2021, 14 classrooms participated in the remote development of one or more topics and 342 online surveys were completed by students concerning their thoughts, suggestions for improvement and further ideas for respective topics. The topics concerned mindfulness, emotional awareness and empathy, class climate, conflict management, bullying, and self-efficacy. Each topic was designed to cover one

school lesson and featured a game-based activity and a main reflection activity. The topic of empathy and emotional awareness, for example, was introduced with an emotion-pantomime game, followed by a main activity discussing how a fictional character feels when laughed at in class and how this character could be supported. Teachers received a detailed script to guide the discussion and reflection to facilitate students' completion of the survey.

Although all participatory workshops and remote participatory methods aimed to collect varied strategy ideas and subsequently discuss or rate the practicality and relevance of these strategies, the remote nature of most of Stage II-activities (due to COVID-19-related restrictions) resulted in a researcher-dominated analysis of collected ideas.

Stage III – Prototyping and Pilot Testing of Implementation Feasibility

The aim of Stage III was to pilot test a prototype of the intervention to maximise acceptability and feasibility and identify intervention aspects in need of refinement (Craig et al., 2019). Observations were made by researchers and students separately and learning outcomes and deviations from the intervention were recorded (Hawkins et al., 2017). Stage III included three multi-day workshops. A two-day workshop was implemented in a first-year secondary school class in June 2021, including 21 children. A three-day workshop was implemented in a summer school of the University of Vienna in July 2021, including twelve children. Finally, another two-day workshop was implemented in a summer school of the Teacher Education University of Lower Austria in August 2021, including seven children. During these workshops, eight intervention sessions were conducted with each group of children to pilot appropriateness and feasibility of contents, activities, and supporting stories. In Stage III, multi-day workshops with the same group of children were conducted to give participating children an overview of the full intervention and enable them to compare which activities are most and least relevant.

Children were invited to reflect on (a) the novelty, relevance, and fun of each topic, and (b) potential changes to ensure activities are fun and informative. Additionally, implementation feasibility of activities in a classroom context was tested.

Results

The co-production cycles informed a variety of specific topics and aspects of the intervention development. As it would be beyond the scope of this paper to report on all these aspects, the following section will report examples of the refinement process of some topics, with particular focus on emotions and general structure elements of the intervention. Therefore, results from participatory activities that informed these aspects will be highlighted, while results, which informed other aspects of the intervention development, will not be discussed. As most of the participatory activities were conducted in Austria, a majority of the presented examples was translated from German to English, except for examples from UK workshops, which will be identified respectively.

Stage I – Defining the Intervention Aims and Potential Intervention Strategies

The first stage aimed at understanding the context and causes of peer relationships during the transition period and discussing change mechanisms that could feed into intervention strategies (Wight et al., 2015). The results of Stage I fed into three specific content-related analyses concerning children's peer relationships (Krammer et al., 2023), children's perspectives on school transition (Stiehl et al., 2023), and children's use of online communication and media (Mittmann et al., 2022). Additionally, considerations regarding the use of participatory methods are discussed in Chapter 3.

Regarding important aspects that support peer relationships, children listed personal emotional factors (e.g., *fun, wellbeing*), personal characteristics (e.g., *kindness, honesty*), and interpersonal

factors, concerning feeling safe, supportive and empathic actions, conflict management, and shared time (Krammer et al., 2023). Regarding support and empathy, they said it was important to *"play with children who get excluded and show the others that you can play with them as well"* or *"try to put yourself in the position of others".* However, when asked about strategies to support upset classmates, children tended to list basic behavioural strategies (e.g., "*giving presents*"). There were fewer mentions of emotional support, such as listening or trying to understand how they feel. Thus, it became clear that potential intervention strategies to improve positive peer relationships could address empathy and emotional support strategies. It proved valuable to have these discussions in the classroom as it created a natural context for discussing peer relationships and facilitated discussion among peers about aspects related to their classroom peer context.

Regarding the school transition, it became clear that children had many fears but did not have specific strategies to combat these fears or cope with transition-related problems (Stiehl et al., 2023). The topics of victimisation and fear of being alone were dominant (Stiehl et al., 2023), as children discussed worries such as "*she is laughed at, can't make new friends, and is rejected because of her looks*", "*fears that no-one likes her*", "*no-one wants to talk to him*", "*being bullied*", or "*being rejected by the class*". Actual school transition experiences were closely linked with peer relationships as many children said it was difficult "*to leave friends from primary school*" and that they "*had a grim feeling, because I'd lose my friends*" but that it would have helped if "*primary school friends went to the same school*". Similarly, positive accounts of the transition highlighted the importance of a warm class atmosphere to establish friends quickly. Children said, "*In the beginning, I thought I won't be included, because everyone else had friends already, but then I found friends quickly*" or "*It was cool in the new class, because I had a warm welcome*". It became obvious that a support programme needed to have a strong

focus on providing children with specific strategies to establish a positive class climate, lay the foundation for positive peer relationships, and prevent bullying in the classroom context.

Regarding methodology, it became clear, that stories were powerful tools to discuss specific scenarios with children. In typical group discussions, children often struggled with abstract questions as this example shows: *"finding more friends [would help with the transition]" – "how do you find more friends?" – "I don't know".* Stories provided children with specific examples and context factors and enabled children to discuss different strategies, such as "*going to support teachers and they speak to the other [children]*" or "*during breaktime, F. approaches the others and says 'Please stop. Why are you doing this?'*". Stories were especially useful stimuli for strategy discussion when paired with group discussion questions (see Chapter 2).

Thus, a methodological implication for the intervention was the need to incorporate comic stories and fictional characters. To aid the discussion of classroom group dynamics, peer problems and bullying without pushing children to share personal experiences – both in the participatory development process as well as in the intervention – the characters of Joe and Ana were developed. Their specific stories and problems were further developed using participatory methods with children in Stage II and III.

Stage II – Refinement of Intervention Strategies and Contents

In Stage I, students helped to identify a focus on emotional awareness and empathy as well as positive class climate as potential intervention topics to support their peer relationships. At the start of Stage II, a general idea of focusing on these topics existed and Stage II aimed to further explore specific strategies to address these topics and develop a preliminary order of intervention contents.

Before the start of the pandemic, four workshops were implemented on emotion regulation and class climate. In contrast to Stage I workshops, the UK-based emotion workshop in Stage II discussed interpersonal support strategies after introducing emotion recognition and personal emotion regulation. It provided a specific scenario and indeed the scenario helped to generate more interpersonal regulation strategies compared to Stage I, including "*tell them to breathe in and out and hug them*" or "*get all the bad things out [of] his head*". In the workshop on class climate, students emphasised the importance of strengthening positive relationships by "*defending others*" and "*engaging with those [children] that you don't get on with*". However, they repeatedly stressed the role of the teachers to support them in "*talking about the problems*". These findings further emphasised the need to (a) slowly build up children's emotional competencies and create specific stimuli or scenarios to discuss, but (b) combine these with teacher-led discussions when addressing peer group dynamics.

Based on these preliminary findings, the remote activities were developed in response to the Covid-19 pandemic. Teachers and their classes were asked to engage with potential activities and discuss them in regard to helping other children (i.e., identifying intervention strategies). Children then completed an online survey including qualitative comments and suggestions and quantitative ratings of the content's novelty, helpfulness and how fun it was. Fun and helpfulness were assessed on a 5-point Likert-scale with 1 indicating low scores ("boring"/"not helpful") and 5 indicating high scores ("very fun"/"very helpful"). Novelty was assessed using an adjustable sliding-scale from a low end (1="I knew everything before") to a high end (101="Everything was new"). Descriptive statistics of mean scores are presented in Table 4.1.

Table 4.1

Mean Values of Fun, Novelty and Helpfulness of Stage II Topics

Lesson	Fun		Helpfulness		Novelty	
	M	SD	M	SD	M	SD
Bullying	4.24	0.88	4.15	1.03	49.05	32.93
Mindfulness	3.85	1.34	3.69	1.25	54.08	33.35
Empathy	3.94	1.13	3.66	1.21	39.38	26.54
Conflict Management	3.91	1.40	3.67	1.27	45.19	27.83
Class Climate	4.47	0.80	4.35	0.89	53.50	27.03
Self-Efficacy	3.15	1.42	3.00	1.37	42.25	31.65

Self-efficacy was included due to its previously established importance for preventive programmes (Pollak et al., 2022). It was here understood as an "individual's belief in their capacity to exercise control over events that affect their life" (Frydenberg, 2011) and thus focused on creating an understanding of social factors that can actively be changed (e.g., my reaction to other people's actions). Children's comments, such as *"I don't think this helped"* and their rating as least helpful activity were in line with the researchers' impression that the topic was too abstract for this age group. Children explained *"If there are negative thoughts, they don't go away, and it takes a while"* or *"I think there is not much I can control"* or *"My thoughts do what they want. They control me not the other way around"*. To improve the activity, children proposed *"more games"* and a few children generally proposed to change the *"content"*, the *"activities"* or *"everything"*.

While the novelty of the topic of empathy (combined with emotional awareness) was low, children reported the activity to be fun and helpful. The activities addressed emotional expressions and asked children how the story character of Ana might feel when being laughed at in class and how she could be supported. Although children might have been able to recognise all emotions and understand how Ana feels, they said the activity was helpful on a personal

level because they saw "*that other children feel exactly like I feel*" and "*when I feel bad, I want to be supported too*". Additionally, the activity was helpful for the class because "*we all spoke about ways to support each other*". Regarding improvements they suggested including "*more on how to handle some feelings*", or specific strategies on "*how to support Ana*". Additionally, they suggested "*more topics*" and a specific focus on "*the class community*" with "*games that need the class to work together*" or "*more teamwork activities*" to link the topics of emotions and class climate.

The class climate topic received high ratings of fun and helpfulness with few suggestions for improvement. Children noted "*we should have done this earlier*", which prompted the researchers to consider this topic for the first intervention session. However, due to the previously reported finding regarding building up children's emotional competencies before discussing interpersonal support strategies, emotions, and empathy were chosen as initial intervention sessions. To link the topic of empathy to the class climate, it was put in the context of a story about a fictional character's school transition. As the topic of class climate seemed central, two intervention sessions were dedicated to discussing and establishing shared classroom values. Mindfulness exercises were generally liked but as students suggested "*fewer exercises on the same topic*", different mindfulness exercises were spread across sessions. Based on children's comments and suggestions, the explicit self-efficacy activity was dropped, as it seemed too abstract. Instead, self-efficacy was integrated with emotions by emphasising that emotions can actively be changed.

Stage III – Prototyping and Pilot Testing of Implementation Feasibility

After specific intervention strategies and the overall structure of the intervention was refined during Stage II, researchers put activities and content related to these strategies together to

create a first prototype of eight intervention sessions. Stage III aimed to pilot test this prototype with a focus on aspects that needed further refinement and implementation feasibility. At this point, the intervention focused on three main topics: (i) empathy and emotional awareness, (ii) classroom climate, and (iii) conflict resolution. In the first of the three workshops of Stage III, children were again asked to rate their perceived novelty, helpfulness, and fun on the same scales described for Stage II with descriptive statistics presented in Table 4.2.

Table 4.2

Mean Values of Fun, Novelty and Helpfulness of Stage II and Stage III Topics

		Fun		Helpfulness		Novelty	
		M	SD	M	SD	M	SD
Bullying	*Stage II*	4.24	0.88	4.15	1.03	49.05	32.93
	Stage III	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Mindfulness	*Stage II*	3.85	1.34	3.69	1.25	54.08	33.35
	Stage III	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Empathy	*Stage II*	3.94	1.13	3.66	1.21	39.38	26.54
	Stage III	4.23	1.26	3.95	1.24	46.94	26.46
Conflict Management	*Stage II*	3.91	1.4	3.67	1.27	45.19	27.83
	Stage III	4.07	1.27	4.06	0.83	48.68	27.67
Class Climate	*Stage II*	4.47	0.80	4.35	0.89	53.50	27.03
	Stage III	3.63	1.09	3.61	1.13	60.68	20.89

Children's perception of empathy and emotional awareness content as being fun, novel, and helpful increased from Stage II to Stage III. Based on children's feedback in Stage II, the topic of empathy and emotions was linked to a story about a fictional classroom to highlight the practical importance of the topic. Children's comments suggested they experienced the adapted content as relevant to their everyday school-life, as they said they had been in similar situations

as the fictional characters (e.g., taking a fall and being laughed at) and thus appreciated discussing peers' potential reactions. Additionally, comments that the content helped to understand "*that everyone feels differently [about the same situation]*" and "*that we should help each other*", highlights how the adaptations achieved practical learning effects, facilitating perspective taking, and prosocial actions.

Suggestions for improvement regarding both topics mostly concerned the storylines of the comic stories and the characters' behaviours, for example "*Rudi could be a bit nicer*" or "*it would be better if they didn't laugh at Ana*". As the comic story's aim was to engage children in discussion and prompt reflection about anti-social behaviours, these elements were deliberately maintained as they seemed to meet their purpose. While children emphasised their enjoyment of the stories, it became apparent that the original stories were slightly too long. Researchers felt children's attention waning after about ten to fifteen minutes. Additionally, the first workshop was conducted in an area with many students from low socio-economic backgrounds and many children did not enjoy reading the story captions, although they enjoyed discussing the characters. Thus, the captions were shortened, the stories were divided into shorter sections, and teachers were asked to recap the content to facilitate reflection. These changes seemed well-placed as children in the second workshop even voted to read another story instead of going to the park for break-time.

Discussion

This paper aimed to present an example of participatory involvement of children in the development process of a peer relationship intervention. Three stages of participatory involvement were implemented (Hawkins et al., 2017) and aimed to (i) integrate existing evidence with stakeholder's perspectives of the problem and potential intervention strategies,

(ii) conduct iterative cycles of discussing and refining content with stakeholders and (iii) test feasibility and acceptability of a prototype. While these aims were mainly achieved, modifications had to be made that impacted the extent of participatory involvement. Some of the reasons for these modifications were external (e.g., restrictions related to Covid-19), other reasons, however, are inherently linked to the challenges of participatory involvement.

When co-producing school-based health interventions, children should be involved in key decisions, specifically problem setting and problem solving (Reed et al., 2021). During Stage I, children's input on their experiences and strategy ideas to support peer relationships during school transition set the intervention's focus on positive class climate, emotional support, and empathy. In Stage II and III, children were involved in problem setting and solving by identifying problems with proposed topics and activities and suggesting changes. While Stage II was meant to include iterative cycles with the same classrooms, restricted access to schools during Covid-19 lockdowns required teacher-led workshops with targeted questions for children. It can be difficult to differentiate between the use of methods such as focus groups (or in this case qualitative comments based on teacher-led discussions) as data collection methods with children as research subjects on the one hand, and participatory methods to grant children active roles in the research process on the other hand (Montreuil et al., 2021). While children's involvement in decision making is central to participatory research (Reed et al., 2021), it is questionable if such involvement is dependent on the specific research methods or on the researchers' appreciation of children's input. As emphasised in one example of older children interviewing younger children, it is not necessarily the methods but the set-up and relational engagement that enables authentic involvement of younger children (Levy & Thompson, 2015). In the context of this research, children's active involvement was encouraged by an introduction emphasising children's expert role regarding the topics and research aims. Open discussion

questions were purposefully framed to elicit reflections on children's experiences and advice they would give to other children. Framed as discussion of practical advice, children were involved in the discussion of potential intervention strategies and, importantly, in *decisions* regarding such strategies. Thus, children's role extended far beyond that of research subjects.

While Stage II was affected by Covid-19 related restrictions, challenges regarding authentic involvement of children and shared decision making are common (Bradbury-Jones et al., 2018). Questions of ownership over the research process and democratic practices have been raised (James & Shaw, 2022). To address power dynamics, some studies provide training in research design or data analysis for participating youth (Bradbury-Jones et al., 2018) or facilitate students' skills to independently engage in problem solving and setting before the development process (Reed et al., 2021). However, creating truly equal power balances is considerably more difficult, the younger the children are, as activities need to be adapted to their development levels (Fails et al., 2012) and allow for enjoyable and meaningful experiences (Levy & Thompson, 2015). Therefore, adaptability and inclusivity of methods are common concerns (Bradbury-Jones et al., 2018). In this research, inclusivity and appropriateness of methods were achieved by structured brainstorming tasks, age-appropriate stimuli, and discussion with adult support. Thus, capacity building was external (Reed et al., 2021), with researchers facilitating students' problem setting and solving. Such guidance has been described as a form of choreography to find a balance between stepping in to help and stepping out to enable free idea generation (James & Shaw, 2022). In the present study, researchers took the lead in presenting topics (e.g., empathy) and proposing activities or context (e.g., Ana's story) to discuss the practical relevance of topics, contextual factors, and strategies to support each other or create positive change (i.e., intervention strategies). Children's active role was in choosing relevant topics, flagging irrelevant topics or activities, proposing links between topics, and suggesting

strategies they perceive as practically relevant and helpful. Such modifications due to external and internal challenges could be understood as limitations of a research study. In this case, however, the adaptation of participatory methodology to the research stage, the school context (specifically the remote school context during the pandemic), and the young stakeholders' needs, is considered a strength of this research. As this discussion aimed to emphasise, appropriate and nuanced adaptation of participatory methodology is essential and this example might help other researchers make informed decisions (Albert et al., 2023).

Furthermore, any researcher-led interpretation and reporting on the participatory process will inevitably present an adult perspective (Spyrou, 2011). Although it is frequently argued that the use of participatory methods as such empowers children (Bradbury-Jones et al., 2018), this cannot be claimed without consideration of children's perception of their role in the research (Montreuil et al., 2021). This again is more challenging when working with younger children, as they cannot be asked to write individual reports of their research experience or their findings. Adult researchers, therefore, need to be mindful of their impact on the research (Levy & Thompson, 2015) and their relationships with participating children (Loveridge et al., 2023). This is linked to ethical concerns regarding children's voluntary engagement, especially over longer periods of participation (Loveridge et al., 2023), and a safe environment for meaningful contributions (Levy & Thompson, 2015). In this study, implementing participatory activities in the classroom aimed to address some of these concerns by creating a safe environment through discussions with trusted peers. Although the engagement of various classes did not allow for long-term relationship building between researchers and students, teachers' and peers' presence seemed to counterbalance this. The heterogeneous group composition of classrooms additionally supported the creation of meaningful discussions between peers, which in turn allowed researchers to hear children's authentic voices. Additionally, working with different

classes in each stage allowed children to further refine, discuss and build on other children's ideas. Therefore, children developed strategies for other children based on children's ideas, which made children's views central to the development process.

Conclusion

This study aimed to provide an example of including children aged 9 to 12 in a participatory intervention development process with three stages. Involving stakeholders in all development stages and key decisions has been proposed as defining criteria of participatory research (Montreuil et al., 2021; Reed et al., 2021). However, there are challenges concerning authentic involvement and equal power balances when working with children (Bradbury-Jones et al., 2018). This study presented an example of the adaptation of existing guidelines for intervention development (Craig et al., 2019) with participatory methodology (Hagen et al., 2012; Hawkins et al., 2017) to specific research stages, the school context, and children's needs. Meaningful involvement in key decisions regarding intervention content and strategies was achieved by adapting the methodology and implementing distinct stages to include children's voices and reflecting on children's previous contributions. By describing all stages of the intervention development process and providing specific examples regarding children's input and involvement in decisions, as well as reflecting on remaining challenges regarding methodological approaches and power balances, we hope this study will support other researchers in planning participatory methodology suitable for their research context.

Main Findings and Implications of Chapter 4

Based on existing guidelines regarding collaborative intervention development (Hagen et al., 2012; Skivington et al., 2021; Wight et al., 2015), iterative stages of stakeholder involvement were implemented to collaboratively refine the intervention. Stage I found child stakeholders to emphasise the role of positive classroom climate for the establishment of positive peer relationships in the classroom. Additionally, a lack of specific emotional support strategies for peers became evident. In Stage II, it became evident that a focus on self-efficacy was not effective and engaging for children. Instead, children suggested an integration of self-efficacy with class climate and empathy and emotional awareness, which was achieved through the integration with stories. In stage III, the intervention was pilot tested and the stories were refined to be short and less reliant on text to engage all children, regardless of their literacy competencies. Based on these findings from the development process and the literature base, a novel positive peer relationship programme was developed. Its intervention effect model was based on evidence regarding the effects of social-emotional skills on peer relationships (Bowker et al., 2010; Flannery & Smith, 2017) as well as children's input during the development process. As the collaborative development highlighted a need to address social-emotional skills and literature suggests a strong relationship between social-emotional skills and peer relationships (Bowker et al., 2010; Flannery & Smith, 2017), it was proposed that the novel programme would promote children's social-emotional skills and increases in skills would facilitate their classroom climate and their peer relationships. Furthermore, an increase of peer connectedness was hypothesised to facilitate happiness in class (Heinsch et al., 2020). The effectiveness of the novel programme and its intervention effect model was evaluated in Chapter 5.

CHAPTER 5

Promoting Peer Connectedness Through Social-Emotional Learning: Evaluating the Intervention Effect Mechanisms and Implementation Factors of a Social-Emotional Learning Programme for 9 to 12-Year-Olds

Presented in the format submitted for publication.

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Abstract

There is little evidence regarding the effect mechanisms of social-emotional learning programmes on children's peer relationships. The current study evaluated a novel school-based social-emotional learning programme for the first year of secondary school with 19 intervention classrooms (n=399) and 16 waitlist-control classrooms (n=281), assessing social-emotional skills, peer connectedness, happiness, student and teacher classroom climate. It was hypothesised that the programme would facilitate social-emotional skills, which would predict peer connectedness and class climate increases, which would predict happiness. Results indicated significant intervention effects for social skills, peer connectedness and happiness. Classroom climate declined for both groups, seemingly affected by the school transition. Hypothesised effect mechanisms were partly supported with significant effects of social-emotional skills on connectedness for children with low baseline skills and significant effects of peer connectedness on happiness for children reporting connectedness decreases. These findings indicate that universal, school-based social-emotional leaning programmes are effective approaches to support peer relationships in the context of the school transition, particularly for children with skills deficits.

Keywords: peer relationships, peer connectedness, early adolescence, social-emotional learning, intervention

Introduction

The last decades have seen an increase in focus on schools' responsibilities to foster children's emotional wellbeing and social skills besides a traditional focus on academic skills. New guidelines and policies (Ofsted, 2019; NICE, 2008) seek to promote personal development and mental health lessons in schools. This heightened prominence is reflected in the 2015 decision of the Programme for International Student Assessment (PISA) to include measures of student wellbeing in addition to its traditional academic measures (Borgonovi & Pal, 2016). This first PISA study including wellbeing, found that about 12% of students are not happy with their lives and students' sense of belonging to school has generally decreased across countries, which are part of the Organisation for Economic Co-operation and Development (OECD) since 2003 (OECD, 2017).

There are many umbrella terms and heterogeneous terminology for prevention and intervention programmes in childhood, such as social-emotional learning (SEL) (Blank et al., 2008; Mackenzie & Williams, 2018), positive psychology (Tejada-Gallardo et al., 2020) or positive youth development (PYD) programmes (Taylor, 2017). A review comparing these frameworks (Tolan et al., 2016) has found core constructs and aims to overlap and has suggested two comprehensive positive development characteristics that are common to all frameworks: (1) management of emotions and related behaviours and (2) positive engagement with others. In other words, improving social-emotional skills and peer relationships is at the heart of most current childhood prevention approaches, highlighting the importance of these factors.

Programmes focusing on social-emotional skills have been found to successfully improve social skills with medium to large effects (Gutman & Schoon, 2015). As prosocial behaviour is vital for establishing friendships (Bowker et al., 2010), social-emotional learning programmes have

been discussed as a means to facilitate peer relationships (Brendgen & Poulin, 2018; Suldo et al., 2013). Specifically, understanding emotions, emotional support and prosocial behaviours seem important for friendship quality and peer liking, while conflict management seems important for friendship stability (Flannery & Smith, 2017). At the same time, peers have been found to impact social behaviours bi-directionally during adolescence (Orson et al., 2020), as this is a period of heightened focus on group norms (Hazen et al., 2008). Classroom prosocial behaviour specifically, was found to predict individual social behaviour (Busching & Krahé, 2020) and social-emotional wellbeing (Wang et al., 2020). Additionally, how students perceived their teachers' attitudes predicted self-reported behaviour and mediated intervention outcomes (Saarento et al., 2015). Thus, school-based intervention efforts were advised to combine a focus on skill instruction and school climate (Domitrovich et al., 2017).

The effectiveness of universal, school-based programmes was, however, found to be mixed (Mackenzie & Williams, 2018) and highly specific to programme characteristics and context variables (January et al., 2011). Particularly, age related differences were highlighted, as school-based programmes seem most effective during developmental transition periods, such early adolescence (January et al., 2011; Mackenzie & Williams, 2018). The brain regions related to emotions are especially malleable during early adolescence (Blakemore & Mills, 2014), thus this period is ideal for social-emotional interventions (Jansen & Kiefer, 2020). However, this period coincides with the primary-secondary school transition, which can be difficult for some children (van Rens et al., 2018) and causes particular instability regarding peer relationships (Ng-Knight et al., 2019). While wellbeing and school climate in primary school are high, there is a decrease after the transition to secondary school in various European countries (Coelho et al., 2020; Eder, 2007; Tobia et al., 2019). Maintaining close friends over the transition was, however, associated with positive mental health aspects (Ng-Knight 2019) and happiness at

school (Heinsch et al., 2020). Associations between wellbeing at school and the relationship to school friends are again bi-directional and a moderating role of emotion transmission was discussed (Kiuru et al., 2020).

This evidence concerning interlinked skills and bi-directional effects during an eventful but promising period for social-emotional learning and intervention implementation, emphasises the need to assess the link between social-emotional learning and peer relationships more closely. Generally, increases in social-emotional skills through intervention programmes (Gutman & Schoon, 2015) seem to positively impact peer relationships (Bowker et al., 2010; Flannery & Smith, 2017) and there is promising evidence regarding long-term effects of PYD interventions and school-based SEL programmes on peer relationships (Pollak et al., 2022; Taylor et al., 2017). A review of programmes aiming to facilitate peer relationships (Pollak et al., 2022) found preventive, universal, school-based programmes to positively affect peer relationships through positive psychology (Shoshani et al., 2016) classroom interactions (Mikami et al., 2005), mindfulness (Lombas et al., 2019; Schonert-Reichl et al., 2015; Terjestam et al., 2016) and emotional resilience (Kozina, 2020; Maalouf et al., 2020; Siu, 2007; Stallard et al., 2007). Typical social-emotional skills programmes, however, commonly addressed neurodiverse and at-risk populations (Pollak et al., 2022), even though social-emotional learning is promoted as the ideal universal, preventive approach in schools (Greenberg et al., 2017). Few studies have addressed the impact of universal, preventive social-emotional learning approaches in school on peer relationships.

Additionally, there is also a need to better understand intervention effect mechanisms (Domitrovich et al., 2017). Especially as normative growth trajectories of various social-emotional skills during adolescence were found to be non-linear and different for girls and boys (Ross et al., 2019), trajectories of intervention effects are likely to be very complex. However,

many evaluation studies do not collect outcome measures on all of the particular skills they address (van de Sande et al., 2019) and evidence from longitudinal studies is rare (Gutman & Schoon, 2015). There is evidence for the impact of prosocial behaviour interventions on peers' perception of classmates (Palacios et al., 2019) and peer relationships seem to impact behaviour outcomes (Witvliet et al., 2009). However, a longitudinal intervention study did not find effects of target skills on loneliness outcomes (Orkibi et al., 2017). Thus, the intervention effect mechanisms between skills improvements and peer relationships are still largely unclear. Overall, the evidence base supports social-emotional skills and peer relationships as central aspects of positive development (Tolan et al., 2016) and suggests a potential of social-emotional learning to have strong effects on social skills (Gutman & Schoon, 2015), thereby positively impacting peer relationships (Flannery & Smith, 2017) and, in turn, wellbeing at school (Ng-Knight et al., 2019). However, to fully understand the role of social-emotional learning in the classroom, and its impact on peer relationships and wellbeing, their intervention effect mechanisms and their impact on behaviour change needs to be assessed (Domitrovich et al., 2017).

Implementation Factors

Additionally, a need to address implementation aspects in an educational setting is emphasised by researchers (Green et al., 2021) and policy documents (Borgonovi & Pal, 2016; Kankaraš et al., 2019). Generally, the implementation of universal, preventive social-emotional skills programmes has been advised as it can be integrated sustainably in school practices and was found to be highly cost-efficient (Domitrovich et al., 2017). However, reviews consistently point towards the link between high quality implementation and intervention effectiveness (Durlak & DuPre, 2008). While intervention research has long been driven by effectiveness

evaluations, complex intervention research needs to account for a range of implementation factors and acceptability among stakeholders (Skivington et al., 2021).

Complex interventions, which are broadly defined as interventions addressing multiple interacting components – such as social-emotional learning programmes – come with implementation and evaluation challenges relating to standardisation, context sensitivity, and the complexity of the effect model of intervention outcomes (Craig et al., 2019). Thus, to increase implementation quality of complex interventions, two aspects need special consideration; (i) a well-defined intervention (effect mechanism) model and (ii) a "support system" to the intervention, consisting of infrastructure and training elements to create a common context for intervention delivery and decrease variability of implementation quality (Domitrovich et al., 2008).

The intervention model should feature core elements derived from the related theory and evidence-base, and consider standardisation and delivery aspects (Domitrovich et al., 2008). To address this in the development and evaluation of a social-emotional learning programme, an evidence-based effect mechanism model considering social-emotional skills and its associations to outcome variables such as peer relationships and psychological wellbeing should be developed. Additionally, evidence regarding timing and appropriate delivery methods (January et al., 2011; Pollak et al., 2022) should be considered. To measure implementation fidelity of the delivery of this intervention model, adherence is the fundamental aspect (Carroll et al., 2007).

The support system should be tailored to the intervention deliverers. While universal school-based interventions have been found to be more effective when delivered by school-personal as compared to external personal (Durlak et al., 2011), teachers lack professional development

opportunities and feel ill-equipped to address social-emotional or mental health needs (Bale et al., 2020; Martínez, 2016). Implementation personals' self-efficacy seems to interact with intervention complexity in regards to student outcomes (Caron et al., 2020), emphasising the importance of targeted support systems in more complex interventions. However, a support system merely aids the implementation and needs to be understood as distinct from intervention strategies (Domitrovich et al., 2008). A teacher training alone, for example, did not increase students' peer relationships (Mikami et al., 2011). It is further unclear whether changing teachers' attitudes even impacts their behaviours in class, with some studies supporting such a relation (Wilson et al., 2022), while others do not (Garrote et al., 2020). However, a combination of personal teacher effects and classroom setting effects were found to impact intervention results (Tolan et al., 2020). Specifically, highly distressed teachers in classrooms with disruptive behaviours were found to profit most from a combined teacher training and classroom intervention (Tolan et al., 2020). Thus, intervention complexity, facilitation strategies, quality of delivery, and participant responsiveness were identified as moderators of implementation fidelity (Carroll et al., 2007) and should be considered when measuring fidelity.

Current Study

Based on this evidence-base regarding associations between social-emotional skills, peer connectedness and happiness in school, a novel prevention programme was developed to support children after the transition from primary to secondary school in the Austrian school context. Although bi-directional effects between social-emotional skills, peer relationships and wellbeing were reported, the central assumption was that social-emotional skills can be taught in social-emotional support programmes (Gutman & Schoon, 2015), which would have consequential effects on students' peer relationships and wellbeing (Flannery & Smith, 2017) – while relationships and wellbeing cannot be taught directly. Specifically, the programme aimed

to train emotional competencies and prosocial behaviours relevant for peer relationships (Flannery & Smith, 2017), assuming that high interpersonal skills will lead to successful interpersonal interactions (Tolan et al., 2016) increasing peer connectedness in the classroom (Bowker et al., 2010) and classroom climate. In turn, by supporting peer relationships in class after the school transition, the programme aimed to facilitate children's happiness in class (Heinsch et al., 2020). Early adolescence was chosen as target age period, as social awareness and receptiveness for social input is particularly high during this period (Hazen et al., 2008) and it was found to be a particularly promising time for implementing social-emotional learning (Jansen & Kiefer, 2020; January et al., 2011). Specifically, the period of school transition was chosen to buffer against potential difficulties with the transition itself (van Rens et al., 2018), and establish favourable classroom norms (L. Chang, 2004). The first year of secondary school has been suggested as an ideal opportunity to facilitate students' adaptation to the new classroom context and promote their wellbeing (Rice et al., 2015). With the primary-secondary school transition in the Austrian context in mind, the programme targeted children aged 9 to 12.

Based on the Medical Research Council (MRC) guidance for intervention development and evaluation (Skivington et al., 2021), the described intervention effect model was developed in order to a) identify potential weak links in the causal chain and b) identify whether such a weak link may be the cause of ineffectiveness on higher outcome levels (i.e., happiness in the classroom). Thus, this study aimed to evaluate intervention outcomes and understand the effect mechanisms to clarify the role of social-emotional learning in the classroom (Domitrovich et al., 2017).

It was hypothesised that compared to a waitlist control group, the intervention group will report increased social-emotional skills over the intervention period (T1-T2) (hypothesis 1). It was further hypothesised that compared to the control group, the intervention group will report

increased peer connectedness, happiness and classroom responsibility climate, both that generated by teachers and that by classmates, over the study period (T1-T3) and over the follow-up period (T2-T3) (hypothesis 2). The intervention effect model predicted that, *in the intervention group,* immediate intervention effects on social-emotional skills during the intervention period (T1-T2) would predict classroom climate generated by students and peer connectedness after the intervention period (T2-T3) (hypothesis 3). In turn, it was expected that, in the intervention group, higher peer connectedness would predict happiness in the classroom (hypothesis 4).

Additionally, exploratory analyses concerning the potential impact of implementation fidelity on outcome variables were conducted. In line with a framework on evaluating implementation fidelity (Carroll et al., 2007), it was first explored, whether higher adherence to the programme manual would result in better outcomes regarding social-emotional skills, class climate, connectedness and happiness. Secondly, moderating factors were assessed. We explored whether teachers reporting more perceived relevance of contents were also perceived as encouraging positive class climate by their students. Lastly, we tested whether students' perceived teacher class climate (i.e., how much the teacher encourages positive behaviour in class) predicted student class climate (i.e., their report of actual behaviour in class) (Saarento et al., 2015).

Methods

The Social-Emotional Learning Programme

The social-emotional learning programme „You, Me and the Little Monsters" is a social-emotional learning programme for the classroom context aiming to increase class climate and further peer connectedness among students. It was developed as part of a wider research project

on children's peer connectedness by researchers, psychologists and psychiatrists at the University of Birmingham, UK, and the Karl Landsteiner University, Austria in an iterative and collaborative development process with schools and children across Austria. Eight consecutive sessions introduced students to their "emotion monsters", which are neither good nor bad but always accompany people in their everyday lives. Emotional vocabulary was expanded through discussing different monster drawings and the concept of emotion regulation was introduced as trying to shrink monsters when they become too big. The discussion of topics such as empathy, conflict resolution, and bullying was supported by short digital stories, that presented children with characters in a classroom and allowed children to drive the storyline by asking them how the characters should react to the situations. By discussing authentic scenarios of school-life and putting newly developed classroom rules into practice, the programme aimed to facilitate social-emotional skills and thereby increase classroom climate and peer connectedness. An overview of the content delivered in each session can be found in Table 5.1.

Table 5.1

Overview of Intervention Sessions

Session	Target Competencies	Description of the Session	Methods Used During the Session
1	Emotion vocabulary, recognising emotions in oneself and others	The metaphor of emotion-monsters is used to externalise emotions, increase emotion-vocabulary and discuss where and how we feel our emotions. Students draw their personal "happy monster" and "anger monster".	Group discussion of monster cartoon prompts, drawing exercise, games, workbook exercise
2	Rating the intensity of emotions, emotion regulation	With the metaphor of small, medium, big and huge emotion-monsters, students learn to rate the intensity of their emotions. Emotion regulation strategies are introduced as ways to shrink monsters. In Joe's story, emotion regulation strategies are discussed.	Group discussion & poster activity, workbook exercise, mindfulness, story
3	Classroom rules, empathy and perspective taking	Students decide on their own classroom rules to feel welcome and safe in their class. Joe's story highlights the importance prosocial behaviour in class as serves as example to reflect on others' feelings, thereby practicing empathy and perspective taking.	Group dynamic games, group discussion & post-it brainstorming, story
4	Empathy, interpersonal emotion regulation	The classroom rules are applied in stories with specific examples to practice prosocial behaviours. Empathy and strategies to support classmates are practiced.	Cooperation game, group reflection, story, individual reflection
5	Communication skills, conflict resolution	Students learn to rate problems and decide whether they are (i) minor and will resolve themselves, (ii) medium and need addressing, or (iii) big and require adult help. In Ana's story, communication is introduced as first and important step to resolve conflicts.	Circle time to reflect on class community, games, story, partner activity, mindfulness
6	Conflict resolution strategies	Specific scenarios are used to practice taking different characters' perspective. Conflict resolution strategies are introduced and discussed in Ana's story.	Circle time, partner activity, workbook exercise, story
7	Bullying, bystander-effect, support strategies	Students learn to treat bullying as big problem that requires help to solve. The bystander-effect is discussed to encourage all students to support each other when witnessing bullying behaviour.	Circle time, workbook exercise, story
8	Recap of emotion regulation, prosocial behaviour strategies, conflict resolution	Through a story about the "anger-monster" that is passed on from student to student, children recap learned strategies to regulate their emotions, support each other and resolve conflicts.	Circle time, workbook exercise, story, reflection

Study Design

This study followed a clustered waitlist-control evaluation design with intervention and control group and three measurement points at pre, post and follow-up. Participants were clustered in their classrooms due to the teacher-lead implementation in schools. The study was conducted between September 2021 and February 2022. Due to ongoing Covid-19 related restrictions and

contingency measures in schools, teachers reported increases in workload and expressed heightened stress levels. In relation to school-specific Covid-19 testing procedures, which were expected to be more frequent and time consuming in the early school months as well as other school-specific procedures at the start of the term (e.g., school trips, project weeks), some schools expressed concerns regarding a programme start in September. As the programme was intended to support children right after the transition, a programme start in September (or early October at the latest) was vital to assess realistic programme benefits. Therefore, the decision was made to assign those schools motivated to participate but concerned about a start in September to the control group. Thus, intervention and control group were not assigned at random.

Ethical approval for this study was obtained at Karl Landsteiner University in Krems, Austria (EK-Nr. 1021/2020). Additionally, approval of the Lower Austrian school authorities was obtained. Schools were recruited through an existing network of the research group and a cooperation with the Lower Austrian Teacher Education University. Headteachers and class teachers were contacted by telephone and received detailed information about the programme and the study. When class teachers agreed to piloting the programme, adult and child-friendly information sheets about the evaluation study were sent to teachers to be read with their students and forwarded to parents. Due to schools' autonomy, teachers and school authorities decided whether to add the programme to their curriculum, however parents and students decided whether to participate in the evaluation of the programme. Thus, children who decided not to participate in this evaluation study were not separated from their classroom while the programme was implemented, which was in line with the programme's intentions to comprehensively increase class cohesion and connectedness between all students. Written informed consent was obtained by teachers and parents and sent to the research group through

the teachers. Additionally, students were shown a video recorded by the researchers (first and second author) informing them about the study aims and explaining the questionnaires and anonymity of the data. Student consent was obtained through ticking a box at the beginning of the evaluation questionnaires. Teachers were asked to provide written consent before completing fidelity measures.

Data was collected via the online questionnaire platform socisurvey via a server at the University of Vienna and was later stored on a secure server at Karl Landsteiner University. Students were asked to provide a self-generated personal identification code, thus, it was not possible to identify individual students and the data was anonymous. This code was used to link students' pre, post and follow-up data. Classroom codes were generated by the researchers to anonymise teacher's qualitative fidelity feedback.

In spring and summer 2021, 44 classes were contacted via the research group's existing network and recruited to participate in the study. Out of those, 23 classes were assigned to the control group due to teachers' time restrictions and preferences. Intervention group teachers received a detailed programme manual and were required to participate in two training sessions lead by the researchers [first and second author] prior to the start of the implementation to increase implementation fidelity. Control group teachers received the same manual after finishing the follow-up questionnaire with their classrooms and were invited to voluntary training sessions. Researchers contacted intervention group teachers regularly by email and telephone to answer any questions and check for fidelity and implementation progress. Intervention group teachers were asked to complete additional written fidelity checklists for each session and both, control and intervention group teachers were asked to complete surveys concerning (additional) social-emotional lessons throughout the intervention period.

Teachers were asked to complete pre-measures (T1) with children who consented to their participation in the evaluation study in late September or early October 2021, before starting programme implementation. For the implementation, teachers were advised to conduct one session per week for eight weeks and complete the post-test (T2) soon after finishing the last session, but no later than December 2021. Aiming for a minimum of a six-week follow-up, teachers were asked to complete the follow-up measures (T3) in late January or February 2022.

While the present paper focused on the intervention's effects on social-emotional skills, classroom climate, connectedness and happiness, and the intervention effect mechanisms, a separate paper focused on variables concerning the impact of the school transition. Specifically, fears related to the school transition and competencies, including emotional abilities and conflict management, will be discussed with attention to gender differences in a prospective publication, which is currently in preparation.

Participants

In spring and summer 2021, 44 classes – 21 intervention classes and 23 control classes – were contacted and recruited to participate in the study. Nine classes dropped out of the study before the completion of pre-tests in September 2021, two of which were in the intervention group and seven in the control group, all referring to Covid-19 related school measures and unforeseen workload demands. Thus, pre-test measures were completed in September and October 2021 by 19 intervention classrooms (n=399) and 16 control classrooms (n=281). Out of the intervention classes, another three classes dropped out of the study after completing pre-measures, due to Covid-19 related or other school-related workload increases. Post-test measures were completed by 16 intervention and 16 control classrooms in November or December 2021. Intervention class teachers were asked to implement one session per week for

eight weeks and complete the post-test soon after the last session. Depending on the number of lessons class teachers had with their class, school holidays, and Covid-19 related measures in their classrooms, the actual implementation period varied between 5 to 13 weeks in intervention classes, with a mean of 10 weeks. Similarly, for control classrooms the period between pre and post measures varied between 5 and 12 weeks, with a mean of 9.8 weeks. Follow-up data was obtained from 29 of the remaining classrooms (*n*= 486), including 14 intervention classes and 15 control classes. The follow-up period ranged between 5 and 14 weeks (mean of 8.8 weeks) for intervention classes and 4 to 8 weeks for control classes (mean of 6.8 weeks).

Out of the intervention group, eight classes did not implement all eight programme sessions due to time constraints, Covid-19 related issues (additional time spent on testing children for Covid-19, illness etc) or other school-related commitments. Six classes completed at least six sessions ("partly finished", *n* =116), two classes completed less than five sessions ("few sessions", *n* =42) and three classes dropped out of the study completely ("drop-out", *n* =46). For the main intervention effect analysis, a per-protocol approach was followed, including only the eight classes that finished all sessions as described in the manual (*n* =195) and the control group classes with pre and post measures (*n* =281). Therefore, the intervention group included in the main intervention effect analysis is smaller than the control group. In the eight classes that finished all sessions, there was missing data for 19 students, eight of whom only completed pre-measures, and eleven of whom completed two out of three measurement-rounds. In the control group, there was missing data for 75 students, 24 of whom completed pre-measures, and 51 of whom completed two out of three measurement-rounds. Demographic characteristics of the groups included in the main intervention effect analysis can be found in Table 5.2. The

share of school type[7] was almost even within groups and equal across groups in the initially recruited sample, with eleven grammar school classes out of 21 intervention classes (52.4%) and 11 grammar school classes out of 23 control classes (47.8%). However, more comprehensive schools dropped out in the intervention group and more grammar school dropped out in the control group, leaving the sample quite unbalanced in this regard.

[7] In the Austrian school context, there are two types of secondary schools. (Lower grade) grammar schools span year 1 to year 4 and cater to students transitioning to higher secondary school, aiming to complete a high school diploma qualifying them for university. Comprehensive schools span year 1 to year 5 and cater to all students, either transitioning to vocational trainings after year 5 or to higher secondary grammar schools after year 4, aiming to complete a high school diploma qualifying them for university. For admission to grammar schools, students need to achieve a good grade average in primary school. The exact grades needed depend on competitiveness of schools, which depends on the school area.

Table 5.2

Demographic Variables for Intervention and Control Group

		Control Group		Intervention Group	
		Count	Percentage	Count	Percentage
Participants	N	281	59%	195	40.9%
Age (years)	9	1	0.3%	1	0.5%
	10	175	66.3%	148	82.2%
	11	82	31.1%	29	16.1%
	12	6	2.3%	2	1%
	n/a	17	-	15	-
Gender	girl	133	50.4%	88	48.9%
	boy	131	49.6%	92	51.1%
	n/a	17	-	15	-
School Type	grammar school	104	37.1%	170	87.2%
	comprehensive school	177	62.9%	25	12.8%
School Setting	rural	96	34.2%	94	48.2%
	urban	185	65.8%	101	51.8%

Note. Demographic data is provided for the control classrooms and intervention classrooms, which finished all programme sessions and were included in the main analysis. Percentage of N compares distribution of the whole sample across the intervention and control group, while percentage data in all other categories indicates the percentage of the subgroup (e.g. girls) within the respective group (e.g. gender in control group). Data were collected at pre-test.

Measures

Happiness and peer relationships were measured with the subscales “happiness” and “peer connectedness” of the EPOCH Measure of Adolescent Wellbeing (Kern et al., 2016). The scale was translated from English to German and adapted to the school context validated with 10 to 18-year-olds (Buerger et al., 2023). It was chosen for its brief, targeted items focused on the

school environment (e.g. Happiness – “I’m mostly happy when I’m at school”, Connectedness – “I have friends in school, who are really important to me”). Each subscale consisted of four items with a five-point Likert scale ranging from 1-“not true at all” to 5-“very true”. In the original measure, the happiness and connectedness subscales had an internal consistencies of α= .83 and α= .77, and re-test reliabilities of *r*= .49 and *r*= .42 (Kern et al., 2016). In the current study, the happiness subscale had an internal consistency of α=.66 and the connectedness subscale had an internal consistency of α=.80.

Social-emotional skills were measured with the subscale “empathy” of the Self-Report Checklist for Social and Learning Behaviour (Lohbeck et al., 2014). While the subscale name “empathy” implies a one-dimensional focus on empathy, its items (e.g. “I comfort classmates after negative experiences” , “I encourage classmates, when they are sad”) are actually referring to empathic, prosocial *behaviours* in a classroom setting, which was the primary focus of this intervention. Additionally, the development of many social-emotional skills and their importance for friendships seem to differ between boys and girls (Flannery & Smith, 2017; Ross et al., 2019), while prosocial behaviours have been found to be important for all children’s friendships (Flannery & Smith, 2017). Thus, this subscale was chosen to measure empathic, prosocial behaviours as specific intervention outcome hypothesised to be relevant for all children’s peer relationships. Students rated themselves on a four-point Likert scale from 0-“never”, 1-“rarely”, 2-“sometimes” to 3-“regularly”. The questionnaire was developed and validated in German, with 9 to 19-year-old youth. In the validation research, the subscale had an internal consistency of Cronbach α= .83 and a re-test reliability of *r*=.67 (Lohbeck et al., 2014). In the current study, the scale had an internal consistency of α=.79.

Student and teacher classroom climate were measured with the student and teacher subscales of the classroom responsibility climate questionnaire (Fernández-Río et al., 2019). This

measure was chosen because it focused on the classmates' and teachers' behaviour contributing to the classroom dynamic, which was the focus of this intervention. Both subscales had 5 items (e.g., student classroom climate "During class, we encourage each other" / teacher classroom climate "The teacher likes that we encourage each other") to be rated on a 7-point Likert scale from 1-"strongly disagree" to 7-"strongly agree". The questionnaire was developed and validated in Spanish with secondary school students. The items were translated to German by the researchers using a parallel bling translation approach (Behling & Law, 2000). In the Spanish version, the student and teacher subscales had a measurement reliability of Cronbach α= .81 and α= .89 respectively (Fernández-Río et al., 2019). In the current study, the student class climate scale had an internal consistency of α=.81 and the teacher class climate scale had an internal consistency of α=.76.

Fidelity Strategy

This evaluation was teacher-implemented to increase sustainability of the intervention at schools and students' acceptability through familiar delivery personnel (Mackenzie & Williams, 2018). However, as this study was conducted in the context of heightened Covid-19 precautions in schools, the researchers were unable to be present for sessions or collect observational fidelity measures. Therefore, a detailed fidelity strategy was developed based on a fidelity framework by Carroll et al. (2007), which advises indexing implementation fidelity by measuring adherence (specifically content, coverage, duration and frequency) and its moderators (specifically complexity, delivery quality, additional facilitation strategies, participants' responsiveness).

As for the moderating factors, more detailed and specific interventions typically achieve higher fidelity (Carroll et al., 2007). By establishing a support system for an intervention, an

appropriate delivery context is created, thus decreasing the variability of the quality of implementation (Domitrovich et al., 2008). Thus, a very detailed teacher manual and student workbook was developed with additional materials such as posters and digital stories to help targeted and guided discussion of contents. Additional facilitation strategies, such as the implementation of two online teacher training workshops, regular email reminders and bi-monthly phone calls to discuss progress and any problems were implemented.

To measure the remaining fidelity aspects, a teacher fidelity questionnaire was sent out after each session. Adherence to the programme manual was measured by asking teachers to report on the duration and frequency of their programme implementation and report their content coverage by indicating how comprehensively they had completed/discussed each activity on a scale from 1 to 5 (1-left out completely, 2-discussed in less detail, 3- completed, 4- discussed in more detail, 5- discussed very thoroughly). Quality of delivery itself was difficult to assess as researchers could not be present for the implementation (due to Covid-19 related measures). Conducting video calls for each session in each classroom would have been logistically impossible. Thus, a sampling of fidelity video calls of some sessions would have been the only option. As it is unclear, how sampling and scheduling of such fidelity video calls or direct observation would affect the implementation by teachers (Barnett et al., 2014), researchers decided against this option. Instead, teachers' perceived relevance of contents for their students was assessed because teachers' explicit attitudes have been found to predict their behaviour in class (Wilson et al., 2022). Thus, it was assumed that their perceived relevance would predict their implementation of these contents. Perceived relevance of programme contents for their students was measured on a scale from 1 to 5 (1-not relevant, 2-little relevance, 3-ok, 4-relevant, 5-highly relevant). As participant responsiveness could not be directly assessed by the researchers either, teachers were asked to rate their perceived student responsiveness ("Did you

feel your students understood all concepts?") on a scale from 1 to 5 (1-didn't understand, 2-understood little, 3-understood ok, 4-fully understood, 5-fully understood and capable of using new competencies). Additional open questions provided room to detail potential deviations of the script and reasons for such deviations.

Statistical Analysis

The statistical analysis was conducted using IBM SPSS Version 29. Linear mixed models were computed to evaluate intervention effects (Hypotheses 1-2) and change score analyses (Hypotheses 3-4) due to their ability to account for fixed and random effects (Detry & Ma, 2016). Restricted maximum likelihood estimation was used to account for missing data. Models assessing intervention effects (in the following referred to as intervention effect models) accounted for main effects of time (T1-T2 / T1-T3) and main effects of group (intervention/control) and interaction effects between group and time. Because it was important to distinguish between intervention period and follow-up period, the analysis was always restricted to including two levels of the factor time. Students' ID and the classroom variable were included in the repeated structure of the model and classroom was specified as a random effect. As maximum likelihood estimation was used, missing data was estimated from present data and no participants were excluded due to missing data. Effect size calculation can be problematic in multilevel models as calculating a change in residual variance when adding predictors to the mode could lead to impossible values (Hox, 2013). It has thus been suggested to interpret effects sizes derived from simple methods as merely indicative (Hox, 2013). For models with factors in the fixed effects structure (e.g. group, time), partial eta squared was computed from the F-statistic, specifically the F-value and its degrees of freedom (Lakens, 2013).

As this study evaluated a novel intervention, it first aimed to establish that a) the intervention had positive effects on outcome variables and b) that changes of primary outcome variable predicted changes of secondary outcome variables (as specified in intervention effect mechanism hypotheses). Thus, intervention effect mechanisms were evaluated by analysing correlations between skills changes during the intervention period and outcome variable changes during a follow-up period to understand the medium- and long-term trajectories of targeted skills and how they were impacting outcome factors (Gutman & Schoon, 2015). Models assessing hypothesised intervention effect mechanisms (in the following referred to as effect mechanism models) predicted the change scores of a hypothesised outcome variable (e.g., peer connectedness) by the change scores of a hypothesised effect variable (e.g., social-emotional skills). Classroom was again specified in the random effects structure and maximum likelihood estimation was used. For models with covariates (i.e., all effect mechanism models) pseudo R^2 was used as indicator of effect size.

An additional exploratory analysis was conducted to evaluate effects of implementation factors, specifically adherence as the main factor representing the delivery of the intervention (Carroll et al., 2007). In its most obvious form, adherence (i.e., duration and frequency) was reflected by the implementation progress made (i.e. how many sessions were completed at the end of the intervention period). Thus, intervention effects were compared between all five implementation groups, including (i) eight "full programme finished" classrooms finishing all sessions (n =195), (ii) six "partly finished" classrooms completing at least six sessions (n =116), (iii) two "few sessions" classrooms having completed less than five sessions (n =42) and (iv) three classrooms dropping out of the study (n =46) and (v) the 16 control classrooms (n =281). When post-hoc tests were used to assess group differences, Fisher's Least Significant Difference (LSD) test was used, as the Bonferroni method is more conservative, specifically when multiple

tests are conducted (Lee & Lee, 2018). Fischer's LSD was suggested to avoid type II error (Lee & Lee, 2018), which seemed relevant as sample size of different implementation groups was much smaller than the overall sample and small effects were expected.

Results

Fidelity Results

The main indicator used to assess adherence was the completion of all eight programme sessions (i.e., frequency and duration of the programme), which was assessed in repeated telephone conversations. Out of 19 intervention classrooms, eight finished the full programme, six "partly finished" the programme, two only completed few sessions and three classes dropped out of the study. Additionally, duration and content coverage of each completed session was collected in the fidelity questionnaires.

Fidelity questionnaires were completed by 14 teachers (see Appendix 5.1). Teachers' consistency in completing fidelity measures differed, with a range of completed questionnaires between 1 and 8 (one questionnaire for each of the 8 sessions). On average, teachers completed 4 questionnaires and only one teacher completed all 8 fidelity questionnaires. However, as some teachers did not implement all 8 sessions, some might have completed all questionnaires for all their completed sessions. Overall, 48,8% reported that they used one school lesson (50 min) to cover the content, while 34,4% reported having spent more time than one school lesson on one session. Teachers, who finished all programme sessions, reported having spent an average of 59.2 minutes on each session, while teachers, who partly finished the programme, spent an average of 65 minutes their sessions. Teachers reported a mean of 3.05 (*SD*= 0.61) for content coverage across all sessions. With a score of 3 indicating all content was covered (and 4-5 indicating more detailed coverage of the content beyond suggested activities), this suggests, on

average, teachers reported completing all suggested programme activities. Teachers who finished the full programme reported a mean of 2.95 (SD=0.19) and teachers, who partly finished the programme, reported a slightly higher content coverage with a mean of 3.22 (SD=0.30). Regarding participants' responsiveness, teachers reported an overall mean of 3.91 (*SD*= 0.62), indicating that, on average, teachers felt their students had achieved a good understanding of the concepts. Lastly, concerning their perceived relevance of concepts and programme contents, teachers reported an average score of 4.12 (*SD*= 0.45), indicating they perceived most contents as relevant. For a detailed report of fidelity per teacher and per session see Appendix 5.1.

Table 5.3

Means and Standard Deviations of All Outcome Variables for Intervention and Control Group

Outcome Variable	Time	Group	*M*	*SD*
Social Skills	*Pre*	control	13.65	0.20
		intervention	13.75	0.26
	Post	control	13.62	0.20
		intervention	13.79	0.26
	Follow-up	control	13.43	0.21
		intervention	14.10	0.27
Classroom Climate Student	*Pre*	control	26.50	0.56
		intervention	27.69	0.75
	Post	control	25.73	0.57
		intervention	26.21	0.76
	Follow-up	control	25.39	0.58
		intervention	26.21	0.78
Classroom Climate Teacher	*Pre*	control	31.76	0.36
		intervention	32.10	0.47
	Post	control	31.76	0.39
		intervention	32.09	0.49
	Follow-up	control	31.38	0.38
		intervention	32.56	0.50
Peer Connectedness	*Pre*	control	16.28	0.27
		intervention	15.92	0.35

	Post	control	16.33	0.28
		intervention	16.05	0.36
	Follow-up	control	16.08	0.28
		intervention	16.36	0.37
Happiness	*Pre*	control	16.03	0.28
		intervention	16.55	0.37
	Post	control	15.88	0.29
		intervention	16.19	0.38
	Follow-up	control	15.40	0.30
		intervention	16.47	0.39

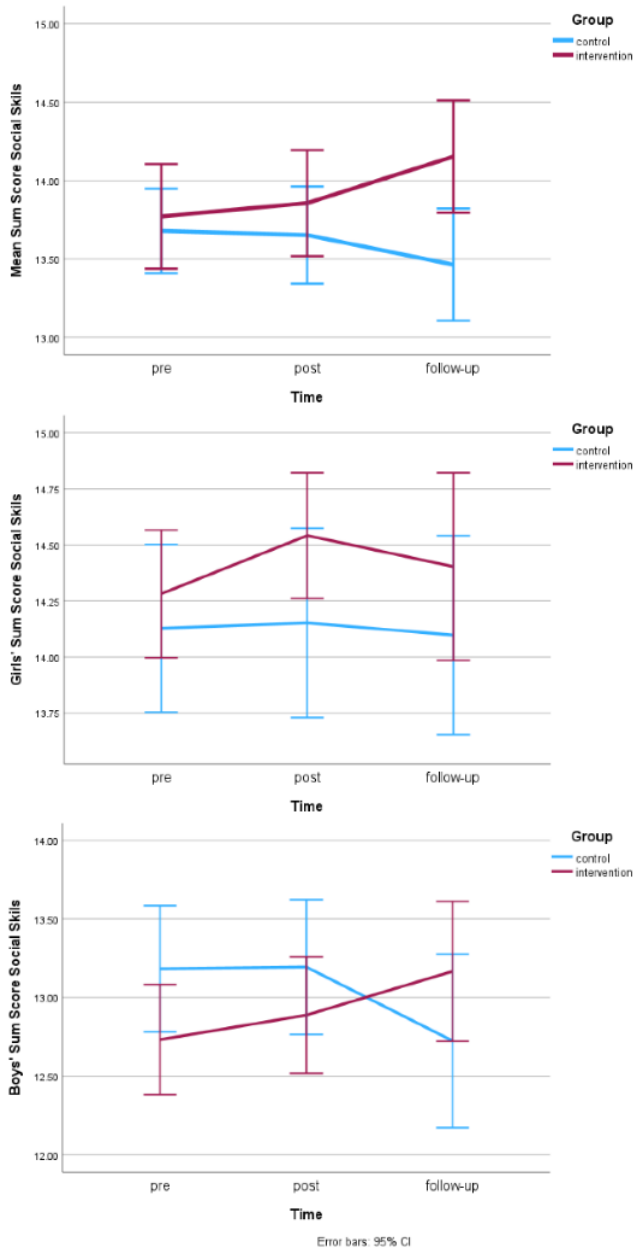
Main Intervention Effect Models

Social-Emotional Skills

No pre-differences in social-emotional skills were found between intervention and control group. Over the intervention period (T1-T2), no significant main effects of time or group and no interaction effect were observed for social-emotional skills (see Table 5.4). However, during the follow-up period (T2-T3), a significant time x group interaction effect ($F(1,365)=6.83$, $p=.009$, $\eta^2_p=0.02$, model fit BIC=3479.64) was found. Similarly, over the whole study period (T1-T3), a significant time x group interaction effect ($F(1,393)=6.39$, $p=.012$, $\eta^2_p=0.02$, model fit BIC=3813.55) was observed. As evident from Figure 5.1, the intervention group steadily increased their social-emotional skills levels with a particular increase from post to follow-up, while the control group slightly but steadily decreased (see also Table 5.3).

Figure 5.1

Changes in Social-Emotional Skills Across Pre- Post and Follow-up



Gender was added to the intervention effect model for the whole study period to analyse gender differences across the whole time period. This model yielded a significant main effect of gender ($F(1,484)=35.12$, $p<.001$, $\eta^2_p=0.07$, model fit =3686.49) and a significant three-way interaction between gender, group and time ($F(1,390)=4.15$, $p=.042$, $\eta^2_p=0.01$). To analyse intervention

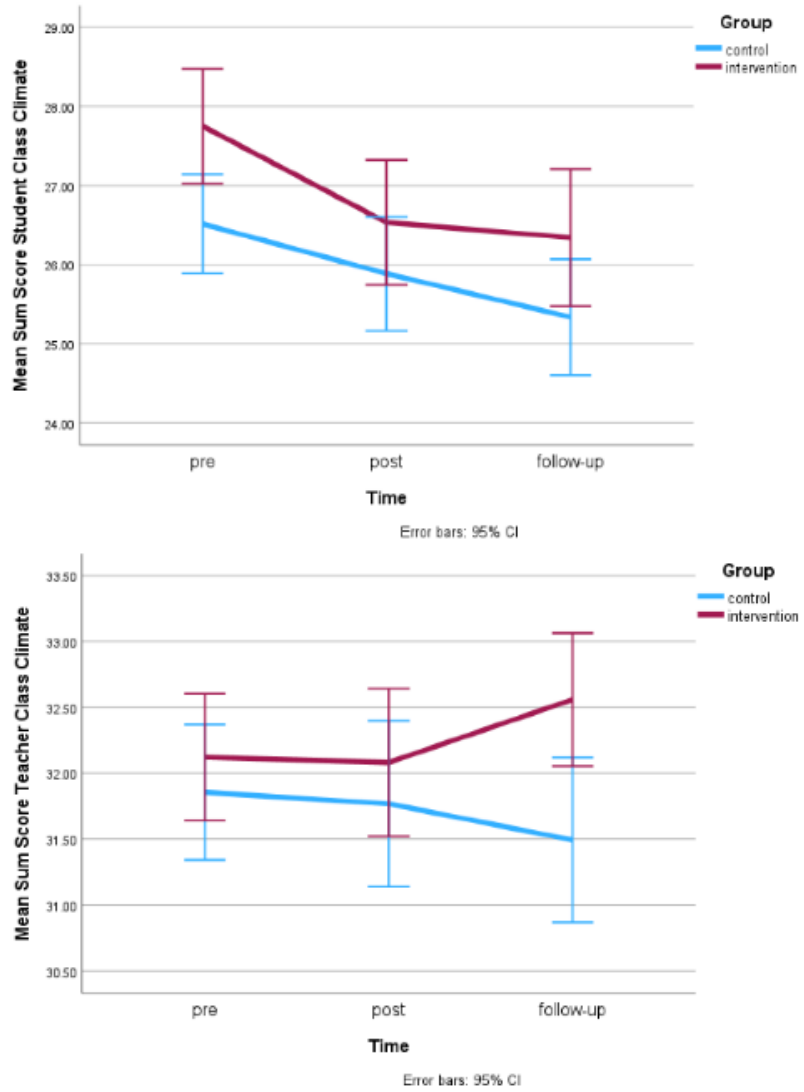
effects in detail for both genders, the data was split by gender and separate intervention effect analyses with time and group were run. While a significant time x group interaction effect on social-emotional skills was found for boys ($F(1,185)=9.02$, $p=.003$, $\eta^2_p=0.05$, model fit BIC=1882.36), this effect was not observed for girls. Descriptive statistics reveal that boys in the control group decreased in their social-emotional skills (pre $M= 13.19$, $SD= 0.31$, follow-up $M= 12.66$, $SD= 0.28$), while boys in the intervention group increased (pre $M= 13.02$, $SD= 0.23$, follow-up $M= 13.59$, $SD= 0.35$).

Classroom Climate Generated by Students

At pre, no significant differences in student classroom climate between intervention and control group were observed. Over the intervention period (T1-T2), a significant effect of time ($F(1,409)=20.98$, $p<.001$, $\eta^2_p=0.05$, model fit BIC=5256.92) was observed, but no interaction effect (see Table 5.4). Similarly, over the whole study period (T1-T3), a significant main effect of time ($F(2,412)=20.29$, $p<.001$, $\eta^2_p=0.05$, model fit BIC=5252.68) was observed, but no interaction effect. Both, the intervention and control group, reported a decrease of class climate from pre to post. The intervention group was stable until follow-up, while the control reported further decreased (see Figure 5.2), differences were however not statistically different (see Table 5.3). No differential effects of gender were found.

Figure 5.2

Changes in Classroom Climate Generated by Students and Teachers Across Pre- Post- and Follow-up



Classroom Climate Generated by Teachers

No significant pre-test differences between intervention and control group were found for teacher generated classroom climate. No significant main effects or interaction effects were found for intervention period (T1-T2), nor follow-up period (T2-T3), nor whole study period (T1-T3). A trend for a time x group interaction ($F(1,398)=3.15$, $p=.076$, $\eta^2_p=0.01$, model fit BIC=4811.54) was observed over whole study period (see Table 5.4). As evident from Figure

5.2, both groups were relatively stable between pre and post, but while the intervention group reported a slight increase, the control group reported a slight decrease at follow-up (see also Table 5.3). No differential effects of gender on perceived teacher classroom climate were found.

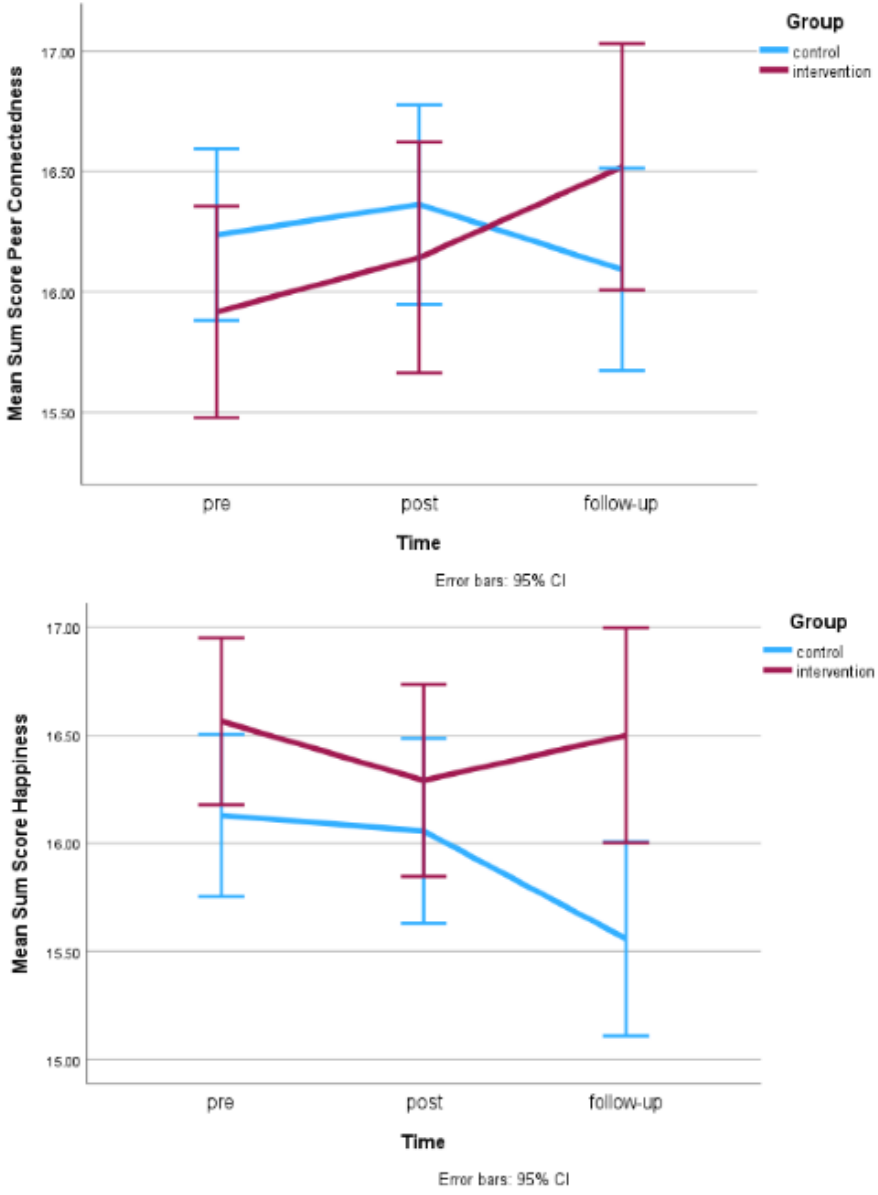
Hypothesis 1, which predicted direct intervention effects (T1-T2) on social-emotional skills, and student and teacher generated class climate, was therefore not supported. Although the significant time x group interaction effects for social-emotional skills indicate effects of the intervention, these effects became evident only when including the follow-up period (T1-T3/T2-T3). With no significant interaction effects for either class climate measure, no intervention effects were observed during the study period (T1-T2).

Peer Connectedness

No pre-differences between intervention and control group were found for peer connectedness. No significant main effects of time or group and no significant interaction effects were found for the intervention period (T1-T2, see Table 5.4). Over the follow-up period (T2-T3), a trend for a group x time interaction effect was observed ($F(1,367)=3.57$, $p=.060$, $\eta^2_p=0.01$, model fit BIC=4021.71) and over the whole study period (T1-T3) a significant interaction effect between group and time was observed ($F(1,406)=4.58$, $p=.033$, $\eta^2_p=0.01$, model fit BIC=4355,12). While both groups slightly increased in their levels of connectedness between pre and post, the intervention group reported further increases until follow-up, while the control group reported a decrease until follow-up (see Figure 5.3 and Table 5.3). When adding gender to the T1-T3 effect model, a significant main effect of gender on connectedness was observed ($F(1,485)=9.11$, $p=.003$, $\eta^2_p=0.02$, model fit BIC=4174.1) with girls reporting higher connectedness than boys (girls overall $M=16.58$, $SD=0.24$, boys overall $M=15.79$, $SD=0.24$). However, no interaction between gender and intervention group or time was observed.

Figure 5.3

Changes in Peer Connectedness and Happiness Across Pre- Post- and Follow-up



Happiness

No pre-differences between intervention and control group in happiness levels were observed. Over the intervention period (T1-T2), no significant effects were observed (see Table 5.4). Over the follow-up period (T2-T3), a significant time x group interaction effect was found (($F(1,371)=7.40$, $p=.007$, $\eta^2_p=0.02$, model fit BIC= 3961.35). Over the whole study period (T1-

T3), a significant main effect of time ($F(1,393)= 6.24$, $p=.013$, $\eta^2_p =0.01$, model fit BIC= 4339.93) was observed. There was a trend towards a significant time x group interaction effect ($F(1,393)= 3.12$, $p=.078$) and a trend towards a main effect of time ($F(1,20)= 3.11$, $p=.093$). While both groups showed a slight decline in happiness from pre to post, the intervention group increased again until follow-up, while the control group further decreased (see Figure 5.3 and Table 5.3). Including gender in the T1-T3 intervention effect model, yielded a main effect of gender ($F(1,526)=11.52$, $p<.001$, $\eta^2_p =0.02$, model fit BIC=5948.61), with girls reporting higher happiness levels than boys (girls overall $M= 16.55$, $SD= 0.24$, boys overall $M= 15.71$, $SD= 0.24$). However, no interaction between gender and intervention group or time was observed.

Hypothesis 2, which predicted significant intervention effects on happiness and connectedness after the intervention and follow-up, was partly supported. Again, no significant intervention effects were observed over the study period (T1-T2), however significant effects on happiness at follow-up were observed.

Table 5.4

Results of Main Intervention Effects Analysis Using Linear Mixed Models

Outcome Variable	Multilevel Linear Model	T1-T2					T2-T3					T1-T3				
	Predictor Variable	df num	def denom	F	p	η^2_p	df num	def denom	F	p	η^2_p	df num	def denom	F	p	η^2_p
Social Skills	*main effect time*	1	405.83	0.024	.877		1	365.58	0.084	.772		1	393.364	.553	.458	
	main effect group	1	22.14	0.251	.621		1	21.13	1.514	.232		1	23.267	1.697	.205	
	interaction time x group	1	405.83	0.429	.512		1	365.58	6.829	**.009***	0.018	1	393.364	6.390	**.012***	0.015
Classroom Climate Student	*main effect time*	1	409.22	20.982	**<.001****	0.051	1	374.56	0.670	.413		1	412.232	20.296	**<.001****	0.046
	main effect group	1	21.40	0.838	.370		1	20.09	0.506	.485		1	21.470	1.260	.274	
	interaction time x group	1	409.22	2.132	.145		1	374.56	0.483	.487		1	412.232	.309	.579	
Classroom Climate Teacher	*main effect time*	1	418.51	0.051	.822		1	380.90	0.005	.945		1	398.859	.038	.845	
	main effect group	1	19.59	0.338	.567		1	18.78	1.109	.305		1	18.831	2.118	.162	
	interaction time x group	1	418.51	0.008	.928		1	380.90	3.392	.066		1	398.859	3.158	.076	
Peer Connectedness	*main effect time*	1	405.48	0.181	.670		1	367.57	0.004	.948		1	406.941	.889	.346	
	main effect group	1	21.19	0.612	.442		1	21.07	0.000	.984		1	22.278	.000	.985	
	interaction time x group	1	405.48	0.122	.726		1	367.57	3.573	.059		1	406.941	4.576	**.033***	0.011
Happiness	*main effect time*	1	400.23	2.569	.109		1	371.38	0.165	.684		1	393.365	6.242	**.013***	0.016
	main effect group	1	20.14	0.892	.356		1	20.13	1.174	.291		1	20.412	3.109	.093	
	interaction time x group	1	400.23	0.740	.390		1	371.38	7.400	**.007***	0.019	1	393.365	3.124	.078	

Implementation Fidelity Analysis

Adherence and Implementation Progress

One of the research aims was to explore whether implementation fidelity factors affected intervention outcomes. As the coverage of all eight intended programme sessions was regarded crucial for the adequate understanding and training of the competencies, the implementation progress was used as the main indicator of adherence. Detailed results of the duration and content coverage of each session can be found in Appendix 5.1. An exploratory analysis of the different implementation progress groups (full programme, partly finished programme, few sessions, drop-out and control group) was conducted, testing for main effects of time and implementation group and time x group interaction effects. For the presented analysis, mixed linear models with group (intervention/control) and three levels of time (T1-T2-T3) were conducted, as this analysis was more exploratory compared to the main analysis, which tested specific predictions by considering intervention period and follow-up period separately.

Pre-test differences in some of the outcome variables indicated that the implementation groups already differed before the start of the intervention. For happiness, significant pre-differences ($F(4, 28)=3.02$, $p=.034$, $\eta^2_p=0.29$, model fit BIC=3447.74) were found. Post-hoc tests indicated that the drop-out group ($M= 14.66$, $SD= 0.61$) reported significantly lower happiness levels than the full programme group ($M= 16.56$, $SD= 0.34$, $p=.011$, 95% C.I.= [0.46, 3.31]) and the control group ($M= 16.05$, $SD= 0.26$, $p=.044$, 95% C.I.=[-2.74, -0.04]). Similarly, classrooms that completed few sessions ($M= 14.50$, $SD= 0.70$) reported significantly lower happiness than full programme classrooms ($p=.014$, 95% C.I.=[-3.64, -0.45]) and control classrooms (p=.048, 95% C.I.=[-3.07, -0.02]). For social-emotional skills, a strong trend ($F(4, 30)=2.63$, $p=.053$, $\eta^2_p=0.25$, model fit BIC=3032.24) indicated pre-test differences and post-hoc tests indicated that

the drop out group (*M*= 12.24, *SD*= 0.46) reported significantly lower social-emotional skills than the full programme (*M*= 13.78, *SD*= 0.25, *p*=.006, 95% C.I.=[-2.60, -0.48]) and the control group (*M*= 13.68, *SD*= 0.19, *p*=.006, 95% C.I.=[-2.45, -0.44]). For student and teacher classroom climate and connectedness, no pre-test differences were found.

For variables with pre-test differences between groups (i.e., happiness and social-emotional skills), the drop-out (and few session) group was excluded from the further analyses to allow the analysis to detect potential interaction effects generated by the intervention, unbiased by pre-test differences between groups. Significant interactions between time and implementation group in some variables indicated that the drop-out, few sessions and partly finished group differed in their trajectories. For social-emotional skills, a significant time x group interaction was found ($F(5, 634)=2.58$, $p=.025$, $\eta^2_p=0.02$, model fit BIC=7048.88).). Post-hoc tests were not significant, but a separate analysis of the full programme group and partly finished group revealed a significant time x group interaction ($F(2,266)=5.59$, $p=.004$, $\eta^2_p=0.04$, model fit BIC=3548.13), with descriptive statistics indicating that the full programme reported consistent increases (pre *M*= 13.75, *SD*= 0.27, post *M*= 13.79, *SD*= 0.27, follow-up *M*= 14.09, *SD*= 0.28) while the partly finished group reported an increase from pre to post, but a decrease in the follow-up period (pre *M*= 13.51, *SD*= 0.33, post *M*= 13.52, *SD*= 0.32, follow-up *M*= 13.06, *SD*= 0.35), similar to the control group's trajectory reported in the main intervention effect analysis (see Figure 5.4).

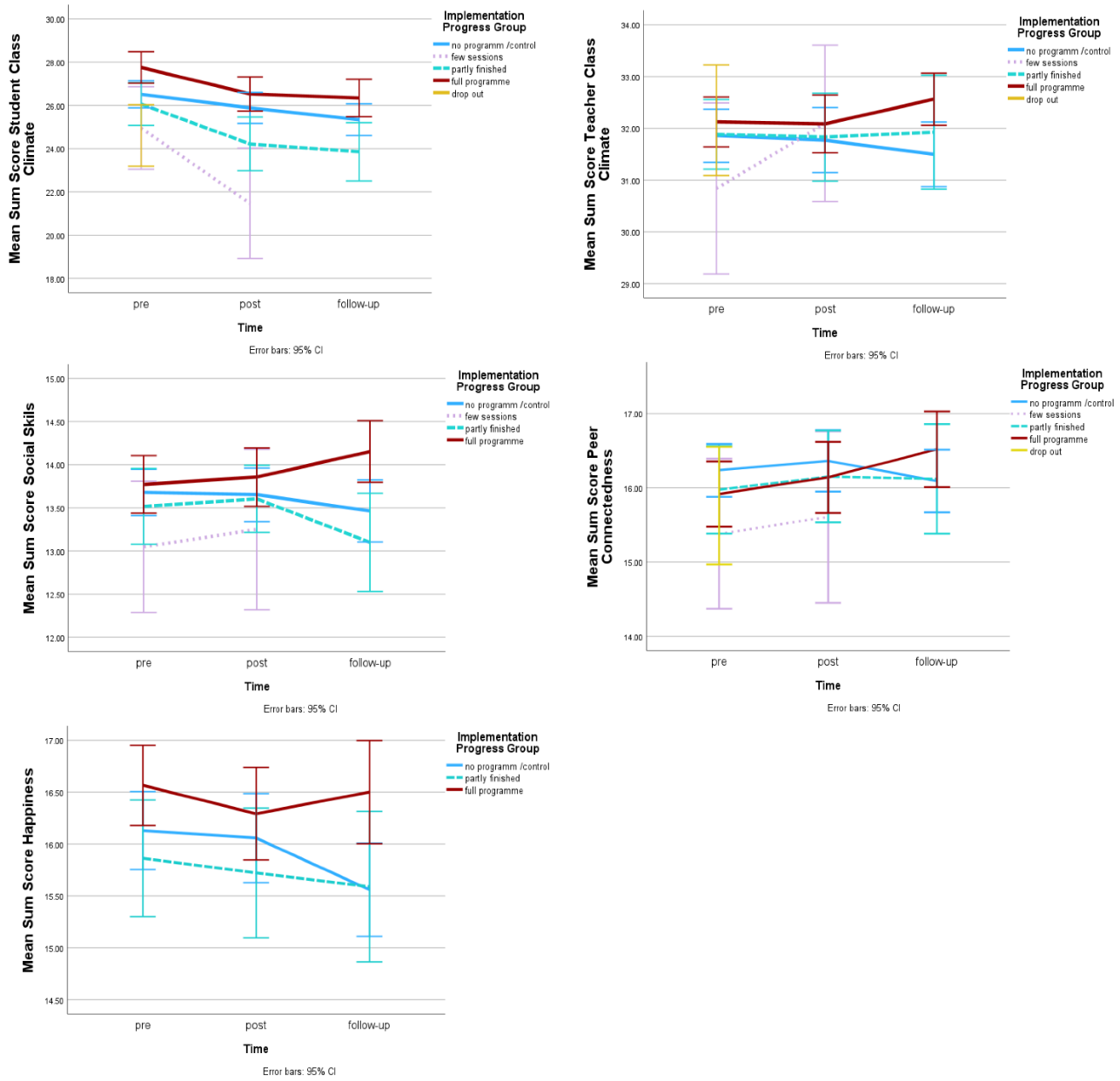
For student classroom climate, a significant time x implementation group interaction was found ($F(5,603)=2.72$, $p=.019$, $\eta^2_p=0.02$, model fit BIC=10230.59), as well as a main effect of time ($F(2,548)=31.09$, $p<.001$, $\eta^2_p = 0.10$) and a trend for a main effect of group ($F(4,31)=2.58$, $p=.056$, $\eta^2_p=0.25$). All groups reported declines in their perceived classroom climate (see Figure 5.4), but post-hoc tests indicated significant differences between the full programme

group and the few sessions group (p=.038, 95% C.I.=[0.20,6.95]) and a trend towards significant differences between the full programme and the partly finished group (p=.097, 95% C.I.= [-4.20, 0.37]). Both, the few sessions group and the partly finished group reported lower pre-test climate (M=24.98, SD= 1.50, and M= 26.32, SD= 0.88 respectively) and decreased further at post (M=21.28, SD= 1.60, and M= 24.39, SD= 0.91 respectively) and follow-up (data available for partly finished group only M=23.64, SD= 0.93), compared to the full programme group (pre M=27.69, SD=0.74, post M= 26.21, SD= 0.76, follow-up M= 26.20, SD= 0.77).

For happiness, the implementation effect model yielded a main effect of time (F(2,503)=3.31, p=.037, η^2_p =0.01, model fit BIC=7683.59) and a trend for an interaction effect between time and implementation group (F(4,505)=2.07, p=.084, η^2_p =0.02). From pre to post, full programme (pre M=16.55, SD= 0.35, post M= 16.19, SD= 0.36), partly finished (M= 15.85, SD= 0.43, post M= 15.68, SD= 0.44) and control group (pre M=10.03, SD= 0.27, post M= 15.88, SD= 0.28), all reported declines in their happiness. At follow-up, the control group (M=15.41, SD=0.29) as well as the partly finished group (M= 15.49, SD= 0.47) reported further declines, while the fully finished group (M= 16.46, SD= 0.38) reported increases (see Figure 5.4). For peer connectedness and teacher classroom climate, no significant effects were observed.

Figure 5.4

Changes of Implementation Fidelity Groups on All Outcome Variables Across Pre- Post- and Follow-up



Teacher Motivation and Class Climate

Additionally, it was explored whether teachers, who reported higher perceived relevance of intervention contents, would be perceived as more engaging concerning the class climate by

their students. Spearman correlation coefficient was computed to assess the relationship between teacher reports of their perceived relevance of contents and student reports of their perceived teacher generated class climate after the intervention period (T2). The relationship was negligible and not significant (r = -.06, p= .83). For all correlations between fidelity measures and student perceived teacher climate see Appendix 5.1.

To explore whether students' perceived teacher class climate predicted student class climate, a linear mixed model predicting the change in student class climate after the intervention period (T2-T3) by the change in teacher generated class climate during the intervention period (T1-T2) was run. As this analysis aimed to explore implementation effects, it included intervention classrooms only. Student class climate was not significantly predicted by teacher generated class climate, but a trend for significance was observed ($F(1,224)=3.65$, $p= .057$, $\eta^2_p =0.02$, model fit BIC=1340.60).

Exploratory Analysis of Low Pre Skills and Connectedness

During the analysis, it became clear that pre-values of social-emotional skills and peer connectedness were skewed towards the top values. The social-emotional skills scale included 4 questions with a 4 point Likert-scale (1-never, 2-seldom, 3-sometimes, 4-regularly). At pre-test, 28.3 % of children reported the maximum score of 16. The peer connectedness scale included 4 questions with a 5 point Likert-scale (1 and 2 - low connectedness, 3 -medium connectedness, 4 and 5 -high connectedness). At pre, one third of participants achieved a sum score of 18 or above (out of 20). As this made overall increases less likely and more difficult to detect, an exploratory analysis was conducted to test whether children reporting lower skills and connectedness at pre, profited differently from the intervention. For social-emotional skills, a cut-off point of 12 was chosen based on the 33% percentile and children scoring 12 or below

at pre (total of 27.3%) were grouped as reporting low social-emotional skills. For connectedness, a cut-off point of 15 was chosen based on the 33% percentile and children scoring 15 or below at pre (total of 36.6%) were grouped as reporting low peer connectedness.

Children reporting lower social-emotional skills at pre, also reported significantly lower happiness levels ($F(1,666)=64.29$, $p<.001$, $\eta^2_p=0.09$, model fit BIC=3356.32), lower peer connectedness ($F(1,665)=114.40$, $p<.001$, $\eta^2_p=0.15$, model fit BIC=3290.77), lower perceived classroom climate ($F(1,664)=82.17$, $p<.001$, $\eta^2_p=0.11$, model fit BIC=4030.27) and lower teacher generated class climate ($F(1,663)=65.67$, $p<.001$, $\eta^2_p=0.09$, model fit BIC=3699.01) compared to children reporting higher social-emotional skills. Similarly, children reporting lower peer connectedness at pre, also reported significantly lower happiness levels ($F(1,669)=74.17$, $p<.001$, $\eta^2_p=0.10$, model fit BIC=3387.88), lower social-emotional skills ($F(1,663)=99.39$, $p<.001$, $\eta^2_p=0.13$, model fit BIC=2951.54), lower perceived classroom climate ($F(1,661)=111.65$, $p<.001$, $\eta^2_p=0.14$, model fit BIC=4027.63) and even lower teacher generated class climate ($F(1,668)=37.40$, $p<.001$, $\eta^2_p=0.05$, model fit BIC=3734.88) compared to children reporting high peer connectedness.

To test whether children reporting lower social-emotional skills at pre profited differently from the intervention, the data used in the main intervention effect analysis ("full programme" and control groups) was split between high and low pre-social-emotional skills and a model predicting skills change scores by the intervention/control group was tested separately for the high and low pre skills group. As the main intervention effect analysis found intervention effects to become apparent in the follow-up period or whole study period, the following analysis focused on these periods only (T1-T3/T2-T3).

Over the whole study period (T1-T3), the intervention did not predict social-emotional skills change scores for either pre skills group. Over the follow-up period (T2-T3), however, the intervention did predict social-emotional skills change scores ($F(1,241)=4.66$, $p=.032$, $\eta^2_p=0.02$, model fit BIC=993.56) for the high pre skills group. In the control group, children, who had reported high social-emotional skills at pre, reported a decrease of social-emotional skills (T2-T3 change score M= -0.32, SD= 0.16), whereas those in the intervention group reported an increase (T2-T3 change score M= 0.19, SD= 0.17).

To test whether children reporting lower connectedness at pre profited differently from the intervention, an equivalent approach was taken with connectedness scores as for social-emotional skills reported above. The intervention group did not significantly predict connectedness change scores in the study period (T1-T3) or follow-up period (T2-T3) for either group. Thus, no differential intervention effects seem to exist in relation to reported pre connectedness scores.

Testing the Intervention Effect Mechanisms

To explain effects in the intervention group, it was hypothesised that changes in social-emotional skills during the intervention period (T1-T2) would predict changes in classroom climate and peer connectedness in the follow-up period (T2-T3). However, over the intervention period (T1-T2), negligible changes in social-emotional skills were observed. Thus, the analysis was slightly modified to assess whether observed changes in social-emotional skills over the whole study period (T1-T3) predicted changes in peer connectedness and class climate in the follow-up period (T2-T3). Similarly, as significant effects on connectedness were observed for the whole study period (T1-T3) but not for the intervention period (T1-T2), we assessed whether observed changes in connectedness over the whole study period (T1-T3)

predicted changes in happiness in the follow-up period (T2-T3). This analysis aimed to assess mechanisms driving intervention effects and thus included the "full programme" group only (n=195) as it was assumed that classes that had not completed the intervention would not display full intervention effects. Due to ceiling effects and reported different intervention effects for low and high pre social-emotional skills groups, additional analysis took pre social-emotional skills and pre connectedness values into account.

Across all "full programme" children, changes in social-emotional skills over the study period (T1-T3) were not found to predict follow-up changes (T2-T3) in connectedness ($F(1,142)=1.12$, $p=.29$). When analysing the groups of low and high pre skills separately, however, social-emotional skills changes were found to significantly predict connectedness changes in the group of children reporting low social-emotional skills at pre ($n=48$, $F(1,30)=5.83$, $p=.022$, $r=.37$, model fit BIC=167.09). The direction of effect was positive, indicating that increases in social-emotional skills lead to increases in connectedness.

Changes in classroom climate over the follow-up (T2-T3), were not found to be significantly predicted by changes in socials skills over the study period (T1-T3), across all "full programme" children. However, a slight trend towards significance was observed ($F(1,142)=3.04$, $p=.083$, $r=.14$, model fit BIC=869.39). When analysing the groups of low and high pre skills separately, no significant effects of social-emotional skills changes on class climate changes were found.

Next, effects of connectedness changes on happiness were evaluated. Across intervention ("full programme") children, changes in connectedness over the whole study period (T1-T3) were not found to significantly predict follow-up changes in happiness (T2-T3). A very slight trend towards significance was observed ($F(1,145)=2.90$, $p=.091$, $r=.14$, model fit BIC=661.44). When analysing the groups of low and high pre connectedness separately, though, a significant

effect of connectedness changes on happiness changes (F(1,95)=4.27, p=.042, r =21, , model fit BIC=437.54) was observed in the group of children with high pre connectedness levels. Children reporting high pre connectedness were more likely to report an overall decrease of connectedness (M= -0.45, SD= 2.92) and the direction of the effect was positive. Thus, the results suggest that a decrease in connectedness led to a decrease in happiness. No effects were found for the group of children reporting low pre connectedness levels.

Hypothesis 3 and 4, predicting that increases in social-emotional skills would predict increases in class climate and connectedness (H3), which would in turn predict happiness (H4) were partly supported. Social-emotional skills increases were found to significantly predict connectedness increases, but only for children reporting low pre skills and no effects on class climate were observed. Connectedness changes were found to significantly predict happiness changes, but only for children reporting high pre connectedness. Thus decreases in connectedness seem to significantly predict decreases in happiness.

Discussion

This study aimed to evaluate the effects of a social-emotional learning programme for 9 to 12-year- olds on social-emotional skills, classroom climate, peer connectedness and happiness. The evaluation of its intervention effect model aimed to address a gap in the evidence base regarding change mechanisms initiated by a social-emotional learning programme after the school transition. The present study's results of significant intervention effects on social-emotional skills and peer connectedness, over the whole study period (T1-T3) as well as on happiness over the follow-up period (T2-T3) support the notion that universal, school-based social-emotional learning programmes have the potential to facilitate peer relationships (Suldo et al., 2013) and happiness in the classroom (Heinsch et al., 2020). However, the intervention effect

model, postulating that social-emotional skills increases would predict increases in peer connectedness, which would in turn predict increases in happiness was only partly supported.

Main Intervention Effect Analysis

While it was hypothesised that the intervention would directly impact social-emotional skills over the intervention period (T1-T2), effects on social-emotional skills only became evident over the whole study period. Similarly, the present study's effects on peer connectedness became evident over the whole study period (T1-T3) and effects on happiness become evident in the follow-up period (T2-T3) only. This is, however, not uncommon. The authors of other intervention studies, which found effects to become evident at follow-up only, suggested it might simply take longer for competencies to unravel or effects of high quality implementation might lead to better maintenance over time (Caron et al., 2020). This might be particularly true for peer relationship programmes. It has been reported that 12% percent of students did not have any friends several months after the school transition (Lessard & Juvonen, 2018). Thus, to understand the long-term effects of social-emotional skills programmes on peer relationships, longitudinal studies are essential (Gutman & Schoon, 2015). The present study's intervention period of six months was able to capture some of the complex developmental trajectories. However, it has been argued that even a 2-year follow-up might not be sufficient to capture all effects (Mackenzie & Williams, 2018), due to this impactful developmental period and non-linear growth trajectories of target skills (Ross et al., 2019).

The findings of this study also point towards common negative trajectories after the school transition. An exploratory analysis of children reporting high and low pre social-emotional skills showed that the intervention particularly helped to prevent decreases in social-emotional skills for children who reported high skills at pre. In the control group, these children tended to

report a decline in skills. Similarly, significant effects of time on happiness suggested a general decline in happiness over the study period, although significant intervention effects over the follow-up period showed that the intervention was able to counterbalance this common trajectory to some degree. These trajectories are particularly interesting, as classroom climate generated by students was found to significantly decline for both the intervention and control group, contrary to this study's hypothesis. Other studies have shown that children's wellbeing, happiness and perceived school climate is highest in primary school and decreases after the transition (Coelho et al., 2020; Eder, 2007; Tobia et al., 2019). Many school climate factors, such as school safety, school liking and teacher-student relationships seem to decline with the transition (Coelho et al., 2020). In the present study, children were asked to complete pre-measures just after the transition in September, thus they might have answered questionnaires with their primary school classroom in mind and expected to replicate the same class climate in their secondary school. After settling in in their secondary classroom they might have answered the post and follow-up questionnaires more realistically matching their secondary classroom – thus this study's finding of a decline of class climate and happiness might just reflect differences in primary and secondary school classroom climate.

Similarly, a reported decline in social skills in the control group might reflect children's process of adjusting their self-perception from the previous primary school context to the new secondary school context. With secondary schools focusing more on academic factors compared to students' emotional needs (van Rens et al., 2018), children have previously reported changes in their relationships with peers and teachers and that it was harder to share problems in secondary school (Bagnall et al., 2020). Thus, the move to a new classroom might also impact children's self-perception of their social-emotional skills due to early adolescents' heightened focus on group norms (Hazen et al., 2008) and classroom norms impacting social

behaviour and acceptance (Chang, 2004). In the intervention group, however, children seemed to retain their positive perspective of their own skills, either due to an actual increase in skills through the intervention or due to more positive classroom interactions which led to more individual prosocial behaviour (Busching & Krahé, 2020). Similarly, significant intervention effects on happiness in the follow-up period suggest that the intervention was able to counterbalance negative transition effects.

Additionally, gender differences became evident in social-emotional skills and peer connectedness. The intervention significantly improved social-emotional skills in boys, while no significant effects were found for girls. This is not surprising as normative growth trajectories of general SEL skills have been found to differ between genders with boys reporting a decrease in their social-emotional skills around the age of eleven before they increase again up until late adolescence (Ross et al., 2019). In line with this, the present study found boys in the control group to slightly decline, thus a school-based intervention seems to have the potential to reverse negative trajectories of social-emotional skills in boys. For girls, however, increases beyond developmentally expected positive trajectories seem less feasible. Additionally, gender differences were found for connectedness with girls reporting higher overall connectedness than boys. General growth trajectories of relationship quality support this gender difference, with girls increasing their relationship quality from early to mid-adolescence and boys decreasing (Ross et al., 2019).

Generally, reported effect sizes are small. However, effects in psychological research are rarely large (Funder & Ozer, 2019) and it has thus been suggested to compare intervention effects to similar intervention studies (Hill et al., 2008). A meta-analysis of universal school-based interventions on wellbeing found effects to be generally small (Tejada-Gallardo et al., 2020). This might have to do with the preventive nature of universal interventions, which may have

little effect on each individual as only few participants will be at-risk, although there is likely a significant cumulative benefit on the community level (Greenberg et al., 2017). On the contrary, targeted interventions for at-risk populations might yield higher effects, but are less likely to have a profound impact on the community (Greenberg et al., 2017). Moreover, for school-based interventions, a trend towards smaller effects of high quality studies has been reported (Mackenzie & Williams, 2018). Additionally, independent narrow measures, such as the ones used in this study, have been found to yield smaller effect sizes compared to broad or researcher-developed measures (Wolf & Harbatkin, 2023). It has been suggested that studies with large samples and small reported effect sizes are likely to reflect real-world circumstances authentically and that small effects can have profound real-world consequences when considering individual effects on a population level or single-occasion effects in the long-run (Funder & Ozer, 2019).

Insights Concerning the Intervention Effect Mechanisms

It was hypothesised that, in the intervention group, increases in social-emotional skills would predict increases in connectedness and class climate (H3), which would in turn predict happiness (H4). This study's findings partly supported these hypotheses. Increases in social-emotional skills were found to predict increases in connectedness specifically for children, who reported low pre-skills. While this finding might be partly explained by the ceiling effects for pre-social-emotional skills, it also seems plausible that specifically children that have skills deficits and subsequently improve their prosocial behaviours gain new friendships (Bowker et al., 2010; Laugeson et al., 2014), and increase their connectedness. The finding that changes in social-emotional skills did not impact class climate is probably related to the overall decreases in class climate, which don't seem to be linked to other effects. Thus, class climate might be

more related to the previously discussed effects of the transition on children's wellbeing in class than to their individual social-emotional skills.

Regarding the impact of changes in connectedness on changes in happiness (H4), a significant effect was found for children with high pre-connectedness only. As connectedness changes in children with high pre-connectedness are more likely to be negative, these results suggest that a decline in connectedness (i.e., loosing friends or decreased relationship quality) might have a greater impact on children's happiness than gaining connectedness. The fear of being alone in the new class has been identified as a prevalent fear at the school transition (Stiehl et al., 2023) and indeed, the presence of a best friend at a negative experience has been found to alleviate some of the negativity, emphasising the importance of close friends in the classroom (Adams et al., 2011). This relation between the experience of negative events without the supporting presence of a friend might explain why specifically a decrease in connectedness seems to be related to a decrease in happiness in class.

Implementation Fidelity

To account for implementation factors during the evaluation (Skivington et al., 2021) and to address the relationship between implementation factors and effectiveness results (de Leeuw et al., 2020), an exploratory analysis evaluated intervention effects of different implementation groups, reflecting adherence (i.e., duration and frequency of implemented sessions) as the main delivery aspect (Carroll et al., 2007). For happiness and social-emotional skills, pre-test differences existed between those classes that ended up completing the programme and those that dropped out of the study (and classes completing few sessions only in the case of happiness). In classes with pre-existing problems, more trouble-shooting and targeted efforts might be necessary, which take up extra time and thus prevent teachers from finishing the

programme or cause early drop-out. These baseline differences are likely to impact the respective variables' trajectories. Indeed, trajectories of social-emotional skills, classroom climate and happiness differed between groups. Generally, classrooms completing fewer sessions reported less favourable outcomes, with even the group of classes partly finishing the programme reporting significantly lower social-emotional skills than the fully finished group. However, as fidelity analysis (see Appendix 5.1) showed, teachers that partly finished the programme spent on average more time on each programme session and reported a higher content coverage compared to teachers finishing the programme. This suggests these teachers might not have managed to finish all programme sessions, as they spent more time on the first sessions. Researchers also had the impression in telephone check-ins that teachers who reported having spent extra time on delivering basic concepts to their students (e.g., emotional vocabulary) would eventually not manage to finish all sessions.

These findings suggest it was not poor implementation fidelity impacting student outcomes, but pre-existing student factors impacting implementation fidelity. Unfortunately, these effects are likely to spiral, when classes with pre-existing problems receive less support. Classes with high levels of disruptive student behaviours and high teacher stress have been found to particularly benefit from interventions (Tolan et al., 2020). Thus, exactly the classes reporting implementation issues should be the focus of researchers and intervention developers. Reasons for these differences are often structural and related to school characteristics and socio-economic inequalities. At the most basic level, schools with more funding are able to better support the school transition by organising more events (Evangelou et al., 2008). Teachers often refer to time restrictions and inflexible curricula as barriers to incorporating social-emotional learning in their class (Martínez, 2016). Schools that facilitate regular training are likely to offer teachers more support and empower them to successfully implement an intervention

programme (Domitrovich et al., 2008), which is even more essential when there are pre-existing classroom problems.

Teacher Motivation and Class Climate

The main intervention effect analysis did not find any significant intervention effects for teacher generated classroom climate, as reported by their students. This variable was included for an exploratory analysis of the effects of teachers' perceived relevance on teacher generated class climate and, in turn, on student generated class climate. Teachers' perceived relevance and teacher generated class climate were not found to correlate significantly, and student generated class climate was not predicted by teacher class climate. While some previous studies have found such effects (Hellmich et al., 2019; Wilson et al., 2022), the findings of the present study are in line with another study that did not find teacher attitudes to predict their classroom management behaviour (Garrote et al., 2020). It has been argued, that classroom management behaviour might reversely impact teachers' attitudes and that teachers' self-efficacy might be a stronger predictor of behaviours (Garrote et al., 2020), which is supported by findings suggesting a mediator role of intervention deliverers' self-efficacy on student outcomes (Caron et al., 2020). This emphasises the importance of implementation support strategies at a school and policy level (Domitrovich et al., 2008). The non-significant effect of teacher generated class climate (i.e., teachers' encouraging behaviours) on student generated class climate is likely related to the reported overall decrease of classroom climate. Secondary school teachers' best efforts to create a positive class climate might not be able to outbalance students' perceived decrease of class climate from primary to secondary school (Coelho et al., 2020; Tobia et al., 2019).

Implications for Intervention Development and Educational Practice

This study's findings regarding the effect mechanisms of a social-emotional learning programme suggest that relationships between social-emotional skills and connectedness and happiness do exist. While social-emotional learning programmes are commonly used to facilitate peer relationships in clinical populations (Pollak et al., 2022), similar approaches have been suggested as ideal universal prevention (Greenberg et al., 2017) to improve peer relationships at the time of school transition (Suldo et al., 2013). This study's findings support this notion, which is particularly relevant as this study also highlighted common negative trajectories of skills, classroom climate and happiness after the transition. Thus, the implementation of adequate social-emotional support programmes seems highly relevant after the school transition to support children's peer relationships and wellbeing (Bagnall et al., 2020; Rice et al., 2015).

The hypothesised intervention effect mechanisms (i.e., effects of social-emotional skill changes on connectedness, and connectedness changes on happiness) only came into effect under certain conditions. Thus, educators and programme developers should carefully consider which aims can be addressed by different programme clusters (e.g., universal SEL) for different populations (Pollak et al., 2022). Social-emotional learning programmes were found to have strongest effects on self- and social awareness (van de Sande et al., 2019), which therefore seem like an ideal primary target skill. The present study found that many children report high baseline social-emotional skills, thus not all children will benefit from such a universal, preventive approach. However, the present findings suggest that particularly children reporting social-emotional skills increases from lower baseline levels will also increase their peer connectedness as a result. As argued in the context of interventions for neurodiverse children or peer-rejected children, intervention efforts aiming to facilitate social-emotional skills of children with

respective deficits are an effective way of increasing peer relationships in the classroom by (a) promoting target children's skills and (b) helping peers with higher social-emotional skills better understand their peer's needs (Kasari et al., 2016; Mikami et al., 2005). Thus, an emphasis on inclusion of struggling children and an empathic understanding of each other's problems is suggested if educators' focus is on increasing connectedness in the classroom. Similarly, the finding that happiness seems to be particularly impacted when high pre-connectedness decreases, points towards the importance of an inclusive class community. Friendship quality has been found to buffer against negative impacts of victimisation (Cuadros & Berger, 2016) and trajectories of more withdrawn and excluded children to increase depression levels have been found to be minimised by the presence of a friendship (Bukowski et al., 2010). Thus, no child should be completely left out to ensure each child's happiness in the classroom. While the proposed benefits might seem very specific and relevant for few children, such preventive efforts can have profound effects on a school or community level (Greenberg et al., 2017).

Furthermore, this study's findings regarding the relation between pre-existing classroom problems and implementation fidelity, highlight the need of targeted adaptations and increased support systems for interventions. While most evaluation studies pursue maximum implementation fidelity, adaptation and adjustments have even been suggested to lead to better overall implementation (Durlak & DuPre, 2008). Teachers indicated that programmes are only sustainable if they are accepted by students, feasible and linked to professional development opportunities (Boardman et al., 2005). Thus, researchers developing and evaluating interventions should account for adaptability and flexibility in their implementation protocols. Instead of disregarding drop-out classes, continued implementation support should be provided, potentially accepting minimised adherence. Additionally, schools should consider shared decision-making processes and providing resources, administrative support and certified

training to enhance implementation (Domitrovich et al., 2008). These implications equally relate to this study's findings that teachers' attitudes do not relate to their classroom behaviour. Even teachers perceiving social-emotional learning as highly relevant might struggle to implement it in their class without appropriate support.

Strengths and Limitations

In this study, the programme was implemented by the class teachers themselves, which is considered a strength. On a practical level, teacher-implementation was necessary due to Covid-19 related access restrictions at schools and economic considerations. Practical considerations are, however, related to ecological validity and sustainability of an intervention, as schools are more likely to sustain low-cost interventions implemented by school staff, and students prefer delivery by a familiar person (Mackenzie & Williams, 2018). Additionally, teacher self-report of implementation practice has been found to be reliable and accurate (Dart et al., 2020). A support system consisting of a detailed manual, teacher training sessions and repeated telephone check-ins were implemented to monitor the implementation and allow for a replication of this implementation (Domitrovich et al., 2008). While it has been suggested that school-based prevention programmes are generally not implemented with high quality outside of research projects (Domitrovich et al., 2008), teacher-lead implementation is likely to counterbalance such research-biases as the implementation during the study is as close to large-scale, unsupervised implementation as possible, making it ecologically valid.

However, this implementation strategy also led to some imbalances between groups. Due to unbalanced drop-out, the intervention group had more grammar school classes than the control group. Teachers, who dropped out of the study mostly referred to time and resource issues. However, school resources are typically linked to the socio-economic profile of schools, which

seems to be associated with students' resilience outcomes (Agasisti et al., 2018) and predict students' academic achievement beyond individual socio-economic background (Perry & McConney, 2010). Thus, this unbalanced drop-out might have impacted the results. At the same time, this bias is likely to be linked to previously discussed structural inequalities leading to teachers of classes with more problems also having less resources and thus not being able to finish the programme. Indeed, seven out of eight teachers, who managed to finish the programme, were grammar school teachers.

Similarly, structural differences might have impacted the timing of the follow-up period, which might have biased follow-up results. As follow-up measures were completed in a set calendar time period (late January, early February 2022), the follow-up period was stretched for classes finishing the programme early and thus having an early post assessment (and eventually comprising the "full programme" group). The remaining classes (eventually comprising "partly finished" and "few sessions" group) were asked to complete post-test just before Christmas, thus creating a short follow-up period. For similar reasons, the "full programme" group had a longer follow-up period than the control group. As developmental changes (both facilitated by intervention effects as well as initiated by the school transition and age-related development) become more apparent over longer time periods, reported superior effects of the full programme over the partly finished group and over the control group in the follow-up period might be impacted by the time frame. While the authors realise this is an important confounding factor, the longer follow-up period in the full programme group is regarded a side effect of this group's pre-existing advantage. If implementation runs smoothly due to high pre-skills and more school resources, the intervention is quick to be completed and an early post-test follows.

Additionally, as for any school-based study, methodological problems, such as the difficulty of randomizing school classes, regulating the control group's school practices and the choice of

outcome measures might impact effects (Mackenzie & Williams, 2018). The context of Covid-19 even complicated matters, as all teachers reported increased workload, stress (Robinson et al., 2023) and mental health problems of students (Theberath et al., 2022) coming out of long lockdowns. To make implementation possible under these conditions, schools were allowed to choose their preferred group assignment (intervention/control) and control classes could not be prohibited from addressing social-emotional needs. Independent narrow measures were chosen to decrease variation of the distribution of latent true effects (Wolf & Harbatkin, 2023), considering validation results for the age group and German language, if possible. Despite these considerations, ceiling effects were found for social-emotional skills and connectedness, thus potentially biasing results. Additionally, this study aimed to consider a variety of implementation aspects, however, major differences in adherence dominated the implementation analysis. As this study's findings suggest that these differences are structural, future intervention efforts should compensate such differences by offering adaptations (Durlak & DuPre, 2008) and school-level support (Domitrovich et al., 2008) to increase implementation quality. By preparing for these implementation factors, suggested in-depth analyses of the impact of organisational factors at the school-level (Jindal-Snape et al., 2020) and a more detailed examination of time and economic resources for each implementation stage (Premachandra & Lewis, 2021) might be possible.

Conclusion

This study aimed to evaluate the effects of a novel social-emotional learning programme and address mixed results concerning the effects of school-based social-emotional learning programmes by evaluating the programme's effect mechanisms. This study's findings regarding overall decreases in class climate and happiness after the school transition, which are consistent with previous findings (Coelho et al., 2020; Tobia et al., 2019), highlight the need to implement

support programmes over the school transition period. Indeed, this study found positive intervention effects on social-emotional skills, peer connectedness and happiness. Thus, the findings support the notion that school-based social-emotional-leaning programmes are effective universal, preventive approaches (Greenberg et al., 2017) and have the potential to support peer relationships in the context of the school transition (Suldo et al., 2013). Regarding specific effect mechanisms, it was expected that the programme would facilitate an increase in social-emotional skills, which would predict increases in connectedness (Bowker et al., 2010) and class climate, which would in turn predict happiness (Heinsch et al., 2020). The results partly supported these trajectories. The expected effect of increased social-emotional skills on connectedness was found for children reporting low baseline skills, indicating that similar universal programmes are particularly important for at-risk children. The findings further suggest that particularly a decrease of previously high connectedness would in turn affect children's happiness. An exploratory analysis of implementation groups found baseline differences between groups, indicating pre-existing issues in classes that eventually dropped out or completed few sessions only. Thus, intervention research should put more emphasis on appropriate support systems (Domitrovich et al., 2008) and account for necessary programme adaptations to increase implementation feasibility.

Main Findings and Implications of Chapter 5

The evaluation study assessed the newly developed programme's effects on children's peer connectedness, social-emotional skills, classroom climate and happiness. The evaluation results suggested significant improvements of social-emotional skills and peer connectedness across the whole study period and significant increases of happiness across the follow-up period. However, a significant decrease of class climate was found for both groups, indicating a general decline of class climate at the start of secondary school, which is in line with literature concerning decreases of class climate after the school transition (Coelho et al., 2020; Tobia et al., 2019). Additionally, a gap in the literature concerning the effect mechanisms of the social-emotional learning programme on peer relationships and happiness was addressed. Hypothesised effects of social-emotional skill changes on peer connectedness changes were partly supported, as an increase of social-emotional skills only predicted increases in connectedness for children, who had reported low pre-skills.

Therefore, the collaborative intervention development process seems to have resulted in an effective and relevant intervention programme supporting social-emotional skills, peer connectedness and happiness at the time of school transition. However, the effect mechanisms were found to be different for different subgroups of children. In the following general discussion, implications of the findings are discussed and additional contextual factors and target group characteristics that might have impacted the development and evaluation process are highlighted.

CHAPTER 6

General Discussion

Although peer relationships are a crucial context of children's social-emotional development (Busching & Krahé, 2020) and mental well-being (Schwartz-Mette et al., 2020), especially so during early adolescence (Blakemore & Mills, 2014), peer relationships are rarely the focus of universal, preventive programmes to support young people's wellbeing. While stakeholder involvement is commonly encouraged to increase relevance and efficacy of such a programme (Hagen et al., 2012), participatory involvement of young people in health related research is still scarce (Sellars et al., 2021). To address these gaps, this research aimed to combine empirical research on aspects relevant to facilitating peer relationships with a focus on methodology. Methods, contents and strategies, and implementation factors were addressed throughout the development process to add to the evidence base regarding appropriate and effective peer relationship programmes.

Specifically, this thesis aimed to address (a) which intervention strategies are effectively facilitating peer relationships in the context of the primary-secondary school transition and (b) which methodological approaches are suitable to engage children in the development and implementation of such intervention efforts. The presented research employed a mixed-methods approach and followed intervention development guidelines (Craig et al., 2019; Wight et al., 2015). First, existing peer relationship programmes were reviewed (Chapter 2), and children were engaged in qualitative research workshops (Chapter 3) to explore appropriate methods, contents, and intervention strategies. Based on this, a peer relationship programme was developed with iterative cycles of stakeholder involvement (Chapter 4) to refine contents and methods. The peer relationship programme was then implemented and evaluated in the school context (Chapter 5) with additional focus on implementation factors. The first part of the discussion will focus on highlighting how findings and implications of each study were integrated to inform the intervention development (and therefore the subsequent studies) which

was subject of this research. Then, in separate sections, implications for the wider research field of peer relationships and participatory methodology will be discussed.

Key Findings Presented in Chapter 2 to 4 and Implications for the Intervention Development Process

The systematic review on peer relationship programmes (Chapter 2) addressed a lack of explicit focus on peer relationships in intervention research. It became evident that the target population's needs should be closely aligned with targeted skills and variables. Both preventive programmes and selective interventions seemed most effective when addressing loneliness and connectedness (which were combined in the review and understood as opposites on a spectrum of social belonging) and when addressing mental wellbeing and self-concepts¸ which is in line with previous findings regarding self-concepts, wellbeing and mental health (Leigh-Hunt et al., 2017; Zhou et al., 2020). Indicated interventions for a clinical population, however, seemed most effective when targeting social skills, emotion regulation and clinical symptoms. Aligning these intervention targets with methods was found to be crucial. Specifically, preventive programmes seemed effective when either aligning a focus on self-concepts and mental health with didactic content, self-awareness tasks, homework, and parental involvement, or aligning a behavioural focus with active practice of skills.

For the intervention development, this implied that a focus on peer connectedness seemed very promising for peer relationship programmes for neurotypical children (in both preventive and selective interventions), while friendships were rarely improved. This might be related to the school context, which was dominant in preventive and selective programmes. Feelings of loneliness and peer connectedness might become apparent very quickly in a new classroom, while friendships can take a few months to establish for some children (Lessard & Juvonen,

2018). Additionally, classroom norms have been found to impact dyadic friendship processes (Laninga-Wijnen et al., 2020), which emphasises the importance of establishing positive classroom dynamics and connectedness first.

Chapters 3 and 4 described the active involvement of children in the development process. Addressing a lack of discussion of participatory practice in late childhood, existing examples of participatory development (Benninger & Savahl, 2017; Hawkins et al., 2017) were adapted to the age group and school setting. This research aimed to provide an example of appropriate methodology to engage children in intervention development (Chapter 3) and iterative involvement in decisions regarding the intervention (Chapter 4). Main findings of Chapter 3 concerned the suitability of story-based tasks and linked focus groups to discuss a range of specific context factors and change mechanisms. Focus group discussions offered the advantage of reflecting on specific strategies' relevance and practical suitability from children's perspectives and touching upon their own experiences.

Implications of these findings for the intervention development process were integrated with methodological implications drawn from the review (Chapter 2), which concerned the importance of combining didactic content delivery and self-awareness tasks for successful preventive programmes. Stories seemed to be suitable stimuli for discussing context and strategies, thus stories about fictional characters were developed to implement didactic content on different emotion regulation and conflict management strategies in a peer context. Interactive elements (i.e., choosing a strategy) were incorporated in the stories to promote group discussion on the implications of different strategies. Self-awareness tasks were integrated with this approach by encouraging reflection of own experiences and emotions.

The findings of the three stages of the participatory development (Chapter 4) were iteratively reviewed and integrated with previous findings and the literature-base. Stage I highlighted the importance of a positive classroom climate from children's perspectives and the need to facilitate emotional support strategies. Stage II found that an explicit focus on self-efficacy was not appreciated by the children, while the integration of the class climate topic with empathy and emotional awareness was suggested and achieved through integration in a comic story. Stage III pilot tested the programme and resulted in refinement of the comic stories to make them short and more visually sufficient and less reliant on text.

Implications of Stage I concerned the importance of class climate and its link to peer connectedness in the classroom. Interestingly, however, the review found positive effects on school connectedness and peer behaviour – which are conceptually similar to class cohesion and peer support strategies – to be rarely tested in prevention programmes. The few studies that did include a focus on school connectedness, however, did report positive results, suggesting that an implementation of class climate strategies might be promising. Social-emotional support strategies, however, seemed – counterintuitively – linked to the review's findings regarding the dominance of social skills interventions for a clinical population. While social-emotional skills interventions are commonly suggested as universal, preventive programmes to promote positive development (Domitrovich et al., 2017; Greenberg et al., 2017), the link between social-emotional learning and peer relationships seemed very strong in clinical interventions but largely unexplored in preventive programmes. This, in turn, was an important implication for the effect mechanisms explored in the subsequent evaluation study (Chapter 5).

Implications of Stage II of the development process (Chapter 4) concerned the topic of self-efficacy, which was included due to the review's findings (Chapter 2). However, a finding of the participatory development was that explicitly addressing self-efficacy seemed too abstract

for this age group. Indeed, while the review's findings suggested that self-concepts are prominent targets of prevention programmes, they were not necessarily linked to successful peer relationship outcomes. These findings were surprising as self-beliefs have been linked to positive mental health and loneliness outcomes (Geukens et al., 2020; Zhou et al., 2020) and have been discussed as driving intervention effects (Ebner et al., 2018; Yardley et al., 2015). A reason for this mismatch might be age-related differences of self-efficacy, as the review has not differentiated between age groups (within the age group of 8-14-year-olds) and self-efficacy develops through social learning and mastery experiences across the lifespan (Dacre Pool & Qualter, 2012). Additionally, it has been argued that self-efficacy can only truly be trained through combining knowledge acquisition, skills and strategy training on challenging tasks (Graham, 2022). Thus, the focus was shifted to *emotional* self-efficacy. This focus on emotional strategies was highlighted in Stage I of the participatory development and linked to the review's findings concerning the prominence of social-emotional skills training for a clinical population. These considerations regarding intervention contents were linked to methodological findings regarding the importance of self-awareness tasks in the review (Chapter 2). Individual self-awareness tasks were aligned with a focus on emotional awareness and included in the form of mindfulness tasks, emotion scaling tasks and interoception tasks to reflect on their own emotional experience (e.g., "Where do I feel my anger?").

These findings highlight the importance of combining top-down literature-based approaches and bottom-up stakeholder-involvement to understand the full picture of relevant and suitable intervention factors (Hagen et al., 2012). This seems especially relevant for interventions in the school context. Like many other reviews in the field (Mackenzie & Williams, 2018; Wolstencroft et al., 2018), the review of existing programmes presented in Chapter 2 differentiated between target populations. In a school context, however, children will have

many different needs. With 23% of students across OECD countries saying they are bullied a few times a month or more (OECD, 2019a) and a point prevalence of 22% for any mental health disorder in Austrian adolescents (Wagner et al., 2017), nearly every fourth young person is in need of intervention strategies. To represent these needs, the collaborative development was conducted in the classroom, in line with guidelines' emphasis on the intervention context (Skivington et al., 2021). The participatory process (Chapter 4) included *all* children irrespective of potential problems and specifically aimed to discuss a wide range of needs. Therefore, findings from the review and the participatory study differed, which highlights the importance of combining different approaches and considering evidence and stakeholders' perspectives before merging them into specific intervention strategies.

In Chapter 5, the implementation of a theoretically informed and collaboratively developed programme is described. As the outlined development process resulted in a focus on peer connectedness, social-emotional skills, class climate and happiness in the classroom, the evaluation study further addressed a gap in the literature regarding the effect mechanisms of social-emotional learning programmes on peer relationships and happiness. The main findings of this study supported the notion of using social-emotional skills interventions to improve peer relationships and happiness, as social-emotional skills, and peer connectedness were significantly improved over the study period and happiness was significantly improved over the follow-up period. Class climate, however, was found to significantly decrease for both groups, which was in line with previous findings regarding the impact of the school transition on class climate (Coelho et al., 2020; Tobia et al., 2019). Expected effect mechanisms of social-emotional skill changes on peer connectedness changes were, however, only evident for children reporting low pre-skills.

Implications of these findings can be linked to the review's findings of skills interventions being dominant in a clinical population. Both findings seem to indicate that facilitating social-emotional skills is particularly relevant for facilitating peer relationships of children with skills deficits. However, while children with diagnoses of ASD or ADHD often have social-emotional skills deficits (Kasari et al., 2016), children without diagnosis might also have unrecognised social-emotional skills deficits. The evaluation study's significant intervention effects on social-emotional skills in a general population sample seem to support this notion. This highlights the need of implementing social-emotional skills programmes with the aim to support peer relationships in a general population sample. This finding is particularly relevant and timely as the Covid-19 pandemic has been found to impact children and adolescents' emotional and behavioural symptoms (Oliveira et al., 2022), moderated by their social-emotional skills (J. Sun et al., 2022).

Table 6.1

Overview of Each Study's Findings and Implications

Study	Relevant Findings for the Wider Research Field	Implications for the Intervention Development Process
Study 1: Review of Peer Relationship Programmes	Alignment of intervention targets and methods seems crucial. Preventive and selective interventions were most effective when targeting connectedness and loneliness, while indicated interventions achieved increases in play dates, peer acceptance/popularity and sociometric ratings. For preventive programmes, a focus on self-concepts and mental health seems effective when employing methods of didactic content delivery, self-awareness tasks, homework, and parental involvement. Alternatively, a behavioural focus seemed effective when employing active practice of skills.	Peer connectedness was chosen as main peer relationship target domain. A focus on self-concepts and well-being factors was implemented in the development workshops. Methodological considerations and findings from the first stage of the development process were linked to the review's findings regarding the impact of didactic content, self-awareness tasks and homework.
Study 2: Qualitative Comparison of Methods	Brainstorming tasks are ideal for creating joint definitions but require very explicit instructions. Similarly, an individual letter activity can be useful for definitions and for personal experiences. Stories have the potential to elicit reflection on context factors and change mechanisms. As stories might also elicit fictional elements, pairing them with focus	Particularly, story-based tasks and focus-group discussions seemed promising for discussing context factors and strategies. Thus, stories about fictional characters were developed to introduce emotion regulation and conflict management strategies in the classroom context. Interactive story elements aimed to facilitate group discussion concerning

	groups tasks seems ideal to elicit personal reflections on change mechanisms, context factors and personal experience.	consequences of strategies and personal preferences.
Study 3: Co-Production of a Peer Relationship Programme	Involving children actively in research activities opens a range of challenges concerning authentic involvement and equal power balances. However, by adapting the methodology and creating distinct stages to engage children in reflections of previous child input, meaningful involvement in key decisions can be achieved. By following and adapting classic intervention development guidelines, a rigorous research approach can be made suitable for different research stages, contexts and stakeholder needs.	An iterative, collaborative development process was employed to adapt the programme to student's needs. The programme's focus was set on positive classroom climate and emotional peer support strategies (stage I). Self-efficacy was integrated with social support strategies and empathy was integrated with the classroom climate topic in interactive stories (stage II). These stories were refined to be as visually sufficient as possible (stage III).
Study 4: Evaluation of a Novel Peer Relationship Programme	The intervention was found to successfully improve peer connectedness, social-emotional skills, and happiness. Thus, social-emotional learning programmes seem to be an effective approach to facilitate peer relationships and happiness in the classroom. However, classroom climate seems to universally decline after the transition, which is in line with previous findings.	Proposed intervention effect mechanisms of increased skills impacting an increase in peer connectedness, was only found for children with pre-skills deficits. Thus, alternative effect mechanisms for different subgroups of children should be assessed in future studies.

Implications Regarding Peer Relationship Intervention Strategies and Implementation Aspects

The first general aim of this research was to explore different strategies to support peer relationships for children in the school context. General findings concerned the importance of context factors and population factors. As emphasised in previous research on other types of programmes, mixed effects of programmes depend on the focus of the programme (Mackenzie & Williams, 2018), particular outcome competencies (van de Sande et al., 2019), programme intensity and the target population's age group (January et al., 2011). The presented review emphasised the impact of the target population and the particular peer relationship outcome domain on effectiveness. The evaluation study further specified that the target population's pre-existing needs (e.g., low social-emotional skills) and the particular context (e.g., the school transition), alongside important implementation factors, are likely to impact outcomes. These aspects and their importance for implementation strategies will be discussed in the following.

The overall finding that the target population and their needs should be central to intervention efforts is not new (Hagen et al., 2012) and has informed this research's aim to explore different support strategies to facilitate peer relationships. Overall, only some children would be expected to have profound peer problems, such as bullying. The problem, described as the prevention paradox (Greenberg et al., 2017), is that a bullying intervention is likely to be beneficial for the few target children, but have small benefits on the community level. At the same time, a preventive focus on positive peer interactions is likely to benefit the whole school (or community) but might not adequately address profound problems such as bullying. The suggested implication of this paradox concerns the implementation of a mix of strategies for different needs, because there is no one-size-fits all approach (Greenberg et al., 2017). Therefore, the peer relationship programme developed in this research combined preventive strategies to improve class climate, as well as strategies concerning conflict management and bullying and a focus on social-emotional skills. To make it explicit that there are no universal strategies for everyone, it was highlighted – specifically in regard to emotion regulation strategies and conflict management – that different people will benefit from different skills. The promising evaluation effects on peer relationships, social-emotional skills and happiness seem to support such a mix of strategies within one programme.

However, the evaluation study's findings also highlighted a variety of specific change mechanisms and aspects influencing intervention effects, as discussed in Chapter 5. For example, effects on social-emotional skills were specifically found in boys and the control group's negative trajectories of happiness and social skills seem to suggest that the intervention was counterbalancing negative trajectories after the school transition. This highlights the need to assess specific change mechanisms of specific subgroups in specific contexts. However, this evaluation study assessed only one line of peer relationship change mechanisms, driven by

social-emotional skills. While the findings indicate that improving social-emotional skills can facilitate peer relationships, this seems to be particularly relevant for children with skills deficits (which could be the case for neurotypical and neurodiverse children). Other specific change profiles have not been assessed in relation to peer relationships. Therefore, other effect mechanisms (e.g. self-efficacy effects on peer relationships and wellbeing) should also be examined to explore which strategies (or mix of strategies) are crucial for facilitating peer relationships.

The implementation of an appropriate mix of strategies is, however, directly linked to implementation aspects. It has previously been criticised that studies rarely link implementation aspects to effectiveness outcomes (de Leeuw et al., 2020). The evaluation study aimed to do this by linking teachers' perceived relevance to the classroom climate, but did not find any significant effects. However, classes that later dropped out or implemented few sessions seemed to have pre-existing difficulties (e.g., lower happiness in class), which implied that implementation aspects are linked to problems in the classroom. As discussed before, a flexible adaptation of intervention strategies tailored to the classroom's needs might help to sustain long-term implementation. In line with this, it has been suggested that intervention fidelity should be focused on achieving the intended change mechanisms rather than strictly following a pre-described set of activities (Reed et al., 2021). Thus, the answer to the prevention paradox might not be a big intervention combining all approaches, but a set of intervention strategies, which can be flexibly and independently implemented by teachers.

Additionally, the present research was conducted in the context of the Austrian school transition, which is likely to impact children's needs. The assumptions of the prevention paradox as described before might be crucially impacted by this context. While only some children would be expected to have peer problems at any given time, peer relationships are a

major concern of most children in the context of the school transition (Bagnall et al., 2020; Rice et al., 2011). This suggests that most children are in need of support strategies during this period. Additionally, transition periods have been suggested as suitable intervention periods, as people tend to reflect on and adapt their behaviour during the transition (National Institute for Health and Care Excellence (NICE), 2007). The context of the school transition is additionally linked to aspects of age. As reported previously (January et al., 2011), pre-school age and early adolescence are particularly important developmental transition periods for intervention efforts. In Austria, the school transition takes place when children are around 10 years old, which is earlier than in many other countries. With profound developments in children's relationship skills throughout (early) adolescence (Ross et al., 2019), this combination of age and the context of school transition might be a crucial backdrop for presented findings, implying that this research's findings regarding peer relationships might not transfer to other contexts. It would therefore be interesting for other researchers to test the effectiveness of the presented intervention approach in a different context and age group. At the same time, presented considerations provide a strong rationale for supporting peer relationships in the context of the school transition.

Another general implication of this research concerned the important differences of peer relationship domains. The author-generated groups of outcome measures reported in the review represented very different peer relationship domains, including friendship quality, socioeconomic status, or connectedness. The presented findings might reflect differences in realistic goals for different programme types (e.g., decreasing loneliness by addressing self-beliefs and mental health in selective bullying interventions) as discussed previously. However, they might also reflect differences in the measures' change sensitivity, which could either be linked to the measure itself or the concept (peer relationship domain) addressed. To illustrate

this, low effectiveness on friendship quality might be related to longer periods necessary to establish friendships, as evident from school transition research (Lessard & Juvonen, 2018), which would result in low change sensitivity over short assessment periods. However, low change sensitivity might also be related to the types of items and subscales in friendship quality questionnaires including aspects, such as security and closeness (Bukowski et al., 1994), which might not be sensitive to further improvement after they have been established. Thus, researchers should not only carefully consider appropriate peer relationship goals for their intervention efforts, as emphasised previously, but they should also consider the timeline of their research period and change sensitivity of items to ensure potential changes could be detected.

Implications Regarding Methodology and Participatory Research

The second aim of this research was to explore suitable methodological approaches to engage children in research. Challenges regarding participatory involvement, specifically concerning children's authentic voices and power dynamics were discussed previously (Chapter 3 and 4). These challenges have led to few studies actually engaging young people in advisory roles (Sellars et al., 2021). While there are examples of younger children involved in empirical research and appropriate data-collection methods (Y. Sun et al., 2023), intervention development is mostly focused on adolescents (Hawkins et al., 2017; Reed et al., 2021). This research is an important contribution by discussing the involvement of children aged 9 to 12 and showing that methodology can be adapted for engaging them at various stages of the intervention development process.

As outlined earlier, schools are an ideal intervention development setting (Reed et al., 2021) due to their educational purpose (Jorm, 2012) and their access to children from heterogeneous

backgrounds (Wagner et al., 2017). Implementing participatory research in a classroom setting seems therefore well suited to move beyond the employment of smaller participatory advisory groups and involve more heterogeneous voices in the development process. However, common methods employed with children, such as interview methods and "draw-and-tell" techniques (Y. Sun et al., 2023) are less feasible in the classroom due to the big groups. In a classroom setting, contextual expectations regarding "correct" answers, the framing of questions, peer group dynamics, and an appropriate mix of methods need to be considered, as discussed in Chapter 3. This research (Chapter 4) highlighted feasibility aspects and practicality of implementing participatory methodology in the classroom and aimed to encourage other researchers to consider the classroom context as valuable setting for participatory involvement of children.

However, the adaptation of activities to child-appropriate levels does not automatically lead to equal power balances (Y. Sun et al., 2023). Importantly, children need to be included in crucial decisions at every stage of the research process (Reed et al., 2021). The use of the term "participatory research" has been criticised if stakeholders were not actively involved in every research stage and every decision with equal roles as the researchers (Montreuil et al., 2021). With examples that are used to explain "ideal" participatory approaches focusing on adolescents (Hawkins et al., 2017), the feasibility of involving younger children in every decision with equivalent roles as the researchers is questionable. In this research, children were included at every stage of the development, however, as discussed previously (Chapter 4), the researchers facilitated and framed their involvement, thus the capacity-building was external instead of at the individual, student level (Reed et al., 2021). It could therefore be argued that this research does not classify as taking a comprehensive participatory research approach and instead merely employed participatory methodology (Montreuil et al., 2021). Indeed, this research mainly

focused on exploring participatory methodology and how methods can be adapted to engage children in the research process. Therefore, it is valid argument that this research did not realise a full participatory approach. It is a limitation of this research, that the achieving of equal power dynamics was not central. Instead, this research focused on making children's voices central to the intervention development process by adapting participatory methodology to enable children to actively participate in the research and in decision-making processes, which has been described as necessary condition for participatory research (Montreuil et al., 2021). Thus, there is not a clear line between participatory methodology and participatory research and the presented work is positioned at their intersection.

A number of important ethical challenges in participatory research were discussed previously (Chapter 2 and 3), specifically power dynamics, authenticity of children's voices, meaningful engagement and representation, recognition of capacities, and children's vulnerability. Another important ethical consideration (Montreuil et al., 2021), which has not been discussed before concerns children's best interests. In the context of this research, which concerned the development of a peer relationship intervention, children's participation always concerned reflections of their experiences and relevant strategies to cope with challenging situations. When creating meaningful experiences of participation (Levy & Thompson, 2015), children were expected to benefit from such reflections. Related harms were considered minimal as discussions of appropriate strategies should even – or especially – be in the interests of children who might have had negative peer experiences such as bullying. Importantly, this goes hand in hand with safeguarding strategies and considerations. In this research, psychologists were always present at participatory workshops, and remote activities were led by teachers, thus children were always monitored for any signs of discomfort. Additionally, Chapter 2 discussed potential ways to adapt methods to specific wellbeing and safeguarding concerns.

Strengths and Limitations of This Research

The implementation of a participatory development process itself is a strength of this research, as stakeholder involvement is encouraged in intervention development guidelines (Skivington et al., 2021), but young people's representation is missing in the majority of empirical research (Sellars et al., 2021). This research goes beyond existing frameworks and examples of participatory involvement (Benninger & Savahl, 2017; Hawkins et al., 2017) by considering and discussing important adaptations of the methodology (Albert et al., 2023) to the school context and target group of children. Additionally, this thesis presented *all* stages of the development process of a peer relationship programme from a literature review of existing evidence (Chapter 2) to considerations of methodological aspects (Chapter 3) to engaging children in all stages of the development (Chapter 4) and discussing the implementation and evaluation of the programme (Chapter 5).

An additional strength of this research is the engagement of large samples of children in each study. Small samples sizes might introduce sampling errors, which causes further problems when reported intervention effects are considered in prospective meta-analyses (Lin, 2018). While the engagement of small, self-selected stakeholder groups is common in many participatory development processes (Reed et al., 2021), this research aimed to involve children from a variety of backgrounds and school locations. In combination with a wide distribution of schools and heterogeneity of backgrounds, the large samples of the first stage of participatory involvement and the evaluation study allow the claim that the presented findings are representative of experiences of children in Lower Austria and Vienna.

However, due to the wide field of peer relationship research, it would have been beyond the scope of this research to address all potentially impactful variables in detail. One potentially

interesting variable is gender, which was not explicitly addressed in the development process and methodological considerations. Gender was addressed in the evaluation study and gender differences were found on social-emotional skills and peer connectedness. While this study found that girls reported overall higher connectedness, relationship skills seem to develop differently for both genders, which is consistent with previous findings (Ross et al., 2019). Therefore, it would have been interesting to consider gender in the intervention development process and explore whether boys and girls report different peer experiences and different peer needs (at different developmental stages). Due to the dynamic nature of the qualitative school workshops, it was difficult to track which child verbally expressed or wrote down each comment. When considered in the workshop design, however, same-gender focus groups could be included or boys and girls could receive different coloured notes.

Other potentially impactful factors are socioeconomic status (SES) and ethnicity. While SES has been linked to academic outcomes (OECD, 2019b), neither SES nor ethnicity have been found to moderate outcomes of universal, school-based SEL programmes (Durlak et al., 2022). However, advantaged target groups commonly benefit most from behaviour change interventions, which has been linked to concerns regarding equity (Wight et al., 2015). PISA discusses equity in terms of inclusion of disadvantaged groups and fairness regarding equal access to education (OECD, 2019b). While it is generally desirable to achieve intervention effects, it would be an unintended intervention effect if groups with pre-advantages, such as higher socioeconomic status, benefit, while disadvantaged groups do not benefit, thereby increasing the disadvantage-gap (Wight et al., 2015). As previously discussed concerning the evaluation study, drop-outs and poor implementation seemed to be linked to pre-existing difficulties in the classroom. Therefore, it is possible that the programme was particularly beneficial for classrooms with existing advantages, while not adequately addressing other

classes' disadvantages. As discussed in Chapter 4, more implementation support and adequate strategies to address existing problems might help to counterbalance this effect (Domitrovich et al., 2008). However, such concerns regarding equity and SES have not been explicitly addressed and accounted for in this research, which would be an important aspect to improve in future studies.

A similar concern regarding equity pertains to the involvement of parents in intervention efforts. The role of parents in peer relationships was briefly acknowledged in relation to increased play dates as measured by the ASD-specific questionnaire (Chapter 2). Apart from this, the role of parents has largely been neglected in this research, although the review (Chapter 2) found parental involvement to be linked to positive effects. For this intervention development effort, however, a deliberate decision was made to focus on the role of schools and educators due to equity concerns. Parents are not always in the position to adequately support their children (due to mental health problems or other resource problems) and parent baseline characteristics such as stress have been linked to child intervention outcomes (Shalev et al., 2020). With only 12% of parents engaging in extracurricular activities (OECD, 2019a), reaching parents who might be stressed and overworked seems unrealistic. Instead, only parents, who are engaged already, are likely to participate, which might further increase inequality. Nevertheless, parents and family members are able to provide valuable support in relation to children's peer relationships and future research should try to either involve parents or control for parental support to address potential impacts on intervention outcomes.

Another limitation concerns the measures of the evaluation study. While exclusively using self-report measures was a deliberate decision in line with this research's aim to focus on children's voices, using exclusively quantitative questionnaires with this age group might be problematic as children of this age might struggle with the abstract nature of some questions (Mellor &

Moore, 2014). If children struggle to fully reflect on abstract questions and thoughtfully report their competencies, this might lead to problems regadring validity or change sensitivity of measures. In the evaluation study, ceiling effects were found for social-emotional skills with 28% of children reporting the highest sum score at pre-test, which probably reduced change sensitivity of the measure. It is likely that these effects impacted the finding that social skills changes impacted peer relationship changes only for children with lower pre-skills (which could further increase). It might be argued that this reflects validity problems of the measure, as the ceiling effects might indicate that the measure does not adequately represent children's real abilities. However, this research focused on self-perception of children. Thus, it is an interesting finding that 28% of children perceive their social-emotional skills as very high. It is further possible that this self-perception of skills is linked to peer relationships, as low self-esteem has been found to predict rejection sensitivity and loneliness (Geukens et al., 2020; Zhou et al., 2020). Problems regarding children's accurate representation of their skills could be addressed by including teacher or parent ratings, however these might be biased in different ways (Garcia et al., 2019). Ideally, the evaluation would have been combined with qualitative feedback discussions or open questions in the questionnaire. Additional concerns regarding change sensitivity were discussed in the previous section.

Furthermore, this research was impacted by lockdowns and social-distancing implemented in the context of the Covid-19 pandemic. As outlined in Chapter 3, lockdowns and school-access restrictions imposed some modifications on Stage II of the development process. Instead of the planned iterative participatory approach, remote activities had to be implemented. This certainly influenced the level of participation that was reached, which had ramifications that are discussed in more detail in the previous section and in Chapter 3.

Future Research

While this research has established that a focus on social-emotional skills in a universal school-based programme can be effective in supporting children's peer relationships, an exploration of other change mechanisms would be desirable. While significant intervention effects on social skills point towards a benefit for the general population, there might be an additional driver of effects on peer relationships (particularly for children without skills deficits). Based on the review's findings, this factor could be emotional self-efficacy, which should be addressed in future research. While self-efficacy has been discussed in detail before, and was not included as a main focus in the programme, it might be interesting to assess this programme's impact on children's emotional self-efficacy and its impact on peer relationships.

The findings of the evaluation study suggested that particularly children with skills deficits can improve their peer relationships through an intervention with focus on social-emotional skills. In such cases, however, the desired outcomes, i.e. peer relationships, will also impact the intervention itself, as peer support has been found to impact intervention learning effects (Orson et al., 2020) and negative peer responding during the intervention has been associated with lower levels of skills and behaviour change of target children (Ho et al., 2022). Thus, future research should focus on the bi-directional aspects of peer relationships and social skills in the context of school-based skills training for children with skills deficits. As discussed in the context of clinical interventions for children with an ASD diagnosis, peer relationship interventions should be conducted in the classroom (Laugeson et al., 2014) to create propinquity and a form of similarity through shared activities, which has been found to foster friendships (Liberman & Shaw, 2019). In this case, closer attention should be paid to the peer dynamics during the intervention implementation to avoid negative peer experiences which could impede intervention effectiveness (Ho et al., 2022).

Additionally, social-emotional skills interventions are just one approach to facilitate peer connectedness in the classroom. As the findings of the review indicated, there are also other effective activities to facilitate peer relationships in the school context, including shared activities, such as breakfast clubs (Defeyter et al., 2015), psychodrama groups (Orkibi et al. 2017), or group counselling (McElearney et al., 2013). While this research focused on the potential of classroom-based intervention programmes, the effects of shared activities and shared positive experiences with classmates as such, as well as the impacts of therapeutic activities in the classroom context would be a relevant extension of this research. Although multi-component programmes have not been found to achieve better results compared to single-component programmes (Durlak et al., 2011), some components might have an additional benefit for specific subgroups of children. In line with the evaluation study's findings concerning particular benefits of a social-emotional skills programme for peer relationships of children with skills deficits, therapeutic programmes might be particularly beneficial for children with individual problems that affect their peer relationships and shared activities might be particularly beneficial for neglected children, as suggested by contact theory (Beelmann & Heinemann, 2014; Paluck, et al., 2019).

The review indicated that friendship quality is not a promising intervention target, while connectedness is a suitable target of universal, preventive programmes. It would, however, be desirable to link friendship and perceived connectedness in a future study, especially across a longer study period. The review's findings (Chapter 2) regarding promising follow-up measures indicate that friendships might take longer to change, which is also supported by transition research suggesting it can take months to form new friendships (Lessard & Juvonen, 2018). Additionally, prosocial classroom norms seem to impact friendship processes (Laninga-Wijnen et al., 2020). Therefore, it would be particularly interesting to assess whether positive

intervention effects on peer connectedness predict positive changes in friendship quality. Additionally, the evaluation study (Chapter 5) found perceived classroom climate to significantly decline for both groups (likely impacted by the school transition), while peer connectedness was increased for the intervention group. Investigating specific links between classroom climate and peer connectedness would be interesting and could even extend to school connectedness, which has largely been neglected in the present research due to its involvement of teacher connectedness.

As discussed previously, future research should also include parents and address their impact. Additionally, future research should clarify differences of age and context in relation to peer relationship programmes. Intervention research usually discusses differences between broader age periods (January et al., 2011; Mackenzie & Williams, 2018). As this research focused on 9 to 12-year-olds particularly, no further age differentiations were made. However, in the context of developing relationship skills (Ross et al., 2019) and neurological developments sensitive to social contexts (Blakemore & Mills, 2014), and in combination with different school transition periods in other countries, differences in age groups should be addressed.

Conclusion

This research explored methods, contents and intervention strategies, and implementation factors appropriate for peer relationship programmes for children. Participatory methodology was adapted to the stakeholders' needs and the context to actively engage children in all stages and relevant decisions concerning the development process. The exploration of appropriate methods for peer relationship programmes highlighted a need to combine content delivery with self-awareness tasks. During the development process, it became clear that stories and group discussions are ideal to engage children in reflective discussions. Therefore, stories were

implemented as content delivery method with interactive elements and self-awareness tasks. Regarding relevant contents and intervention strategies, a review of existing programmes found a focus on peer connectedness and mental health factors to be promising to facilitate peer relationships in universal programmes. During the development process, it became evident that a focus on positive classroom climate and emotional support strategies is also relevant for the target population. Thus, the novel programme had a strong focus on social-emotional skills, while incorporating strategies to address different needs, including positive classroom climate. In the programme evaluation, proposed effect mechanisms of social-emotional skills on peer connectedness were only evident for children with skills deficits, which was in line with the review's findings concerning promising effects of social-emotional skills on peer relationships of a clinical population. However, the evaluation study's findings concerning general improvements of social-emotional skills and peer relationships indicate that neurotypical children also benefit from a focus on social-emotional skills. Nevertheless, future research could explore other potential intervention effect mechanisms driving changes in peer relationships. In addition, the evaluation study's findings highlighted the need to provide adequate implementation support for teachers and potentially provide flexible intervention strategies to sustain long-term implementation. Overall, this research provides a strong rationale for implementing preventive programmes with focus on social-emotional skills and wellbeing in the context of the school transition to facilitate children's peer relationships.

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Appendix 2.1

This appendix concerns Chapter 2 and is presented in its published format.

Online Resource 1: A Systematic Review of Intervention Programs Promoting Peer Relationships Among Children and Adolescents: Methods and Targets used in Effective Programs

Pollak Isabella, Mitic Marija, Birchwood James, Dörfler Sylvia, Krammer Ina, Rogers Jack C., Schek Esther Judith, Schrank Beate, Stiehl Katharina A.M., and Woodcock Kate Anne

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Information Sources and Search Strategy

Full documentation of the search strategy for the primary search and the search update is provided below. For the primary search and the search update, a double-screening process was implemented with at least two researchers independently screening each record. Conflicts were resolved through discussions.

In addition to this, a citing and cited reference search was conducted and 37 other systematic reviews on related interventions were examined. The set of papers, which provided the basis for these secondary searches, was the larger than the final 65 papers, as papers with missing data were initially included in the set of eligible papers, while authors were contacted about missing data. Cited references were extracted from the papers and for citing references, Google Scholar was used.

Papers written in any language other than English were extracted by a researcher fluent in this language.

Ovid MEDLINE(R) and In-Process & Other Non-Indexed Citations 1946 to June 12, 2020

Restricted to 2018 to Current

No.	Term	Hits in title
#1	“emotional ADJ1 support”	59
#2	“emotional ADJ1 connection”	4
#3	“social ADJ1 network”	483
#4	“social ADJ1 networks”	366
#5	“social ADJ1 relation”	2
#6	“social ADJ1 relations”	41
#7	“social ADJ1 relationship”	14
#8	“social ADJ1 relationships”	96
#9	“social ADJ1 connection”	19
#10	“social ADJ1 connections”	14
#11	“social ADJ1 connectivity”	3
#12	“social ADJ1 connectedness”	56
#13	"social ADJ1 wellbeing"	6
#14	"social ADJ1 well-being"	41
#15	“social ADJ1 acceptance”	16
#16	“social ADJ1 isolation”	260
#17	“social ADJ1 withdrawal”	34
#18	loneliness	582
#19	friendship	171
#20	friendships	59
#21	friends	411
#22	“peer ADJ1 relation”	0
#23	“peer ADJ1 relations”	18
#24	“peer ADJ1 relationship”	13
#25	“peer ADJ1 relationships”	30
#26	“peer ADJ1 connection”	0
#27	“peer ADJ1 connections”	1
#28	„peer ADJ1 connectedness“	0

#29	"peer ADJ1 network"	9
#30	"peer ADJ1 networks"	12
#31	"peer ADJ1 support”	286
#32	belongingness	42
#33	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32	2.992
No.	**Term**	**Hits in keywords**
#34	child*	203.083
#35	adoles*	156.730
#36	teenage*	2.168
#37	youth	13.843
#38	young	201.253
#39	#34 OR #35 OR #36 OR #37 OR #38	385.945
No.	**Term**	**Hits in title**
#40	Prevention*	15.712
#41	Intervention*	29.119
#42	Program*	23.769
#43	Train*	19.104
#44	Curricul*	2.116
#45	Club*	876
#46	Psychoeducat*	212
#47	Treatment*	105.989
#48	Game*	2.874
#49	Evaluat*	65.368
#50	Mentor*	1.011
#51	"support ADJ1 group*”	164
#52	"support ADJ1 camp*”	1
#53	"peer ADJ1 group*”	45
#54	Counsel*	1.915
#55	Psychodrama	14

#56	"stress ADJ1 management”	180	
#57	"social ADJ1 skill*”	134	
#58	Project*	6.324	
#59	Tool*	16.284	
#60	Therap*	85.985	
#61	#40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60	345.421	
#62	#33 AND #39 AND #61		**125**
Duplicates	**-**	**Total**	**125**

EMBASE **1974 to 2020 June 12** searched on 15.06.2020 via Ovid interface

Restricted to 2018 to Current

No.	**Term**	**Hits in title**
#1	“emotional ADJ1 support”	76
#2	“emotional ADJ1 connection”	4
#3	“social ADJ1 network”	560
#4	“social ADJ1 networks”	414
#5	“social ADJ1 relation”	1
#6	“social ADJ1 relations”	38
#7	“social ADJ1 relationship”	16
#8	“social ADJ1 relationships”	97
#9	“social ADJ1 connection”	16
#10	“social ADJ1 connections”	22
#11	“social ADJ1 connectivity”	4
#12	“social ADJ1 connectedness”	67
#13	"social ADJ1 wellbeing"	9
#14	"social ADJ1 well-being"	52
#15	“social ADJ1 acceptance”	21
#16	“social ADJ1 isolation”	338
#17	“social ADJ1 withdrawal”	49

#18	loneliness	729
#19	friendship	169
#20	friendships	61
#21	friends	493
#22	“peer ADJ1 relation”	0
#23	“peer ADJ1 relations”	18
#24	“peer ADJ1 relationship”	13
#25	“peer ADJ1 relationships”	38
#26	“peer ADJ1 connection”	1
#27	“peer ADJ1 connections”	1
#28	„peer ADJ1 connectedness“	0
#29	"peer ADJ1 network"	9
#30	"peer ADJ1 networks"	13
#31	"peer ADJ1 support”	382
#32	belongingness	44
#33	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32	3.497
No.	**Term**	**Hits in keywords**
#34	child*	332.090
#35	adoles*	182.862
#36	teenage*	3.728
#37	youth	18.494
#38	young	183.206
#39	#34 OR #35 OR #36 OR #37 OR #38	520.020
No.	**Term**	**Hits in title**
#40	Prevention*	22.179
#41	Intervention*	40.293
#42	Program*	34.016
#43	Train*	25.979
#44	Curricul*	2.914

#45	Club*	1106
#46	Psychoeducat*	281
#47	Treatment*	163.632
#48	Game*	3.260
#49	Evaluat*	96.362
#50	Mentor*	1.195
#51	"support ADJ1 group*"	275
#52	"support ADJ1 camp*"	1
#53	"peer ADJ1 group*"	63
#54	Counsel*	2.927
#55	Psychodrama	19
#56	"stress ADJ1 management"	228
#57	"social ADJ1 skill*"	188
#58	Project*	9.528
#59	Tool*	22.061
#60	Therap*	133.686
#61	#40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60	512.999
#62	#33 AND #39 AND #61	**141**
Duplicates	-	**Total** **141**

PsycINFO (1967 to June Week 2 2020) searched via Ovid interface on 16.06.2020

Restricted to 2018 to Current

No.	**Term**	**Hits in title**
#1	"emotional ADJ1 support"	65
#2	"emotional ADJ1 connection"	7
#3	"social ADJ1 network"	435
#4	"social ADJ1 networks"	376
#5	"social ADJ1 relation"	1

#6	“social ADJ1 relations”	65
#7	“social ADJ1 relationship”	18
#8	“social ADJ1 relationships”	104
#9	“social ADJ1 connection”	19
#10	“social ADJ1 connections”	16
#11	“social ADJ1 connectivity”	2
#12	“social ADJ1 connectedness”	68
#13	"social ADJ1 wellbeing"	7
#14	"social ADJ1 well-being"	40
#15	“social ADJ1 acceptance”	25
#16	“social ADJ1 isolation”	126
#17	“social ADJ1 withdrawal”	33
#18	loneliness	597
#19	friendship	283
#20	friendships	126
#21	friends	371
#22	“peer ADJ1 relation”	0
#23	“peer ADJ1 relations”	37
#24	“peer ADJ1 relationship”	16
#25	“peer ADJ1 relationships”	71
#26	“peer ADJ1 connection”	0
#27	“peer ADJ1 connections”	2
#28	„peer ADJ1 connectedness“	0
#29	"peer ADJ1 network"	10
#30	"peer ADJ1 networks"	14
#31	"peer ADJ1 support”	192
#32	belongingness	81
#33	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR #30 OR #31 OR #32	3.093
No.	**Term**	**Hits in keywords**
#34	child*	62.107

#35	adoles*	32.220
#36	teenage*	1.096
#37	youth	14.309
#38	young	23.353
#39	#34 OR #35 OR #36 OR #37 OR #38	93.759
No.	**Term**	**Hits in title**
#40	Prevention*	2.492
#41	Intervention*	10.152
#42	Program*	7.735
#43	Train*	5.935
#44	Curricul*	961
#45	Club*	192
#46	Psychoeducat*	214
#47	Treatment*	10.779
#48	Game*	1.901
#49	Evaluat*	7.774
#50	Mentor*	726
#51	"support ADJ1 group*"	132
#52	"support ADJ1 camp*"	4
#53	"peer ADJ1 group*"	53
#54	Counsel*	2.211
#55	Psychodrama	67
#56	"stress ADJ1 management"	89
#57	"social ADJ1 skill*"	310
#58	Project*	1.757
#59	Tool*	2.155
#60	Therap*	9.436
#61	#40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60	55.760

#62	#33 AND #39 AND #61	**99**	
Duplicates	-	**Total**	**99**

ERIC (via Ebsco Host) 15.06.2020

TI (“emotional support” OR “emotional connection” OR “social network” OR “social networks” OR “social relation” OR “social relations” OR “social relationship” OR “social relationships” OR “social connection” OR “social connections” OR “social connectivity” OR “social connectedness” OR "social wellbeing" OR "social well$being" OR “social acceptance” OR “social isolation” OR “social withdrawal” OR belongingness OR loneliness OR friendship OR friendships OR friends OR “peer relation” OR “peer relations” OR “peer relationship” OR “peer relationships” OR “peer connection” OR “peer connections” OR “peer connectedness“ OR "peer network" OR "peer networks" OR "peer support”)

AND

(child OR children OR adolescence OR adolescent OR adolescents OR teenage OR teenager OR teenagers OR youth OR young)

AND

TI (prevention OR preventions OR intervention OR interventions OR programme OR programmes OR program OR programs OR train OR training OR trainings OR curriculum OR curricula OR club OR clubs OR psychoeducation OR psychoeducating OR treatment OR treatments OR game OR games OR evaluation OR evaluations OR mentorship OR mentoring OR mentor OR "support group” OR “support groups” OR "support camp” OR “support camps” OR "peer group” OR “peer groups” OR counselling OR counseling OR psychodrama OR

"stress management” OR "social skill” OR “social skills” OR project OR projects OR tool OR tools OR therapy OR therapies OR therapeutic)

Published after December 2017

Total: 18

(8 imported, others duplicated or not relevant)

ProQuest (advanced search) 13.12.

TI ("emotional support" OR "emotional connection" OR "social network" OR "social networks" OR "social relation" OR "social relations" OR "social relationship" OR "social relationships" OR "social connection" OR "social connections" OR "social connectivity" OR "social connectedness" OR "social wellbeing" OR "social well$being" OR "social acceptance" OR "social isolation" OR "social withdrawal" OR belongingness OR loneliness OR friendship OR friendships OR friends OR "peer relation" OR "peer relations" OR "peer relationship" OR "peer relationships" OR "peer connection" OR "peer connections" OR "peer connectedness" OR " peer network " OR " peer networks " OR " peer support")

AND

AB (child* OR adoles* OR teenage* OR youth OR young)

AND

TI (prevention OR preventions OR intervention OR interventions OR programme OR programmes OR program OR programs OR train OR training OR trainings OR curriculum OR curricula OR club OR clubs OR psychoeducation OR psychoeducating OR treatment OR treatments OR game OR games OR evaluation OR evaluations OR mentorship OR mentoring OR mentor OR "support group” OR “support groups” OR "support camp” OR “support camps”

OR "peer group” OR “peer groups” OR counselling OR counseling OR psychodrama OR "stress management” OR "social skill” OR “social skills” OR project OR projects OR tool OR tools OR therapy OR therapies OR therapeutic)

Limited to published after: December 2017

Document type: Working Paper/Pre-Print, Review, Research Topic, Report, Literature Review, Conference Paper, Article,

Total: **205**

(200 imported, after this limit reaches, remaining 5 duplicates or not relevant anyway)

Cochrane library (search manager) 29.11.

#1 child OR children OR adolescence OR adolescent OR adolescents OR teenage OR teenager OR teenagers OR youth OR young

In Abstract, Title, Keywords

Limited to 2018-2020

AND

#2 “peer support” OR “emotional support” OR “social network” OR “social networks” OR “social relation” OR “social relations” OR “social relationship” OR “social relationships” OR “social connection” OR “social connections” OR "social connectedness" OR "belongingness" OR loneliness OR “social isolation” OR “social acceptance” OR “social withdrawal” OR friendship OR friendships OR friends OR “peer relation” OR “peer relations” OR “peer

relationship” OR “peer relationships” OR “peer connection” OR “peer connections” OR "social wellbeing" OR "social well$being" OR "school connectedness"

In Record Title

Limited to 2018-2020

#3 prevention OR preventions OR intervention OR interventions OR programme OR programmes OR program OR programs OR train OR training OR trainings OR curriculum OR curricula OR club OR clubs OR psychoeducation OR psychoeducating OR treatment OR treatments OR game OR games OR evaluation OR evaluations OR mentorship OR mentoring OR mentor OR "support group” OR “support groups” OR "support camp” OR “support camps” OR "peer group” OR “peer groups” OR counselling OR counseling OR psychodrama OR "stress management” OR "social skill” OR “social skills” OR project OR projects OR tool OR tools OR therapy OR therapies OR therapeutic

In Record Title

Limited to 2018-2020

#1 and #2 and #3

Total: **33**

Appendix 2.2

This appendix concerns Chapter 2 and is presented in its published format.

Online Resource 2: A Systematic Review of Intervention Programs Promoting Peer Relationships Among Children and Adolescents: Methods and Targets used in Effective Programs

Pollak Isabella, Mitic Marija, Birchwood James, Dörfler Sylvia, Krammer Ina, Rogers Jack C., Schek Esther Judith, Schrank Beate, Stiehl Katharina A.M., and Woodcock Kate Anne

Corresponding author: Isabella Pollak, email:

Use of Cochrane ROB 2 Tool

A few minor modifications were made to the Cochrane ROB 2 tool in order to make it applicable for the specific context of interventions and all study types (e.g. cluster RCTs).

In order to account for different design requirements in cluster RCTs, the appropriate sub-questions in domain 1(b) were retrieved from the Cochrane RoB2 tool for cluster RCTs and used for the appraisal of cluster RCTs.

Among the optional questions in domain 2 (effect of adhering to intervention) only question 2.4 on intervention implementation was used. Non-protocol interventions (question 2.3) were difficult to judge in complex school and community backgrounds and non-adherence (question 2.5) was not applicable in psychological intervention contexts where any adherence to intervention procedures beyond students' mere presence at sessions was not controllable.

Author-Derived ROB Assessment Based on Cochrane ROB 2

Rating for Level of Study Quality

Study Design

Randomised controlled trials (RCTs) received 2 points, controlled trials received 1 point and uncontrolled trials received 0 points.

Randomization

This rating was based on Cochrane ROB 2 tool. Two points were given if a judgement of "low risk" was achieved following Cochrane ROB 2, 1 point for "some concerns" (e.g. randomized trials, without adequate concealment or in case results suggest problems with randomization) and 0 points for "high risk" (e.g. non-randomised).

Implementation fidelity

This rating was based on Cochrane ROB 2 tool. Two points were given if a judgement of "low risk" was achieved following Cochrane ROB2 (e.g. quantitative checks of fidelity, not suggesting any issues), 1 point for "some concerns" (e.g. some kind of checks were implemented, but no quantitative data was provided) and 0 points for "high risk" (e.g. no information).

Missing Data

This rating was also based on Cochrane ROB 2, however in practice only two outcomes could be achieved. Either papers were given 2 points for "low risk" or 0 points for "high risk". Papers were judged as "low risk" if outcome data was reported for almost all participants or if authors provided evidence that outcome is not biased due to missing data. Papers were judged "high risk" if no information was provided or if missingness could be related to outcomes (e.g. drop outs due to more stress during intervention).

Total scores of between 0 and 8 points could be achieved. Results were presented as percentage out of the total possible points to make interpretation more intuitive.

Level of Evidence Rating

The (B) *level of evidence rating* comprised (i) between group significance (if applicable), (ii) effect sizes, (iii) follow-up evidence (if applicable) and (iv) sample size. Effect sizes were incorporated because they (a) are crucial for inferring practical significance of results and compare results across studies (Lakens, 2013) and (b) their consideration in reviews has been suggested to limit the potential bias of significant but hardly effective studies (Popay et al., 2006). Since it is frequently argued that the interpretation of effect sizes should take contextual considerations into account (Fritz et al., 2012; Funder & Ozer, 2019; Hill et al., 2008), effect sizes were not merely rated according to Cohen's standard cut-offs, instead the rating was specifically designed to better reflect effect sizes observed in psychological intervention studies (Funder & Ozer, 2019; Richard et al., 2003). Also, not all studies included a control group or a follow-up analysis. Since both features are commonly related to money or time constraints, the rating incorporated reported evidence without downgrading studies with fewer categories of evidence.

For the level of evidence rating, the range for each category was between -1 and 2 points. Using the tool, negative, non-significant and negligible evidence (non-significant between group effects, Cohens d effect size below .1) were each rated with -1 point. Absent evidence (no control group, no follow-up) was rated with 0 points. Equally, a very small sample size of below 30 participants and small effect sizes (.1 - .25) were each rated with 0 points. Thus, any study with 0 or less points was rated as a study providing weak evidence. One point each was given for moderate effect sizes (.25 - .55), a follow-up maintained short-term (up to 6 months), or medium sample size (30-250). Two points each were given for high effect sizes (> .55), maintained effects at follow-up in the long-term (> 6 months), a high sample size (>250 participants) and significant between-group effects. Thus, total scores for the level of evidence

rating could lie between -3 and 8 points with a rating below or equal 0 indicating weak results, and a rating equal or above 1 indicating (strong) positive results.

Between Group Effects

This rating was effectively either negative (-1) for non-significant evidence, non-existent (0) for uncontrolled trials or positive (as in receiving full 2 points) for significant effects.

n.s.= -1 *N/A= 0* *significant= 2*

Effect Sizes

The classical benchmarks set by Cohen (1988) are considered relatively high in the context of applied psychological research (Bosco et al., 2015). Cohen (1988) himself suggested his benchmarks could be used if no other basis for interpretation was applicable. Instead, effect sizes could be meaningfully interpreted in the context of typical effect sizes obtained in psychological research (Funder & Ozer, 2019) or effect sizes common in the particular filed of study (Bosco et al., 2015). Based on empirically observed effects in psychological research and considerations regarding long-term consequences of individual effects, Funder & Ozer (2019) suggest alternative benchmarks of r .05 – very small, r .10 – small (and potentially more consequential in the long-run), r .20 – medium (of explanatory use even in the short run), and r .30 – large and powerful in short and long run. They suggest effect sizes of r .40 and larger are likely to be overestimations. A meta-analysis of effect sizes in individual differences research suggested similar guidelines based on empirical effect sizes; r. 0.10 - small 0.20 – medium and 0.30 – large. Regarding common effect sizes in the field of study linked to this review, a meta-analysis of effect sizes in social psychology found a mean r of .17 for studies related to health psychology, a mean r of .19 for intergroup relations and a mean r of .22 for relationships

(Richard et al., 2003). Since r and d can be easily converted (Funder & Ozer, 2019), it is assumed that these considerations similarly apply to benchmarks for Cohen's d.

Assuming that r .10 = d .20 represent small effects, r .20 = d. 40 medium effects and r .30 = d .629 large effects and that effects sizes common in health research and relationships average between r .17 = d. 345 and r .22 = d .4511, the following interpretation of effect sizes in the context of this review was created:

Neg & .0 effects= -1 small(.1 - .25)= 0 moderate(.25 - .55)=1 strong (> .55) =2

Follow-Up Evidence

This rating could either refer to within-group or between-group effects. Significant between-group effects at follow-up or within-group effect sizes *at the same level* (small, medium or large) at follow-up as reported for post-test data. The rating focused on the duration of the follow-up period instead of effect sizes:

Not maintained = -1

N/A= 0

maintained at short term (< 6 months)= 1

maintained at medium and long term (>6 month) = 2

Two special cases were acknowledged:

Large effect size at post-test may decrease to medium effect size without being downgraded. Medium effect sizes after a follow-up period are still stronger compared to small effect sizes maintained at low level, thus medium effects are considered maintained effects.

An increase in effect sizes to a higher level is rated with 1 or 2 points (according to the time frame).

Sample Size

Cheung and Slavin (2016) found that studies with a sample size below N=30 tend to overestimate effect sizes and studies with a sample size larger than N= 250 tend to underestimate effect sizes. Having more than 30 participants was also suggested as general rule of thumb for finding effects in a pilot study (Lancaster et al., 2004). Therefore, the following benchmarks were used:

Studies with N < 30 received 0 points, implicating that effect sizes might be overestimated and thus mitigating overly positive effects (e.g. high effect sizes). Studies with N between 31-249 received 1 point. Studies with N > 250 received 2 points, as literature suggest very large sample sizes might underestimate effect sizes, which might to a lower effect size rating, thus these study receive more points for extraordinary large samples.

N < 30 = 0 *N 31 – 249 = 1* *N > 250 = 2*

Full Level of Evidence Rating Table

As sum score was calculated for the level of evidence rating, with a rating of 0 or below indicating negative or negligible intervention effects and a rating above 0 indicating positive intervention effects. For this rating, it was assumed that negative evidence in one domain (between-group effects, follow-up or effect sizes) would outweigh positive evidence to some degree. A moderate within-group effect size, for example, would be outweighed by non-significant between-group effects. In practical terms, if the intervention group seemed to have improved peer relationship levels to some degree, but the no significant improvement over a control was found, it can be assumed that a general effect of time exists, which is not attributed to the intervention. A detailed overview of the overall rating can be found below.

Between *effect size* *follow-up* *N<30* *rating* *N>30* *rating*

n.s. -1	*n.s. -1*	*n.s. -1*	*0*	***-3***	*1*	***-2***
n.s -1	*small 0*	*n.s. -1*	*0*	***-2***	*1*	***-1***
N/A 0	*n.s. -1*	*N/A 0*	*0*	***-1***	*1*	***0***
n.s. -1	*small 0*	*N/A 0*	*0*	***-1***	*1*	***0***
N/A 0	*small 0*	*n.s. -1*	*0*	***-1***	*1*	***0***
N/A 0	*small 0*	*N/A 0*	*0*	***0***	*1*	***1***
n.s. -1	*moderate 1*	*N/A 0*	*0*	***0***	*1*	***1***
N/A 0	*moderate 1*	*n.s. -1*	*0*	***0***	*1*	***1***
n.s. -1	*high 2*	*n.s -1*	*0*	***0***	*1*	***1***
n.s.-1	*high 2*	*N/A 0*	*0*	***1***	*1*	***2***
N/A 0	*moderate 1*	*short 1*	*0*	***2***	*1*	***3***
n.s. -1	*moderate 1*	*short 1*	*0*	***1***	*1*	***2***
n.s. -1	*high 2*	*short 1*	*0*	***2***	*1*	***3***
Sig 2	*moderate 1*	*n.s. -1*	*0*	***2***	*1*	***3***
Sig 2	*moderate 1*	*N/A 0*	*0*	***3***	*1*	***4***
N/A 0	*high 2*	*short 1*	*0*	***3***	*1*	***4***
Sig 2	*high 2*	*short 1*	*0*	***4***	*1*	***5***
Sig 2	*moderate 1*	*short 1*	*0*	***4***	*1*	***5***
sig 2	*high 2*	*long 2*	*0*	***6***	*1*	***7***

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Appendix 2.3

This appendix concerns Chapter 2 and is presented in its published format.

Online Resource 3: A Systematic Review of Intervention Programs Promoting Peer Relationships Among Children and Adolescents: Methods and Targets used in Effective Programs

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Table 1

Study Characteristics Table

Author	Program	Country	Age group	Level of Intervention	Setting	Duration Intensity	Methodological Components	Positive Effects	Outcome Measure of Peer Relationships	Quality of Evidence	Level of Evidence
Afsharnejad et al., 2020	KONTAKT, social skills group training	Australia	M= 14.09	Clinical intervention	community and social care	weekly 90 min sessions for 10 weeks	Homework, group discussions, active practice in group, context for interaction (snack time specifically designed for unstructured interaction)	ASD Symptoms, emotion recognition, emotion regulation and social skills, goal attainment	Perth A-Loneliness Scale (PALs)	50%	0.00

Bauminger, 2007	Cognitive-behavioral-ecological (CB-E) social skills training for ASD	Israel	7 to 11	Clinical intervention	school-based	3 h per week over a 7-month period	Content delivery (affective education, core social objectives), context for interaction (meeting up with peer), parental involvement,	social skills (other directed), emotion regulation & Coping (self-directed)	Self-Perception Profile for Children (Harter, 1985), Loneliness Rating Scale (Asher et al., 1984)	0%	0.00
Bostick & Anderson, 2009	S.S.GRIN social-skills training	US	3d grade (8-9 years)	Selective intervention	school-based	10 weeks	Content delivery (skills developed), active practice in group (role-play, modeling), implicit reinforcement of behaviors (token system), individual /self-awareness (ER, impulse control, perspective taking)	Social anxiety, academic performance	Social Dissatisfaction Questionnaire (Asher & Wheeler, 1985)	0%	3.00
Breeman et al., 2016	Good Behavior Game (GBG)	Netherlands	Grade 1–6 (age 4 - 12)	Clinical intervention	school-based	1-year period period 1: 5-10min/week period 2 & 3: up to 180mins/week	Collaborative tasks (cooperation in teams), active practice in group (obey rules), implicit reinforcement of behaviors (reward system, generalizing rules to classroom setting)	Problem behavior (internalizing / externalizing)	Social preference scores	62%	-1.00
Capodieci et al., 2019	Cooperative learning for ADHD	Italy	6 to 9.8 years (M=8.1 years)	Clinical intervention	school-based	6 weekly 2-h sessions	Collaborative tasks, Individual tasks and Didactic content delivery	ADHD Symptoms (inattention & hyperactivity)	Social preference scores	37.50%	3.00
Craig et al., 2016	Zoo U - interactive social skills training online game	US	7 to 11 years (M = 9.65 years)	Prevention	community and social care	10 week intervention period, several activities	Online Game: content delivery, active practice (scenarios and personalized feedback)	Social skills, self-efficacy	Loneliness and Social Dissatisfaction Scale (LSDS; Cassidy and Asher 1992)	87.50%	4.00

da Silva et al., 2016	Behavioral cognitive intervention based on social skills	Brazil	6th grade (M=11.24 years)	Selective intervention	school-based	8 weekly 50 min sessions	Active practice in group, homework, content delivery, discussion of homework	Victimization	Peer Nominations	12.50%	0.00
Deckers et al., 2016	Social Skills Training for ASD	Netherlands	M= 10.1 years	Clinical intervention	community and social care	3 months, 12 weekly sessions	Homework, discussion (of homework), active practice in group (role-play), parental involvement (parent sessions), content delivery (step-by-step-guidelines), group reward system	Social Skills	Loneliness and Aloneness Scale for Children and Adolescents	12.50%	1.00
Defeyter et al., 2015	Breakfast Clubs and After School Clubs	England	5 to 10	Prevention	school-based	8 months	Providing context for interaction	Peer victimization	Friendship Qualities Scale	75%	4.00
DeRosier, 2004	S.S.GRIN social-skills training	US	7 to 10 (M= 8.6 years)	Selective intervention	school-based	8 weekly 50-60mins sessions	Active practice in group (role-play, modeling, activities), content delivery (coping strategies), individual/awareness (coping strategies, self-esteem), implicit reinforcement of behaviors (reinforce prosocial attitudes)	Social anxiety, self-efficacy, self-esteem, antisocial/deviant affiliations,	Peer Nominations	25%	4.00
DeRosier & Marcus, 2005	S.S.GRIN social-skills training	US	7 to 10 (M= 8.6 years)	Selective intervention	school-based	8 weekly 50-60mins sessions	Active practice in group (role-play, modeling, activities), content delivery (coping strategies), individual/awareness (coping strategies, self-esteem), implicit reinforcement of	Self-esteem, self-efficacy, social anxiety, depression, rejection, victimization, social withdrawal, leadership	Peer Nominations	Follow-up DeRosier, 2004	Follow-up DeRosier, 2004

							behaviors (reinforce prosocial attitudes)				
Desbiens & Royer, 2003	**Two programs:** PARC1 social skills training & PARC1 social skills training plus educational activities in class	Canada	3rd grade (8-9 years)	Selective intervention	school-based	twice weekly 60mins sessions for 10 weeks	Active practice in group (role-play, modeling, shaping), content delivery (skills), collaborative tasks	Academic ability, athletic ability (beliefs & self-concept), prosocial skills (behavior towards peers)	Peer Nominations	37.50%	two programs : -2.00 / -1.00
Dion et al., 2005	Peer-Assisted Learning Strategies (PALS) peer-tutoring reading program	US	3rd to 4th grade (M= 14.3 years)	Prevention	school-based	11 weekly 30mins sessions	Collaborative tasks (work in pairs), implicit reinforcement	N/A	Peer Ratings	25%	-1.00
Essau et al., 2019	Super Skills for Life (SSL)	UK	8 to 12 years (M= 10.19)	Selective intervention	community and social care	8 group sessions, each lasting approximately 45 minutes, once a week	Didactic content delivery, individual tasks/ self-awareness (positive and rewarding activities, Video task), active practice (teaching skills to help during social interaction), homework	Anxiety, emotional symptoms, hyperactivity, appearance and academic self-esteem	Peer problem subscale of Strengths and Difficulties Questionnaire (*SD*Q; Goodman, 1997), Peer relations subscale of Self-	0%	3.00

									Description Questionnaire I (*SD*Q-I; Marsh, 1990b)		
Flannery-Schroeder & Kendall, 2000	**Two programs:** cognitive-behavioral group treatment (GCBT) & individual cognitive-behavioral treatment (ICBT)	US	8 to 14 years	Clinical intervention	community and social care	18 weekly 50-90 mins sessions	Active practice of skills, homework, content delivery	anxiety	Friendship Questionnaire (FQ; Bierman & McCauley, 1987), Loneliness Scale (LS; Asher, Hymel, & Renshaw, 1984)	37.50%	1.00 / 0.00
Fox & Boulton, 2003	Social skills training (SST) program to support victims of bullying	UK	9 to 11 years	Selective intervention	school-based	8 weekly 60mins sessions	Content delivery (friendships, body language), individual/awareness (think positively, relaxation skills), discussions, active practice of skills (role-play), homework sheets	global self-worth	Peer Nominations	12.50%	2.00
Frankel et al., 2010	Parent-assisted children's friendship training (CFT)	US	2nd to 5th grade	Clinical intervention	community and social care	12 weekly 60mins session	Content delivery (instruction on simple rules), homework, active practice in group (coached behavioral rehearsal), parental involvement (coaching by parents, parent sessions), discussions	self control	Loneliness Scale (Asher et al. 1984), Popularity subscale of Piers-Harris Self-Concept Scale (PHS, Piers 1984),	75%	7.00

									Quality of Play Questionnaire (Frankel & Mintz)		
Mandelberg et al., 2014a	**Follow-up** Parent-assisted children's friendship training (CFT)	US	M= 12.6 years	Clinical intervention	community and social care	12 weekly 60mins session	Content delivery (instruction on simple rules), homework, active practice in group (coached behavioral rehearsal), parental involvement (coaching by parents, parent sessions), discussions	social skills problem behavior conflict at play dates	Loneliness scale (Asher et al., 1984)	N/A	+2 for Frankel et al., 2010
Fraser & Pakenham, 2008	Koping adolescent group program (KAP)	Australia	12 to 17	Prevention	community and social care	3 6h-sessions fortnightly	Content delivery (psychoeducation), discussion, individual/awareness (coping skills)	mental health literacy, life satisfaction, decrease in worry, emotional symptoms	Social Connectedness Scale (Lee et al. 2001), Peer Problems Subscale of Strength and Difficulties Questionnaire (Goodman et al., 1998)	12.50%	-3.00
Frederickson & Turner, 2003	Circle of friends	UK	6 to 12	Selective intervention	school-based	6 weekly 30 -40 mins meetings	Discussion, context for interaction, active practice in group (role-play), didactic content, homework	self worth	Peer Nominations	62.50%	4.00
Frederickson et al., 2005	Circle of friends	UK	6.8 to 11.3 years (M= 9.8 years)	Selective intervention	school-based	period of 6-10 weeks	Discussion, active practice in group, context for interaction, didactic content, homework	N/A	Peer Nominations	0%	3.00

Gardner et al., 2019	Program for the evaluation and enrichment of relational skills (PEERS)	US	11 to 16 years (M=12. 4 years)	Clinical intervention	community and social care	14 weekly 90-min sessions	Homework, parental involvement, content delivery (taught skills), active practice (derived from other intervention descriptions)	social skills knowledge	Friendship Qualities Scale (FQS Bukowski et al., 1994), Quality of Socialization Questionnaire –Revised (QSQ-R adapted from Frankel & Mintz, 2011)	12.50%	2.00
Hannesdottir et al., 2017	OutSMARTers (SMART for social, mind, affect, and resourcefulness training) program	Iceland	8.3 to 10.8 years (M = 9.2 years)	Clinical intervention	community and social care	10 2h-sessions for 5 weeks, twice weekly	Discussion (to solve problems), active practice in group (practice meeting new kids), content delivery, parental involvement, homework, implicit reinforcement (token system), individual tasks (workbook, relaxation activities)	ASD symptoms, social skills cooperation, assertion, responsibility, emotion regulation	Peer relationship subscale of Strengths and Difficulties Questionnaire (*SD*Q)	37.50%	-1.00
Healy & Sanders, 2014	Resilience Triple P	Australia	6 to 12	Selective intervention	community and social care	8 group sessions + 3 optional individual sessions within 3 month	Parental involvement, content delivery (strategies described, modeled), active practice in group (strategies practiced)	Bullying, victimization, internalizing depression, liking school, coping facilitative parenting, sibling warmth	Loneliness Questionnaire (Asher&Wheeler, 1985)	87.50%	4.00
Helseth & Frazier (2018)	Peer-assisted social learning (PASL)	US	5 to 12 years (M= 8,25)	Prevention	community and social care	21 30mins sessions & daily activities for 10 weeks	Discussion (group discussion at the end of each session), collaborative tasks, active practice in group	Social skills, problem behaviors assertive response	Peer Ratings	62.50%	-2.00

Idris et al. (2020)	PEERS® social skills program	Netherlands	12 to 18 (M= 14.22 years)	Clinical intervention	community and social care	14 weekly 90mins sessions	Homework, parental involvement, didactic content delivery (didactic lesson, videos), active practice in group (behavioral reearsals w performance feedback)	Social skills knowledge, social communication (SRS), social motivation (SRS)	Quality of Socialization Questionnaire (QSQ: Laugeson & Frankel, 2010)	12.50%	3.00
Jenkinson et al., 2018	GLAMA (Girls Lead Achieve Mentor Activate) and BLAST (Boys Lead Activate Succeed Together) peer-led school connectedness and physical activity self-efficacy intervention	Australia	Year 7 (12 to 13 years)	Prevention	school-based	7 sessions during term 1 and 2, over 8 weeks	Discussion, collaborative tasks	Physical activity self-efficacy	Social Connectedness (Bond et al., 2007), Relationship subscale of School Connectedness (Bond et al., 2007)	12.50%	-1.00
Kasari et al., 2012	**Two programs:** Child-assisted & peer-mediated social skills program for ASD	US	6 to 11	Clinical intervention	school-based	20 mins twice a week for 6 weeks	Child assisted: content delivery (direct instructions on strategies), active practice (role-play, practice) Peer mediated: content delivery (strategies), active practice (role-play, rehearsal), discussions	Peer engagement, social skills	Peer Nominations	50%	3.00 / 2.00

Kato et al., 2019	Tabletop Role-Playing Games (TRPGs) for children with ASD	Japan	M= 14 years	Clinical intervention	community-based	5 sessions involving TRPG's	Context for interaction (leisure activity), collaborative tasks, discussion	QoL	Peer Subscale of Kid-KINDL Questionnaire	0%	3.00
King et al., 2018	LET's CONNECT community mentorship program	US	12 to 15 (M= 13,5)	Selective intervention	community and social care	M= 120.32 days over 6-month period, meetings M= 8.02 (*SD* = 7.63)	mentorship, parental involvement	N/A	UCLA Loneliness Scale-Revised (Russell, et al., 1980)	75%	5.00
Kozina, 2020	MY FRIENDS program	Slovenia	13 to 14 years	Prevention	school-based	10 weekly sessions (& booster sessions)	Content delivery (relationships between thoughts and feelings, recognizing emotions), individual/awareness (relaxation), homework, parental involvement	N/A	Peer problems subscale of the *SDQ* (Strengths and Difficulties Questionnaire, Goodman, 1997)	25%	7.00
Lan et al., 2020	**Two programs:** Group executive function training (GEFT) and Social skills training	China	9 to 13 years (M= 10.87)	Clinical intervention	school-based	12 weekly 60mins sessions	GEFT: implicit reinforcement of behaviors (gifts), active practice in group (group rules etc.), individual/awareness tasks (meta-cognition), didactic input Social Skills Training: didactic content delivery, homework, implicit reinforcement of behaviors (tokens), active practice (behavioral rehearsal, coached play	GEFT: ADHD symptoms, executive functions SST: social skills	Peer function subscale of social adjustment inventory for children and adolescents (SAICA)	25%	5.00 / 3.00

							interaction), parental involvement				
Laugeson et al., 2012	Program for the Education and Enrichment of Relational Skills (PEERS)for children with ASD	US	12 to 17 years (M = 14.6)	Clinical intervention	community and social care	14 weekly 90min sessions	Homework, parental involvement, active practice in group, content delivery	Social skills, assertion and responsibility, self control, ASD symptoms, problem behaviors, externalizing behaviors	The Quality of Play Questionnaire (QPQ; Frankel & Mintz 2011)	25%	7.00
Laugeson et al., 2009	Program for the Education and Enrichment of Relational Skills (PEERS) for teens with ASD	US	13 to 17 (M= 14,6)	Clinical intervention	community and social care	12 weekly 90min sessions	Content delivery (didactic instruction), active practice (role-play, behavioral rehearsal), homework, parental involvement	Knowledge of social skills, social skills	Quality of Play Questionnaire (QPQ; Frankel & Mintz 2008) Friendship Quality Scale (Bukowski et al. 1994)	37.50%	6.00
Mandelberg et al., 2014	**Follow-up** to Laugeson et al. 2012 and Laugeson et al. 2009	US	12 to 18 (M = 14.4)	Clinical intervention	community and social care	12-14 weekly 90min sessions,	Content delivery (didactic lessons), active practice in group (role-play, modeling, rehearsal), parental involvement, homework	Social skills, social skills knowledge, social responsiveness	Quality of Play Questionnaire (QPQ; Frankel & Mintz, 2011)	N/A	+2 for Laugeson et al. 2009 and Laugeson et al. 2012

LeCroy, 2004	Preventive intervention for early adolescent girls	US	M= 13.5 years	Prevention	community and social care	12 weekly 60 mins after school-classes	Content delivery (didactic instruction), active practice (role-play), homework (journal assignments), individual tasks (journaling, self-awareness tasks), discussion	body image (self concept), assertiveness, attractiveness, self-efficacy, self-linking, competence, hopelessness, help endorsement	Peer self esteem about friendships (Hare, 1985)	37.50%	-1.00
Lee et al., 2015	Mentoring	Korea	10 to 15 years	Selective intervention	community and social care	20 weekly sessions	Mentorship	family self-esteem	Social Self-Esteem Inventory (Coopersmith, 1968)	0%	-1.00
Leflot et al., 2013	Good Behavior Game	Belgium	2nd to 3rd grade (M= 7.4)	Selective intervention	school-based	3 sessions a week for 2 years	Collaborative tasks (cooperative activities), active practice in group (obey behavioral rules in classroom), implicit behavioral reinforcement (card game designed around learning behavioral rules)	N/A	Peer Nominations	37.50%	0.00
Lombas et al., 2019	Happy Classrooms Program	Spain	M= 13.6	Prevention	school-based	minimum of 5min activities twice weekly for 8 weeks	Individual tasks/ self-awareness, active practice in group	Satisfaction with life, emotional intelligence, aggression	Affiliation subscale of Classroom Environment Scale (Moos et al. 1989), Relatedness subscale of Psychological Needs Satisfaction Scale in Education (ESNPE; León et al. 2011)	25%	3.00

Maalouf et al. (2020)	FRIENDS program, a universal preventive cognitive behavioral school-based interventio n	Lebanon	12 years	Prevention	school-based	10 weekly 45- 50mins sessions	Content delivery, individual/self-awareness activities, parental involvement, homework	Depression, internalizing/exter nalising problems	Peer problems subscale of the Strengths and Difficulties Questionnaire (*SD*Q, Goodman, 1997)	75%	1.00
McElearney et al., 2013	School counseling interventio n	Northern Ireland	M= 12.5 years	Selective intervention	school-based	6-8 weekly 35-60 mins one-to-one sessions	Content delivery, individual tasks/ self-awareness	ASD Symptoms, internalizing/exter nalizing problems, behaviors towards others	Peer problems subscale of the Strengths and Difficulties Questionnaire (*SD*Q, Goodman, 1997)	0%	3.00
Mikami et al., 2005	Peer rejection prevention studio	USA	grades 6 to 8 (11-14)	Prevention	school-based	45 mins activities for 8 weeks	Collaborative tasks (games, academic activities), discussion, context for interaction (heterogeneous groups to promote interaction with unfamiliar peers)	N/A	Sociometric Measure	37.50%	6.00
Mikami et al., 2011	My Teaching Partner-Secondary	USA	middle school & high school students (10-14 years)	Prevention	school-based	whole academic year (fall to spring)	Implicit reinforcement of behaviors	N/A	Positive Peer Interactions (Mikami et al., 2005)	75%	0.00
O'Connor et al., 2012	Children's Friendship Training	USA	M =8.77 years	Clinical intervention	community and social care	12 weekly 90mins sessions	Content delivery, active practice in group, parental involvement, homework, discussion	Social skills knowledge, physical appearance, happiness, satisfaction, assertion & responsibility	Popularity subscale of Piers-Harris Children's Self-Concept Scale (Piers & Herzberg, 2005)	37.50%	4.00

Orkibi et al., 2017	School-based psychodrama group therapy	Israel	13 to 16 years (M = 14.5)	Prevention	school-based	weekly 90-min sessions throughout the school year (16 to 22 sessions)	Individual / self-awareness, active practice in group (role-play, practice new roles, rehearsal for upcoming events)	Self-concepts	Loneliness Questionnaire (Asher&Wheeler, 1985)	25%	4.00
Palacios et al., 2019	ProCiviCo (Promoting prosocial behavior and civic engagement for social cohesion in school settings)	Chile	M= 12.32 years	Prevention	school-based	16 workshops and 4-5 lessons (May-November)	Discussion, active practice (role-play), didactic input (lessons)	N/A	Peer Nominations	25%	1.00
Pella et al., 2017	Coping and Promoting Strength (CAPS) intervention	USA	6 to 13 years (M= 8.69)	Prevention	community and social care	8 weekly 60 min sessions and 3 optional monthly booster sessions	Parental involvement, content delivery, individual tasks/ self-awareness (practicing individual skills, e.g. negative self-talk), active practice in group, guided discussions, homework	Anxiety, depression, internalizing/externalising problems	Friendship Quality Questionnaire (Parker & Asher, 1993)	37.50%	3.00
Peng et al., 2019	Group Sandplay	China	M= 9.75 years	Prevention	community and social care	weekends for 8 weeks	Collaborative tasks (sandplay)	Anxiety, depression	Escala de soledad para niños (CLS) (Maes et al., 2015)	37.50%	5.00
Rabin et al., 2018	Program for the Education and Enrichment of Relational Skills (PEERS®)	USA	12 to 17 years (M=13, 99 years)	Clinical intervention	community and social care	14 weekly 90-minute sessions	Active practice in group, content delivery, homework, parental involvement	Social skills, ASD symptoms, global social competence, communication, assertion, responsibility, empathy	Quality of socialization questionnaire (QSQ, Laugeson et al., 2009), Loneliness and social dissatisfaction questionnaire	25%	5.00

									(L*SD*Q; Asher et al., 1984)		
Sanchez et al., 2017	Adventures aboard based the S.S. GRIN, translates a proven in-person interventio n into a nine-episode interactive online adventure game	US	7 to 11 years	Selective intervention	community and social care	Episodes released weekly for 9 weeks, participants had 1 week to complete each episode	Content delivery, active practice (in virtual situations, with feedback provided)	Social anxiety, social literacy, bullying, victimization	Loneliness and Social Dissatisfaction scale (L*SD*Q; Asher et al., 1984)	75%	4.00
Schohl et al., 2013	Program for the Education and Enrichmen t of Relational Skills (PEERS) for children with ASD	US	11 to 16 years (M= 13.65)	Clinical intervention	community and social care	weekly 90-min sessions over 14 weeks	Content delivery (didactic instruction), active practice (role-play, behavioral rehearsal), homework, parental involvement	Social skills knowledge, social anxiety, social responsiveness, social skills, ASD symptoms	Friendship Qualities Scale (FQS; Bukowski et al. 1994), Quality of Socialization Questionnaire (QSQ; Frankel & Mintz, 2008)	37.50%	4.00

Schonert-Reichl et al., 2015	MindUP curriculum	Canada	9 to 11 years (M= 10.24)	Prevention	school-based	12 weekly 40-50 mins sessions	Individual / self-awareness, content delivery (literature, work through scenarios), collaborative tasks (collectively engaging in community service learning), active practice (activities to practice), discussion, homework	Emotion regulation & coping, social skills, depression, self-concepts, behavior towards others, wellbeing	Peer Nominations	100%	4.00
Shechtman et al., 2002	Counseling groups	Israel	9th grade (14 to 15 years)	Prevention	school-based	15 weekly 45-minute sessions	Individual / self-awareness, discussions	N/A	The Intimate Friendship Scale for Children (Sharabany, 1994)	37.50%	5.00
Shih et al., 2019	Remaking Recess (RR), a social skills interventio n	USA	5 to 11 years (mean = 8)	Clinical intervention	School-based	12 week program, recess support	Providing context for interaction, implicit reinforcement of behavior	Social skills	Friendship Survey (Cairns & Cairns, 1994)	62.50%	5.00
Shoshani et al., 2016	Maytiv Program school-based positive psychology program	Israel	11 to 14 years (M= 13.5)	Prevention	school-based	15 lessons lasting 90min, every two weeks for 30 weeks	Collaborative tasks (exercises to be completed as pair/group, team building), individual / self-awareness (mindfulness, drawing exercises), discussions (separate step), content delivery (stories), homework (action to be delivered in interval between sessions)	Academic achievement, wellbeing, school connectedness	Friends subscale of the School Adjustment Report (Conduct Problems Prevention Research Group [CPPRG], 2001)	87.50%	7.00

Shum et al., 2019	Program for the Education and Enrichment of Relational Skills (PEERS®) for children with ASD	Hong Kong	11 to 15 years (M = 13.51)	Clinical intervention	community and social care	14 weekly 90 mins sessions	Active practice in group, content delivery, homework, parental involvement	Social skills knowledge, social functioning (social communications and interactions, fewer restricted and repetitive behaviors)	Quality of Play Questionnaire (QPQ, Frankel & Mintz, 2011)	62.50%	3.00
Siu, 2007	FRIENDS program	Hong Kong	7 to 10 years	Prevention	school-based	8 weekly sessions	Individual / self-awareness, content delivery (teaching of skills), parental involvement, homework	Internalizing behaviors, depression, anxiety	Social Self-esteem subscale of Culture-Free Self-Esteem Inventory-III (CFSEI-3, Battle, 2003)	25%	4.00
Stallard et al., 2005	FRIENDS, a universal cognitive behavioral intervention	UK	9 to 10	Prevention	school-based (nurse delivered)	10 sessions	Content delivery, individual tasks / self-awareness (workbook), homework, parental involvement	Anxiety, self-esteem, family factors	Social Self-esteem subscale of Culture-Free Self-Esteem Inventory-III (CFSEI-3, Battle, 2003)	25%	1.00
Stallard et al., 2007	FRIENDS, a universal cognitive behavioral intervention	UK	9 to 10	Prevention	school-based	10 weekly sessions over spring term	Content delivery (cognitive strategies), parental involvement, individual / self-awareness, homework	anxiety self-esteem	Social Self-esteem subscale of Culture-Free Self-Esteem Inventory-III (CFSEI-3, Battle, 2003)	25%	3.00

Stallard et al., 2008	**Follow-up** to Stallard et al., 2007	UK	9 to 10	Prevention	school-based	10 weekly sessions over spring term	Content delivery (cognitive strategies), parental involvement, individual / self-awareness, homework	anxiety self-esteem	Social Self-esteem subscale of Culture-Free Self-Esteem Inventory-III (CFSEI-3, Battle, 2003)	N/A	+2.00 for Stallard et al., 2007
Terjestam et al., 2016	Compassion and Attention in the Schools (Compas), mindfulness-based program	Sweden	grades 5, 7 and 8	Prevention	school-based	3 times a week for 8 weeks	Individual / self awareness, content delivery (instructions on skills/practice), active practice in group (mindfulness in group)	Emotion Regulation, coping, school connectedness	Peer problems subscale of the Strengths and Difficulties Questionnaire (*SD*Q, Goodman, 1997)	62.50%	4.00
van Santvoort et al., 2014	Support groups to stimulate mutual social support, psycho-education and coping skills training.	Netherlands	8 to 12 years	Prevention	community and social care	8 weekly 90-min sessions and booster sessions after 3 months	Discussion, active practice in group (role play games), parental involvement, content delivery, homework, individual tasks (about adopting thoughts and self-reflection)	self worth, general wellbeing, parent-child interaction, internalizing / externalising problems,	Social Acceptance of Self-Perception Profile for Children (SPPC) (Harter, 1985)	100%	3.00
Witvliet et al., 2009	Good Behavior Game (GBG)	Netherlands	6 to 8 (6 years at start of intervention, 2 year intervention)	Prevention	school-based	regularly implemented over course of 2 years	Collaborative tasks (cooperation in teams), active practice in group, implicit reinforcement of behaviors	reduction of externalizing problems	Peer Nominations	25%	5.00
Yamada et al. (2020)	Program for the Education and	Japan	11 to 15 years (M = 13.08)	Clinical intervention	community and social care	14 weekly 90-minute sessions	Active practice in group, homework, parent involvement, didactic content delivery	Social skills, socialization, behaviour towards others	Quality of Play Questionnaire (QPQ,	50%	-1.00

	Enrichment of Relational Skills (PEERS)								Laugeson & Frankel 2010)		
Yoo et al., 2014	Program for the Education and Enrichment of Relational Skills (PEERS)	South Korea	12 to 18 years (M= 13.79)	Clinical intervention	community and social care	14 weekly 90-minute sessions	Active practice in group, homework, parent involvement, didactic content delivery	Social skills knowledge, internalizing problems, ASD symptoms (communication & social interaction)	Quality of Play Questionnaire (QPQ, Laugeson & Frankel 2010)	62.50%	0.00

Table 2

Results of Prevention Programs by Outcome Measure

	Sociometrics	Friendship Quality	Peer Acceptance / Popularity	Loneliness / Connectedness
Number of Studies	6	4	14	4
Measure used by % of Preventions	24%	16%	56%	16%
Mean Strength of Evidence	2.33	2.5	2.21	3.75
Range of Strength of Evidence	-2 - 6	-1 - 5	-3 - 7	2 - 5
Mean Quality Rating	45.8%	40.6%	44.6%	40.6%
Mean Effect Size (Cohen's d)	.44	.2	.32	.61
Range of Effect Size	-.42 - 1.9	.04 - .55	-.26 - 1.19	-.03 - .81
Follow-up	1 available, effects not maintained	50% available, 50% increased, 50% maintained	43% available, 33% increased, 33% maintained medium & low, 17% maintained high	N/A
Between Group Effects	100% available, 50% sig	100% available, 50% sig	85% available, 50% sig	100% available, 100% sig

Table 3

Positive Intervention Effects of Prevention Programs

	Number of Studies	Percentage of Studies	Mean Level of Evidence	Mean ES (Cohen's d)	Mean Quality
Self-Concept	9	36%	2	.38	46%
Internalizing/ Externalizing	7	28%	2	.36	50%
Wellbeing	6	24%	2	.14	60%
Emotion Regulation	5	20%	2	.27	55%
Depression	5	20%	3	.67	55%
Anxiety	5	20%	3	.62	30%
Social Skills	4	16%	1	.16	69%
Family Factors	3	12%	3	.58	50%
School Connectedness	2	8	6	.43	75%
Academic Factors	1	4%	7	.45	87%
Peer Behaviors	1	4%	4	.36	100%
Victimization	1	4%	4	.55	0%

Table 4

Methodological Components and Positive Intervention Effects of Prevention Programs

ID Number	Author	Positive Effects	Collaborative Tasks	Group Dis-cussion	Individ-ual/ Self-aware-ness	Context for Inter-action	Didactic Content Delivery	Active Practice in Group	Home-work	Parental Involve-ment	Implicit Reinforcement	Mentor-ship	Effect Size (Cohens d)	Level of Evidence Results
KO20	Kozina 2020	N/A			■		■		■	■			1 19	7 00
SH16	Shoshani et al , 2016	General Wellbeing, Academic Factors, School Connectedness	■	■	■		■		■				0 45	7 00
M 05	Mikami et al , 2005	N/A	■	■		■							1 91	6 00
SH02	Shechtman et al , 2002	N/A		■	■								0 16	5 00
PE19	Peng et al (2019)	Anxiety, Depression	■										0 8	5 00
WI09	Witvliet et al , 2009	Internalizing / Externalising Problems	■					■			■		0 54	5 00
S 07	Siu (2007)	Self-concepts, Anxiety, Depression, Internalizing / Externalizing Problems, Family Factors			■		■		■	■			1 55	4 00
SC15	Schonert-Reichl et al , 2015	Emotion Regulation & Coping, Social Skills, Self-concepts, Depression, Behaviour towards Peers, General Wellbeing	■	■	■		■	■	■				0 36	4 00
TE16	Terjestam et al , 2016	Emotion Regulation& Coping, School Connectedness			■		■	■					0 41	4 00
OR17	Orkibi et al , 2017	Self-concept			■			■					0 81	4 00
CR16	Craig et al , 2016	Social Skills, Emotion Regulation & Coping, Self-concept					■	■					0 65	4 00
DE15	Defeyter et al , 2015	Victimization				■							0 55	4 00
PE17	Pella et al , 2017	Anxiety, Depression, Internalizing / Externalizing Problems		■	■		■	■	■	■			0 38	3 00
ST07	Stallard et al , 2007	Anxiety, Self-concepts			■		■		■	■			0 23	3 00
VS13	van Santvoort et al , 2013	Self-concepts, Internalizing / Externalizing Problems, General Wellbeing, Family Factors		■	■		■	■	■	■		■	0 02	3 00
LO19	Lombas et al , 2019	Emotion Regulation & coping, Internalizing / Externalizing Problems, General Wellbeing			■			■					0 19	3 00
MA20	Maalouf et al (2020)	Depression, Internalizing /			■		■		■	■			0 26	1 00

| | | |

Table 5

Results of Selective Intervention Programs for Typical Developing Children by Outcome Measure

	Sociometrics	Peer Acceptance / Popularity	Loneliness / Connectedness
Number of Studies	8	5	4
Measure used by % of Selective Interventions	53.3%	33%	27%
Mean Strength of Evidence	0.75	1	4
Range of Strength of Evidence	-2 - 4	-2 - 3	3 - 5
Mean Quality Rating	28.1%	15%	59.4%
Mean Effect Size (Cohen's d)	.28	.20	.66
Range of Effect Size	- .12 - .96	-.34 - .75	.31 - .88
Follow-up	37,5% available, 67% maintained	40% available, 100% maintained	1 study available, effects maintained
Between Group Effects	87,5% available, 28,6% sig	40% available, none sig	75% available, 67% sig

Table 6

Positive Intervention Effects of Selective Intervention Programs for Typical Developing Children

	Number of Studies	Percentage of Studies	Mean Level of Evidence	Mean ES (Cohen's d)	Mean Quality
Self-concept	6	40%	2	.35	29%
Anxiety	4	27%	4	.38	25%
Internalizing/ Externalizing	3	20%	3	.55	29%
Victimization	3	20%	3	.38	58%
Peer Behaviors	3	20%	0	.29	25%
Academic Factors	3	20%	0	.34	25%
Social Skills	2	13%	4	.20	50%
ASD Symptoms	2	13%	3	.49	0%
Family Factors	2	13%	2	.18	44%
Emotion Regulation	1	7%	4	.68	68%
Depression	1	7%	4	.68	68%
Wellbeing	1	7%	4	.68	68%
School Connectedness	1	7%	4	.68	68%

Table 7

Methodological Components and Positive Effects of Selective Programs for Typical Developing Children

Author	Positive Effects	Collaborative Tasks	Group Discussion	Individual/ Self-awareness	Context for Interaction	Didactic Content Delivery	Active Practice in Group	Homework	Parental Involvement	Implicit Reinforcement	Mentorship	Effect Size	Level of Evidence
King et al., (2018)	N/A								■		■	0.76	5.00
DeRosier (2004)	Social Skills, Self-concepts, Anxiety			■		■	■			■		0.09	4.00
Fredrickson & Turner (2003)	Self-concepts		■		■	■	■	■				0.96	4.00
Healy & Sanders (2014)	Emotion Regulation, Depression, Internalizing/Externalizing Problems, Wellbeing, Victimization, School Connectedness					■			■			0.68	4.00
Sanchez et al., (2017)	Social Skills, Anxiety, Victimization					■	■					0.31	4.00
Bostick & Anderson (2009)	Anxiety, Academic Factors			■		■	■			■		0.88	3.00
Essau et al. (2019)	Self-concepts, ASD Symptoms, Anxiety, Internalizing/Externalizing Problems			■		■	■	■				0.23	3.00
Frederickson et al., (2005)	N/A		■		■	■	■	■				0.8	3.00
McElearney et al., (2013)	ASD Symptoms, Internalizing/Externalizing Problems, Behaviors towards others,			■		■						0.75	3.00
Fox & Boulton (2003)	Self-concepts		■	■		■	■	■				0.67	2.00
da Silva et al., (2016)	Victimization	■				■	■	■				0.15	0.00
Leflot et al., (2013)	N/A	■					■			■		-0.12	0.00
Desbiens & Royer (2003)b	Self-concepts, Behavior towards others, Academic Factors					■	■					0.11	-1.00
Lee et al., (2015)	Family Factors										■	-0.33	-1.00
Desbiens & Royer (2003)a	Self-concepts, Behavior towards others, Academic Factors	■				■	■					0.02	-2.00

Table 8

Results of Intervention Programs for Children with Clinical Diagnosis by Outcome Measure

	Sociometrics	Friendship Quality	Peer Acceptance / Popularity	Loneliness / Connectedness	Quality of Play
Number of Studies	5	5	8	6	9
Measure used by % of Interventions	20%	20%	32%	24%	36%
Mean Strength of Evidence	2.4	-1	2.38	1.33	3.22
Range of Strength of Evidence	-1 - 5	-3 - 2	-1 - 5	-1 - 7	-1 - 7
Mean Quality Rating	52.5%	32.5%	34.4%	35.4%	36.1%
Mean Effect Size (Cohen's d)	.44	-.01	.68	.29	.75
Range of Effect Size	- .03 - .78	-.15 - .11	.28 - 1.27	.13 - .50	.26 - 1.17
Follow-up	60% available, 1 maintained, 1 high effect dropped to medium, 1 medium effect dropped to small	40% available, 1 study increased, 1 stable at low level	75% available, 50% maintained	83% available, 60% maintained	67% available, 66% maintained
Between Group Effects	100% available, 60% sig	80% available, 25% (1) sig.	87.5% available, 57% sig	67% available, 1 sig	78% available, 71% sig

Table 9

Positive Effects of Intervention Programs for Children With Clinical Diagnosis

	Number of Studies	Percentage of Studies	Mean Level of Evidence	Mean ES (Cohen's d)	Mean Quality
Social Skills	17	68%	3	.68	34%
ASD Symptoms	9	36%	3	.69	40%
Emotion Regulation	8	32%	2	.55	41%
Peer Behaviors	5	20%	2	.39	50%
Anxiety	3	12%	2	.63	38%
Internalizing/ Externalizing	2	8%	5	.72	44%
Wellbeing	2	8%	4	.59	19%
Self-concept	1	4%	4	.40	38%

Table 10

Methodological Components and Positive Effects of Clinical Intervention Programs

Author	Intervention Targets other than SC	Collaborative Tasks	Group Discussion	Individual/ Self-awareness	Context for Interaction	Didactic Content Delivery	Active Practice in Group	Homework	Parental Involvement	Implicit Reinforcement	Mentorship	Effect Size (Cohens d)	Level of Evidence Results
Frankel et al., 2010	Emotion Regulation											0 27	7 00
Laugeson et al., 2012	Emotion Regulation, Social Skills, ASD Symptoms, Internalizing/externalizing problems,											1 17	7 00
Laugeson et al., 2009	Social Skills											1 14	6 00
Lan et al., 2020a	Social Skills, ASD Symptoms											1 17	5 00
Rabin et al., 2018	Social Skills, ASD Symptoms, Behaviour towards others											0 77	5 00
Shih et al., 2019	Behaviour towards others											0 39	5 00
O'Connor et al., 2012	Social Skills, Self-beliefs, Wellbeing											0 4	4 00
Schohl et al., 2013	Social Skills, ASD Symptoms, Anxiety											0 72	4 00
Capodieci et al., 2019	ADHD Symptoms											0 49	3 00
Idris et al., 2020	Social Skills											0 7	3 00
Kasari et al., 2012a	Social Skills, Behaviours towards otehrs											0 55	3 00
Kato et al., 2019	Wellbeing											0 78	3 00
Lan et al., 2020b	Social Skills											1 27	3 00
Shum et al., 2019	Emotion Regulation, Social Skills, ASD Symptoms											0 78	3 00
Gardner et al., 2019	Social Skills											0 99	2 00
Kasari et al., 2012b	N/A											0 78	2 00
Deckers et al., 2016	Social Skills											0 35	1 00
Flannery-Schroeder & Kendall, 2000a	Emotion Regulation, Anxiety											0 41	1 00
Afsharnejad et al., 2020	Emotion Regulation, Social Skills, ASD Symptoms											0 5	0 00
Bauminger 2007	Emotion Regulation, Social Skills											0 13	0 00
Flannery-Schroeder & Kendall, 2000b	Emotion Regulation, Anxiety											0 75	0 00
Yoo et al., 2014	Social Skills, ASD Symptoms, Internalizing/Externalizing Problems											0 26	0 00
Breeman et al., 2016	Behavior towards others											-0 029	-1 00

Hannesdottir et al., 2017	Emotion Regulation, Social Skills, ASD Symptoms					0 35	-1 00
Yamada et al., 2020	Social Skills, Behavior towards others					0 27	-1 00

Appendix 2.4

This appendix concerns Chapter 2 and provides information about study-specific funding, acknowledgements and individual authors' contributions.

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Authors' Contribution

IP conceived of the study, lead the literature search, conducted and coordinated data extraction and data analysis, and drafted the manuscript; MM conceived of the study and participated in the literature search and coordination of data extraction and data analysis; JB participated in the discussion of data presentation; SD participated in data extraction and data analysis; IK participated in data extraction and data analysis; JCR participated in the discussion of data presentation; EJS participated in the literature search and conceptualization of this study; BS conceived of the study and participated in coordination of data extraction and data analysis; KAMS participated in data extraction and data analysis; KAW conceived of the study and participated in coordination of data extraction and data analysis; All authors read and approved the final manuscript.

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Appendix 3.1

This appendix concerns Chapter 3 and is presented in the format submitted for publication.

Supplementary Materials Table 1

Analysis Table of the Brainstorming Task

Brainstorming with Sticky Notes		
Example	**Interpretation**	**Category**
Fun / getting along well / being there for each other / when you're sad and someone cheers you up / feeling safe where you are / when your friends always help you	Definition of friendship characteristics; descriptions of core aspects that are central for building and maintain friendship in the eyes of participants	**Definition** – Characteristics of friendship A1
Everyone should have friends, being who you are – there is no point in pretending / not everyone needs to be your friend	General views on friendships, values and opinions about what is needed to be friends with someone, reflections on the importance of friendships	**Definition** – Values and expected benefits of friendship A2
School trips / sitting next to each other in class	Participants mention external events that support building friendships.	**Context** – Events B1
Having known them since year 1 / having money / good grades / live close to each other / being similar / having internet	Background factors and past or present circumstances that supports friendships	**Context** – Personal Circumstances B2
Help / cheer up / listening / being there for them	General recommendations for day-to-day behaviours important for building or maintaining friendships	**Change Mechanisms (Definition)** – General behaviours C1
Biking / cinema / Fortnite / ice cream / shopping / invite to birthday party	Specific recommendations for activities to do together to become friends or shared hobbies in a friendship	**Change Mechanisms (Definition)** – Shared activities C2

Be nice / be honest / be trusting / be fair / shy / outgoing	Factors related to an individual's identity, which are perceived to facilitate friendships	**Change Mechanisms (Definition)** – Identity factors C3
Cuddling with my cats and dogs / horse back riding / spending a lot of time with family	Factors, that seem to bring participants joy, but are unrelated to the topic of friendships.	**Additional Information –** Other Sources of Happiness E1

Appendix 3.2

This appendix concerns Chapter 3 and is presented in the format submitted for publication.

Supplementary Materials Table 2

Analysis Table of the Secret Letter Task

Secret Letter		
Example	**Interpretation**	**Category**
Everyone should be respected by others, noone should tell others how to behave. Everyone should be who they are / Having friends is great for your future / You don't need to be friends with everyone, but you need to be nice to everyone / you can achieve a lot with friendships and friendship is one of the most important effects	General views on friendships, values and opinions about what is needed to be friends with someone, reflections on the importance of friendships.	**Definition** - Values and expected benefits of friendship A2
It takes time to become friends / you can always make new friends just try / what do I do if I like somebody but they don't like me	Reminiscence and thoughts on friendships and why and how they evolve, including open questions regarding aspects of friendships participants are wondering about themselves	**Definition** - Philosophical Reflections and Questions A3
say hello / help / First, you need to find out if your friend is really honest with you / First: approach them, second: play: third: invite over to your place, last: be friends	General recommendations for day-to-day behaviours important for building or maintaining friendships	**Change Mechanism** – General Behaviours C1

Not being selfish / always being happy	Factors related to an individual's identity, which are perceived to facilitate friendships	**Change Mechanism** – Identity Aspects C3
I recently lost my best friend, I don't want to experience this again, it's like a piece of your heart broke off / I don't have a friend in this classroom. At the start of the school year X was my friend, but X is now friends with Y. I want to have a friend, who is nice and spends time with me.	Accounts of feelings and personal emotional experiences related to participants' friendships	**Experience** - Self-disclosure About Own Friendships D1
I always make new friends when I start playing with them / mostly we also start to speak to each other	Description of personal strategies of making new friends.	**Experience** - Personal Strategy Use D2
stealing money / parents behaviour negatively affecting the child	Self-disclosure of problematic situations and behaviours, which are unrelated to the topic of friendships	**Experience** - Self-disclosure about Worries and Problems Unrelated to Friendships D3
I don't want to lose you and you are the best	Messages directly addressing classmates	**Additional Information** - Messages to Classmates E2
secret: Children ages 10-15 are easily embarrassed e.g. dropping something	General comments providing context for the researchers	**Additional Information** - Messages to Researchers E2
I think what you're doing is great, It was great taking about friendships	Feedback concerning the workshop or activity	**Additional Information** - Feedback to researchers E3
I am a real animal lover, and love cuddling animals, how	Unrelated disclosure or unrelated comments	**Additional Information** - Unrelated Comments E4

do you get white teeth – by eating apples, I am good at dancing		

Appendix 3.3

This appendix concerns Chapter 3 and is presented in the format submitted for publication.

Supplementary Materials Table 3

Analysis Table of the Story Task

Finishing a Story		
Example	**Interpretation**	**Category**
Bullying is hard. People get hurt, they might not want to go to school anymore. / There is no point in making life difficult for each other, there will always be difficult times and it's good to have someone supporting you. / The more friends you have, the safer you feel.	General views on friendships, values and opinions about what is needed to be friends with someone, reflections on the importance of friendships.	**Definition Aspects** – Values and Expected Benefits of Friendship A2
They stay friends forever. / He grows up and has few friends, but close friends. / He is glad to have new friends. He is happy again.	Participants talk about results of friendships and long-term outcomes for the character is the story.	**Definition Aspects** – Long-term Outcomes of Friendship A4
He wins a competition for the class, this helps to make friends. / Girl who bullied her is now bullied herself. Now she knows how it feels and they become close friends. / Because new friend is the prettiest girl in class, everyone wants to be friends with her too.	Participants talk about how and why friendships evolve. These statements show implicit expectations about why somebody wants to be friends with them.	**Definition Aspect** – Implicit believes about WHY friendships form A5
They go on a school trip, where he makes friends. / She is invited to somebody's birthday party.	Participants mention contexts and places and external events that support building friendships.	**Context Factors –** Events and Places B1

She is allowed to invite a friend over. / They have known each other forever.	Background factors and past or present circumstances that supports friendships.	**Context Factors** – Personal Circumstances B2
Her mum buys PS4. / She gets a new computer and plays Fortnite. / Her mum buys all school materials.	Participants mention material goods which facilitate friendships.	**Context Factors** – Assets B3
Classmates / New friends / Old Friends / Boyfriends-Girlfriends / Teachers / Parents and Family / Care Service Providers	Participants talk about other people who support them when making friends or support them when feeling upset.	**Context Factors –** Characteristics and Behaviours of Other People B4
She is friendly to everyone. / She comforts others. / They go cycling and go for ice cream together. / She asks her if they want to be friends.	Participants mention general recommendations for day-to-day behaviours important for building or maintaining friendships	**Change Mechanism–** General Behaviours C1
The build a secret fort in the woods. / She invited her for ice cream and they become best friends.	Participants describe specific activities to do together to become friends or shared hobbies in a friendship.	**Change Mechanism–** Shared Activities C2
She is good in sports. / He could change his style. He has red hair, he could dye it blond. / He should become braver.	Participants talk about factors related to an individual's identity, which are perceived to facilitate friendships.	**Change Mechanism –** Identity Aspects C3
L. says "Can we be friends". Other boy "Yes, sure". / Important is to ask if they want to be friends with you.	Participants describe how to approach others directly to establish a new friendship.	**Change Mechanism –** Approach Others C4
I would go to the teacher. / She talks to the headteacher and he talks to the other children. / He asks for advice via a helpline for children.	Participants suggest asking for help and indicate that teachers, parents etc. will help solve the problem.	**Change Mechanism** – Social Support and Help Seeking Behaviour C5
He believes he will make friends eventually. There is still a child that bullies him, but he doesn't care because	Participants suggest specific cognitive coping strategies to combat their worries, e.g.	**Change Mechanism –** Cognitive (Emotion Regulation) Strategies C6

he focuses on his new friend. / He tells himself "I am the strongest". / He should try to ignore the bullying.	focusing on positives or reattribution.	
I met someone through a Playstation game and I followed them and we became friends. / I was bullied. A boy helped and defended me and helped me make more friends.	Participants talk about own experiences of making friends. These accounts are not specific strategies that were deliberately followed, but recollections of how a specific friendship developed.	**Experience –** Personal Experience of Making New Friends D4
I would go crazy if I was bullied. I'd ask my dad for help.	Participants comment on how they would feel if they were in the situation described in the story.	**Experience –** Putting Yourself in the Situation D5
Her best friends moves back to her school because it is easier. / A new girl joins class and defends him. / His friend joins his class. He is tall and strong and defends him. / He asks why they are mean and they say sorry and they all become good friends.	Typical storylines are created with external events / other people offering a solutions to the character's problems. These scenarios are "easy solutions" and although this could happen in reality it seems more like wishful thinking. The characters themselves don't need to act / find strategies to navigate problems themselves.	**Additional Information -** External Solutions – Wishful Thinking E5
She wins 1 Mio. Euros in the lottery, saves the money and offers it to friends. / He travels back in time to the summer break and prevents bad things from happening. / He trains to be a ninja and takes revenge.	Participants offer fictional storylines which might be found in children's stories and movies.	**Additional Information -** External Solutions Fictional Scenarios E5
She gets a trampoline and is happy. / Santa Claus comes to school and everyone gets presents.	Participants offer storylines to make characters happy without finding a solution to friendship problems. These are driven by external events / people.	**Additional Information -** External Solutions Unrelated to Friendships E5

That’s not going to help, they will never stop [bullying]. / But they are just internet friends, you can’t go out with them to do things.	Creating a storyline elicited some form of discussion about strategies between participants.	**Additional Information** - Discussion between Participants E6

Appendix 3.4

This appendix concerns Chapter 3 and is presented in the format submitted for publication.

Supplementary Materials Table 4

Analysis Table of the Focus Group Task

Focus Group Collecting Advice for a Fictional Character		
Example	**Interpretation**	**Category**
[…] to trust someone and they should not spread secrets you tell them, because otherwise you feel betrayed. / If you make one friend, you'll surely make more friends soon.	General views on friendships, values and opinions about what is needed to be friends with someone, reflections on the importance of friendships.	**Definition Aspect -** Values and Expected Benefits of Friendships A2
The longer you are in the same class, the better you get along usually. / Making new friends is hard, making enemies is easy.	Reminiscence and thoughts on friendships and why and how they evolve.	**Definition Aspect** – Philosophical Reflections A3
Wearing football shoes, everyone will like him, because it looks cool. / Be the clown of the class will make him popular.	Participants talk about how and why friendships evolve. These statements show implicit expectations about why somebody wants to be friends with them.	**Definition Aspect** – Implicit believes about WHY friendships form A5
Making friends in Fortnite. / Save their number in WhatsApp and speak every Thursday.	Participants mention contexts and places and external events that support building friendships.	**Context** – Events and Places B1
Parents and Family / Teachers / old friends / health care professionals	Participants talk about other people who support them when making friends or support them when feeling upset.	**Context** – Characteristics and Behaviours of Other People B4

Help with homework. / Don't punch. / Do something nice.	Participants mention general recommendations for day-to-day behaviours important for building or maintaining friendships.	**Change Mechanism** – General Behaviours C1
You need to be brave. / Be who you are. / Be strong. / Be open, talk to people.	Participants talk about factors related to an individual's identity, which are perceived to facilitate friendships.	**Change Mechanism** – Identity Aspects C3
Talk to someone. / She could join in with some children and stay with them even if she is too shy to speak a lot. / Ask "Do you want to be my friend?"	Participants describe how to approach others directly to establish a new friendship.	**Change Mechanism –** Approach Others C4
Talk to the headteacher. / Go to the teacher. / Talk to parents […], parents and teacher can talk to the other child.	Participants suggest asking for help and indicate that teachers, parents etc. will help solve the problem.	**Change Mechanism** – Social Support and Help Seeking Behaviours C5
Don't listen to the others […] decide for yourself what you think is true. / Tell yourself that you are brave. / Try to ignore them. / Talk to your best friend about your worries. / Take a deep breath and hope everything goes well.	Participants suggest specific cognitive coping strategies to combat their worries, e.g. focusing on positives or reattribution.	**Change Mechanism** – Cognitive Strategies C6
You don't approach them anymore. / You avoid them in the corridors. / Don't speak to the really mean children, that's too dangerous.	Participants suggest avoiding any situations that might lead to bullying or negative experiences.	**Change Mechanism** – Avoiding others C7
You fight back. / She should defend herself and shouldn't put up with everything. / She should say "Leave me alone" […] "I will report you or tell the headteacher".	Participants suggest ways to confront unpleasant situations and children who bully them.	**Change Mechanism** – Confrontation C8

I had three points written down: saying hello, asking about similarities, inviting to a play date. It does not always work 100%. / No matter who they are, the most important thing is that you can talk to each other. I would try to get a feel for everyone.	Participants talk about their own strategies to make new friends.	**Experience** – Personal Strategy Use D2
First everyone was mean, I asked the teacher but that didn't help […] Someone started being nice. / I had a similar problem in primary school, I wanted to help but they said I had made fun of them […]	Participants talk about own experiences of making friends. These accounts are not specific strategies that were deliberately followed, but recollections of how a specific friendship developed.	**Experience** – Personal Experiences of Making New Friends and Everyday School Life D4
Changing school. / Play a trick on the teacher, then they leave the school and they get a new teacher.	Participants suggest solutions that could happen in reality, but are unlikely to succeed, seems more like wishful thinking. The characters themselves don't need to act / find strategies to navigate problems themselves.	**Additional Information -** External Solutions Wishful Thinking E5
Give them a bread with Nutella and poison it. / Give out money to all the classmates. / Get the most beautiful woman in the world and be able to afford a Lamborghini.	Participants offer fictional storylines which might be found in children's stories and movies.	**Additional Information -** External Solutions Fictional Scenarios E5
Report it to the headteacher – then there will be more bullying – I don't think so- I do. / Try to ignore the bullying – As if that was so easy – but then they loose interest. / Be aggressive, bully them in return – Does that help? – No, then there might be war.	Giving advice for a character elicited some form of discussion about strategies between participants.	**Discussion between Participants E6**

Appendix 3.5

This appendix concerns Chapter 3 and provides information about study-specific funding, acknowledgements, and individual authors' contributions.

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Authors' Contribution

IP conceived of the study, collected the data, conducted the data analysis, and drafted the manuscript; KAMS and BS participated in iterative discussions of coding decisions, themes, and definitions, JB, MM and JCR participated in the discussion of data presentation, KAW participated in iterative discussions of coding decisions, themes, and definitions as well as in the discussion of data presentation; All authors read and approved the final manuscript.

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Appendix 4.1

This appendix concerns Chapter 4.

Workshop Schedule for Participatory Development Study

Hello, my name is [name of researcher] and this is [name(s) of other researcher(s) present]. We are really pleased to welcome you to this workshop.

Before we begin, we just wanted to check a few things with you all. We know that you have all been informed about this research and your parents said it's okay for you to participate. But it is up to you whether you want to take part in this workshop. All the activities will be voluntary, this means you don't have to take part in an activity if you don't want to. If you feel uneasy at any point, you can stop participating and come to sit with one of us and help us observe the activities.

We will not share anything you tell us about yourself with anybody else. If we use the information you give us, it will not be linked to your name. But it is important to remember that everything you say will be shared with your classmates. Thus, we would like to encourage you all to keep anything discussed here private. Nevertheless, because we cannot guarantee that what you say is kept private, please make sure that you only discuss issues you feel comfortable other people knowing about.

General Plan for the Session

1. **Introduction (5 min)**

   Maybe you are wondering why we are here today? We are developing materials for schools. But it is really important to us, that the materials we develop are interesting and fun for children like you. This is why we are very interested in hearing your opinions! We are here today because we want to ask you for your help in developing these materials.

   Our topic today is feelings. We will discuss what feelings are, what comes to your mind when you think of feelings and your experiences with feelings. It is important to remember that there are no wrong answers! Everything you say is valuable for us!

2. **Ice-Breaker Activity (10 min)**

Feelings-Chinese Whispers:

Ask children to split into two groups (both groups should have the same number of team members). Each group stands in a line, all facing the front of the room.

We will now play a game that is very similar to Chinese Whispers. Do you all know how Chinese Whispers works? Okay, but in our game the rules are a bit different. Instead of passing on a word, we will pass on a feeling. And instead of whispering the feeling in each other's ears, we will use pantomime! We will ask you to form two lines, all of you facing the black board. I will show a card with a feeling on it to the last person in the line. This person will then tap on the next person's shoulder to make them turn around and then they will mimic the feeling with their facial expressions. You can also use your hands and make some gestures. Then the next person taps on the shoulder of the person in front of them and passes on the feeling. The first person in the line will tell us quietly which feeling they think they saw. And when both groups are finished, we will compare the feelings.

Important: You can only turn around if you feel the person behind you tapping on your shoulder! And you're not allowed to speak!

Shall we try one round?

[There will be one point for the faster group and one point for getting the emotion right – so if both groups get the emotion right both groups get on point and the faster group gets one extra point]

Use angry, sad, afraid and happy

Discussion:

(We need someone to take notes)

Did you find it difficult to recognise the feeling?

Why do you think did we get it wrong sometimes?

3. Brainstorming activity around Emotions (10 min)

[Draw a big circle on the blackboard / a poster]

Today we will talk about Feelings. Can you think of any good feelings?

[collect ideas on sticky-notes and put them in the circle. If they bring up negative emotions, question "Is this really a positive emotion?", if they bring up causes/ideas that are not feelings question "Is this really a feeling?" See how many actual feelings (emotions) they can find]

Okay and can we also think of negative feelings?

[See how many emotions they can find]

Okay, let's now think about what makes us happy? What brings us in the Happy Zone?

[If someone said a cause before (e.g., school or home) ask how this makes them feel and put in either in the circle (good) or outside (bad)]

4. **Drawing Activity on Emotional Expression (10 min)**
   (We need someone to take notes)

[Draw a basic figure of girl on the blackboard / poster – no face!]

This is Polly [name that is very rare??]. Polly is your friend and you are in the park together. A dog comes up to you. You like dogs, so you go up to the dog and pet it. But your friend is very afraid of dogs. But you don't know that. Would you notice that she is afraid? How would you notice?

[wait for them to describe physiological or behavioural expressions of this emotion and add them to the drawing]

Discuss: Do you think it might be difficult sometimes to recognise other people's feelings?

Do you think that people always show their feelings?

[Draw a new, even more basic figure (gender neutral!) next to the other one]

Okay, so now let's imagine this is you. You have just found out that your little sister broke a favourite toy (or let's your phone). You are extremely angry with her. Can you describe how you feel? What is happening with you when you're really, really angry.

Discuss: Do you think it might be difficult sometimes to recognise how you are feeling?

5. **Brainstorming on Personal Emotion Regulation Strategies (10 min)**

[Post-it notes and Pens will be distributed]

Let's think back to the example we just discussed. Imagine you are really, really angry because someone broke your favourite toy. So, we just discussed how intense anger feels like. Let's now think about what we could do to feel less angry. How would you handle being angry in this situation. What could you do to feel less angry? Please write your idea on a sticky note.

Does anyone want to share how they would handle being angry?

[Collect some ideas, stick sticky notes to black board / poster]

We now want to collect as many ways of coping with being angry as we can think of! Can you think of any other ways people might cope with being angry?

Do you think that some of these reactions are better than other reactions? Which ones are those? Why do you think so? **(We need someone to take notes)**

6. Drawing Activity with Their own Emotion Regulation Strategy (10 min)

[hand out white paper]

Now we want to do a drawing together. We want to draw a picture of a thermometer. This is our Anger Thermometer. At the top of the Anger Thermometer there is a tornado. Because a tornado is full of energy and when we are at the top of the Anger Thermometer we are really angry. At the bottom of the Angry Thermometer is a snail. Because snails do not have a lot of energy and they are very calm. So, when we are at the bottom, we are very calm.

[Draw a picture at the black board / poster and wait for all the children to finish their drawing]

Now I would like you all to add your energy level to the Anger Thermometer. How angry do you feel at the moment? How calm do you feel? I would say I am here. I feel very calm, so I am like a snail.

Now please think back to our story of someone breaking your favourite toy. Where would you be at the Thermometer if someone broke your favourite toy? Can you add that to your drawing? Would you feel like a tornado?

And now please think back to the different ways you could handle being angry. What do you usually do when you feel like a tornado? Can you please make a note on your drawing to describe what you usually do when you're angry?

7. **Brainstorming on Interpersonal Emotion Regulation Strategies (10 min)**

Let's think back to the other example we discussed before. You are in the park with your friend Polly. And you are approached by a dog. And your friend is very afraid of dogs. What could you do to make her feel better? Please write your idea on a sticky note.

Does anyone want to share their idea?

[Collect some ideas, stick sticky notes to black board / poster]

We now want to collect as many things as we can think of to help our friend! Can you think of any other ways to make her feel better?

Do you think some ways to react to a friend being afraid are better than others? Are there bad ways to react to a friend being afraid? **(We need someone to take notes)**

8. **Group Discussion and Personal Notes on Friendships and Emotions (10 min)**

[Maybe split in smaller groups, have an open group discussion, try taking notes while having the discussion]

Do you think that feelings are important for friendships? In which ways are they important?

Are our feelings and our friendships in any way related?

Do you think that learning about your feelings and reactions to emotions would help you with your friendships?

Which skills are important for friendships? Are there any skills that you think would help to improve friendships? [specifically, skills regarding emotions]

Do you think you have these skills? Which of these skills would you like to improve or practice more?

Do you think it would be good to practice these skills in school? Do you have any ideas how you could practice these skills in school? Are there any specific activities you can think of?

[Individual sheets of paper will be handed out]

Because I am interested in hearing everyone's opinion, I want to ask each of you to individually write a note about what we have just discussed. Please think about feelings and friendships. How do you think feelings and friendships are related? / Why are feelings important for friendships?

[Give children some time to write a note]

And I have a second question for you: Is there anything in particular you would like to learn about feelings and friendships? Any skills you would like to practice?

9. **Feedback on the Session (5 min)**

[Definitely split into smaller groups]

Before we finish today's workshop, I am interested in how you liked it. Which of the activities we have done did you like best? Why?

Which of the activities did you like least? Why?

Do you feel you learned something new about feelings?

Is there anything else you would like to tell me?

10. **Debrief** and handing out of information cards, providing the contact details of the research groups as well as relevant charities and child safety organisations (e.g. child hotline). **(5 min)**

Thank you for your participation in this workshop. We want to develop a workshop package for schools to help children learn more about social roles, emotions and mental health. These topics are very important for our social and emotional well-being. But sometimes thinking about these topics can trigger very strong emotions. If we discussed anything during this workshop that upset you or made you feel anxious, you can come and speak to us or contact us. We are now giving out contact cards. On these cards you will find our contact details as well as the contact of some other organisations you can turn to if you ever feel upset or anxious.

Do you have any questions?

Thank you for your participation today! Everything you said was very helpful for us!

Appendix 5.1

This appendix concerns Chapter 5 and is presented in the format submitted for publication.

Promoting peer connectedness through social-emotional learning: Evaluating the intervention effect mechanisms and implementation factors of a social-emotional learning programme for 9 to 12-year-olds

Pollak I., Stiehl K.A.M., Birchwood J., Schrank B., Zechner K.A., Wiesner C., and Woodcock K.A.

Measures Used in This Study

Classroom Responsibility Climate Questionnaire (Fernández-Río et al., 2019)

rated on a 7-point Likert scale from 1-“strongly disagree” to 7-“strongly agree”

translated to German by the researchers

Student Responsibility Climate

Während des Unterrichts mit dem Klassenvorstand…

… helfen sich Schüler bzw. Schülerinnen gegenseitig.

… unterstützen wir uns gegenseitig.

… sind Schüler bzw. Schülerinnen nett zueinander.

… arbeiten Schüler bzw. Schülerinnen zusammen, wenn es notwendig ist.

… halten sich Schüler bzw. Schülerinnen an die Klassenregeln.

Teacher Responsibility Climate

Die Lehrperson mag es, dass wir uns gegenseitig unterstützen.

Die Lehrperson möchte, dass wir nett zueinander sind.

Die Lehrperson besteht darauf, dass wir zusammenarbeiten müssen.

Die Lehrperson weiß zu schätzen, dass wir versuchen zu tun, worum er/sie uns bittet.

Self-Report Checklist for Social and Learning Behaviour (Lohbeck et al., 2014)

on a four-point Likert scale from 0-“never”, 1-“rarely”, 2-“sometimes” to 3-“regularly”

Developed in German

Subscale “Empathy”

Ich tröste andere Mitschüler, wenn sie etwas Schlimmes erlebt haben

Ich höre anderen Mitschülern zu, wenn sie Sorgen haben

Ich mache anderen Mitschülern Mut, wenn sie traurig sind

Ich versuche, andere Mitschüler bei einem Problem zu verstehen

EPOCH Measure of Adolescent Wellbeing (Kern et al., 2016)

rated on a five-point Likert scale ranging from 1-“not true at all” to 5-“very true”

translated from English to German, adapted to the school context and validated with 10 to 18-year-olds by Buerger et al. (2023)

Subscale Peer Connectedness

Wenn mir etwas Gutes passiert, möchte ich in der Schule jemandem davon erzählen.

Wenn ich ein Problem habe, gibt es in der Schule jemanden, der für mich da ist.

Es gibt Personen in der Schule, die sich wirklich für mich interessieren.

Ich habe Freunde in der Schule, die mir sehr wichtig sind.

Subscale Happiness

Ich fühle mich wohl in der Schule.

Ich habe viel Spaß in der Schule.

Ich gehe sehr gerne in die Schule.

In der Schule bin ich meistens fröhlich.

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Appendix 5.2

This appendix concerns Chapter 5 and is presented in the format submitted for publication.

Promoting peer connectedness through social-emotional learning: Evaluating the intervention effect mechanisms and implementation factors of a social-emotional learning programme for 9 to 12-year-olds

Pollak I., Stiehl K.A.M., Birchwood J., Schrank B., Zechner K.A., Wiesner C., and Woodcock K.A.

Detailed Results of Fidelity Measures

A fidelity strategy was developed based on Carroll et al. (2007). To collect data about adherence to intervention protocol, teachers were asked to report about frequency and duration of their programme implementation and were additionally asked “Please indicate how detailed you covered the suggested content for this session?” (to be rated on a scale from 1-left out completely, 2-discussed in less detail, 3- completed, 4- discussed in more detail, 5- discussed very thoroughly). In open questions teachers were prompted to report any deviations of the script and reflect on their reasons to deviate. Additionally, teachers were asked “Did you feel your students understood all concepts?” (to be rated on a scale from 1-didn’t understand, 2-understood little, 3-understood ok, 4-fully understood, to 5-fully understood and capable of using new competencies) and “Do you feel the contents of this session are relevant for your students?” (to be rated on a scale from 1-not relevant, 2-little relevance, 3-ok, 4-relevant, to 5-highly relevant).

Table 1 lists all intervention group teachers and their number of completed sessions, completed fidelity questionnaires and average duration of their sessions. Average time spent on programme sessions is further detailed in Table 2 across all sessions and all teachers. Overall average ratings across all sessions and teachers are provided in Table 3. Teachers’ individual fidelity scores

concerning content coverage, participant responsiveness and perceived relevance are reported in Table 4. Respective scores per session are reported in Table 5.

Regarding adherence to the programme, the number of completed sessions was used as main indicator and teachers were grouped into four implementation progress groups based on this. Only the "full programme" group (i.e. completed all eight sessions) was included in the main analysis. The additional adherence factors, duration of each session and programme coverage can be found in Tables 1 and 4. On average, teachers who finished all programme sessions spent 59.2 minutes on each session, while teachers who partly finished the programme spent an average of 65.3 minutes on their sessions (see Table 1). Similarly, teachers, who partly finished the programme, reported a slightly higher content coverage (M=3.22, SD=0.30) compared to teachers who finished the full programme (M=2.95, SD=0.19). For teachers who dropped out or finished few sessions only, not enough data is available to calculate a mean score.

To assess a possible association between teacher fidelity reports and students' perceived teacher generated class climate after the intervention (T2) (i.e. did students feel the teacher actively encouraged a positive class climate), spearman correlation were computed (for raw data see Table 6). There correlation between students' perceived teacher class climate and teacher's perceived relevance of contents was negligible (r = -.06, p= .83). There was a weak, negative correlation between students' perceived teacher class climate and teacher's reported student responsiveness (r = -.11, p= .71). There was a moderate, negative correlation between students' perceived teacher class climate and teacher's reported content coverage (r = -.50, p= .069). Content coverage was included in this analysis for the purpose of comprehensive reporting, however interpretation of any analysis using content coverage alone is difficult. As some teachers did not implement all eight sessions, implementation progress (i.e. how many sessions were implemented) was used as main indicator of adherence and implementation progress

might be low even if content coverage for singular completed session might be high. Thus, content coverage alone is an incomplete indicator of adherence and analyses using content coverage alone are potentially misleading.

Table 1

List of Intervention Group Teachers and Number and Duration of their Completed Sessions

	Number of Competed Sessions	Progress Implementation group	Number of Fidelity Questionnaires Completed	Mean Session Duration
Teacher 1	6	partly finished	5	60
Teacher 2	2	few session	2	50
Teacher 3	7	partly finished	1	100
Teacher 4	7	partly finished	4	50
Teacher 5	-	drop out	-	N/A
Teacher 6	8	full programme	-	N/A
Teacher 7	8	full programme	-	N/A
Teacher 8	8	full programme	3	50
Teacher 9	8	full programme	2	50
Teacher 10	8	full programme	2	75
Teacher 11	7	partly finished	7	64
Teacher 12	8	full programme	3	47
Teacher 13	-	drop out	4	43
Teacher 14	8	full programme	5	50
Teacher 15	7	partly finished	5	51
Teacher 16	6	partly finished	4	68
Teacher 17	8	full programme	8	84
Teacher 18	2	few session	-	N/A
Teacher 19	-	drop out	-	N/A

Note. This table lists all teachers of the intervention group and which programme progress group they are belong to, their number of completed fidelity questionnaires and their reported average time spend on sessions.

Table 2

Average Time Spent on One Programme Session

Session Duration in Minutes	Frequency	Percent	Valid Percent	Cumulative Percent
25	1	1.7	1.8	1.8
35	1	1.7	1.8	3.5
40	1	1.7	1.8	5.3
45	6	10.3	10.5	15.8
50	28	48.3	49.1	64.9
60	2	3.4	3.5	68.4
70	4	6.9	7.0	75.4
80	8	13.8	14.0	89.5
90	1	1.7	1.8	91.2
100	5	8.6	8.8	100.0
Total	57	98.3	100.0	
Missing	1	1.7		
Total	58	100.0		

Note. This table shows how much time teachers spend on average on programme sessions.

Table 3

Overview Fidelity Measures

	N	Minimum	Maximum	Mean	SD
Content Coverage	57	1.50	4.75	3.05	0.61
Participant Responsiveness	56	2.67	5.00	3.91	0.63
Perceived Relevance	57	3.00	5.00	4.12	0.45

Note. This table provides all three average fidelity score across all sessions and teachers.

Table 4

Fidelity Results per Teacher

	Content Coverage		Participant Responsiveness		Perceived Relevance	
	Mean	SD	Mean	SD	Mean	SD
Teacher 1	3.47	0.76	4.33	0.74	3.88	0.69
Teacher 2	2.63	0.53	4.15	0.49	4.70	0.42
Teacher 3	3.50	-	3.75	-	4.50	-
Teacher 4	2.71	0.70	4.29	0.67	3.77	0.31
Teacher 8	2.97	0.21	4.47	0.06	4.11	0.32
Teacher 9	3.17	0.47	3.83	0.60	3.79	0.06
Teacher 10	2.68	1.31	3.20	0.28	4.33	0.11
Teacher 11	3.34	0.39	4.12	0.66	3.84	0.46
Teacher 12	3.13	0.23	3.57	0.40	4.18	0.38
Teacher 13	2.98	0.67	3.93	0.52	4.28	0.71
Teacher 14	2.78	0.35	4.22	0.75	4.36	0.33
Teacher 15	3.01	1.19	3.35	0.47	4.43	0.24
Teacher 16	3.28	0.61	3.70	0.24	4.30	0.43
Teacher 17	2.99	0.37	3.44	0.43	3.94	0.30

Note. This table provides teachers' average self-reported fidelity scores across all their completed fidelity checks (only teacher 14 completed all 8 fidelity checklists). Number of teachers is congruent with teachers in Table 1, teachers who did not complete any fidelity questionnaires have not been included in this table.

Table 5

Fidelity Results for each Programme Session

	Content Coverage		Participant Responsiveness		Perceived Relevance	
	Mean	SD	Mean	SD	Mean	SD
Session 1	3.14	0.79	4.08	0.82	4.14	0.50
Session 2	3.22	0.70	4.04	0.57	4.35	0.42
Session 3	3.11	0.32	3.90	0.73	4.01	0.47
Session 4	3.03	0.41	4.01	0.45	3.97	0.55
Session 5	2.84	0.62	3.63	0.58	3.97	0.42
Session 6	3.08	0.38	3.61	0.67	4.14	0.47
Session 7	2.67	0.58	3.80	0.35	4.20	0.20
Session 8	2.93	0.64	3.67	0.42	4.27	0.42

Note. This table provides average fidelity measures completed by teachers for each session.

Table 6

Students' Perceived Class Climate Generated by Teachers and Students for each Teacher

	Teacher Climate T2		Student Class Climate T2	
	Mean	SD	Mean	SD
Teacher 1	31.52	4.51	24.09	5.67
Teacher 2	31.43	4.70	20.62	6.49
Teacher 3	31.08	6.80	21.77	8.80
Teacher 4	33.69	1.84	30.31	4.33
Teacher 5	31.82	3.58	27.73	5.91
Teacher 6	31.82	3.58	27.73	5.91
Teacher 7	30.43	5.36	23.65	5.82
Teacher 8	32.35	3.49	29.73	4.17
Teacher 9	30.57	4.41	25.33	5.57
Teacher 10	33.05	3.02	23.50	5.21
Teacher 11	31.59	3.72	23.04	5.87
Teacher 12	33.29	1.86	25.41	4.32
Teacher 13	33.00	3.71	28.42	4.21

Teacher 14	33.00	3.71	28.42	4.21
Teacher 15	33.32	3.46	25.32	7.10
Teacher 16	30.00	5.60	22.13	5.54
Teacher 17	32.20	3.52	27.28	4.89

Note. Number of teachers is congruent with teachers in Table 1 and 4. These data was collected after the intervention period (T2).

Appendix 5.3

This appendix concerns Chapter 5 and provides information about study-specific funding, acknowledgements, and individual authors' contributions.

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Authors' Contribution

Pollak I., Stiehl K.A.M., Birchwood J., Schrank B., Zechner K.A., Wiesner C., and Woodcock K.A.

IP conceived of the study, oversaw the implementation of the programme in the school context, conducted the data analysis, and drafted the manuscript; KAMS supported the programme development, and the implementation, and participated in discussions data presentation, JB and BS participated in the discussions regarding data analysis and data presentation, ZKA and CW supported the implementation of the study, and KAW participated in discussions regarding the data analysis and data presentation; All authors read and approved the final manuscript.

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