



Pretend play-based training improves some socio-emotional competences in 5–6-year-old children: A large-scale study assessing implementation

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ABSTRACT

The purpose of this study is to evaluate the effect of a pretend play-based training in 5–6-year-old children in a large scale school context on emotion comprehension, emotion regulation, prosocial behaviour and on their pretend play competences. The analysis of implementation variables was carried out in order to ensure program implementation quality in the experimental group. Results show an improvement in emotion comprehension and a decrease in aggressive behavioural responses in children in the experimental group ($n = 101$) compared to those in the control group ($n = 79$). Findings are discussed in regard to implementation outcomes and the influence of this form of play on the improvement of these variables.

1. Introduction

Pretend play and socio-emotional competences are essential and have to be fostered in the early school years (Richard, Gay, & Gentaz, 2021). However, it is not always clear to teachers how to intervene in the children pretend play in order to scaffold it (Marinova et al., 2020) and at the same time support the development of academic learning (Pramling Samuelsson & Björklund, 2022) or the socio-emotional competences of these children. Moreover, concerning the place of pretend play in kindergarten, in French-speaking countries (which is the context of this study), a report realised by Bouysse et al. (2011) in France showed that kindergarten tend to become more “academic/formal”. The authors mention in particular the importance of work in the form of workshops and the rise of worksheets (pencil-paper). Regarding pretend play, they report that this form of play is no longer as frequent as it once was and that in some classes, the space, time and materials for this play do not exist. In the Swiss context (French part) in kindergarten, a tendency towards a more “academic/formal”, transmissive pedagogical has also been reported (Clerc-Georgy & Kappeler, 2020; Gilliéron Giroud et al., 2013). Concerning the support of the emotional aspects in school context, teacher training also needs to be strengthened (Audrin, 2020). It is therefore essential to provide teachers with tools that offer practical and theoretical guidelines to teach them how to intervene on these elements in class. Unfortunately, there are few school programs in

kindergarten that explicitly and simultaneously support pretend play and socio-emotional competences, and that have been the topic of quasi-experimental studies. In the francophone context, to our knowledge, only one program has been tested in schools and has provided quantitative data on some socio-emotional competences (i.e., Landry's thesis, Landry, 2014). However, firstly, this program was not part of a three-step implementation process. This whole process includes an exploratory study, the implementation of the adapted version by a group of teachers and the implementation of the final version in a large-scale study (Cèbe & Goigoux, 2018; Gentaz & Richard, 2022). That would provide data on how to improve the program and show if some results could be replicated in different studies. Secondly, Landry's study did not examine the effect of the program on pretend play itself and did not include measures on the program implementation in the experimental group.

The purpose of this article is therefore to present the results of the third-step implementation process of the last version of a school program. This program targets pretend play and socio-emotional competences among 5–6-year-olds in a specific part of Switzerland (French speaking part) built on Landry's program. It also seeks to document the implementation of the program in the group that used it in class. The particularity of this program is that it combines structured teaching time on certain socio-emotional competences with moments of pretend play. Pretend play is used both as a pedagogical tool to promote the

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reinvestment of certain socio-emotional competences, but it is also considered as an object of knowledge that is taught. In this introduction, we will describe the importance of supporting socio-emotional competences during the preschool period. In particular, we will focus on understanding and regulating emotions as well as prosocial behaviour. We will also highlight pretend play and its importance in the child's cognitive and socio-emotional development in order to create innovative tools that foster these socio-emotional competences in the preschool period. Finally, we will outline the key variables that will be examined in the implementation of this program.

1.1. Socio-emotional competences

The importance of socio-emotional competences is clearly recognized in children's schooling (Durlak et al., 2011; MacCann et al., 2020; Murano et al., 2020). Although their importance is largely recognized, they are still difficult to categorise, which necessitates further research in this area. Generally, socio-emotional competences are considered a multidimensional construct comprising intra- and interpersonal competences that enable children to develop an awareness of themselves and others (e.g. understanding of emotions, empathy); make responsible decisions, achieve goals (e.g. through interpersonal problem solving); manage emotions and behaviour, and establish and maintain positive social relationships. Moreover, these competences are learned by children (Social-Emotional Learning, SEL) (Collaborative for Academic, Social, and Emotional Learning, n.d.; Zins et al., 2007). Schools will therefore play a key role in teaching and helping develop these competences particularly during the first years of school (Richard, Gay, & Gentaz, 2021).

Recently, Murano et al. (2020) have focused their meta-analysis exclusively on preschool children (mean age 4.31 years). They examined the effects of universal programs (conducted with all children) aimed at developing socio-emotional competences (33 studies). An overall improvement in social and emotional competences (Hedges's $g = 0.34$) and a decrease in behavioural problems ($g = 0.32$) in children who received these interventions was demonstrated compared to children in control conditions. Overall, this meta-analysis demonstrated that preschool children benefit from these interventions focusing on the development of social and emotional competences. It is therefore essential to pursue research on preschool children in order to develop innovative educational tools adapted to the specific developmental needs of children starting school. In this vein, pretend play, especially social pretend play (its most mature, cooperative form) would be beneficial to the cognitive and socio-emotional development of 3- to 7-year-old children (Duncan & Tarulli, 2003; Fleer, 2017; Vygotsky, 1933/2016). It also represents a pedagogical approach that supports children's learning, but it must be taught to teachers and children (Clerc-Georgy et al., 2020; Truffer-Moreau, 2020). The support of this form of play should therefore be part of programs implemented in schools that focus on the development of socio-emotional competences in preschoolers. Some of these competences would be particularly essential to be supported in the context of pretend play. These are emotion comprehension, emotion regulation and prosocial behaviour.

These constructs are closely related to each other and seem particularly essential to develop early in the development, because children with better skills to understand emotions are more likely to regulate their emotions (Eisenberg et al., 2005; Raver, 2002). As a result, young children with better ability to manage emotions have fewer behavioural problems (Leerkes et al., 2008), are more likely to better regulate social relationships in a prosocial way (for example, sharing resources with peers, helping peers to develop their learning skills), which would facilitate social interactions and academic achievement (Denham et al., 2012). Indeed, better relationships may also indirectly influence academic achievements through providing children with a "social support network" that supports them when they are confronted to a learning challenge requiring expert (peer, teacher) help (Cavadini et al., 2021;

MacCann et al., 2020). We will now define these core constructs assessed and trained in this study and pretend play, as well as their importance in the early school years.

1.1.1. Emotion understanding

Firstly, emotion understanding, which according to Eisenberg et al. (2005) refers to the ability, "(...) to successfully attend to relevant emotion-laden language and information in one's environment, identify one's own and others' experienced and expressed emotions, understand which emotions are appropriate given the circumstances, and recognize the causes and consequence of emotions" (p. 110). A longitudinal study showed that the ability to detect and label emotional cues at age 5 represents a predictor of children's social skills and academic performance at age 9 (Izard et al., 2001). Recently, Cavadini et al. (2021) have demonstrated that emotion knowledge, locomotor activity and social behaviour are interdependent and associated with numerical skills in 706 pupils from age 3 to 6. Emotion understanding seems to be a core component for the building of social competence and academic performance. It is also a competence that is closely linked to emotion regulation.

1.1.2. Emotion regulation

Emotion regulation can be defined as the process of modulating emotion arousal and its expression in order to achieve intra- or interpersonal goals and is particularly crucial at the beginning of school, when children are faced with new social and educational demands (for a selective review on emotion regulation in preschoolers in regard to school readiness see Harrington et al., 2020). In their longitudinal study including three time of measurements, Lucas-Molina et al. (2020) highlighted the predictive relation between emotion regulation at age 3 and emotion comprehension at age 4, and between emotion regulation at age 4 and emotion comprehension at age 5. Another longitudinal study jointly examined four central constructs related to early school success. Emotion regulation, executive functioning, emotion knowledge and metacognition were examined as distal (age 3) and proximal (age 4) predictors of school achievement and adjustment at age 5. When only findings related to emotion regulation and emotion knowledge were considered, the results showed that these two constructs (assessed at age 4) were direct predictors of teacher-reported school performance (Blankson et al., 2017).

1.1.3. Prosocial behaviour

Prosocial behaviour represents another core construct for academic success in kindergarten and, in turn, subsequent academic achievement. This competence is defined as a "voluntary behavior intended to benefit others" (Eisenberg et al., 2006, p. 646). More specifically, it includes "social actions that provide other people with resources, instrumental help, comfort, or the expression of empathetic/sympathetic feelings" (Hay et al., 2021, p. 10). Different studies have demonstrated the close links between prosocial behaviour and other socio-emotional variables as well as academic achievement. For instance, in elementary schools, prosocial nominations by peers (tendency to be prosocial) were predicted negatively by negative emotionality (a composite of negative arousal and emotional intensity) and positively by attentional regulation, as well as children's socially competent functioning (i.e., socially appropriate behaviour, constructive coping and peer acceptance). In addition, the interaction of attentional regulation with emotionality predicted additional variance in prosocial behaviour (Eisenberg et al., 1996). In a large-scale study, that includes 52,661 kindergarten students for whom subsequent achievement results were obtained in grade 3, showed that prosocial behaviour (comprising three subdomains: cooperative behaviour, socially responsible behaviour and helpful behaviour) was significantly associated with grade 3 achievement via kindergarten achievement (full mediation) (Collie et al., 2018).

In conclusion, it seems critical to foster these three core constructs during the first years of school, because they will impact the earlier and

later social and academic abilities of young children. They should be integrated into the conceptualisation of pretend play-based program.

1.2. Pretend play-based training

In the Vygotskian perspective, what makes pretend play unique, what distinguishes it from other general forms of activity, is that the children create imaginary situations in which they are led to select and enact roles containing precise rules of behaviour which they apply to themselves and which refer to the roles they choose to endorse (Vygotsky, 1933/2016). This type of play is considered the “leading activity” for children age 3 to 7 years (Clerc-Georgy, 2020; Duncan & Tarulli, 2003; Vygotsky, 1933/2016). In other words, pretend play (and particularly is more mature cooperative form) is considered the most favorable activity to generate developmental gains specific to this age period (Bodrova & Leong, 2012). Indeed, currently, several studies tend to show that this form of play enhances children's cognitive and socio-emotional development. In a recent study, White et al. (2021) showed the effect of social pretend play on inhibitory control in preschool children. The proportion of social pretend play during free play was associated with increased inhibitory control over the school year. Social pretend play was the only predictor of gains in inhibitory control. Interestingly, neither solitary pretend play nor social play (e.g., interacting or conversing with peers) predicted changes in inhibitory control. In a prospective, longitudinal study, preschool children engaged in high levels of pretend play were likely to display greater executive functions (EF) and were more likely to display better inhibitory control two years later (Thibodeau-Nielsen et al., 2020). Regarding socio-emotional development, Bauer et al. (2021) demonstrated that a higher propensity towards pretend play in a preschool sample enhanced cognitive and affective control (cool and hot EF, respectively), significantly predicted higher levels of prosocial behaviours and that the link between prosocial behaviour was fully mediated by hot EF. Finally, Richard and Gentaz (2020) showed an association between pretend play and socio-emotional competences (i.e., emotion understanding (e.g., Seja & Russ, 1999), emotion regulation (e.g., Galyer & Evans, 2001; Lindsey & Colwell, 2013; Slot et al., 2017) and social competences (e.g., Connolly et al., 1988; de Lorimier et al., 1995)), through their synthesis of quantitative studies (correlational and interventional).

However, it is also important to note that most of these researches are correlational in nature and does not currently clearly identify a causal link (Lillard et al., 2013). The relation between these constructs needs to be further investigated using methodologically rigorous experimental paradigms, such as interventional research. In this perspective, this study will contribute to expanding the amount of intervention research in the area of pretend play in the school context with 5- to 6-year-old children and provide new evidence to infer a causal link between a pretend play-based program and the development of certain socio-emotional competences.

In the existing literature, some school programs designed to promote socio-emotional learning incorporate aspects of pretend play with young children (e.g. the *Second Step* program), but none of them propose scaffolding pretend play with particular interventions to specifically support emotion understanding, emotion regulation, and prosocial behaviour (Richard et al., 2019). To our knowledge, only the popular *Tools of the Mind* program (Bodrova & Leong, 2001) and the french program developed in Landry's thesis (Landry, 2014) provide specific support to pretend play in a school context in order specifically to develop the level of play and some aspects of socio-emotional competences. *Tools of the Mind* is a complete curriculum (not an “add-on” curriculum) consisting of numerous activities centered on academic knowledge (e.g. math, literacy) and the development of self-regulation (Nesbitt & Farran, 2021). This program was inspired by Vygotsky's historico-cultural theory of child development, which posits that children acquire knowledge and develop high-order cognitive functions using cultural tools that are internalized and become “Tools of the mind”

through the collaboration with knowledgeable others. A central focus of this program is the scaffolding of pretend play so that it becomes mature. See Leong and Bodrova (2012) for details about an immature/mature pretend play; e.g. children are able to negotiate, discuss their roles and scenarios before and during play, adjust their roles in function of the evolution of the scenario; they do not necessarily need props to symbolize their actions, and their play extends over a long period of time. A second essential component of this program is the importance given to social interactions through shared activities and language while learning. As reported by Nesbitt and Farran (2021), the effects of *Tools* on child outcomes have been mixed in the existing scientific literature due to different factors, such as the grade-level targeted, the methodological details, the variables measured (in addition to their monograph, which included the randomized control trial (RCT) of a large scale, longitudinal study on the program, see their review of eight separate RCTs of either the full (preschool or kindergarten) *Tools of the Mind* or sections of it on the development of preschool and kindergarten children). In contrast, in Landry's thesis (Landry, 2014), the impact of scaffolding pretend play was evaluated more particularly on the development of “social thought” and social adaptation to school in five-year-olds. Her program also relied on *Second Step* (Committee for children, 2002) and Bodrova and Leong (2012) and was added to the “regular curriculum” over a certain period of the school time. Children in the experimental group participated in relational opportunities that were centered on scaffolding pretend play over a three-month period. Findings showed a higher score for the group that benefited from the program on two measures of “social thought”: the ability to adopt others' perspectives and the ability to solve social problems.

The program examined in this paper is an “add-on” program to the regular curriculum (for program details see the section “Pretend play-based program”) that is focused on the development of emotion understanding, emotion regulation, prosocial behaviour and simultaneously the scaffolding of pretend play. It is in line with the work of Landry. In other words, the overall structure of the program consists in children reinvesting the socio-emotional competence elements they previously worked on with the teacher in a guided way (structured phase with all the children) in the pretend play moments which are simultaneously scaffolded with the purpose of developing play as well.

Different mechanisms could explain the importance to integrate times of pretend play in order to reinforce the socio-emotional development of children. Some of these mechanisms are common to these programs. This is the case for the mobilization of executive functions when children play. Indeed, this mechanism could explain the beneficial effect of using and scaffolding pretend play in order to develop socio-emotional competences. Different researches showed the central role played by executive functions on socio-emotional competences (e.g., Carlson & Wang, 2007; Ferrier et al., 2014; Garcia-Andres et al., 2010). In addition, as explained above, this type of play represents a “leading activity” for preschool children (particularly its more developed form), i. e. the activity that facilitates the development of high mental functions (like executive functions) in the preschool period. For instance, a child when he/she endorses a role and play with other, has to remind the role features, the scenario planned, regulate his/her behaviour or other children's behaviour, adapt the plotline of the scenario (Sukhikh et al., 2022; Veraksa et al., 2022). As a result, in fostering executive functions, pretend play would indirectly enhance the development of socio-emotional competences due to the close link between socio-emotional aspects and executive functions.

Other mechanisms would be more specific to the program implemented in this study (Richard, Baud-Bovy, et al., 2021). First, during the periods of realization of pretend play, children have the opportunity to repeat and experiment directly in various fictitious ecological situations the elements of skills worked on in the more structured moments (more specifically in the program implemented in the present study). According to Truffer-Moreau (2020), pretend play occupies different functions and in particular that of knowledge reinvestment and of revealing

children progress. Indeed, they can reinvest and experiment the ideal forms proposed by the teacher (e.g., questions to ask oneself and others to solve an interpersonal problem, to identify an emotion). In this vein, repetition in different simulated situations could be a first explanatory mechanism. A second mechanism could be a transfer of newly acquired competences to real-life situations. As explained before with the repetition mechanism, these new competences would be gradually internalized through these periods of play, facilitating their use in their daily “real” life. Verbalization and explanations of emotions, their causes, and consequences during meta-communications related to scenario planning/guidance are probably a third potential mechanism. The role played by language through conversations about emotions between teacher and the children, and among peers (particularly during pretend play moments), probably facilitates a better comprehension of emotional terms (Richard et al., 2019).

To conclude, it should be noted that all these mechanisms would be more solicited with the active participation of an expert play partner, like children and the adult, in the child's play. Indeed, active participation of the adult in the play of children is associated to a better level of pretend play (Perren et al., 2019) and behavioural inhibition (Veraksa et al., 2022). Moreover, peers influence the pretend play quality. Indeed, skilled players tend to elicit more mature pretend play in others (Jaggy, Mainhard, et al., 2020). As a result, a more mature pretend play would allow the child to ‘verbalize’ more, to ‘repeat’ elements of socio-emotional competencies by playing more sophisticated roles and more elaborated scenarios, thus facilitating the transfer to more complex ‘real-life’ situations.

1.3. Documenting implementation

The need to evaluate the implementation of interventions in classrooms, the training of teachers, and the co-construction of intervention programs by researchers and teachers are some central factors to be considered in intervention research, as they aim to foster the implementation of effective interventions on a large-scale population. Various parameters must therefore be evaluated in order to conclude whether a program is effective or not. Collecting data related to the implementation of intervention programs therefore seems crucial, since these data can be a source of important variation in students' progress (Gentaz, 2018).

The review of the scientific literature conducted by Durlak and DuPre (2008) supports this view. Indeed, this review aimed to evaluate the impact of implementation on the effects generated by prevention and health promotion programs for children and adolescents. The results clearly indicated that effective implementation of a program is associated with better outcomes. The authors pointed out that in the absence of implementation data, the research cannot accurately document how the results should be interpreted. Evaluating a program's implementation therefore seems to be an absolute necessity.

Currently, it is possible to distinguish a number of components related to the notion of implementation that researchers can evaluate in the context of setting up an innovative tool. Proctor et al. (2011) proposed a taxonomy of “implementation outcomes” i.e., acceptability, adoption, appropriateness, costs, feasibility, fidelity, penetration and sustainability. They define implementation outcomes as “the effects of deliberate and purposive actions to implement new treatments, practices, and services (p. 65)”. Interestingly, of all these different parameters assessing the impact of how an intervention is implemented, fidelity of implementation was more often measured than the other indicators. Fidelity refers to the extent to which an intervention was implemented as prescribed in the original protocol (Dusenbury et al., 2003). Two other components of implementation are interesting to get relevant information on the maintenance or institutionalization of a newly implemented program, which refers to sustainability, and if an innovation can be used successfully in a given context, which refers to feasibility (Proctor et al., 2011). These two indicators are really interesting in

complement to fidelity, because they provide information on how teachers perceive the usefulness and feasibility of the program. These are good indicators of the future program integration to their regular practice.

1.4. The present study

In this paper, two main goals were pursued. Given the importance of pretend play in the development of socio-emotional competences and the need to support socio-emotional competences in preschool period, the first aim was to evaluate the effects of a large-scale pretend play-based intervention program on some socio-emotional competences and the development of pretend play itself in a francophone school context with 5- to 6-year-old children. In French countries, only one program based on the pretend play scaffolding (i.e. Landry's program, Landry, 2014) has been tested in kindergarten and provided quantitative data on some socio-emotional measures. However, as pointed out in the introduction, this program did not follow an implementation process that included an exploratory study, the implementation of a revised version of the program by a group of teachers, and a final larger-scale study with the latest version of the program. This three-step process of implementing a program allows for modifications to the program and examines whether certain results could be replicated in other educational contexts through the different implementations stages (Gentaz & Richard, 2022). Therefore, the second aim was to evaluate the program's implementation in the experimental group in order to verify the fidelity, sustainability and feasibility of the last version of the program. In the present study, the results of the third stage's implementation program were analysed.

The final version of the program has been implemented by teachers on a large scale and new constructs were assessed in addition to aspects of emotion comprehension, regulation and prosocial behaviour. These new constructs are related to pretend play (in both groups) and implementation (only for the experimental group).

Thus, our aims were more precisely the following:

- Firstly, we planned to evaluate the effect of this adapted program on emotion comprehension, some aspects of emotion regulation and prosocial behaviour. Compared to the two previous studies and in the perspective of generalising these findings with a larger sample size, we assumed that the program would improve emotion comprehension (Richard et al., 2019; Richard, Baud-Bovy, et al., 2021) and would likely enhance the results on one measure of emotion regulation (Richard et al., 2019) and on prosocial behaviour in the experimental group compared to the control group.
- In this study, pretend play was assessed and we hypothesized that the experimental group would have a higher level of pretend play after the training compared to the control group.
- Finally, measures of fidelity, sustainability and feasibility of the program's implementation were collected in the experimental group in order to assess the way the intervention was implemented, to deepen our understanding of how it was implemented, to determine whether teachers think it is a useful tool in their daily classroom practice, and if it would be beneficial in their long term practice.

2. Method

2.1. Participants

Twenty-four teachers in public kindergarten classes in Switzerland agreed to participate in the study and to voluntarily integrate the control (n = 12) or experimental group (n = 12). Information and a written consent form were then sent to parents. The parents of 192 children gave their consent to participate in the study in September 2020. However, 12 children were excluded from the analyses. Five children presented a neurodevelopmental or learning disorder, or mutism. One child refused

to participate in the individual interviews. Three children had great difficulty in understanding the instructions and questions during the individual interviews. One child dropped out of the study because the parents wished to withdraw their child. Two children moved during the study. The interpretable data are therefore based on a sample of 180 children. There are 79 children in the control group (Mean age in year at pre-test time = 5.73, $SD = 0.28$; girls = 38, boys = 41) and 101 children in the experimental group (Mean age in year at pre-test time = 5.77, $SD = 0.31$; girls = 53, boys = 48). This project has been approved by the Ethics Commission of the Faculty of Psychology and Educational Sciences of the University of Geneva.

2.2. Procedure: assessments

A pretest, intervention (end November 2020 to end February 2021), post-test study design was used. The assessment of the children by direct measures of both groups started in September–October with two collective evaluations measuring verbal and non-verbal intelligence (control variables to ensure the homogeneity of the two groups). They were conducted directly in the classroom and required approximately two 30-min sessions. In November 2020 and in March 2021, children of both groups participated in individual interviews in a quiet room next to their classroom. Data collectors were mainly undergraduate students in education and psychology (blind to the research hypotheses) and, in specific cases, the principal investigator (in case of absence, unavailability of experimenters or illness of children). Because of the Covid-19 pandemic, all examiners wore masks and were instructed to disinfect their hands after each interview. In the individual assessments, the order of administration of the tasks and the structured interview was identical in the pre-test and post-test. According to Carlson and Moses (2001), fixed orders are standard practice in individual difference research, because “it is critical that the individuals be exposed to identical stimulus contexts” and the order in which they are presented (p. 1035). Parents also participated in this study by completing a questionnaire on their child's emotion regulation and prosocial behaviour in November 2020 and March 2021. The teachers of both groups completed an assessment of the social pretend play skills of each child participating in the study. Only the teachers of the experimental group completed a weekly grid measuring different indicators of program implementation. Finally, a questionnaire on program implementation at the end, in March 2021, was completed by the teachers.

2.3. Control group

The teachers of this group did not implement a specific, researcher-designed program in their classrooms. During this period, this group took the “usual” classes with their teachers. However, at least one hour per week was scheduled for children to engage in pretend play during “free activities”. All teachers reported allocating time for this form of play. In this group, the scaffolding of pretend play is freer, it does not follow a planned program. Overall, in those moments of play, teachers' scaffolding consisted of observation times to determine the level of children's play, knowledge (in different disciplines: mathematics, reading, etc.) socio-emotional and cognitive skills. In addition, or alternatively, the teachers reinvested elements of the program and fostered new knowledge not necessarily related to socio-emotional competences (unlike what is specifically targeted in the program's sessions). Twenty-two out of twenty-four teachers (control and experimental group) benefited from a continuing education course before this study. A part of this training was centered on the scaffolding of pretend play. Different theoretical and practical inputs were provided, such as props; allowing time and space for this form of play; daring to intervene during play; assuming a role in order to develop the children's play; observing children playing, for instance in order to identify curriculum knowledge (a privileged form of assessment in the early school years, as it reveals the child's zone of proximal development); presenting an

evaluation grid making it possible to determine the maturity of pretend play (Leong & Bodrova, 2012) and highlighting the necessity of this form of play for learning and development. This training lasted a total of about seven hours spread over several half-days. The second author and another professor of the Valais university of teacher education delivered these sessions. It is important to note that this course was compulsory for all preschool and kindergarten teachers in this specific part of Switzerland. The other two teachers benefited from this input during their initial teacher training (before graduating).

Regarding the teaching of socio-emotional competences by the teachers in the control group, this work was globally carried out through storytelling, discussions with children, pretend play, in situations (e.g., during conflict resolution) and through the creation of tools (e.g., thermometer or wheel of emotions) helping children to identify or regulate their emotions. The teachers in the experimental group also planned teaching/learning sessions on socio-emotional competences in their regular school program, because their development is an essential part of the kindergarten school curriculum.

2.4. Program based on pretend play: experimental group

As indicated above, in this study, the program was partly based on Landry's thesis (Landry, 2014) and it has been the object of an implementation process including a first step of assessing the feasibility of the program in a kindergarten class (5–6 years). Thus, the first researcher implemented the 11 sessions of the program in a class. Results showed that, compared to the control group, the experimental group improved in their ability to recognize the emotions of anger and disgust, emotions presented with a visual context and the ability to associate an emotional term with an emotional facial expression. It also showed a decrease in the frequency of use of dysfunctional emotional regulation strategies (Richard et al., 2019). After this first exploratory study, adaptations were consequently made to the program. In a second study, the intervention was implemented by a group of teachers who benefited from 20 h of training in order to help them establishing the activities proposed in their classroom. The teachers experimented with this new version of the program and gave us feedback on the activities proposed and the effects on the children. Findings for this study highlighted a significant improvement in the experimental group's ability to associate an emotional term with an emotional facial expression, to recognize the emotion of anger and to recognize emotions globally and with no visual context (Richard, Baud-Bovy, et al., 2021).

As in the second study (Richard, Baud-Bovy, et al., 2021), teachers received 20 h of specific training by the main researcher on the content of the sessions of the program and their implementation. These training sessions allowed the researchers to maintain contact with the teachers throughout the implementation process, to answer their questions about the program and its effects on the children, and to address the topic of pretend play, its scaffolding, and socio-emotional competences. The program implemented in the present study consisted of 11 sessions lasting approximately 60 min with detailed planning for each session and a document suggesting different interventions to be implemented in order to raise the level of pretend play (see Supplemental material: pedagogical booklet, Richard, in press). In this last version, based on teachers feedback from the second study (Richard, Baud-Bovy, et al., 2021), the major changes made are as follows: an addition of extra time (about 20 min) to allow children to explore the play props (in the sessions 6 and 8), all the illustrations used were finalized for this study, a pedagogical booklet proposing intervention guidelines (in addition to the indications present in the program sessions) to support the development of pretend play.

The first two weeks of the 11-week program required two 30-min sessions each, followed by one 60-min session for the nine subsequent weeks. At weeks six and eight, there was an additional 20 min before the sessions dedicated to exploring the new pretend play accessories. Each session included a highly structured teaching/learning time guided by

the teacher with the group of students gradually decreasing to allow more time for play. During these sessions, competence elements specifically focused on socio-emotional skills (i.e. emotion comprehension, emotion regulation and prosocial behaviour) were worked on with the students. Pictures were used to support the recognition of emotions or the stories told by the teacher. Other pictures were used to illustrate strategies for regulating negative emotions. Stories from children's literature were also read to the children. The pupils were then asked questions so that they can learn to identify, for example, the emotions of the characters, or use a procedure to solve an interpersonal problem. These questioning times were linked to teaching times during which the teacher highlighted what needs to be learned (by explaining, rephrasing, pointing out, clearly indicating what needs to be learned). The teacher and pupils then co-constructed the knowledge and the pupils should in turn reuse it spontaneously or with the close assistance of the teacher in the pretend play times that systematically followed these structured teaching/learning moments. In order not only to make the play more mature but also to develop previously targeted elements of socio-emotional competences, the pretend play times were globally structured as follows (for more details on targeted learning, structured activities and pretend play scaffolding see Richard, Baud-Bovy, et al., 2021, and the file "Supplemental material: Training sessions"): 1) Pretend play time increased gradually; 2) The teacher's scaffolding of pretend play was very tight at the beginning of the program then should become more flexible during session 11, depending on the level of pupils' pretend play (e.g. at the beginning, it was the teacher who proposes the scenarios; only certain aspects of pretend play were worked on such as mimicking an emotion, then adding a word or phrase and varying the prosody. The teacher interpreted a role, then during the last session he or she should intervene more punctually depending on the level of pupils' pretend play); 3) Challenges related to the pretend play scenario were given to the pupils so that they develop the ability to plan their play, but also put into practice the knowledge they had worked on in the structured moments with the group; 4) Pretend play was first performed by the whole class together with the teacher, then in pairs, in teams of 3–4 and 5–6 children during the last sessions; 5) Props were introduced as of session 6 and were aimed to help the children support the development of their roles and scenario ideas (e.g. some children need to have the stethoscope, glasses and doctor's coat to be able to take on the role and maintain it).

2.5. Measures

2.5.1. Group comparison: control variables

2.5.1.1. Non-verbal intelligence. Non-verbal intelligence assessment was carried out with the support of a black-and-white version of Raven's Progressive Matrices (PM-47) test (Raven et al., 1998). This test comprised 36 items. For each item, the children had to complete a matrix. To do so, they were asked to identify which of the items shown below the matrix correctly completed it. The difficulty of the items increased as the test progressed. Each correct item was worth 1 point, with a maximum score of 36.

2.5.1.2. Verbal intelligence. Verbal intelligence was assessed using an active and passive vocabulary (TVAP) test for 5- to 8-year-old children (Deltour & Hupkens, 1980). In this task children had to choose (among six) the image that corresponded to a word pronounced by the examiner. A total of 30 words were presented. Each correct item was worth 2 points and each "approaching" answer, 1 point, with a maximum score of 60.

2.5.2. Socio-emotional measures at pre- and post-test

2.5.2.1. Emotion comprehension. Task 1. "The emotional label

comprehension task" (Richard et al., 2019 adapted from Theurel & Gentaz, 2015). In this task, children were asked to point at the emotional facial expression (from a choice of three) which corresponded to an emotional label read by the examiner. The emotional facial expressions used were from Baron-Cohen et al. (1997). Six items were presented in order to assess six basic emotions (sadness, anger, disgust, fear, joy and surprise). Each correct item was worth 1 point, with a maximum score of 6.

Task 2. "Test of Emotion Recognition" (Theurel et al., 2016). This task included two subtests. The entire task is available in a booklet online (Theurel & Gentaz, 2016). In the "Facial Emotion Recognition Task" (first subtest), a child's emotional facial expression (joy, fear, anger, sadness and disgust) was presented through a character in a street (visual scene containing no contextual cue). After the presentation of each picture (a total of ten for the first part), the children had to point at the correct emotional facial expression (corresponding to the emotion felt by the character in the picture) among three expressions given by three different children of the same gender as the character in the previous picture. This task assessed the ability to recognize emotional facial expressions displayed without visual context. In the second subtest, "Emotion Recognition in Context Task", the design is the same. A picture of a character expressing a basic emotion was presented. After the presentation, three emotional facial expressions were displayed. The children chose the facial expression among the three that corresponded to the emotion felt by the character in the visual setting. The differences with the previous subtest were the following: the second part was composed of twenty pictures and the character was presented here in a visual scene containing contextual information congruent with the character's emotional facial expression. This second part of the test assessed the ability to recognize emotional facial expressions displayed within a context. Each correct item was worth 1 point, with a maximum of 30. A global score was calculated.

Task 3. "Emotion comprehension task" (Cavadini et al., 2021). This task was adapted from previous work (Pons & Harris, 2000; Theurel et al., 2016) and included two subtasks: 1. Recognition of four basic emotions and a neutral facial expression; 2. Emotion comprehension of external causes in others, itself subdivided into two tasks. Only the second subtask was used for this study. In this trial, the children had to understand the causes of four basic emotions (joy, fear, anger and sadness) plus a neutral facial expression by (1) pointing to, and (2) naming the one that matched the emotion felt by a character in five given situations based on external contextual elements. The examiner displayed five cartoon scenarios illustrated by a picture of a character in a specific situation (e.g., "A boy just got a birthday present"). These five stories were read by the examiner, who showed the picture corresponding to the scenario. Then, the children were asked to answer how the character felt in that situation, first by pointing to one of the four emotional facial expressions and the neutral response representing the character's emotional responses (five illustrations), and secondly, by labelling the emotion felt by the protagonist. Each correct answer (pointing and labelling) was worth 1 point, with a maximum of 5 for each subtask. We computed two independent scores (percentage of correct answers) for the two subtasks, one for pointing and one for labelling.

The four scores obtained for these three tasks were converted to each child's percentage of success. The four scores were aggregated and divided by four in order to obtain a global percentage of success representing the variable "emotion comprehension". Only this score was used in our analyses.

2.5.2.2. Prosocial behaviour. Task 4. "Social Challenge". To assess children's ability to choose prosocial solutions when confronted with an interpersonal problem, we used a variation of the "Challenging Situation Task" (CST) (Denham et al., 1994). The task was translated into French by the first author and adapted. The children had to select a behavioural

response from a limited choice of answers, after the presentation and oral description of three situations illustrated by three pictures of physical provocation. Thus, the children were asked what they would do in that situation and three possible responses were displayed using three pictures representing prosocial, aggressive or avoiding behaviour. The score corresponds to the number of times each child chose one of these three responses to the three situations shown by the experimenter, which is represented by one point per situation. The score ranged from 0 to 3 for each behaviour category.

Task 5. “Prosocial orientation” (Ornaghi et al., 2015). This task included four illustrated scenarios describing familiar situations experienced by a child (a boy or girl, corresponding to the gender of the child participating in the study). The four items were centered on specific prosocial behaviours: comforting, peacemaking, sharing and helping. A story was read by the experimenter for each picture, followed by a question evaluating the child's prosocial orientation (“How do you think the story will end?”). The children's responses were directly transcribed. The original coding procedure was adapted in order to integrate not only the point of view of the protagonist of the story, but also the point of view of the respondent. Thus, for instance, answers included prosocial interventions proposed by the child's respondent (e.g., “They will take turns on the swings”), but not systematically including “an action of the protagonist of the story” (e.g., “Lucas (protagonist) says that they can take turns on the swing”) were accepted. A score of 0, 0.5 or 1 was granted for each item, resulting in a maximum possible score of 4. First, two judges coded together 5 of the children's responses in both groups at pre- and post-test, then they independently coded those responses, attaining a satisfactory level of inter-rater reliability at both time points (Measure of agreement $\kappa_{11} = 0.869$ and $\kappa_{12} = 0.843$). The coders resolved disagreements via discussion and created a final set of scores.

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). The French version of this questionnaire was used (Fombonne et al., 2005). This tool is utilized for behavioural (adaptive and problematic) assessment adapted for children aged 3 to 16 years. It includes 25 items that can evaluate five categories of behaviours on a three-point scale (0 = *Not true*, 1 = *Somewhat true*, 2 = *Certainly true*): emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour. In this study, we used only the subscale that assesses prosocial behaviour, which was completed by parents. This subscale comprises 5 items examining consideration for others, the ability to share, empathetic attitude, kindness, and tendency to help others. The maximum score was 10. The psychometric properties of the SDQ are strong, particularly for teacher. For the subscale prosocial behaviour, mean internal consistency was high ($\alpha = 0.82$) and test-retest reliability was satisfactory over time ($r = 0.79$) (Stone et al., 2010). In this study, Cronbach's alpha for the prosocial behaviour scale is acceptable at t1 and t2 ($\alpha_1 = 0.632$, $\alpha_2 = 0.534$).

2.5.2.3. Emotion regulation. Structured interview with concrete scenario. To assess the children's perception of the frequency of use of functional and dysfunctional strategies to regulate negative emotions, a French interview was used (Richard, Baud-Bovy, et al., 2021). First, the experimenter read a specific scenario from López-Pérez et al. (2017). It described the situations most frequently mentioned by parents: “Imagine you cannot do something you really want to, such as play with a toy, see your best friend or go to a place you really like”. After that, children had to estimate how they would feel on a scale illustrated by five smileys (1 = *very bad* to 5 = *very good*). If a child answered “*bad*” or “*very bad*” the interview continued, otherwise it stopped.

After that, nine strategies of emotion regulation were read to each child. They were illustrated with the use of a picture representing a neutral character that could be perceived as either a girl or a boy (e.g. “When you feel like this (*very bad/bad*, pointing to the smiley at the same time), do you breathe deeply (show the child) like the child in the picture?”). Six strategies were considered functional: physio-relaxant strategy,

social sharing, cognitive reappraisal, behavioural distraction, physical comfort seeking and situation modification, and the other three, dysfunctional: expressive suppression, rumination and verbal/physical aggression. The experimenter then asked the children how often they used the strategy: *never*, *sometimes* or *almost always* (with a score ranging from 1 to 3). Cronbach's alpha for the scale frequency of use of functional strategies is acceptable at t1 and t2 ($\alpha_1 = 0.575$, $\alpha_2 = 0.640$). In contrast, Cronbach's alpha for the scale frequency of use of dysfunctional strategies is not satisfactory at time 2 ($\alpha_1 = 0.466$, $\alpha_2 = 0.254$). However, it is important to note that this scale includes only 3 items, which is a small number of items. According to Pallant (2011), it is common to find quite low Cronbach's values with short scales. Slightly increasing the number of items would lead to acceptable values for Cronbach's alpha. Mean scores for the frequency of use of functional regulation strategies and the frequency of use of dysfunctional strategies were computed and used in our analyses.

Emotion Regulation Checklist. The French version of the emotion regulation checklist (ERC, Shields & Cicchetti, 1995, 1997; ERC-fv, Nader-Grosbois, 2013) is another-report measure of children's self-regulation composed of 24 items. Parents assessed their children's ability to regulate their emotions. Each item was rated on a 4-point Likert scale. Two dimensions composed the questionnaire: “Lability/Negativity” and “Emotion Regulation”. As we focus only on emotion regulation, we will analyze the data from this subscale exclusively. The items included in this dimension describe behaviours that refer to the ability to adaptatively display emotional reactions, empathy and emotional self-awareness. Even though Cronbach's alpha for the emotion regulation scale is low in this study with the French validation at t1 and t2 ($\alpha_1 = 0.416$, $\alpha_2 = 0.425$), internal consistency for this factor was considered adequate for the French version validation (Nader-Grosbois & Mazzone, 2015; $\alpha = 0.72$, with children age 36–76 months). Regarding test-retest reliability, the correlation between ERC-fv scores at time 1 and time 2 was high 0.92 ($p < .001$) for this subscale (Nader-Grosbois & Mazzone, 2015). The mean scores on the scale were used for the analyses. Mean scores were computed under the condition applied by Gaspard et al. (2021) that “more than half of the items had valid responses”.

2.5.2.4. Pretend play. A short questionnaire on children's social pretend play was completed by teachers. This questionnaire was developed by Perren and Sticca (2019). The tool consisted of three items. The first and the second assessed the frequency of pretend play in general and with peers while the third item assessed the overall level of children's pretend play. A detailed description of the theoretical definition of low and high social pretend play was included by the authors in order to help the teachers understand the item and better assess the level of pretend play. Each question was rated on a five-point Likert scale (e.g. 0 = *never*, 1 = *seldom*, 2 = *sometimes*, 3 = *often*, 4 = *always*), with a maximum score of 12. Jaggy, Perren, and Sticca (2020) showed a good test-retest reliability ($r(59) = 0.71$, $p < .01$) and internal consistency ($\alpha_1/t_2 = 0.80/0.78$) with children aged between 37 and 56 months. According to the authors, this tool seems to be sensitive to differences in changes between children. However, they ran their analyses only on the two last items. Nevertheless, this gave us an important indication as to the interest of using this measure. In this study, Cronbach's alpha is acceptable, if we take into account the fact that there are only 3 items, at t1 and t2 ($\alpha_1 = 0.506$, $\alpha_2 = 0.538$). The questionnaire was translated into French by the first author and some adaptations have been made to some terms to correspond to the terminology used by the teachers in the training sessions on pretend play (i.e., in the first question we added the specification: “during the moments of free play”; for the third item, we used the terms “immature/mature” in the description, instead of the terms “low/high”; we used “poorly developed to highly developed” instead of “very low to very high level” of play in the Likert scale).

2.5.3. Program Implementation (only experimental group)

In order to assess the fidelity, sustainability and feasibility of the program in the experimental group, teachers first reported their perception of how the intervention was implemented using a “Weekly Implementation Grid” (WIG) inspired in part by [Bierman et al. \(2008\)](#), and then at the end of the 11 sessions they completed a “General Questionnaire on Program Implementation”. The weekly grid included one question on adherence, two questions on exposure to program content, and one question assessing students’ understanding (responsiveness) (see [Table 2](#) for the questions). The “General Implementation Questionnaire” (GIQ) was also created for this study, it included questions about a) use of materials b) length of sessions c) group formation during sessions d) student engagement e) reinvestment of program tools and content in daily classroom life f) usefulness of the program for managing behavioural problems g) ease of integrating the program into the regular program h) sustainability i) open-ended comments (program strengths and weaknesses). Not all questions were examined in this paper; only the questions presented in [Table 2](#) were included to evaluate the implementation of the program. Qualitative data were also collected, but they will likewise not be explored in this paper.

Finally, 14 sessions (delivered by each of the 12 teachers with two teachers being observed twice) were assessed by the principal researcher and two independent observers. Adherence to the script and instructions, and children’s comprehension of the essential elements of the session were evaluated using the same two questions used in the teacher WIG presented below ([Table 2](#)).

3. Results

Regarding the effect of the intervention on children’s socio-emotional competences, the children included in the analysis were able to carry out all the tasks, and no one was excluded due to outlier outcomes. We applied the same rule to not exclude outliers to the questionnaires completed by parents and teachers. However, those children in the structured interview with a concrete scenario who did not report feeling “bad” or “very bad” could not continue the interview on negative emotion regulation strategies and were excluded from the analysis exclusively for this measure. Statistical analyses were computed using IBM SPSS Statistics (Version 27) Computer Software. The results are presented in two sections: namely, descriptive statistics and group comparisons at pre-test time for all study variables and the effects of the intervention on socio-emotional competences and pretend play competence.

Concerning the implementation outcomes in the experimental group, descriptive statistics related to teachers’ answers to the WIG and GIQ and differences among the teachers’ assessments and the external observers’ evaluations on some fidelity measures are presented.

3.1. Descriptive statistic and group comparisons at pretest time

[Table 1](#) shows the means, standard deviations, minimum, maximum and median for all variables as a function of group condition at both pre- and post-test. Statistical *t*-tests and a Mann-Whitney test were run on the control variables (verbal and non-verbal intelligence) and on socio-emotional variables to ensure group homogeneity at pretest. One Mann-Whitney test was carried out on the variable measuring aggressive responses in the Challenging Social task given that values for skewness and kurtosis were extreme at pretest and moreso at post-test indicating a strong violation of normality. According to [Weston and Gore Jr. \(2006\)](#), absolute values for skewness and kurtosis higher than 3 and 20 respectively are judged extreme. Globally, there is almost no difference between the experimental and control groups at pretest in the different variables and particularly in the control variables, except for the prosocial variable measured by the SDQ and the frequency of functional strategies.

3.2. Effect of the intervention on children’s socio-emotional competences

A first repeated measures multivariate analysis of variance was run, with the factors Time (pre vs. post), Group Condition (experimental vs. control) as the independent variables. Specifically, Time was a *within-subject* factor whereas Group Condition was a *between-subject* factor. This MANOVA procedure gives a global picture of the effect of the training on the general dependent variable, here “socio-emotional competences”. Indeed, schematically, this procedure constructs a linear combination of the dependent variables to form a single synthetic variable on which an anova can be used ([Dancey & Reidy, 2016](#)). Scores for Emotion Comprehension, Emotion regulation scale, Prosocial Orientation and SDQ prosocial were the dependent variables. We excluded CST prosocial and avoidant from this multivariate analysis, as Levene’s tests¹ were significant at pre-test time. Effect sizes were assessed by calculating the partial eta-squared (η_p^2) value. Values of 0.01, 0.06, and 0.14 indicate small, medium, and large effects, respectively ([Richardson, 2011](#)). A significant effect of Time, $Wilks'\lambda = 0.511$, $F(4, 175) = 41.86$, $p < .001$, $\eta_p^2 = 0.489$, and a marginally significant effect of Time x Group condition, $Wilks'\lambda = 0.952$, $F(4, 175) = 2.22$, $p = .069$, $\eta_p^2 = 0.048$, emerged from this preliminary analysis.

The univariate tests revealed that the Time, and especially the Time x Group Condition interaction were significant for emotion comprehension, $F(1, 178) = 4.33$, $p = .039$, $\eta_p^2 = 0.024$ for Time x Group Condition. Significant effects of time were found for Emotion Regulation, $F(1, 178) = 11.215$, $p = .001$, $\eta_p^2 = 0.059$, Prosocial orientation, $F(1, 178) = 41.05$, $p < .001$, $\eta_p^2 = 0.187$, and SDQ Prosocial, $F(1, 178) = 11.32$, $p = .001$, $\eta_p^2 = 0.060$, but no significant effects of Time x Group condition were found for these variables.

As the number of subjects was different for the frequency of use of functional strategies of negative emotion regulation and dysfunctional strategies of negative emotion regulation, we ran a second, separate repeated measures multivariate analysis of variance, with these two variables as dependent variables representing the general construct “emotion regulation”. A significant effect of Time, $Wilks'\lambda = 0.935$, $F(2, 154) = 5.385$, $p = .005$, $\eta_p^2 = 0.065$ and no significant effect of Time x Group condition, $Wilks'\lambda = 0.992$, $F(2, 154) = 0.65$, $p = .525$, $\eta_p^2 = 0.008$, were obtained through this analysis. The univariate tests highlight a significant effect of Time, $F(1, 155) = 8.12$, $p = .005$, $\eta_p^2 = 0.050$ only for dysfunctional strategies of negative emotion regulation, but no significant effects of Time x Group condition were found for the two variables.

As the data were not normally distributed for the CST aggressive variable, a Wilcoxon signed-rank test was run as a function of group condition. For the control group, the score for aggressive response was not significantly lower at post-test time, $z = -1.27$, $p = .206$, $r = -0.34$. However, for the experimental group the opposite was true: the score for aggressive response was significantly lower at post-test time, $z = -2.68$, $p = .007$, $r = -0.51$. We calculated an approximate effect size using this equation $r = \frac{z}{\sqrt{N}}$ ([Rosenthal, 1991](#) cited by [Field, 2018](#)), where *z* is the *z*-score and *N* is the number of total observations on which *z* is based. For the control group, *N* corresponds to a total of 14 observations (7 participants contributed 2 scores), because 72 participants were excluded as they had differences of zero. For the experimental group, *N* corresponds to a total of 28 observations (14 participants contributed 2 scores), because 87 participants were excluded as they had differences of zero. The experimental group effect size was above Cohen’s benchmark of 0.5 ([Field, 2018](#)), indicating a large change in levels of aggressive behaviour after the training.

Finally, as the Levene’s tests were significant at pre-test time for prosocial and avoidant CST, we also carried out Wilcoxon signed-rank

¹ This test can be used to test “the null hypothesis that the variances in different groups are equal”. In other words, this test examines if “the variance of the outcome variable or variables is the same in each group” ([Field, 2018, p. 257](#)).

Table 1Means (and Standard Deviations), minimum, maximum and median of all variables as well as the significance (2-tailed) of statistical tests in pretest (Independent Samples *t*-Tests and one Mann-Whitney test).

	Pre-test										Post-test										
	Control					Experimental					Control					Experimental					
Variable	N	M (SD)	Min	Max	Mdn	N	M (SD)	Min	Max	Mdn	N	M (SD)	Min	Max	Mdn	N	M (SD)	Min	Max	Mdn	p
Emotion comprehension ^b	79	65.62 (13.53)	23.33	93.33	65.83	101	66.19 (12.57)	31.67	90.00	67.50	79	73.60 (9.97)	41.67	89.17	75	101	78.23 (9.76)	44.17	100	79.17	0.772
Emotion regulation	79	3.28 (0.31)	2.56	4.00	3.33	101	3.31 (0.31)	2.25	3.89	3.33	79	3.38 (0.30)	2.78	3.89	3.44	101	3.35 (0.30)	2.56	4.00	3.33	0.587
Fr. of functional strategies ^a	71	2.23 (0.45)	1.33	3.00	2.33	86	2.07 (0.42)	1.17	3.00	2.17	71	2.24 (0.43)	1.17	3.00	2.33	86	2.18 (0.45)	1.00	3.00	2.17	0.027*
Fr. of dysfunctional strategies ^a	71	1.64 (0.53)	1.00	3.00	1.67	86	1.61 (0.51)	1.00	2.67	1.67	71	1.50 (0.44)	1.00	2.33	1.33	86	1.48 (0.44)	1.00	2.67	1.33	0.677
CST.Prosocial	79	2.18 (0.84)	0	3	2.00	101	2.01 (1.07)	0	3	2	79	2.14 (0.94)	0	3	2.00	101	2.15 (0.95)	0	3	2.00	0.243
CST.aggressive	79	0.09 (0.33)	0	2	0	101	0.17 (0.45)	0	2	0	79	0.04 (0.19)	0	1	0	101	0.05 (0.26)	0	2	0	0.183 ^c
CST.avoidant	79	0.73 (0.75)	0	2	1.00	101	0.82 (0.97)	0	3	1.00	79	0.82 (0.94)	0	3	1.00	101	0.80 (0.93)	0	3	1.00	0.495
Prosocial orientation	79	2.73 (1.003)	0	4.00	3.00	101	2.68 (0.98)	0	4.00	3.00	79	3.11 (0.89)	0	4.00	3.50	101	3.29 (0.75)	0.50	4.00	3.50	0.764
SDQ.prosocial	79	8.44 (1.60)	0	10.00	9.00	101	8.88 (1.30)	4.00	10.00	9.00	79	8.84 (1.23)	5.00	10.00	9.00	101	9.13 (1.14)	5.00	10.00	9.00	0.044*
Pretend play	79	7.92 (1.80)	4.00	12.00	8.00	101	7.63 (2.34)	0	11.00	8.00	79	9.00 (1.85)	2.00	12.00	9.00	101	8.86 (1.65)	4.00	12.00	9.00	0.363
Verbal intelligence	79	36 (9.19)	14	50	38	101	35.24 (9.44)	12	54	37											0.587
Non-verbal intelligence	79	20.89 (5.95)	10	32	21	101	20.28 (5.66)	7	33	20											0.485

* $p < .05$.

^a Children who did not answer that they felt “bad” or “very bad” at the concrete scenario read by the experimenter at pre- and/or post-test were excluded from the analysis only for this measure. Therefore, the interpretable data on the “frequency of use of functional and dysfunctional strategies” are based on a sample of 71 children in the control group and 86 children in the experimental group.

^b Scores are expressed as a percentage of success.

^c A Mann-Whitney test was run.

tests as a function of group condition. No significant results were found for these two variables.

3.3. Effect of the intervention on children's pretend play competence

A repeated measure with Time as a within-subjects factor, pretend play competence as a within-subjects variable and Group condition as between-subjects factor was run. Tests of within-subjects effects revealed a significant effect of Time $F(1, 178) = 54.29, p < .001, \eta_p^2 = 0.234$, but no significant effect of Time x Group condition was found.

3.4. Implementation outcomes for the experimental group

Table 2 shows the descriptive statistics related to teachers' answers to the WIG and GIQ as a function of fidelity, feasibility and sustainability. Moreover, Mann-Whitney tests were run in order to compare teachers' assessments to the external observers' evaluations on some fidelity measures.

The average rating for fidelity ($M = 1.35$) and children's comprehension ($M = 1.34$) indicate that, from the teacher's perspective, the program was delivered with high fidelity and children's comprehension was high. Children's absence per session was very low ($M = 0.303$), daily reinvestment of elements of the program was *sometimes* globally carried out by teachers and children. Only eight teachers integrated the props program during "free activities", which means that children could freely reuse the props used in the program at other play times outside the sessions. Interestingly, children's engagement and interest were quite high and the intervention seems to be *very useful* for dealing with behaviour problems for the majority of the teachers. Another good indicator of program implementation revealed that more than half of the teachers report that they will use the program next year and recommend it to their colleagues indicating that the program may be progressively integrated into the daily pedagogical practice. Finally, the average rating for feasibility ($M = 4.08$) was quite high, suggesting that the program was globally *easy* to implement.

Mann-Whitney tests were run to examine if there were differences among the teachers' assessments, the external observers' evaluations of adherence and the children's comprehension of the essential elements of the sessions. The results reveal a significant difference between the teachers' assessments ($M = 1.21, SD = 0.426$) and the external observers' assessments ($M = 1.86, SD = 0.535$) of adherence, $U = 155.50, p = .007$. External observers' ratings tended to highlight more *minor changes* in program delivery compared to the teachers' ratings. We find no significant result for the teachers' evaluations ($M = 1.29, SD = 0.469$) and the external observers' evaluations ($M = 1.00, SD = 0.000$) of the children's comprehension, $U = 70.00, p = .210$, indicating an agreement between them on this point.

4. Discussion

According to the purpose and hypotheses of our intervention study, we obtained the following main results: the program based on pretend play had a positive effect on children's global performance on emotion comprehension and on the decrease in aggressive responses to the CST. The intervention did not significantly improve participants' frequency of use of functional emotion regulation strategies or of emotion regulation, nor did it significantly decrease participants' frequency of use of dysfunctional negative emotion regulation strategies. Finally, regarding prosocial behaviour, the program had no positive effect on prosocial orientation, prosocial or avoidant (with a reduction in) responses to the CST or to the SDQ prosocial subscale. These findings are now discussed with a special focus on the influence of pretend play and the data collected in relation to the program implementation on the experimental group.

The children who benefited from this pretend play-based program displayed significantly greater gains in emotion comprehension than

Table 2

Teachers' answers to the WIG and GIQ as a function of the main implementation outcomes: fidelity, feasibility and sustainability.

Fidelity	Adherence	Fidelity reported by teachers for the 11 sessions ^a	M^b = 1.35, SD = 0.185 [1 = as described in the planning session; 2 = minor changes; 3 = major changes; 4 = session not achievable]
		Use of program materials	All the teachers reported using all or almost all of the materials M^b = 0.303, SD = 0.206
	Exposure (including transfer to the daily activities in class)	Children's absence per session (only children included in the study) ^a Children's frequency of reinvestment of program elements during the week (outside the specific sessions) ^a . Teachers' frequency of reinvestment of program elements during the week (outside the specific sessions) ^a . Integration of the props program during "free play" time	M^b = 2.06, SD = 0.320 [1 = <i>never</i> ; 2 = <i>sometimes</i> ; 3 = <i>very often</i>] M^b = 2.25, SD = 0.165 [1 = <i>never</i> ; 2 = <i>sometimes</i> ; 3 = <i>very often</i>] 8 teachers = <i>systematically</i> 2 teachers = only for the program 2 teachers = some of the props M^b = 1.34, SD = 0.338 [1 = almost all children understood the main points of the session; 2 = about half of the children understood the main points of the session; 3 = almost no children]
	Responsiveness	Children's comprehension of the essential elements taught in the 11 sessions. ^a	10 teachers = almost all children understood the main points of the session; 2 = about half of the children understood the main points of the session; 3 = almost no children]
		Children's engagement and interest during the sessions	10 teachers = almost all children 2 teachers = about the half of the children 0 teacher = almost no children 10 teachers = <i>very useful</i> 2 teachers = moderately useful 0 teacher = not very useful
		Program's usefulness to deal with children's behaviour problems	9 teachers = yes 2 = perhaps 1 = <i>no</i> 11 teachers = yes 1 teacher = <i>no</i> M = 4.08, SD = 1.165 [1 = <i>very difficult</i> to <i>very easy</i> = 5]
Sustainability		Use of the program next year	
Feasibility		Recommendation of the program to colleagues Ease of integrate the intervention to the regular school program	

Note.

^a All these questions are taken from the teachers' "weekly implementation grid".

^b Mean and Standard Deviation were calculated on the basis of the 11 sessions. After each session, teachers reported the information required in their weekly implementation schedule.

their peers in the control group. This result confirms that the intervention enhanced the emotion comprehension competence of the participants, in line with positive outcomes previously obtained in some aspects of emotion comprehension with children of the same age (Richard et al., 2019; Richard, Baud-Bovy, et al., 2021). Emotion comprehension therefore seems to be one of the most sensitive constructs to the effects of the program compared to the other competences. Different explicative hypotheses can be envisaged in regard to pretend play. Firstly, when children endorse a role, they need to imagine the emotional perspective of the role and when pretend play becomes social they must imagine others' emotional experiences (if they want to play together). The more complex form of pretend play (social) seems to be more beneficial for understanding emotion, because children have more opportunity to practice their ability to imagine others' emotional states (Lindsey & Colwell, 2013). In sum, using one's imagination to adopt others' emotional perspectives should allow children to experience the emotional state of their roles or that of their play partners and therefore understand it better (Harris, 2007; Seja & Russ, 1999). Secondly, pretend play generates social situations in which children experience emotions. These emotional experiences in the context of pretend play should gradually familiarise them with the characteristics of situations that trigger these emotions and how to express these emotions (Seja & Russ, 1999), thus enhancing their competence to understand the causes and consequences of the emotions they and the others express. Finally, other potential mechanisms have been highlighted by Richard, Baud-Bovy, et al. (2021): 1) the repetition of the elements of competences (e.g., aspects of emotion comprehension) worked on during the more structured teaching times in various simulated situations in the context of play or 2) the importance of verbalizing and explaining emotions during the structured teaching time between children and the teacher and during the pretend play phase (with the conversations between children and with the teacher on the causes of some emotions, how to express them etc.). All these potential explanations give us a different perspective to understand the effect of the intervention on emotion comprehension.

Another interesting result was the program's positive effect, in reducing the aggressive behavioural responses to the CST in the experimental group. We did not obtain significant decreases in the control group. According to Bauer et al. (2021) a higher propensity towards pretend play in a preschool sample enhanced cognitive and affective control (cool and hot EF, respectively). This study sheds some light on our result in that, through the pretend play phases (during meta-communications on emotions, on the negotiation of the scenario, the roles and the props, as well as during immersion in imaginary scenes via role interpretation), children improved their affective control and consequently may decrease their aggressive response strategies. On the other hand, it is possible that the functional negative emotion regulation strategies taught during the program were probably (at least cognitively as new rules of behaviours) integrated by the children, leading them to decrease their "venting" strategies such as aggressive behaviours. Our finding is moreover in line with the teachers' answers related to "*program's usefulness to deal with children's behaviour problems*". More than the majority declare that the program was *very useful*.

Regarding the effects of the program on the other variables, no significant results were found. For emotion regulation, children likely need more time to integrate the several strategies taught during the intervention to regulate negative emotions in their everyday behaviour. They only had the last six sessions in which they could use some of them during pretend play time. Moreover, some of these strategies, cognitive reappraisal strategy or situation modification for example, were complex for children of this age and needed to be used with the help of an adult and reinvested regularly. For prosocial behaviour, our argument is the same: children need more time and external assistance to integrate and internalise more complex skills such as the use of prosocial solutions when they are confronted with an interpersonal problem or a situation in which another child expresses distress. In addition, this type of

behaviour needs to be scaffolded by the teacher outside the specific sessions in order to encourage the transfer of newly learned abilities in different social situations. In this vein, teachers' and children's frequency of reinvestment of the program elements during the week (outside the specific sessions) could be strengthened, as links with aspects of the program were generally *sometimes* realised ($M = 2.25$ by the teachers and $M = 2.06$ by children, see in Table 2, respectively at "Teachers' and children' frequency of reinvestment of program elements during the week"). In a future study, the procedures to strengthen new socio-emotional skills need to be planned to integrate parents, for instance. Indeed, the largest effect sizes are found when an intervention is delivered both at home and at school (Murano et al., 2020). Another way could be to strongly recommend the integration of props used in the program into free play time. Two teachers reported integrating "some of the props" and two other teachers reported using props "only for the program". Props integrated systematically after the sessions could represent good cues to retrieve the elements of skills worked on during the sessions. Regarding the assessment of the program's implementation fidelity, we found that the evaluation of 14 sessions by an external observer were significantly different from the teachers' evaluations. This finding suggests that although their assessment of the program implementation is high ($M = 1.35$) (See Table 2, in the "adherence" section: Fidelity reported by teachers), some aspects of the program were not fully implemented as planned indicating adaptations that had potentially impacted our results or revealing that some aspects of the program still need to be adapted. A qualitative analysis on teachers feed-back would be interesting to conduct in a future study.

Finally, concerning the non-significant effect of the program on pretend play competence, we can hypothesize that the lack of effect for the experimental group may be due to children in the control group having time to play during school and probably because teachers in this group scaffold also pretend play moments. In future studies, it would be interesting to include a third group with teachers not allowing time for this form of play in their classroom (e.g., games with rules or workshops) in order to see if children still make progress. However, this finding is still quite positive in the sense that allocating time and support to these moments of pretend play seems to significantly improve the level of pretend play competence in the two groups. While remaining cautious about the methodological aspects in our study (no third control group, no assessment on the way teachers scaffold pretend play), this result is in line with studies that highlight the importance of adults supporting play in order to increase the level of pretend play (Kalkusch et al., 2021).

5. Limitations

This study presents several limitations that need to be highlighted. Firstly, children's prosocial competence, strategies used to regulate emotions and level of pretend play competence were measured using 1) a task, 2) a semi-projective measure for prosocial behaviour, 3) and hetero-report questionnaires filled out by parents for prosocial behaviour and emotion regulation or by teachers for pretend play, and 4) a structured interview with children evaluating their frequency of use of negative emotion regulation strategies. It would be of great interest in future research to supplement these tools with ecological measures of children's prosocial behaviour, strategies of negative emotion regulation and levels of pretend play in the school context using observational instruments. Secondly, more observational assessments by trained independent observers needed to be done in the classroom in order to provide more unbiased insight into the fidelity of program implementation. Moreover, in a future study, the number of teachers involved in program implementation should be increased in order to measure the influence of the implementation fidelity on socio-emotional outcomes, as in the Goble et al. (2021) study. Indeed, they examined the relations between implementation (with a trained observer rating fidelity and scaffolding) by 75 teachers of the *Tools of the Mind* program and classroom-level gains in executive function. Thirdly, an observational

tool that assesses the scaffolding of pretend play and the way socio-emotional competences are taught at school should be used in order to evaluate the homogeneity of the two groups on these variables. The use of an observational tool such as CLASS (Classroom Assessment Scoring System; Pianta et al., 2008) would have been interesting to use in order to assess the emotional support domain in the classroom and/or with self-report questionnaires evaluating teachers' emotion socialization behaviours, such as self-reported positive and negative emotional expressiveness in the classroom, supportive and unsupportive reactions to children's emotions and beliefs about emotions (Denham et al., 2020). Teachers' expectations about their students can also play a role on socio-emotional program implementation as it is linked to teacher-child conflict (Trang & Hansen, 2021). For pretend play scaffolding, an observational tool such as the MPOT (Make-believe Play Observational Tool; Germeroth et al., 2019) centered on adult dimensions (e.g. teacher intervention) would be useful to determine teachers' behaviours during pretend play-based activities. All these variables are among the many key factors that can potentially impact the results of this type of research and need to be controlled for as far as possible in future studies. In addition, regarding the promising result about the decrease in aggressive responses in the experimental group, it is important to note that due to the non-parametric test we had to run, we could not examine the interaction between time and group. It is therefore necessary to be cautious in the interpretation of this result, and for this reason, we examined the results of each group separately and did not compare them. Finally, we don't know if the training effect on emotion comprehension and aggressive behaviour remains stable over time. In a further study a follow-up stage should be integrated into the research design (Durlak et al., 2011).

6. Kindergarten school implications, and future research directions

Despite these limitations, we believe that the results of this research have interesting implications for school learning and education professionals. Pretend play can be used in the classroom as a real working modality for teachers in order to foster some socio-emotional abilities and not only used as an activity in which young children can release a "surplus of energy". In Switzerland, some French-speaking authors propose a theoretical model for preschool and kindergarten teachers that integrates pretend play into a dynamic "Pedagogical structure" including five interdependent components (i.e., "pretend play", "structured/systematized teaching/learning activities", "consolidation activities", "Reunion" which can be understood as a period of meeting with children in which knowledge awareness is targeted and the component "knowledge" is at the center of the model and represents the linking unit of each component) (Truffer-Moreau, 2020). In addition to development, pretend play occupies important functions in this model, such as that of recognizing children's needs, integration in the classroom context, reinvestment of knowledge and of revealing their progress. In this perspective, pretend play scaffolding is essential to foster all these functions. Different interventions that support the development of this form of play can be conducted and taught to preschool and kindergarten professionals (for a typology of teacher interventions that support progress in pretend play and in school learning see Michel-Chevalley & Clerc-Georgy, 2020). In conclusion, more research using pretend play (in different ways) in order to enhance, for instance, socio-emotional competences need to be conducted in school contexts with trained teachers. The teacher training related to the support of socio-emotional competences in the first years of school and the scaffolding of pretend play need to be strengthened in order to build the necessary foundations for children's schooling. The combination of structured teaching moments on elements of socio-emotional competences followed by pretend playtime scaffolded around these socio-emotional elements seems to improve some aspects of socio-emotional competences. This approach appears to be an interesting one to develop some socio-emotional

competences compared to more "free responsive scaffolding" of pretend play.

Declaration of competing interest

We declare that no competing interests exist.

Data availability statement

All relevant data are within the paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.actpsy.2023.103961>.

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