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DOI
10.1016/j.jsp.2021.11.003

Publication date
2022

Document Version
Final published version

Published in
Journal of School Psychology

License
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Link to publication

Citation for published version (APA):
de Mooij, B., Fekkes, M., van den Akker, A. L., Vliek, L., Scholte, R. H. J., & Overbeek, G. (2022). Does affirming children's autonomy and prosocial intentions help? A microtrial into intervention component effects to improve psychosocial behavior. *Journal of School Psychology*, *90*, 60-81. https://doi.org/10.1016/j.jsp.2021.11.003

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Download date:14 9月 2026

Journal of School Psychology 90 (2022) 60–81

Contents lists available at ScienceDirect

Journal of School Psychology

journal homepage: www.elsevier.com/locate/jschpsyc

Does affirming children's autonomy and prosocial intentions help? A microtrial into intervention component effects to improve psychosocial behavior

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ARTICLE INFO

Action Editor: Eric Buhs

Keywords:
Prosociality
Autonomy
Social-emotional skills intervention
Microtrial

ABSTRACT

Prior research has related children's prosocial behavior to overall well-being, and stimulating prosocial behavior is the aim of many social-emotional skills interventions. This study assessed if affirming children's autonomy stimulates their psychosocial behavior. We conducted a three-arm microtrial with four repeated measures to assess if a social-emotional skills intervention with an autonomy affirmation component had an additive effect on children's behavior as compared to a "regular" intervention focused exclusively on teaching social-emotional skills and a no-treatment control condition. Our sample consisted of 779 children in Grades 4–6 ($M_{age} = 10.61$, $SD = 0.93$). Findings from latent change modeling demonstrated that the social-emotional skills intervention with an autonomy affirmation component yielded superior effects as compared to the "regular" intervention and the no-treatment control condition on the improvement of internalizing and externalizing problem behavior in the three-month period after the intervention. The intervention with autonomy affirmation did not yield superior effects on prosociality and social skills, self-efficacy, and self-esteem or self-perceived competence. The absence of these effects may be attributed to the dosage of the interventions implemented—the affirmation of children's autonomy may require more than four sessions to sort observable effects. Overall, however, the findings of this study provide an initial suggestion that it may be beneficial to affirm children's autonomy and prosocial intentions when enhancing children's behavior.

Prosocial behavior is characterized as positive and voluntary behavior directed towards the benefit of others, such as helping others get something they want, sharing toys, and comforting and caring for others when they are sad (Eisenberg et al., 2006, 2016). Engaging in prosocial behavior requires several sociocognitive abilities, such as holding a theory of mind, adequate processing of social information, and the ability to effectively regulate emotions (Dirks et al., 2018; Pakaslahti et al., 2002; Yagmurlu, 2014). Moral affect (e.g., feeling guilt or empathy) and moral cognition (e.g., moral reasoning and perspective-taking) also shape prosocial behavior (Laible et al., 2014). The interaction of these moral determinants produces behavior ranging from other-oriented and altruistic (e.g.,

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https://doi.org/10.1016/j.jsp.2021.11.003
Received 16 July 2020; Received in revised form 14 July 2021; Accepted 18 November 2021
Available online 2 December 2021
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comforting a sad friend) to more self-oriented and self-serving (e.g., helping to reduce negative arousal; Eisenberg et al., 2006; Paulus, 2014; Penner et al., 2005). As the behavior typically referred to as prosocial behavior not only includes behavior but also entails cognitive and emotional aspects, it is referred to as *prosociality* in this study.

Prosociality can be seen as a tool to maintain a desired level of social relatedness, social approval, and relationships. This is perhaps why adolescents tend to increase their prosociality when their peers accept them but are likely to reduce their prosociality when they feel excluded (Twenge et al., 2007; Wentzel & McNamara, 1999). In any case, research has provided evidence that people are more likely to behave prosocially when they feel connected to others (Pavey et al., 2011), and prosocial behavior provides access to the pleasures derived from positive social interactions (Paulus, 2014). For instance, positive other-oriented acts are related to increased positive affect and meaningfulness of experiences (e.g., Martela & Ryan, 2016). Prosocial children show higher academic achievement (Caprara et al., 2000), have fewer hostile attributions, and are less reactive to provocation than less prosocial children (Nelson & Crick, 1999). Prosocial behavior is also related to self-efficacy as children's belief in their ability to show empathy and regulate negative affect helps determine the display of prosocial behavior (Caprara et al., 2012).

Low levels of prosocial behavior have been related to peer rejection, anxiety, depression, and externalizing behavior in children (Flynn et al., 2015; Nantel-Vivier et al., 2015; Wentzel & McNamara, 1999). Even though prosocial behavior is not the polar opposite of externalizing behavior, a recent meta-analysis (Memmott-Elison et al., 2020) showed that higher levels of prosocial behavior were associated with lower levels of internalizing and externalizing behavior. This meta-analysis also found that the association between prosocial behavior and internalizing behavior was strongest for children ages 10–13 years old. Therefore, improving children's prosocial behavior may cascade into improvements in adverse well-being outcomes as well.

1. Enhancing children's psychosocial behavior

Many different social-emotional skills interventions have been designed and implemented to help children acquire an adequate set of social-emotional skills that enable them to show appropriate behavior (including prosociality) and prevent the development of problem behavior (Catalano et al., 2002). Most interventions apply a cognitive-behavioral approach (Bandura, 1978; Crick & Dodge, 1994) and aim to bring about behavior change by teaching children adaptive skills using methods such as modeling, role-play, and reinforcement techniques (e.g., tangible rewards and praise; Spence, 2003).

Merely teaching children *how* to show social-emotional skills may yield limited behavioral changes because this means imposing an external view on a child's behavior. According to self-determination theory (SDT), psychological growth and well-being require the fulfillment of three basic needs: competence, relatedness, and autonomy. SDT also poses that people generally have prosocial intentions and are more likely to show positive social behavior when the three basic psychological needs are satisfied (Ryan & Deci, 2000). Research has also shown that the effect of autonomy support on prosocial behavior is mediated by basic need satisfaction (Gagné & Deci, 2005; Kındap-Tepe & Aktas, 2019). This means that following the SDT model of change, people not only need to have a sense of being respected, understood, and cared for (i.e., relatedness) and to learn the tools and skills for behavior change (i.e., competence), but also need to value and personally endorse the behavior (i.e., autonomy; Ryan et al., 2008). Children's autonomy can be supported by adults who are responsive to children's needs, adults who provide choices, and adults who facilitate children to act in line with their personal values (Black & Deci, 2000; Soenens & Vansteenkiste, 2005).

SDT also poses that behavioral changes tend to be more lasting when people feel their needs are met (i.e., when they are highly self-determined) because they feel in control and responsible for their actions and are intrinsically motivated (Ryan et al., 2008; Ryan & Deci, 2017). In childhood, this means that children need to learn social-emotional skills, feel connected to their classmates, teachers, or trainers, and perceive that their behavior and goals are self-advocated. In other words, all basic needs have to be met for children to internalize the motivation to behave prosocially.

Skills associated with self-determination—the ability to make choices and decisions, solve problems, set goals, regulate behavior, be assertive, and feel like being in control (i.e., self-efficacy; e.g., Algozzine et al., 2001; Carter et al., 2011)—are not uniquely related to self-determination, but rather overlap with "regular" skills taught in childhood social-emotional skills interventions. For example, these interventions include strategies to strengthen social, emotional, behavioral, cognitive, and moral competencies (Catalano et al., 2002). To illustrate, Carter et al. (2011) established that a sizeable number of school-based interventions for children with or at risk for emotional and behavioral disorders included components aimed at skills associated with self-determination (95% of the reviewed studies). Only a few reviewed studies, however, included a component specifically aimed at self-advocacy (8.6% of the reviewed studies). Intrinsic motivation and the sense of responsibility to behave positively are thought to flourish when all three SDT needs are met. Thus it may be essential to affirm children's autonomy and intrinsic positive intentions to improve prosocial behavior (Ryan & Deci, 2017; Weinstein & Ryan, 2010).

2. Do social-emotional skills interventions work?

A systematic review of review articles and meta-analyses concluded that universal, school-based social-emotional skills programs had small to moderate positive effects on children's prosocial behavior and problem behavior (Weare & Nind, 2011). Other meta-analyses have also shown that these types of interventions appeared to have small effects on children's prosocial behavior (Cohen's d ranging from 0.23 to 0.39), internalizing behavior (Cohen's d ranging from 0.10 to 0.23), and externalizing behavior (Cohen's d ranging from 0.17 to 0.43; Durlak et al., 2011; de Mooij et al., 2020; Sklad et al., 2012). Interventions specifically targeting prosocial interactions yielded a moderate effect on children's interpersonal skills (Cohen's $d = 0.66$). Interventions specifically targeting internalizing behavior had a small effect on children's emotional skills (Cohen's $d = 0.26$), and interventions targeting externalizing

behavior had a small effect on children's interpersonal behavior (Cohen's $d = 0.66$; de Mooij et al., 2020).

Evidence for effects of childhood social-emotional skills intervention with a focus on SDT, and the additive effect of affirming children's autonomy, specifically, is scarce. Even so, previous research backs the notion that enhancing autonomy in interventions may be beneficial. Cross-sectional research in adults showed that being autonomously self-regulated was related to greater prosocial engagement (Gagné, 2003), and self-endorsed (i.e., autonomous) functioning has been related to positive psychological adjustment in adolescents (Van Petegem et al., 2012). Autonomy-supportive care climates predicted higher levels of autonomy, competence, and relatedness. Meta-analyses have also shown that promoting autonomy predicted improved physical and mental health in adolescents and adults (Ng et al., 2012; Teixeira et al., 2012).

These previous studies tell us that encouraging children's self-determination through autonomy support may be an important additive component to enhance children's social-emotional skills and reduce problem behavior. However, at this moment, the evidence is scarce for the effectiveness of autonomy affirmation as an intervention component in a school-based social-emotional learning context. Our current study was intended to fill this gap in intervention evaluations by examining the autonomy affirmation component from the Topper Training intervention program. To our knowledge, Topper Training is the only childhood intervention that explicitly affirms children's autonomy and prosociality. Prior studies have found that Topper Training improved children's prosocial behavior and self-esteem and reduced children's negative internalizing and externalizing behaviors (Vliek, 2019; Vliek et al., 2014, 2019). These findings suggest that an intervention that teaches social-emotional skills and affirms children's autonomy is beneficial to children's well-being but we are not able to conclude whether the observed improvements were specifically driven by the autonomy affirmation component of the intervention.

In general, social-emotional skills interventions include multiple components and strategies to attain similar goals. These programs are mostly evaluated as complete packages, surpassing the evaluation of the effects of specific components and strategies that are part of the complete intervention package. Programs that target children's social and emotional skills are heterogeneous, and the effectiveness of interventions varies considerably (Weare & Nind, 2011), calling for research into what drives intervention effects. Furthermore, if autonomy affirmation proves to have an additive effect when enhancing children's behavior, existing social-emotional skills interventions may become more effective with minor adjustments targeting autonomy as an intervention component.

3. Present study

In this study we assessed whether affirming children's autonomy and intrinsic prosocial intentions has an additive effect on universal social-emotional skills interventions' effect on children's prosociality and psychosocial behavior. Affirming children's autonomy is expected to improve children's psychosocial behavior and well-being via satisfaction of their psychological needs (Nelson et al., 2015; Ryan & Deci, 2000).

We used a three-arm microtrial approach, which is a brief randomized experimental approach to assess the impact of separate intervention components (Howe et al., 2010). The goal of microtrials is to test the effects of discrete intervention components on proximal outcomes rather than to bring about full intervention effects on distal outcomes. The information derived from microtrial studies like this one can inform intervention theory and help advance practice (Leijten et al., 2015).

We addressed two research questions in this study: (a) Are brief classroom-based social-emotional skills interventions effective in improving children's prosociality and psychosocial behavior? and (b) Is a brief classroom-based social skills-emotional intervention with an autonomy affirmation component more effective in enhancing children's prosociality and psychosocial behavior compared to a brief classroom-based social-emotional skills intervention without this component?

Our first hypothesis was that the interventions with and without an autonomy affirmation component would both be effective in improving children's prosociality, social skills, self-esteem, self-efficacy, self-perceived social competence, positive classroom climate, internalizing behavior, and externalizing behavior (de Mooij et al., 2020; Durlak et al., 2011; Sklad et al., 2012; Weare & Nind, 2011). We thus expected both interventions to outperform the no-treatment control group. Our second hypothesis was that an autonomy affirmation component has an additive intervention effect. We thus expected the intervention with the autonomy affirmation component to outperform the intervention without this component on all outcomes (Nelson et al., 2015; Ryan & Deci, 2000; Vliek et al., 2014, 2019).

It is widely accepted that early intervention is important to prevent the development of adverse well-being outcomes. Even though the development of prosocial behavior starts early in life (e.g., Eisenberg et al., 2006), social-emotional skills interventions aimed at children's prosocial behavior mostly target school age children (Mesurado et al., 2019; Weare & Nind, 2011). Also, self-determination seems to be a developmental task and promoting this from an early age may be beneficial (Dirks et al., 2018; Eisenman & Chamberlin, 2001). Therefore, this study focussed on children ages 8–12 years old. From a practice-based viewpoint, focussing on this age group was expected to generate the most beneficial insights for professionals implementing and developing social-emotional skills interventions.

4. Method

4.1. Participants

Our sample consisted of children attending Dutch primary schools. The participants had a mean age of 10.61 years ($SD = 0.93$, range 8.14–13.67) at Pretest 1. The sample consisted of 779 participants in which 157 children participated in the social-emotional skills intervention without the autonomy affirmation component (SS-Condition), 243 children participated in the social-emotional

skills intervention with the autonomy affirmation component (SS-AA-Condition), and 379 children were in the no-treatment control condition. Approximately half of the sample was male (53%, $n = 410$). Non-Dutch children (i.e., those who identified themselves as originating from a country other than the Netherlands) made up 45.1.% ($n = 353$) of the sample. Seven children did not disclose their ethnicity. Not all children completed all measurement occasions (see Fig. 1); however, those who completed all measurement occasions did not differ significantly from those who missed one or more measurement occasions on any of the outcome variables at Pretest 1.

4.2. Design

We used a randomized microtrial approach with three conditions (i.e., SS-Condition, SS-AA-Condition, and a no-treatment control condition) and four timepoints. Randomization took place at the school level before the first timepoint. As some schools had a larger student body than others, the number of participants in the three experimental conditions was uneven. The measurement occasions took place approximately five weeks before the start of the intervention (i.e., Pretest 1), one week before the start of the intervention (i.e., Pretest 2), one week after the intervention had ended (i.e., Posttest), and approximately three months after the intervention had ended (i.e., Follow-up). Power analysis was performed using G*Power and was based on the effects found for Topper Training in Vliek (2015). The power analysis established that a sample size of $n = 100$ participants per condition was required to find a difference between group means of Cohen's $d = 0.40$ at an alpha level of 0.05 (two-sides) and a power of 0.80. The Ethics Review Board of the University of Amsterdam (protocol number 2017-CDE-8098) approved this study.

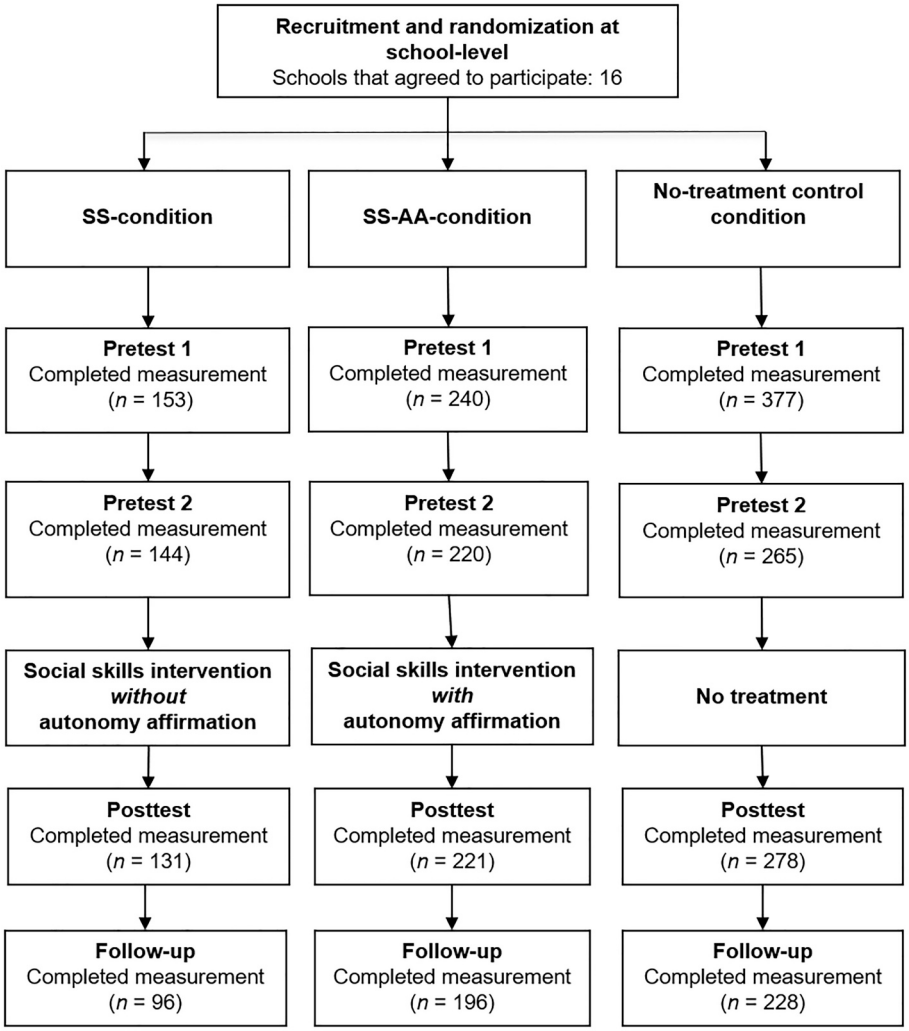

Fig. 1. Participant flowchart.

4.3. Sampling procedures

For the first wave of recruitment into the study, we sent information letters to schools in the area of Utrecht, the Netherlands. We invited schools to participate in our study if they provided regular primary education and had a sufficient number of pupils (i.e., at least 50 children in Grades 4–6). We excluded schools that had previously implemented Topper Training because we based our intervention with the autonomy affirmation component on this universal intervention (described in more detail below). All schools that met these selection criteria could enter the study. Schools were randomized into one of the three conditions upon registration to the study using a random number generator.

We recruited twelve schools between May 2017 and August 2017. Four schools completed the first measurement occasion in September 2017, and eight schools completed the first measurement occasion in January 2018. Another four schools were recruited through an advertisement in a Dutch national magazine for school counselors between May 2018 and August 2018 to achieve the required number of participants in the two experimental conditions. These schools completed the first measurement occasion in September 2018. One school in the control group only completed Pretest 2 and was therefore excluded from the final sample, which consisted of 15 schools: four in the SS-Condition, five in the SS-AA-Condition, and six in the no-treatment control condition. All classes in Grades 4–6 of these schools participated in the study. The SS-Condition contained a total of nine classes, the SS-AA-Condition contained 14 classes, and the control condition contained 24 classes. Compensation for schools in the experimental conditions was 50 euro and 150 euro for schools in the control group.

4.4. Procedure

We informed parents about the study and written informed consent was obtained before Pretest 1. These forms were collected by classroom teachers and the school counselor. Members of the research team visited all participating schools to supervise data collection at Pretest 1. Before the distribution of the questionnaires, we reviewed the informed consent forms, informed children that the study aimed to improve current childhood interventions, and shared that our goal was to gather information about children's opinions and day-to-day feelings at school. The completion of the instrument battery took approximately 60 min at each timepoint. After Pretest 1, school personnel supervised the remaining three measurement occasions for which they were provided an instruction manual. Before each measurement occasion, a member of the research team contacted school personnel to remind them of the upcoming measurement occasion and to check that the instructions were clear.

4.5. Outcome measures

4.5.1. Prosociality

Children's prosociality was measured using the Prosocial behavior subscale from the Topper Questionnaire, which has been shown to have adequate construct and convergent validity and reliability (Vliek, 2015). This self-report subscale measures to what extent children behave in a prosocial manner, feel competent in doing so, and desire to behave in a prosocial manner. An example item is "I help children in my class". Children answered the 9-item subscale on a 4-point scale (1 = *not true at all*, 4 = *very true*). The summed score of the items could range from 9 to 36; reliability was acceptable across measurement occasions (α = 0.94 to 0.99). Table 1 includes the means and standard deviations for all study variables.

4.5.2. Social skills

Children's social skills were measured using the Dutch translation (van den Heuvel et al., 2017) of the self-report version of the Social Skills Improvement System-Rating Scales (SSIS-RS; Gresham & Elliott, 2008). The English version of the SISS-RS has shown strong psychometric properties (Gresham et al., 2011). This measure includes multiple scales measuring aspects of social skills with children answering items on a 4-point scale (1 = *not true at all*, 4 = *very true*). The sum of the subscales Assertion (e.g., "I ask for information when I need it"; 7 items), Cooperation (e.g., "I pay attention when others present their ideas"; 7 items), Communication (e.g., "I say 'please' when I ask for things"; 6 items), Responsibility (e.g., "I have good manners"; 7 items), Empathy (e.g., "I try to forgive others when they apologize"; 6 items), Engagement (e.g., "I get along with other children"; 7 items), and Self-control (e.g., "I stay calm when I am being teased"; 6 items) comprised the social skills outcome measure. Summed scores can range from 46 to 184; reliability was acceptable across measurement occasions (α = 0.97–0.99).

4.5.3. Self-esteem

We assessed global self-esteem using the Dutch version of the Rosenberg Self-Esteem Scale (RSES; Franck et al., 2008), which is a well-established scale used to assess self-evaluations. This scale consists of five positively worded items (e.g., "I am happy with myself") and five negatively worded items (e.g., "I feel worthless sometimes.") that children respond to using a 4-point scale (1 = *not at all true*, 4 = *very true*). The items were transformed so that higher scores reflect higher self-esteem. Summed scores can range from 10 to 40; reliability was satisfactory across measurement occasions (α = 0.65–0.75).

4.5.4. Self-efficacy

We used the Dutch adaptation of the General Self-Efficacy Scale (GSES; Teeuw et al., 1994) to measure children's general self-efficacy. This scale measures how children cope with difficult situations and whether they believe they can successfully deal with challenging situations. This measure consists of 10 items (e.g., "I can solve most problems if I try hard enough") that children respond

Table 1
Means and standard deviations of outcome variables at four measurement occasions.

Outcome	SS-Condition							SS-AA-Condition							Control condition						
	Pretest 1	Pretest 2		Posttest		Follow up		Pretest 1	Pretest 2		Posttest		Follow up		Pretest 1	Pretest 2		Posttest		Follow up	
	n	*n*		*n*		*n*		*n*	*n*		*n*		*n*		*n*	*n*		*n*		*n*	
	M	*M*	*d*	*M*	*d*	*M*	*d*	*M*	*M*	*d*	*M*	*d*	*M*	*d*	*M*	*M*	*d*	*M*	*d*	*M*	*d*
	(SD)	*(SD)*		*(SD)*		*(SD)*		*(SD)*	*(SD)*		*(SD)*		*(SD)*		*(SD)*	*(SD)*		*(SD)*		*(SD)*	
Prosocial behavior	153	127		127		92		232	178		139		151		357	285		309		266	
	30.77	31.07	0.08	30.96	−0.03	30.62	−0.07	31.40	32.11	0.22	32.79	0.21	32.43	0.11	31.13	31.38	0.07	31.72	0.09	31.67	0.01
	(3.35)	(3.47)		(4.44)		(5.24)		(3.28)	(3.23)		(3.26)		(3.18)		(3.26)	(3.44)		(3.67)		(3.75)	
Social skills	151	143		128		92		235	179		141		150		361	286		313		264	
	141.16	142.69	0.08	144.82	0.11	143.74	−0.05	144.42	148.94	0.26	150.92	0.11	151.42	0.03	143.65	146.34	0.17	147.36	0.06	147.68	0.02
	(16.94)	(19.39)		(20.40)		(20.82)		(16.90)	(17.82)		(18.44)		(16.04)		(16.17)	(16.29)		(17.21)		(19.07)	
Self-esteem	152	140		126		94		230	177		161		150		355	303		312		266	
	20.76	21.42	0.15	22.26	0.19	21.88	−0.08	21.31	22.01	0.15	23.13	0.24	23.31	0.05	21.90	22.45	0.14	22.83	0.09	23.62	0.18
	(4.51)	(4.40)		(4.43)		(4.84)		(4.45)	(5.08)		(4.20)		(3.95)		(3.87)	(4.10)		(4.35)		(3.65)	
Self-efficacy	152	139		124		94		230	177		161		150		354	303		311		265	
	29.03	29.92	0.15	30.44	0.10	30.14	−0.05	30.86	31.66	0.16	32.61	0.19	31.79	0.16	29.91	30.60	0.15	31.43	0.17	31.86	0.09
	(5.53)	(5.14)		(5.66)		(6.33)		(4.96)	(5.15)		(5.02)		(5.33)		(4.43)	(4.57)		(4.92)		(5.03)	
Self-perceived competence	153	142		128		94		224	179		139		149		361	282		312		263	
	58.76	60.59	0.23	61.04	−0.06	60.08	−0.11	60.86	62.47	0.21	63.54	0.15	63.41	−0.02	61.57	61.97	0.06	62.71	0.10	63.49	0.11
	(8.13)	(7.38)		(7.94)		(8.80)		(7.73)	(7.39)		(7.13)		(7.26)		(6.66)	(7.61)		(7.46)		(7.03)	
Class climate	153	130		129		94		234	179		164		152		361	302		314		268	
	64.38	64.77	0.06	64.68	0.01	64.32	−0.04	65.16	65.33	0.03	65.51	0.03	66.14	0.11	64.35	64.10	0.05	64.59	0.08	65.13	0.09
	(6.28)	(5.81)		(8.06)		(8.69)		(5.30)	(6.22)		(6.24)		(5.46)		(5.67)	(5.52)		(6.40)		(6.06)	
Internalizing behavior	153	142		130		93		235	179		141		152		362	285		314		265	
	17.97	16.90	0.18	16.19	0.11	17.38	−0.18	17.44	16.03	−0.25	15.01	−0.18	14.50	0.10	16.60	15.38	−0.23	14.86	−0.10	15.32	0.08
	(5.91)	(5.83)		(6.45)		(6.78)		(5.73)	(5.66)		(5.39)		(5.01)		(5.28)	(5.30)		(5.30)		(5.45)	
Externalizing behavior	153	142		130		92		235	179		141		151		362	285		314		265	
	24.90	24.53	0.05	23.49	−0.14	24.45	0.13	24.26	22.34	−0.32	22.06	−0.05	21.25	−0.13	23.91	23.12	−0.13	22.77	−0.06	23.18	0.06
	(6.50)	(7.39)		(7.27)		(7.40)		(6.41)	(5.61)		(6.60)		(5.58)		(5.82)	(6.07)		(6.49)		(7.24)	

Note. SS-Condition = social-emotional skills intervention; SS-AA-Condition = social-emotional skills intervention with autonomy affirmation.

to by using a 4-point scale (1 = *not at all true*, 4 = *very true*). A higher score reflects greater general self-efficacy. Summed scores can range from 10 to 40; reliability of the GSES was acceptable across measurement occasions (α = 0.94–0.99).

4.5.5. Self-perceived competence

Children's self-perceived social competence was measured using the Dutch translation (Veerman et al., 1997) of the Self-perception Scale for Children (SPPC; Harter, 1985). We included the subscales Social Acceptance, Behavioral Conduct, and Global Self-Worth (18 items in total). In the original scale, all items consisted of two conflicting statements in which children were to indicate how accurate the best fitting statement is for them. To simplify the items and make them more consistent with the other outcome measures, we reformulated the items and response anchors (1 = *not true at all*, 4 = *very true*). An example item is "I have a hard time making friends." Summed scores can range from 18 to 72; reliability of the SPPC was acceptable across measurement occasions (α = 0.83–0.86).

4.5.6. Classroom climate

We used the Classroom Peer Context Questionnaire (CPCQ) to assess how children viewed the climate in their classroom. The CPCQ has good validity and reliability (Boor-Klip et al., 2016). This scale includes five subscales: Comfort (e.g., "I like my class"; 4 items), Cooperation (e.g., "In this class, children collaborate well"; 4 items), Conflict (e.g., "In this class, children gossip about each other"; 4 items), Cohesion (e.g., "In this class, everyone gets along well"; 4 items), and Isolation (e.g., "In this class, some children are outsiders"; 4 items). All items were rated by children on a 5-point scale (1 = *not true at all*, 5 = *very true*). Summed scores can range from 20 to 100; reliability of the CPCQ was acceptable across measurement occasions (α = 0.90–0.98).

4.5.7. Internalizing behavior

Children's internalizing behavior was assessed using the subscale Internalizing Behavior (e.g., "I am afraid of many things"; 10 items) from the SSIS-RS (Gresham & Elliott, 2008). Children answered all items on a 4-point scale (1 = *not true at all*, 4 = *very true*). Summed scores can range from 10 to 40; reliability was acceptable across measurement occasions (α = 0.90–0.99).

4.5.8. Externalizing behavior

To assess children's problem behavior we used the Externalizing Behavior (e.g., "I hurt others when I am angry") and Bullying (e.g., "I don't allow others to join my group of friends") subscales from the SISS-RS (Gresham & Elliott, 2008). Children answered the 15 items on a 4-point scale (1 = *not true at all*, 4 = *very true*). Summed scores can range from 15 to 60; reliability was acceptable across measurement occasions (α = 0.93–0.99).

4.6. Brief classroom interventions

We developed two brief classroom interventions for this study. The first intervention taught children general social-emotional skills with an additional, specific focus on affirming children's autonomy (i.e., SS-AA-Condition). This intervention consisted of social-emotional skills exercises that are standard in the repertoire of social-emotional skills interventions in the Netherlands, such as exercises that teach children communication skills and emotional skills. To form the intervention with the autonomy affirmation component, we distilled the core autonomy affirming exercises (see example in Appendix A) and autonomy-supportive language from Topper Training (Topper Training Foundation, 2007–2020).

We compared this first intervention to a second intervention that taught children general social-emotional skills without the explicit focus on affirming autonomy (i.e., SS-Condition). To form this intervention without the autonomy affirmation component, we distilled exercises from Topper Training that did not specifically address children's autonomy but rather addressed general social-emotional skills. As the use of autonomy-supportive language is a core feature of Topper Training, the more general social-emotional skills exercises were adapted to remove autonomy-affirming instructions. To guarantee that both interventions were time-equal, the intervention without autonomy affirmation (SS-Condition) was supplemented with adapted exercises from existing, well-used programs, including the ABC Competency training (Het ABC Onderwijsadviseurs, 2015) and Zippy's Friends (Mishara & Ystgaard, 2006; Partnership for Children, 2007).

The two interventions (i.e., SS-Condition and SS-AA-Condition) were extensively reviewed by experienced trainers to guarantee appropriateness for the target audience and employability. Both interventions (a) consisted of four, 1 h sessions separately provided to Grades 4, 5, and 6; (b) were implemented weekly, during school hours, in four consecutive weeks; (c) included information letters for parents and teachers about each session; (d) used language to stimulate children's experience of relatedness to each other and the trainer; and (e) used complementary materials, such as hand-outs and posters. Teachers were present during sessions but did not actively partake in the child-focused interventions. Table 1A in Appendix A presents a summary of the interventions.

All trainers in this study had previously received professional training to deliver social-emotional skills interventions to children and were familiar with the general social-emotional skills exercises that were included in both intervention conditions through their daily work. The intervention with autonomy affirmation was implemented by five trainers who were trained to implement Topper Training and were therefore also specifically trained to deliver the autonomy affirming exercises and use autonomy affirming language (i.e., both are also part of the regular Topper Training). The intervention without autonomy affirmation was provided by two trainers who were not trained to implement Topper Training but were trained to deliver social-emotional skills interventions. The intervention manuals—which were highly structured—were discussed with all trainers before implementation to adequately prepare them to deliver the intervention. Trainers had an average of 4.5 years of professional experience implementing social-emotional skills interventions for children.

In the SS-Condition, 81%–100% of the exercises were implemented as described in the intervention manual across intervention groups (i.e., classrooms). In the SS-AA-Condition, 79%–93% of the exercises were implemented as described in the intervention manual across intervention groups. It is important to note that not all trainers completed the implementation forms, so fidelity information was available for only half of the classrooms trained in the intervention conditions.

4.6.1. Social-emotional skills intervention without an autonomy affirmation component (SS-condition)

The social-emotional skills intervention without the autonomy affirmation component (i.e., SS-Condition) included exercises that teach children general social-emotional skills that are part of the standard repertoire of social-emotional skills enhancing exercises and that are typically included in established social-emotional skills interventions. Several skills that are important for positive social interactions were addressed in this intervention, including communication skills, problem-solving skills, and emotional skills. For example, children were taught to look others in the eye and practiced basic communication techniques such as starting and maintaining a conversation and communicating boundaries. The exercises included language used by trainers aimed to instruct children on how to behave in a prosocial manner and model this behavior.

4.6.2. Social-emotional skills intervention with an autonomy affirmation component (SS-AA-Condition)

The social-emotional skills intervention with the autonomy affirmation component (i.e., SS-AA-Condition) addressed the same social-emotional skills as the intervention without autonomy affirmation, with one core difference: all exercises were geared towards affirming children's autonomy and prosocial intentions (i.e., the autonomy affirmation component). This intervention builds on the notion that most people have the authentic desire to be trusted and act in ways that increase the well-being of the self and others and that people have agency over how they behave. Autonomy and prosocial intentions were stimulated at the instructional level (i.e., the trainers used autonomy-supportive language to increase awareness of the motivation and choice for prosocial behavior), as well as through the actual exercises. All exercises affirmed children's prosocial intentions and the responsibility to make choices that are in line with this intention (Vliek, 2015; Vliek et al., 2019).

Children reflected on their authentic selves (i.e., their personally valued interests) and practiced behaving authentically and respectfully towards themselves and others. An example of an autonomy affirmation exercise is the *caps exercise* that teaches children they can choose how they want to behave and reflect on their responsibility and prosocial intentions using different colored caps that represent different types of behavior (see Appendix A). The white cap stands for authentic and reliable behavior. A child that "wears" this cap chooses to be authentic and trustworthy, which is behavior that is typically desired by most children. Trainers model and children role-play different types of behavior using these caps to make children aware of their own and others' (choice in) behavior. Children are also made aware of the consequences of their behavior using a feedback exercise. Appendix A Table A1 and Vliek (2015) provide a more detailed explanation of the exercises.

4.7. Statistical analyses

We analyzed the data using latent change models (LCMs) in M*plus* version 7.31 (Muthén & Muthén, 1998–2015). This approach has a larger power to detect effects and is robust to non-normality as compared to traditional analysis of variance (Kline, 2011; Schmidt et al., 2014). All analyses were intention-to-treat and the models were fit using full information maximum likelihood to make use of all the available data (e.g., Raykov, 2005). We accounted for non-independence of observations due to the nesting of participants within classes by correcting the standard errors of the estimates for the non-independence of the data (i.e., type complex command; Muthén et al., 2002).

We assessed changes in the three conditions using a multigroup approach and based our model on the model described by Schmidt et al. (2014). First, we ran LCMs to assess the changes between measurement occasions (i.e., the base model). The reference point (i.e., intercept) in our models was Pretest 2, which allowed us to assess the changes in children's self-reported behavior from Pretest 1 to Pretest 2 (hereafter labeled the pre-intervention period), and from Pretest 2 to Posttest (hereafter labeled the intervention period). We used an equivalent model with Posttest as the reference point to assess the change from Posttest to Follow-up (hereafter the Follow-up period). Appendix B, Fig. B1 presents an illustration of our model. Model fit was considered good when the chi-square statistic was non-significant, the root mean square error of approximation (RMSEA) value was lower than 0.08, and the comparative fit index (CFI) value was higher than 0.95 (Hu & Bentler, 1999).

Next, we constrained the parameters representing the change between timepoints to equality within conditions (e.g., pre-intervention period change and intervention period change in the SS-Condition) and across conditions (e.g., intervention period change in the SS-Condition and the control condition) to assess both within- and between-condition differences. We compared the fit of constrained models to the fit of unconstrained models using chi-square difference tests. A significant chi-square difference means that the constrained parameters were statistically significantly different. For example, the parameter representing the intervention period change would be constrained to equality for the SS-Condition and the control condition. This means that, in the constrained model, the value for the intervention period change parameter is set to be the same in the two conditions. When this model fits the data significantly worse than the base model (e.g., the chi-square difference is statistically significant), this means that these two parameters are not the same (and are thus significantly different from one another). The syntax for the (un)constrained models is provided in Appendix B.

Table 2
Model parameters for the unconstrained latent change models.

Outcome	SS-Condition				SS-AA-Condition				Control condition			
	Intercept	Δ_{2-1}	Δ_{3-2}	Δ_{4-3}	intercept	Δ_{2-1}	Δ_{3-2}	Δ_{4-3}	intercept	Δ_{2-1}	Δ_{3-2}	Δ_{4-3}
	μ (SE)	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*
Prosocial behavior	30.76 (0.26)	0.22 (0.22)	-.08$_{a}$ (0.27)	−0.24 (0.45)	31.41 (0.36)	**0.63*** (0.31)	0.51 $_{ab}$ (0.26)	−0.17 (0.16)	31.12 (0.24)	−0.01 (0.16)	**0.51*****$_{b}$ (0.11)	−0.15 (0.17)
Social skills	141.12 (1.67)	0.83 (0.61)	2.52 (1.30)	−0.16 (1.65)	144.50 (1.51)	**3.67**** (1.29)	1.80* (0.86)	0.73 (1.19)	143.47 (1.21)	**2.41**** (0.86)	1.50* (0.68)	−0.89 (1.30)
Self-esteem	20.75 (0.37)	0.52 (0.40)	**0.68**** (0.24)	0.13 (0.23)	21.31 (0.35)	**0.88***** (0.25)	0.75** (0.23)	0.36 0.21	21.82 (0.21)	**0.55**** (0.21)	0.50 (0.18)	0.54* (0.26)
Self-efficacy	28.93 (0.51)	**0.91*** (0.22)	0.46 (0.38)	−0.00 (0.24)	30.89 (0.45)	0.58 (0.37)	**0.58*** (0.27)	−0.37 (0.33)	29.87 (0.24)	0.68** (0.19)	0.78*** (0.20)	0.37 (0.24)
Self-perceived competence	58.60 (0.88)	**1.71***** (0.32)	0.42 (0.38)	0.25 (0.54)	60.81 (0.44)	**1.73**** (0.61)	1.24** (0.47)	−0.39 (0.31)	61.46 (0.36)	0.27 (0.32)	0.88** (0.30)	0.73 (0.44)
Class climate	64.45 (0.53)	0.07 (0.47)	0.14 (0.75)	−0.44 (0.91)	65.15 (0.45)	0.41 (0.46)	−0.08 (0.38)	0.67 (0.45)	64.31 (0.51)	−0.12 (0.29)	0.37 (0.37)	0.27 (0.36)
Internalizing behavior	18.09 (0.49)	**−1.14**** (0.34)	−0.82 (0.52)	.84$_{b}$ (0.51)	17.49 (0.47)	**−1.70***** (0.31)	−0.60 (0.34)	-.57$_{a}$ (0.31)	16.70 (0.28)	**−1.27***** (0.27)	−0.38 (0.25)	.58$_{b}$ (0.40)
Externalizing behavior	25.06 (0.77)	**−0.54*** (0.24)	−0.76 (0.59)	.90$_{b}$ (0.52)	24.38 (0.42)	**−1.77***** (0.32)	0.13 (0.28)	−1.07**$_{a}$ (0.32)	24.03 (0.44)	−0.72** (0.25)	−0.35 (0.19)	.48$_{b}$ (0.45)

Note. Intercept = pretest 1; Δ_{2-1} = pre-intervention period; Δ_{3-2} = intervention period; Δ_{4-3} = follow-up period; SS-Condition = social-emotional skills intervention; SS-AA-Condition = social-emotional skills intervention with autonomy affirmation. Latent means in bold differ significantly from the within-group (pre-)intervention period at $p < .05$. Latent means that do not share subscripts differ at $p < .05$.

* $p < .05$.
** $p < .01$.
*** $p < .001$.

5. Results

5.1. Preliminary analyses

Before running the latent change models, we examined whether randomization had been successful using ANOVAs and chi-square tests. Results showed that the conditions did not differ concerning gender or baseline levels of prosociality, social skills, externalizing behavior, and classroom climate. There was a difference between conditions at Pretest 1 in terms of age, F (2,776) = 10.45, $p < .001$. Specifically, children in the control group ($M = 10.75$, $SD = 0.86$) were older than children in the SS-Condition ($M = 10.47$, $SD = 0.86$) and the SS-AS-Condition ($M = 10.44$, $SD = 1.03$). The SS-Condition also contained more children of non-Western origin as compared to the control condition, χ^2 (1, N = 779) = 131.65, $p < .001$. Linear regression analyses showed that age and ethnicity did not explain statistically significant variance (regression statistics available on request), so we did not control for age or ethnicity in the subsequent models. There were also statistically significant differences between the conditions concerning Pretest 1 scores on self-esteem, F (2,736) = 4.18, $p = .02$, self-efficacy, F (2,735) = 7.01, $p < .001$, self-perceived social competence, F (2,736) = 7.98, $p < .001$, and internalizing behavior, F (2,749) = 3.77, $p = .02$. The LCMs included Pretest 1 scores to control for initial differences. Table 1 presents the means and standard deviations of all outcomes at all measurement occasions.

Bivariate correlations (see Tables C1 and C2 in Appendix C) indicated significant, moderate to strong associations in the expected direction between all outcome variables except internalizing behavior, externalizing behavior, and class climate. Only the correlation between externalizing behavior and classroom climate at Pretest 2 was statistically significant.

5.2. Differences between the SS-condition, the SS-AA-condition, and the control group

We assessed potential change in the three conditions using multigroup latent change models (LCMs). The fit indices were adequate for all outcome measures (for the full fit statistics, see Table D1 in Appendix D). Table 2 presents parameter estimates for the LCMs. Subscripts indicate a statistically significant difference in parameters between conditions. Parameters in bold font indicate a statistically significant difference between the change during the pre-intervention period and the change during the intervention period within a condition; the parameter in bold signals the larger change. Tables D2 and D3 in Appendix D present the complete fit indices for the constrained LCMs and the chi-square difference values used to assess the between-condition and within-condition differences.

There were no statistically significant differences between the conditions concerning change in prosociality, social skills, self-esteem, self-efficacy, self-perceived competence, and class climate during the intervention period. During the follow-up period, children's scores in the SS-AA-Condition decreased significantly on internalizing and externalizing behavior, and this change was significantly larger as compared to both the SS-Condition ($\Delta\chi^2 = 4.36$, $p < .01$, and $\Delta\chi^2 = 13.16$, $p < .001$, respectively) and the control condition ($\Delta\chi^2 = 7.18$, $p < .01$, and $\Delta\chi^2 = 12.38$, $p < .001$, respectively). In the SS-Condition and the control condition children's internalizing behavior and externalizing behavior increased during the follow-up period (see Figs. 2 and 3). There were no other significant differences between the conditions during the follow-up period.

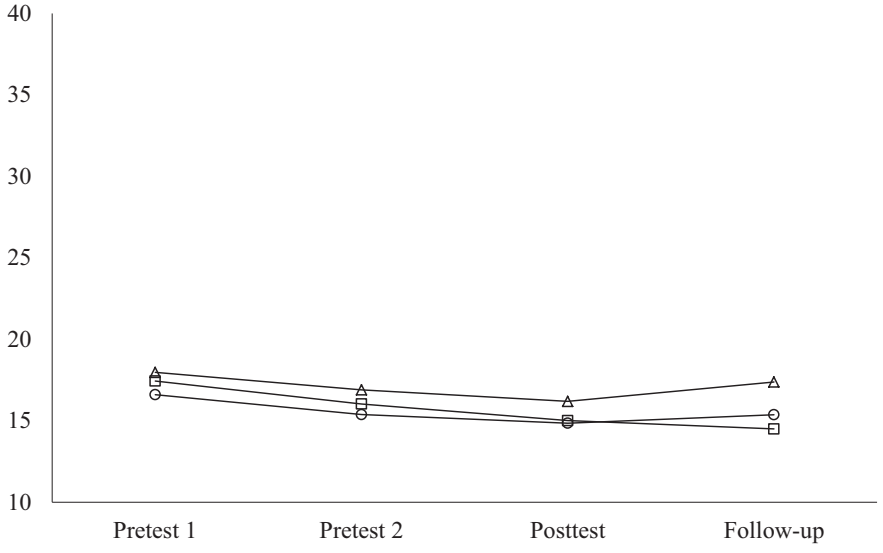

Fig. 2. Changes in internalizing behavior across conditions.
Note. Square marker = SS-AA-Condition; triangular marker = SS-Condition; round marker = control condition.

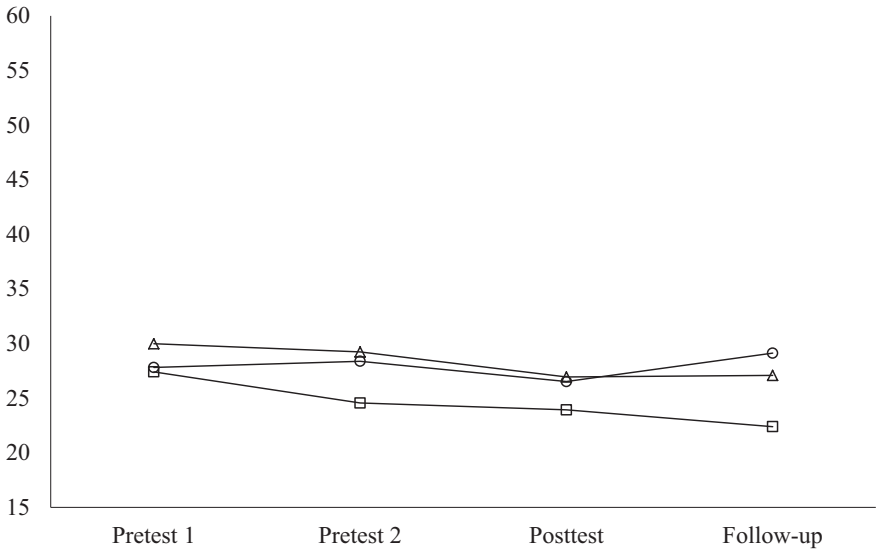

Fig. 3. Changes in externalizing behavior across conditions.
Note. Square marker = SS-AA-Condition; triangular marker = SS-Condition; round marker = control condition.

5.3. Additional analyses: differential effects for children with high externalizing behavior

To assess whether the intervention with autonomy affirmation was differentially effective for children reporting above-average externalizing behavior, we ran all latent change models for a subgroup of children from the SS-AA-Condition that scored one standard deviation or more above the sample mean on externalizing behavior at Pretest 1. We compared the effects of the intervention with autonomy affirmation in 206 children scoring below 1 *SD* on externalizing behavior (hereafter the low-group) to a group of 37 children scoring 1 *SD* or above on externalizing behavior (hereafter the high-group). We did not assess LCMs for prosociality, social skills, and class climate due to poor fit of the model to the data. The LCMs for the remaining outcomes had good model fit (non-significant chi-squares, RMSEA below 0.08, and CFI above. 95; see Table E1 in Appendix E).

In the high group, children's self-esteem increased significantly during the follow-up period ($\mu = 2.64$, $SE = 0.86$, $p < .01$) and this was significantly larger than the change in the low group during this period ($\mu = 0.04$, $SE = 0.22$, $p > .05$; $\Delta\chi^2 = 10.12$, $p < .001$). In the high-group, children's externalizing behavior also significantly decreased during the follow-up period ($\mu = -4.48$, $SE = 0.70$, $p < .001$) and this was significantly larger than the change in the low-group during this period ($\mu = -0.43$, $SE = 0.31$, $p > .05$; $\Delta\chi^2 = 18.73$, $p < .001$). Tables E2, E3, and E4 in Appendix E present the complete results for the additional analyses.

5.4. Within-condition changes

We also assessed within-condition changes. As this was not the main focus of this study, only the statistically significant results are described in this section. An extensive description of the within-condition changes is available in Appendix F.

In the SS-AA-Condition, children's social skills, self-esteem, and self-perceived competence increased significantly during the pre-intervention and intervention period, but these changes were larger in the pre-intervention period ($\Delta\chi^2 = 22.69$, $p < .001$, $\Delta\chi^2 = 22.59$, $p < .001$, and $\Delta\chi^2 = 31.50$, $p < .001$, respectively). Children's self-efficacy only improved in the intervention period. Children's prosociality, internalizing behavior, and externalizing behavior improved significantly in the pre-intervention period. Externalizing behavior also significantly decreased in the follow-up period.

In the SS-Condition, children's self-esteem increased significantly during the intervention period and this increase was significantly larger than the change during the pre-intervention period ($\Delta\chi^2 = 6.75$, $p < .01$). Children's self-efficacy, self-perceived competence, internalizing behavior, and externalizing behavior significantly changed during the pre-intervention period; these changes were significantly larger than the changes during the intervention period ($\Delta\chi^2 = 7.01$, $p < .01$, $\Delta\chi^2 = 11.14$, $p < .001$, $\Delta\chi^2 = 8.52$, $p < .01$, and $\Delta\chi^2 = 5.89$, $p < .05$, respectively).

In the control condition, children's prosociality and self-perceived competence increased significantly from Pretest 2 to Posttest (i.e., the intervention period for the experimental conditions). Children's social skills and self-efficacy increased significantly from Pretest 1 to Pretest 2 and from Pretest 2 to Posttest. For social skills, this change was significantly larger from Pretest 1 to Pretest 2 ($\Delta\chi^2 = 29.18$, $p < .001$). The increase in self-efficacy was significantly larger from Pretest 2 to Posttest ($\Delta\chi^2 = 30.68$, $p < .001$). Children's self-esteem increased significantly from Pretest 1 to Pretest 2 and from Posttest to follow-up, and both of these changes were significantly larger than the change from Pretest 2 to Posttest ($\Delta\chi^2 = 12.28$, $p < .001$, and $\Delta\chi^2 = 11.94$, $p < .001$, respectively). From Pretest 1 to Pretest 2, children's internalizing behavior and externalizing behavior decreased significantly but this change was only significantly larger than the change from Pretest 2 to Posttest for internalizing behavior ($\Delta\chi^2 = 18.45$, $p < .001$).

6. Discussion

This study assessed the additive effect of an autonomy affirmation component in a social-emotional skills intervention. We used a three-arm microtrial design with four repeated measures, comparing the effects of a social-emotional skills intervention that explicitly addressed children's autonomy to a brief classroom-based social-emotional skills intervention that did not, as well as to a no-treatment control condition.

6.1. Does affirming children's autonomy have an additive effect?

Our findings indicated that the autonomy affirmation component might have an additive beneficial effect in the long-term: the intervention with autonomy affirmation had superior effects—showing that in the three months after the intervention, children's externalizing behavior decreased significantly. This behavior change was substantially larger than the observed changes in the other two conditions during this period. Similarly, children showed a continued decrease in internalizing behavior in the three months after the intervention with autonomy affirmation, whereas in the other two conditions, children's internalizing behavior increased again.

These findings are a first indication that affirming children's autonomy may have a positive, accumulating effect on children's internalizing and externalizing behavior. In other words, helping children identify their inner goals and prosocial motivation using social-emotional skills exercises, guided by autonomy-supportive language (e.g., "Was it your intention to upset that child?") might have a beneficial effect on children's thinking patterns and behavior. However, it may take time for these changes to become evident. This finding is in line with previous research on the Topper Training program—the intervention that the intervention with autonomy affirmation was built on—showing that the complete intervention (consisting of ten, 90-min sessions) had a delayed positive effect on children's symptoms of depression, but had an immediate and longlasting positive effect on children's internalizing behavior and externalizing behavior in a sample of children with mild to severe psychological problems (Vliek et al., 2019).

Research has shown that adolescents with more controlling parents experience more autonomy need frustration and that this is likely related to more behavioral problems (e.g., van Petegem et al., 2015). Perhaps this association also holds in the opposite direction for the relationship between children and teachers or trainers. Thus, the mechanism of change underlying the effects of the intervention with autonomy affirmation may be as follows: the use of autonomy-supportive language teaches children that they may take up space to behave autonomously, and children's awareness of this responsivity diminishes the frustration of their need for autonomy. As a result, this might lead to a decrease in internalizing and externalizing behavior.

The autonomy affirmation component might teach children to act according to their own goals and desires, whereas "regular" social-emotional skills interventions teach children to show prescribed behavior and rely on incentives to do so. Relying on and affirming children's internal motivation for positive behavior might improve children's internalizing and externalizing behavior because it helps them perceive (the change in) their behavior as emanating from their authentic selves instead of an external force. It might also help children to internalize the idea that positive behavior allows them to reach goals—such as having friends or being positively evaluated—more easily (Ryan & Deci, 2000; Vansteenkiste et al., 2010). The behavioral change associated with the autonomy affirmation component may not be contingent on those providing the intervention (as opposed to modeling behavior) and may translate beyond the intervention context better. Affirming children's autonomy may also stimulate their engagement in the intervention, which might make children more apt to apply the competencies they learn in the intervention in other contexts (Ryan et al., 2008).

The effect found for the intervention with autonomy affirmation may have been boosted by the positive attitude of school personnel towards this intervention. Trainers observed that teachers were enthusiastic about the autonomy-supportive language used in the intervention and were motivated to apply this in their regular teaching. In contrast, the intervention without autonomy affirmation did not provide such language for teachers. We did not track to what extent teachers applied techniques from the interventions in their regular teaching, which raises the issue of whether our findings in the autonomy affirmation condition may have been augmented by teachers' continued use of autonomy-supportive language. Previous research has shown that intervention effects might be boosted when the child's environment is actively engaged in an intervention (e.g., Department for Education, 2018; Durlak et al., 2007). Such active involvement may not only pertain to teachers but could perhaps be extended to include children's broader context of development (e.g., whole school and parents). The interventions implemented in this study did not actively involve children's parents, but teaching parents to use autonomy-supportive language at home may further enhance intervention effects.

Contrary to our expectation, neither the intervention with autonomy affirmation nor the intervention without autonomy affirmation had effects on children's prosociality, social skills, self-efficacy, self-esteem, self-perceived competence, and class climate that were larger than the changes in the control condition. These findings suggest that the interventions were equally ineffective for these outcomes. Universal social-emotional skills interventions generally entail more extensive programs, and our findings suggest that four sessions implemented at the classroom level might not be a sufficient dosage to elicit behavioral changes and improve the classroom dynamic. In a recent meta-analysis, we found that a specific dosage of intervention components is related to their effectiveness; the inclusion of 10–20 exercises aimed at improving prosocial skills and problem-solving yielded the largest effects on children's social and emotional skills (de Mooij et al., 2020). The intervention with autonomy affirmation included nine exercises aimed at social skills acquisition, and the intervention without autonomy affirmation included eight such exercises. Extending these interventions to include a higher dosage of components might result in more pronounced intervention effects. A recent microtrial examining the effective components intended to improve children's social anxiety supported this idea. That study showed that brief interventions with either cognitive restructuring or exposure were effective in improving children's social anxiety. In comparison, a time-equivalent intervention with both components—each with a smaller dosage—sorted significantly fewer effects (de Mooij et al., 2020). This

explanation, however, supposes that the autonomy affirmation components yield unique effects on the constructs that were not detected in this study. Another possibility could be that the lack of significant findings can be attributed to our choice of outcome measures. Autonomy support is expected to satisfy SDT needs, and this satisfaction of needs is expected to lead to more intrinsic motivation for prosociality (Gagné & Deci, 2005; Ryan & Deci, 2017). Therefore, more effects may have been found if more proximal outcome measures had been used, such as mapping (changes in) children's personal values (e.g., using semi-structured interviews), measuring children's motivation, and using more individualized measures to assess if children feel more autonomous after the intervention with autonomy affirmation.

It is possible that the analysis at the group level caused significant intervention effects in subgroups of children to go unnoticed. Regular classrooms likely contain children with adequate social skills who may not benefit from a universal intervention to the same extent as children with a social skills deficit (e.g., Greenberg & Abenavoli, 2017). Analyzing intervention effects at the group level may, therefore, have obscured differential effects in subgroups of children. For example, affirming autonomy may be more effective for children showing more externalizing problem behavior, which may be a reaction to experiencing a lack of self-determinance (Deci & Ryan, 2000). Additional analyses indeed found that the intervention with autonomy affirmation worked better for children that scored high on externalizing behavior at Pretest 1 as compared to children that scored lower on externalizing behavior at Pretest 1. These findings should be interpreted with caution as there were only a few children that scored high on externalizing behavior and received the intervention with autonomy affirmation. Even so, these findings provide preliminary support for the notion that intervention components may have differential effects, an interesting avenue for future research.

6.2. *Limitations and strengths*

There are a number of limitations to this study that call for a cautious interpretation of our findings. The intervention without autonomy affirmation consisted of Topper Training exercises supplemented by social-emotional skills exercises from other intervention programs. As a result, some researchers may argue that this study did not provide a fair assessment of the additive effect of the autonomy affirmation component. However, the intervention without the autonomy affirmation was supplemented by exercises that are common in frequently used social-emotional skills interventions and was extensively reviewed by professionals who implement these interventions regularly. We, therefore, are confident that this intervention was a good representation of common social-emotional skills interventions. Both interventions also included multiple intervention components and our design did not allow us to assess causal interdependence of components. The combination of, for example, problem-solving skills and autonomy affirmation may have synergistic effects that future research can evaluate using factorial designs (e.g., Leijten et al., 2021) or network analyses (e.g., Blanken et al., 2019).

Another important limitation is that we relied on self-report data to assess children's prosociality. Using peer-nomination or teacher-report data might have provided a more comprehensive view of children's changes on prosociality and related outcomes as children might not be able to reliably or accurately assess their prosociality (Nelson & Crick, 1999). Also, we measured trait self-esteem and it can be considered a limitation to expect short-term changes on a trait construct that most believe builds over time slowly (e.g., Heatherton & Wyland, 2003). This may also explain the lack of effects found on this outcome measure. However, it may also simply be the case that an intervention aimed at improving prosociality does not work to improve self-esteem as the development of these constructs may only be moderately correlated (see Zuffianò et al., 2014).

The significant changes from Pretest 1 to Pretest 2 observed in all conditions also create an interpretive issue for our findings. We did not collect data on social-emotional skills interventions implemented by schools in the year(s) before the study. Dutch schools are required by law to attend to children's social-emotional development, making it likely that schools implemented some form of social-emotional skills intervention prior to the present study. The fact that other interventions may have already been ongoing in the participating schools might have confounded our findings and may also explain the improvements from Pretest 1 to Pretest 2 observed in all conditions. We did, however, exclude schools that had previously participated in Topper Training, so we are confident that children were not previously exposed to the autonomy affirmation component as implemented for this study. All timepoints were included in the models, which means that the model controls for the other timepoints in calculating a difference between timepoints, and thus we are confident that the findings from Pretest 2 to follow-up can be attributed to the implemented interventions. It is likely that schools that applied to participate in our study were generally motivated to attend to their student's social-emotional development, which may have resulted in a sample with fewer social-emotional deficits beforehand.

We did not collect any data on classroom-level or school-level climate or autonomy affirmation, which limited our ability to fully account for the nested structure of our data. However, we accounted for nesting within classrooms, and as such, we are fairly confident that our findings are not confounded by differences in classroom-level differences. We also did not control for trainers' baseline levels of autonomy-supportiveness. Trainers that implemented the intervention without autonomy affirmation were instructed to strictly adhere to the intervention manual, which did not include the use of autonomy affirming language. However, it may be that trainers are naturally inclined to support children's autonomy and this may have affected our findings.

Despite its limitations, this study also presents several strengths. To our knowledge, this is the first microtrial to examine the extent to which an autonomy affirmation component in a social-emotional skills intervention has added benefit when improving children's prosociality. The autonomy-supportive language included in the intervention directed at affirming children's autonomy and prosocial intentions can be implemented in existing social-emotional skills programs easily, which substantiates the practical relevance of our findings. Furthermore, our study displayed adequate power, increasing the confidence with which we drew our conclusions. Another strength was the inclusion of a follow-up and a broad measurement approach that allowed us to assess both the longer-term effects of the intervention with and without autonomy affirmation and enabled us to detect effects on outcome domains that we would have

otherwise missed. Using a sophisticated latent change modeling approach enabled us to identify the additive effect of addressing children's autonomy in a preventive intervention context. Finally, the lessons learned from this microtrial can inform future research into the effects of individual intervention components.

Future research on this topic may implement extended interventions and include an extended follow-up measurement to examine if the effect of affirming children's autonomy in a social-emotional skills intervention takes more time to become apparent. Future research should also include multiple informants, use proximal, state versions of dependent measures (e.g., experienced autonomy and motivation), take trainers' baseline levels of autonomy-supportiveness into account, measure the extent to which teachers apply techniques from the intervention in their regular teaching, and control for previously implemented interventions. More research into the determinants of children's social behavior could provide insights that may be beneficial for these interventions. Insights into children's motivation for prosociality may aid the development or adjustment of intervention components to specifically target this motivation (e.g., Eisenberg et al., 2016). Finally, we recommend recruiting a large enough sample to reach sufficient power to conduct subgroup analyses.

7. Conclusions

We evaluated the additive effect of an autonomy affirmation component in a universal social-emotional skills intervention, which yielded several conclusions with practical relevance. Although our findings should be interpreted with caution due to a number of limitations, our study provides a first indication that teaching children they have a choice in how to behave and reminding them of their responsibility to behave according to their (prosocial) intentions may reduce children's internalizing and externalizing behavior. Satisfying children's need for autonomy may be just as important as enhancing children's skills (i.e., supporting competence) and stimulating connection and trust (i.e., supporting relatedness) when aiming to change children's behavior.

Appendix A. Overview of the modules used

Table A1
Overview of the exercises in the social-emotional skills intervention (SS-condition) and the social-emotional skills intervention including the autonomy affirmation component (SS-AA-condition).

Session	Exercises in the social-emotional skills intervention (SS-Condition)	Exercises in the social-emotional skills intervention with autonomy affirmation (SS-AA-Condition)
1.	1. Introduction of the training. 2. Connecting with the trainer in a trusting way.* 3. Exercise to practice looking others in the eye.* 4. Exercise to practice standing tall and with confidence. 5. Vocalization exercise to allow children to experience their vocal range and to teach them to speak at a clear, appropriate level. 6. Introducing yourself to others, during which they keep in mind what they have learned about looking others in the eye, standing with confidence and speaking clearly. 7. Closure of the training session.	1. Introduction of the training. 2. Connecting with the trainer in a trusting way. 3. Caps exercise to teach children that there are four types of behavior (black: aggressive and dominating; yellow: shy and anxious; red: annoyingly funny and careless; white: authentic and trustworthy). 4. Explanation of importance of being authentic and trustworthy (white cap). 5. Exercise to practice looking others in the eye.* 6. Self-reflection exercise asking children to evaluate their own behavior in the classroom. 7. Explanation of worksheet with caps that children complete with their parents. 8. Closure of the training session.
2.	1. Opening of the session. 2. Review of exercises from the previous session.* 3. Exercise aimed at increasing children's emotion vocabulary. Distinguish between positive and negative emotions. 4. Exercises acting out emotion-words, aimed at teaching children that body language reflects emotions. 5. Exercise to practice giving and receiving compliments in an appropriate way. 6. Exercises to increase children's awareness of what a person's qualities can be and to teach children that everybody has positive qualities. 7. Explanation of a worksheet that children fill in with their parents, listing the positive qualities that make them unique. 8. Closure of the session.	1. Opening of the session. 2. Review of exercises from the previous session.* 3. Exercise to teach children how their behavior/attention can encourage negative and unacceptable behavior in others. 4. Exercise to practice standing tall and with confidence.* 5. Exercise to practice giving and receiving compliments in an appropriate way.* 6. Trust exercises aimed at teaching children they have social responsibility and to physically interact with each other in a respectful way. 7. Closure of the session.
3.	1. Opening of the session. 2. Review of the exercises from the previous session.* 3. Discuss the qualities worksheet that children completed with their parents. 4. Exercise aimed at teaching children a conversations technique to show an interest in others: asking short questions.*	1. Opening of the session. 2. Review of the exercises from the previous session.* 3. Exercise aimed at teaching children to show their boundaries and saying "no" to others.* 4. Exercise using statements to reflect on what it means to be a good friend (stimulate each other to behave in a prosocial way).

(*continued on next page*)

Table A1 (*continued*)

Session	Exercises in the social-emotional skills intervention (SS-Condition)	Exercises in the social-emotional skills intervention with autonomy affirmation (SS-AA-Condition)
	5. Exercise aimed at teaching children a conversation technique to get to know others better: listening to others well and asking in depth questions.* 6. Exercise to stimulate teamwork and practice with both leading and following another person. 7. Closure of the session.	5. Exercise to practice behaving in a authentic, trustworthy manner, even when others behave negatively. 6. Explanation of strategy to handle a situation in which the child has indicated it's boundary, but a peer continues negative behavior. 7. Feedback exercise aimed at children becoming aware of how peers view them. 8. Closure of the session.
4.	1. Opening of the session. 2. Review of the exercises from the previous session. 3. Exercise aimed at teaching children to show their personal boundaries by saying "no" to others.* 4. Exercise aimed at teaching children to control their impulses. 5. Explanation of strategies to stay calm when children need to control their emotions/impulses. 6. Exercises aimed at allowing children to practice with impulse control strategies. 7. Trust fall exercise aimed at increasing children's trust in each other. 8. Closure of the training program with a certificate.	1. Opening of the session. 2. Review of exercises from the previous session. 3. Exercise to stimulate children to talk about their feelings, especially when they feel sad or lonely. 4. Feedback exercises aimed at children becoming aware of how peers view them. 5. Stage dive exercise aimed at increasing children's trust in each other. 6. Closure of the training program with a cetrificate.

Note. Exercises indicated by an asterix (*) were the same in both intervention modules.

A.1. Explanation of the caps exercise (SS-AA-intervention exercise 3, session 1)

An example of a key exercise in the intervention with the autonomy affirmation component (SS-AA-condition) is the caps exercise. This is an exercise that stimulates children to reflect on their behavior using caps that represent three qualities of behavior and three pitfalls. The white cap represents trust and authenticity. This combination builds on the vision that by far the most people have the (authentic) desire to be trusted and to find solutions that increase well-being of the self and others. When the white cap is combined with the other colored caps, people show trustworthy behavior according to their desires: (white-black: trustworthy with power; white-yellow: trustworthy with empathy; white-red: trustworthy with humor). When trust is gone (in the group) or one does not act upon one's own autonomous (prosocial) desires, the white cap moves away and one shows the pitfall of each strength: too powerful behavior (black cap: bossy, bullying), too sensitive behavior (yellow cap: shy, anxious, pitiful), or too funny behavior (red cap: laughing at others, supporting the black cap behavior). In this exercise, children become aware of their own and others' behavior and of the consequences of their behavior (in feedback exercises). They become motivated to act upon their positive intentions and learn that they can choose how to behave (which cap(s) you choose to wear).

Appendix B. M*Plus* syntax for the unconstrained model with pretest 2 as the intercept

```
GROUPING = Group (0 = Condition1 1 = Condition2 2 = Condition3);
ANALYSIS
TYPE = COMPLEX;
ESTIMATOR = MLR;
MODEL:
intercptpre by Time1- Time4@1;
intercptpre difpre1pre2 | Time1@1 Times2@0 Time3@0 Time4@0;
intercptpre difpre2post | Time1@0 Time2@0 Time3@1 Time4@0;
intercptpre difpre2fu | Time1@0 Time2@0 Time3@0 Time4@1;
Time1@0;
Time3@0;
Time4@0;
difpre1pre2 with difpre2post@0;
difpre1pre2 with difpre2fu@0;
```

M*plus* syntax for the constrained model with posttest as the intercept used to assess the difference between condition 2 and condition 3 on the change from pretest 2 to posttest.

```
GROUPING = Group (0 = Condition1 1 = Condition2 2 = Condition3);
ANALYSIS
TYPE = COMPLEX;
ESTIMATOR = MLR;
MODEL:
intercptpost by Time1- Time4@1;
intercptpost difpre1post | Time1@1 Time2@0 Time3@0 Time4@0;
intercptpost difpre2post | Time1@0 Time2@1 Time3@0 Time4@0;
```

```
intercptpost difpostfu | Time1@0 Time2@0 Time3@0 Time4@1;
Time1@0;
Time2@0;
Time4@0;
difpre2post with difpostfu@0;
difpre1post with difpostfu@0;
[difpre2post](100);
MODEL Condition2:
[difpre2post](1);
MODEL Condition3:
[difpre2post](1);
```

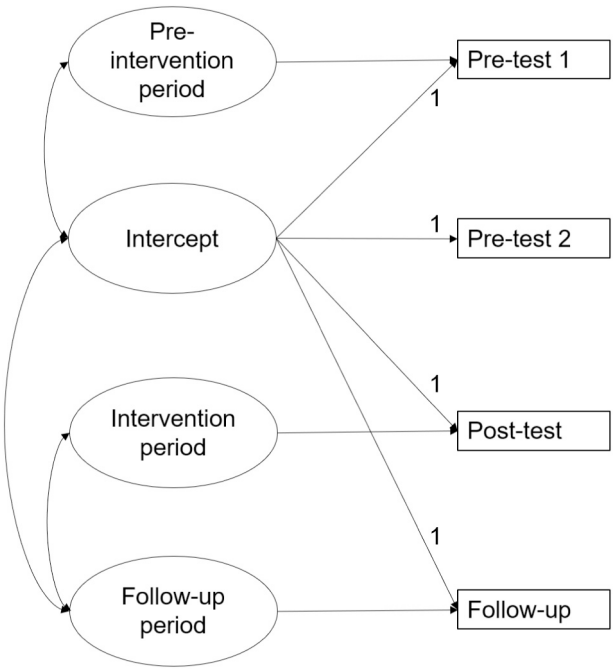

Fig. B1. Latent change model (LCM) with pretest 2 as the intercept.

Appendix C. Correlations between outcome measures at all measurement occasions

Table C1
Correlation between outcomes at pretest 1 (above diagonal) and pretest 2 (below diagonal).

	1.	2.	3.	4.	5.	6.	7.	8.
1. Prosocial behavior	–	0.67**	0.30**	0.49**	0.40**	0.27**	−0.12**	−0.35**
2. Social skills	0.66**	–	0.34**	0.61**	0.52**	0.25**	−0.20**	−0.47**
3. Self-esteem	0.35**	0.36**	–	0.45**	0.64**	0.14**	−0.52**	−0.34**
4. Self-efficacy	0.50**	0.60**	0.50**	–	0.54**	0.26**	−0.30**	−0.33**
5. Self-perceived competence	0.43**	0.50**	0.72**	0.54**	–	0.18**	−0.56**	−0.47*
6. Class climate	0.26**	0.24**	0.13**	0.25**	0.17**	–	−0.02	0.03
7. Internalizing behavior	−0.20**	−0.18**	−0.61**	−0.35**	−0.60**	−0.03	–	0.42**
8. Externalizing behavior	−0.39**	−0.46**	−0.33**	−0.35**	−0.50**	0.10*	0.49**	–

* $p < .05$.
** $p < .01$.

Table C2
Correlations between outcomes at posttest (above diagonal) and follow-up (below diagonal).

	1.	2.	3.	4.	5.	6.	7.	8.
1. Prosocial behavior	–	0.69**	0.44**	0.54**	0.48**	0.33**	−0.24**	−0.43**
2. Social skills	0.64**	–	0.39**	0.61**	0.52**	0.32**	−0.26**	−0.47**
3. Self-esteem	0.35**	0.40**	–	0.48**	0.71**	0.15**	−0.63**	−0.47**

(*continued on next page*)

Table C2 (*continued*)

	1.	2.	3.	4.	5.	6.	7.	8.
4. Self-efficacy	0.53**	0.62**	0.44**	–	0.53**	0.32**	−0.30**	−0.36**
5. Self-perceived competence	0.47**	0.55**	0.68**	0.50**	–	0.19**	−0.62**	−0.56**
6. Class climate	0.33**	0.30**	0.12**	0.26**	0.19**	–	−0.04	0.05
7. Internalizing behavior	−0.28**	−0.33**	−0.59**	−0.35**	−0.61**	−0.03	–	0.55**
8. Externalizing	−0.45**	−0.50**	0.41**	−0.35**	−0.54	0.04	0.65**	–

** $p < .01$.

Appendix D. Model fit indices of the unconstrained and constrained latent change models

Table D1
Fit indices for the unconstrained latent change models.

Outcome	χ^2	*df*	*p*	Scaling corrector	*RMSEA*	*95% CI*	*CFI*
Prosocial behavior	4.98	3	0.17	1.3934	0.05	[0.00, 0.13]	1.00
Social skills	7.35	3	0.06	0.9452	0.07	[0.00, 0.14]	0.99
Self-esteem	4.01	3	0.26	1.8852	0.04	[0.00, 0.12]	1.00
Self-efficacy	1.68	3	0.64	1.2978	0.00	[0.00, 0.08]	1.00
Self-perceived competence	4.48	3	0.21	1.6862	0.04	[0.00, 0.12]	1.00
Class climate	2.91	3	0.40	1.0477	0.00	[0.00, 0.10]	1.00
Internalizing behavior	1.58	3	0.66	1.2738	0.00	[0.00, 0.08]	1.00
Externalizing behavior	0.60	3	0.89	1.1829	0.00	[0.00, 0.05]	1.00

Note. RMSEA = Root Mean Square Error of Approximation; 95% CI = 95% confidence interval; CFI = Comparative Fit Index.

Table D2
Model fit statistics for latent change models used to assess the equality of parameters within conditions.

Outcome	Model	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*	$\Delta\chi^2$
Prosocial behavior	Unconstrained model	4.98	3	0.17	0.05	[0.00, 0.13]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	5.78	4	0.22	0.04	[0.00, 0.11]	1.00	0.80
	Δ_{3-2} and Δ_{4-3} equal in SS	6.17	4	0.19	0.05	[0.00, 0.11]	1.00	1.19
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	25.68	4	0.00	0.14	[0.09, 0.20]	0.96	20.70***
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	6.26	4	0.18	0.05	[0.00, 0.11]	1.00	1.28
	Δ_{2-1} and Δ_{3-2} equal in CTRL	11.49	4	0.02	0.08	[0.03, 0.14]	0.99	6.51**
	Δ_{3-2} and Δ_{4-3} equal in CTRL	8.93	4	0.06	0.07	[0.00, 0.13]	0.99	3.94*
Social skills	Unconstrained model	7.35	3	0.06	0.07	[0.00, 0.14]	0.99	
	Δ_{2-1} and Δ_{3-2} equal in SS	10.79	4	0.03	0.08	[0.02, 0.14]	0.99	3.44
	Δ_{3-2} and Δ_{4-3} equal in SS	11.60	4	0.02	0.09	[0.03, 0.14]	0.99	4.25*
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	30.04	4	0.00	0.16	[0.11, 0.21]	0.97	22.69***
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	12.81	4	0.01	0.09	[0.04, 0.15]	0.99	5.46*
	Δ_{2-1} and Δ_{3-2} equal in CTRL	36.54	4	0.00	0.18	[0.13, 0.23]	0.96	29.18***
	Δ_{3-2} and Δ_{4-3} equal in CTRL	5.37	4	0.25	0.04	[0.00, 0.11]	1.00	1.98
Self-esteem	Unconstrained model	4.01	3	0.26	0.04	[0.00, 0.12]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	10.76	4	0.03	0.08	[0.02, 0.14]	0.99	6.75**
	Δ_{3-2} and Δ_{4-3} equal in SS	6.38	4	0.17	0.05	[0.00, 0.11]	1.00	2.37
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	26.60	4	0.00	0.15	[0.10, 0.20]	0.97	22.59***
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	14.15	4	0.01	0.10	[0.05, 0.16]	0.98	10.14**
	Δ_{2-1} and Δ_{3-2} equal in CTRL	16.29	4	0.00	0.11	[0.06, 0.17]	0.98	12.28***
	Δ_{3-2} and Δ_{4-3} equal in CTRL	15.95	4	0.00	0.11	[0.06, 0.16]	0.98	11.94***
Self-efficacy	Unconstrained model	1.68	3	0.64	0.00	[0.00, 0.08]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	8.69	4	0.07	0.07	[0.00, 0.13]	0.99	7.01*
	Δ_{3-2} and Δ_{4-3} equal in SS	2.94	4	0.57	0.00	[0.00, 0.08]	1.00	1.26
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	13.01	4	0.01	0.09	[0.04, 0.15]	1.00	11.33**
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	1.91	4	0.75	0.00	[0.00, 0.06]	1.00	0.23
	Δ_{2-1} and Δ_{3-2} equal in CTRL	32.36	4	0.00	0.16	[0.11, 0.22]	0.96	30.68***
	Δ_{3-2} and Δ_{4-3} equal in CTRL	19.29	4	0.00	0.12	[0.07, 0.18]	0.98	17.61***
Self-perceived competence	Unconstrained model	4.48	3	0.21	0.04	[0.00, 0.12]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	15.26	4	0.00	0.10	[0.05, 0.16]	0.98	11.14***
	Δ_{3-2} and Δ_{4-3} equal in SS	6.24	4	0.18	0.05	[0.00, 0.11]	1.00	1.76
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	35.98	4	0.00	0.18	[0.13, 0.23]	0.94	31.50***
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	7.08	4	0.13	0.05	[0.00, 0.12]	0.99	2.60
	Δ_{2-1} and Δ_{3-2} equal in CTRL	11.70	4	0.02	0.09	[0.03, 0.15]	0.99	7.22**
	Δ_{3-2} and Δ_{4-3} equal in CTRL	13.87	4	0.01	0.10	[0.04, 0.16]	0.98	9.39**
Class climate	Unconstrained model	2.91	3	0.40	0.00	[0.00, 0.10]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	3.26	4	0.51	0.00	[0.00, 0.09]	1.00	0.35
	Δ_{3-2} and Δ_{4-3} equal in SS	2.51	4	0.64	0.00	[0.00, 0.08]	1.00	0.40
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	3.21	4	0.52	0.00	[0.00, 0.08]	1.00	0.30

(*continued on next page*)

Table D2 (*continued*)

Outcome	Model	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*	$\Delta\chi^2$
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	4.39	4	0.36	0.02	[0.00, 0.10]	1.00	1.48
	Δ_{2-1} and Δ_{3-2} equal in CTRL	3.71	4	0.45	0.00	[0.00, 0.09]	1.00	0.80
	Δ_{3-2} and Δ_{4-3} equal in CTRL	5.45	4	0.24	0.04	[0.00, 0.11]	1.00	2.54
Internalizing behavior	Unconstrained model	1.58	3	0.66	0.00	[0.00, 0.08]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	10.10	4	0.04	0.08	[0.02, 0.14]	0.99	8.52**
	Δ_{3-2} and Δ_{4-3} equal in SS	1.74	4	0.78	0.00	[0.00, 0.06]	1.00	0.16
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	33.52	4	0.00	0.17	[0.12, 0.22]	0.93	31.94***
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	14.22	4	0.00	0.10	[0.05, 0.16]	0.98	12.64***
	Δ_{2-1} and Δ_{3-2} equal in CTRL	20.03	4	0.00	0.12	[0.07, 0.18]	0.96	18.45***
	Δ_{3-2} and Δ_{4-3} equal in CTRL	1.77	4	0.78	0.00	[0.00, 0.06]	1.00	0.19
Externalizing behavior	Unconstrained model	0.60	3	0.89	0.00	[0.00, 0.05]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in SS	6.49	4	0.16	0.05	[0.00, 0.11]	1.00	5.89*
	Δ_{3-2} and Δ_{4-3} equal in SS	0.66	4	0.96	0.00	[0.00, 0.00]	1.00	0.06
	Δ_{2-1} and Δ_{3-2} equal in SS-AA	22.89	4	0.00	0.13	[0.08, 0.19]	0.97	22.29***
	Δ_{3-2} and Δ_{4-3} equal in SS-AA	7.33	4	0.12	0.06	[0.00, 0.12]	0.99	6.73**
	Δ_{2-1} and Δ_{3-2} equal in CTRL	2.07	4	0.72	0.00	[0.00, 0.07]	1.00	1.47
	Δ_{3-2} and Δ_{4-3} equal in CTRL	0.65	4	0.96	0.00	[0.00, 0.00]	1.00	0.05

Note. RMSEA = Root Mean Square Error of Approximation; 95% CI = 95% confidence interval; CFI = Comparative Fit Index; Δ_{2-1} = pre-intervention period; Δ_{3-2} = intervention period; Δ_{4-3} = follow-up period; SS-Condition = social-emotional skills intervention; SS-AA-Condition = social-emotional skills intervention with autonomy affirmation; CTRL = no-treatment control condition.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table D3

Fit indices for the unconstrained and constrained latent change models.

Outcome	Model	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*	$\Delta\chi^2$
Prosocial behavior	Unconstrained model	4.98	3	0.17	0.05	[0.00, 0.13]	1.00	
	Δ_{3-2} equal in SS & CTRL	8.64	4	0.07	0.07	[0.00, 0.13]	0.99	3.66*
	Δ_{3-2} equal in SS-AA & CTRL	5.25	4	0.26	0.03	[0.00, 0.10]	1.00	0.30
	Δ_{3-2} equal in SS & SS-AA	7.93	4	0.09	0.06	[0.00, 0.12]	0.99	2.95
	Δ_{4-3} equal in SS & CTRL	5.49	4	0.24	0.04	[0.00, 0.11]	1.00	0.51
	Δ_{4-3} equal in SS-AA & CTRL	5.83	4	0.21	0.04	[0.00, 0.11]	1.00	0.85
	Δ_{4-3} equal in SS & SS-AA	5.52	4	0.24	0.04	[0.00, 0.11]	1.00	0.54
Social skills	Unconstrained model	7.35	3	0.06	0.07	[0.00, 0.14]	0.99	
	Δ_{3-2} equal in SS & CTRL	6.87	4	0.14	0.05	[0.00, 0.12]	1.00	0.48
	Δ_{3-2} equal in SS-AA & CTRL	7.17	4	0.13	0.05	[0.00, 0.12]	1.00	0.18
	Δ_{3-2} equal in SS & SS-AA	7.12	4	0.13	0.05	[0.00, 0.12]	1.00	0.23
	Δ_{4-3} equal in SS & CTRL	6.23	4	0.18	0.05	[0.00, 0.11]	1.00	1.12
	Δ_{4-3} equal in SS-AA & CTRL	8.11	4	0.09	0.06	[0.00, 0.13]	0.99	0.76
	Δ_{4-3} equal in SS & SS-AA	6.65	4	0.16	0.05	[0.00, 0.12]	1.00	0.70
Self-esteem	Unconstrained model	4.01	3	0.26	0.04	[0.00, 0.12]	1.00	
	Δ_{3-2} equal in SS & CTRL	4.92	4	0.29	0.03	[0.00, 0.10]	1.00	0.91
	Δ_{3-2} equal in SS-AA & CTRL	5.13	4	0.27	0.03	[0.00, 0.10]	1.00	1.12
	Δ_{3-2} equal in SS & SS-AA	4.84	4	0.30	0.03	[0.00, 0.10]	1.00	0.08
	Δ_{4-3} equal in SS & CTRL	5.47	4	0.24	0.04	[0.00, 0.11]	1.00	1.46
	Δ_{4-3} equal in SS-AA & CTRL	4.74	4	0.31	0.03	[0.00, 0.10]	1.00	0.73
	Δ_{4-3} equal in SS & SS-AA	5.12	4	0.27	0.03	[0.00, 0.10]	1.00	1.11
Self-efficacy	Unconstrained model	1.68	3	0.64	0.00	[0.00, 0.08]	1.00	
	Δ_{3-2} equal in SS & CTRL	2.24	4	0.69	0.00	[0.00, 0.07]	1.00	0.56
	Δ_{3-2} equal in SS-AA & CTRL	2.14	4	0.71	0.00	[0.00, 0.07]	1.00	0.46
	Δ_{3-2} equal in SS & SS-AA	1.89	4	0.76	0.00	[0.00, 0.06]	1.00	0.21
	Δ_{4-3} equal in SS & CTRL	2.47	4	0.65	0.00	[0.00, 0.07]	1.00	0.79
	Δ_{4-3} equal in SS-AA & CTRL	4.56	4	0.33	0.02	[0.00, 0.10]	1.00	2.88
	Δ_{4-3} equal in SS & SS-AA	2.35	4	0.67	0.00	[0.00, 0.07]	1.00	0.67
Self-perceived competence	Unconstrained model	4.48	3	0.21	0.04	[0.00, 0.12]	1.00	
	Δ_{3-2} equal in SS & CTRL	5.72	4	0.22	0.04	[0.00, 0.11]	1.00	1.24
	Δ_{3-2} equal in SS-AA & CTRL	5.15	4	0.27	0.03	[0.00, 0.10]	1.00	0.67
	Δ_{3-2} equal in SS & SS-AA	6.31	4	0.18	0.05	[0.00, 0.11]	1.00	1.83
	Δ_{4-3} equal in SS & CTRL	5.49	4	0.24	0.04	[0.00, 0.11]	1.00	1.01
	Δ_{4-3} equal in SS-AA & CTRL	7.97	4	0.09	0.06	[0.00, 0.12]	0.99	3.49
	Δ_{4-3} equal in SS & SS-AA	5.78	4	0.22	0.04	[0.00, 0.11]	1.00	1.30
Class climate	Unconstrained model	2.91	3	0.40	0.00	[0.00, 0.10]	1.00	
	Δ_{3-2} equal in SS & CTRL	2.96	4	0.56	0.00	[0.00, 0.08]	1.00	0.05
	Δ_{3-2} equal in SS-AA & CTRL	3.62	4	0.46	0.00	[0.00, 0.09]	1.00	0.71
	Δ_{3-2} equal in SS & SS-AA	2.89	4	0.58	0.00	[0.00, 0.08]	1.00	0.02

(*continued on next page*)

Table D3 (*continued*)

Outcome	Model	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*	$\Delta\chi^2$
	Δ_{4-3} equal in SS & CTRL	3.49	4	0.48	0.00	[0.00, 0.08]	1.00	0.58
	Δ_{4-3} equal in SS-AA & CTRL	3.46	4	0.48	0.00	[0.00, 0.09]	1.00	0.55
	Δ_{4-3} equal in SS & SS-AA	4.43	4	0.35	0.02	[0.00, 0.10]	1.00	1.52
Internalizing behavior	Unconstrained model	1.58	3	0.66	0.00	[0.00, 0.08]	1.00	
	Δ_{3-2} equal in SS & CTRL	2.16	4	0.71	0.00	[0.00, 0.07]	1.00	0.58
	Δ_{3-2} equal in SS-AA & CTRL	1.88	4	0.76	0.00	[0.00, 0.06]	1.00	0.30
	Δ_{3-2} equal in SS & SS-AA	1.72	4	0.79	0.00	[0.00, 0.06]	1.00	0.14
	Δ_{4-3} equal in SS & CTRL	1.84	4	0.76	0.00	[0.00, 0.06]	1.00	0.26
	Δ_{4-3} equal in SS-AA & CTRL	8.76	4	0.07	0.07	[0.00, 0.13]	0.99	7.18**
	Δ_{4-3} equal in SS & SS-AA	5.94	4	0.20	0.04	[0.00, 0.11]	1.00	4.36*
Externalizing behavior	Unconstrained model	0.60	3	0.89	0.00	[0.00, 0.05]	1.00	
	Δ_{3-2} equal in SS & CTRL	1.06	4	0.90	0.00	[0.00, 0.04]	1.00	0.46
	Δ_{3-2} equal in SS-AA & CTRL	2.26	4	0.69	0.00	[0.00, 0.07]	1.00	1.66
	Δ_{3-2} equal in SS & SS-AA	2.55	4	0.63	0.00	[0.00, 0.08]	1.00	1.95
	Δ_{4-3} equal in SS & CTRL	0.98	4	0.91	0.00	[0.00, 0.04]	1.00	0.38
	Δ_{4-3} equal in SS-AA & CTRL	12.98	4	0.01	0.09	[0.04, 0.15]	0.98	12.38***
	Δ_{4-3} equal in SS & SS-AA	13.76	4	0.01	0.10	[0.04, 0.15]	0.98	13.16***

Note. RMSEA = Root Mean Square Error of Approximation; 95% CI = 95% confidence interval; CFI = Comparative Fit Index; Δ_{3-2} = intervention period; Δ_{4-3} = follow-up period; SS-Condition = social-emotional skills intervention; SS-AA-Condition = social-emotional skills intervention with autonomy affirmation; CTRL = no-treatment control condition.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Appendix E. Results from additional analyses with a subgroup of children from the SS-AA-condition scoring + 1 *SD* on externalizing behavior at pretest 1

Table E1

Fit indices for the unconstrained latent change models.

Outcome	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*
Prosocial behavior	10.58	2	0.005	0.19	[0.09, 0.31]	0.93
Social skills	23.60	2	0.00	0.30	[0.20, 0.41]	0.95
Self-esteem	0.89	2	0.64	0.00	[0.00, 0.14]	1.00
Self-efficacy	1.89	2	0.38	0.00	[0.00, 0.18]	1.00
Self-perceived competence	3.09	2	0.21	0.07	[0.00, 0.20]	1.00
Class climate	41.73	2	0.00	0.40	[0.30, 0.51]	0.84
Internalizing behavior	2.51	2	0.28	0.05	[0.00, 0.19]	1.00
Externalizing behavior	2.57	2	0.27	0.05	[0.00, 0.19]	1.00

Note. RMSEA = Root Mean Square Error of Approximation; 95% CI = 95% confidence interval; CFI = Comparative Fit Index.

Table E2

Model parameters for the unconstrained latent change models.

Outcome	LOW (n = 206)				HIGH (n = 37)			
	Intercept	Δ_{2-1}	Δ_{3-2}	Δ_{4-3}	Intercept	Δ_{2-1}	Δ_{3-2}	Δ_{4-3}
	μ (SE)	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*	*μ (SE)*
Self-esteem	21.84 (0.30)	0.79* (0.36)	**0.83**** (0.29)	$.04_a$ (0.22)	18.44 (0.88)	−1.03 (0.71)	0.38 (0.75)	**2.64**$_a$ (0.86)
Self-efficacy	31.29 (0.50)	0.52 (0.40)	**0.65*** (0.27)	−0.38 (0.36)	28.70 (0.51)	0.80 (0.65)	0.09 (0.98)	−0.29 (0.58)
Self-perceived competence	61.76 (0.56)	**1.49**** (0.53)	1.35** (0.47)	−0.62 (0.33)	55.79 (1.14)	3.91* (1.79)	−1.47 (1.28)	2.11 (1.24)
Internalizing behavior	16.88 (0.40)	**−1.51***** (0.33)	−0.65 (0.40)	−0.35 (0.25)	20.80 (1.39)	−2.56*** (0.62)	−0.78 (1.31)	−1.60 (1.49)
Externalizing behavior	21.27 (0.27)	**−1.34**** (0.33)	−0.13 (0.41)	$-.43_a$ (0.31)	3571 (0.68)	**−4.87***** (0.84)	1.71 (0.90)	−4.48***$_a$ (0.70)

Note. LOW = children scoring <+1 *SD* on externalizing behavior at Pretest 1; HIGH = children scoring ≥ + 1 *SD* on externalizing behavior at pretest 1; Intercept = Pretest 1; Δ_{2-1} = pre-intervention period; Δ_{3-2} = intervention period; Δ_{4-3} = follow-up period. Latent means in bold differ significantly from the within-group (pre-)training period at $p < .05$. Latent means that share subscripts differ at $p < .05$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table E3
Model fit statistics for latent change models used to assess the equality of parameters within conditions.

	Model	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*	$\Delta\chi^2$
Self-esteem	Unconstrained model	0.89	2	0.64	0.00	[0.00, 0.14]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in LOW	22.07	3	0.00	0.23	[0.15, 0.32]	0.94	21.18***
	Δ_{3-2} and Δ_{4-3} equal in LOW	6.87	3	0.08	0.10	[0.00, 0.21]	0.99	5.98*
	Δ_{2-1} and Δ_{3-2} equal in HIGH	3.01	3	0.39	0.00	[0.00, 0.15]	1.00	2.12
	Δ_{3-2} and Δ_{4-3} equal in HIGH	10.55	3	0.01	0.14	[0.06, 0.34]	0.98	9.66**
Self-efficacy	Unconstrained model	1.89	2	0.38	0.00	[0.00, 0.18]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in LOW	12.91	3	0.00	0.16	[0.08, 0.26]	0.98	11.02**
	Δ_{3-2} and Δ_{4-3} equal in LOW	2.99	3	0.51	0.00	[0.00, 0.14]	1.00	1.10
	Δ_{2-1} and Δ_{3-2} equal in HIGH	2.51	3	0.47	0.00	[0.00, 0.14]	1.00	0.62
	Δ_{3-2} and Δ_{4-3} equal in HIGH	2.18	3	0.53	0.00	[0.00, 0.14]	1.00	0.29
Self-perceived competence	Unconstrained model	3.09	2	0.21	0.07	[0.00, 0.20]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in LOW	54.78	3	0.00	0.38	[0.29, 0.47]	0.85	51.69***
	Δ_{3-2} and Δ_{4-3} equal in LOW	5.39	3	0.14	0.08	[0.00, 0.19]	0.99	2.30
	Δ_{2-1} and Δ_{3-2} equal in HIGH	3.93	3	0.27	0.05	[0.00, 0.17]	1.00	0.84
	Δ_{3-2} and Δ_{4-3} equal in HIGH	2.82	3	0.42	0.00	[0.00, 0.15]	1.00	0.27
Internalizing behavior	Unconstrained model	2.51	2	0.28	0.05	[0.00, 0.19]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in LOW	33.14	3	0.00	0.29	[0.20, 0.38]	0.88	30.63***
	Δ_{3-2} and Δ_{4-3} equal in LOW	14.29	3	0.00	0.18	[0.09, 0.27]	0.96	11.78***
	Δ_{2-1} and Δ_{3-2} equal in HIGH	5.31	3	0.15	0.08	[0.00, 0.19]	0.99	2.80
	Δ_{3-2} and Δ_{4-3} equal in HIGH	5.01	3	0.17	0.07	[0.00, 0.18]	0.99	2.50
Externalizing behavior	Unconstrained model	2.57	2	0.27	0.05	[0.00, 0.19]	1.00	
	Δ_{2-1} and Δ_{3-2} equal in LOW	18.05	3	0.00	0.20	[0.12, 0.30]	0.92	15.48***
	Δ_{3-2} and Δ_{4-3} equal in LOW	4.81	3	0.19	0.07	[0.00, 0.18]	0.99	2.24
	Δ_{2-1} and Δ_{3-2} equal in HIGH	8.01	3	0.05	0.12	[0.01, 0.22]	0.97	5.44*
	Δ_{3-2} and Δ_{4-3} equal in HIGH	18.03	3	0.00	0.20	[0.12, 0.30]	0.92	15.46***

Note. RMSEA = Root Mean Square Error of Approximation; 95% CI = 95% confidence interval; CFI = Comparative Fit Index; Δ_{2-1} = pre-intervention period; Δ_{3-2} = intervention period; Δ_{4-3} = follow-up period; LOW = children scoreing <+1 *SD* on externalizing behavior at pretest 1; HIGH = children scoring ≥ + 1 *SD* on externalizing behavior at pretest 1.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table E4
Fit indices for the unconstrained and constrained latent change models (LCMs) controlling for age and ethnicity.

Outcome	Model	χ^2	*df*	*p*	*RMSEA*	*95% CI*	*CFI*	$\Delta\chi^2$
Self-esteem	Unconstrained model	0.89	2	0.64	0.00	[0.00, 0.14]	1.00	
	Δ_{3-2} equal in LOW & HIGH	1.27	3	0.74	0.00	[0.00, 0.11]	1.00	0.38
	Δ_{4-3} equal in LOW & HIGH[a]	11.56	3	0.00	0.15	[0.07, 0.25]	0.97	10.12***
Self-efficacy	Unconstrained model	1.89	3	0.38	0.00	[0.00, 0.18]	1.00	
	Δ_{3-2} equal in LOW & HIGH	2.39	3	0.49	0.00	[0.00, 0.14]	1.00	0.50
	Δ_{4-3} equal in LOW & HIGH	2.33	3	0.51	0.00	[0.00, 0.14]	1.00	0.44
Self-perceived competence	Unconstrained model	3.09	2	0.21	0.07	[0.00, 0.20]	1.00	
	Δ_{3-2} equal in LOW & HIGH	5.58	3	0.13	0.08	[0.00, 0.19]	0.99	2.49
	Δ_{4-3} equal in LOW & HIGH	5.41	3	0.14	0.08	[0.00, 0.19]	0.99	2.32
Internalizing behavior	Unconstrained model	2.51	2	0.28	0.05	[0.00, 0.19]	1.00	
	Δ_{3-2} equal in LOW & HIGH	2.14	3	0.54	0.00	[0.00, 0.13]	1.00	0.37
	Δ_{4-3} equal in LOW & HIGH	3.55	3	0.31	0.04	[0.00, 0.16]	1.00	1.04
Externalizing behavior	Unconstrained model	2.57	2	0.27	0.05	[0.00, 0.19]	1.00	
	Δ_{3-2} equal in LOW & HIGH	5.48	3	0.14	0.08	[0.00, 0.19]	0.99	2.91
	Δ_{4-3} equal in LOW & HIGH	21.30	3	0.00	0.22	[0.14, 0.32]	0.90	18.73***

Note. RMSEA = Root Mean Square Error of Approximation; 95% CI = 95% confidence interval; CFI = Comparative Fit Index; Δ_{3-2} = intervention period; Δ_{4-3} = follow-up period; LOW = children scoring < +1 SD on externalizing behavior at pretest 1; HIGH = children scoring ≥ + 1SD on externalizing behavior at Pretest 1.

*** $p < .001$.

[a] Compared to a model with model fit: χ^2 (2) = 1.47, p = .48, RMSEA = 0.00, 95% CI [0.00, 0.16], CFI = 1.00.

References

Algozzine, B., Browder, D., Karvonen, M., Test, D. W., & Wood, W. M. (2001). Effects of interventions to promote self-determination for individuals with disabilities. *Review of Educational Research, 71*(2), 219–277. https://doi.org/10.3102/00346543071002219.

Bandura, A. (1978). Social learning theory of aggression. *Journal of Communication, 28*(3), 12–29. https://doi.org/10.1111/j.1460-2466.1978.tb01621.x.

Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education, 84*(6), 740–756. https://doi.org/10.1002/1098-237X(200011)84:6%3C740::AID-SCE4%3E3.0.CO;2-3.

Blanken, T. F., van der Zweerde, T., van Straten, A., van Someren, E. J. W., Borsboom, D., & Lancee, J. (2019). Introducing network intervention analysis to investigate sequential, symptom-specific treatment effects: A demonstration in co-occurring insomnia and depression. *Psychotherapy and Psychosomatics, 88*, 52–54. https://doi.org/10.1159/000495045.

Boor-Klip, H. J., Segers, E., Hendrickx, M. M., & Cillessen, A. H. (2016). Development and psychometric properties of the classroom peer context questionnaire. *Social Development, 25*(2), 370–389. https://doi.org/10.1111/sode.12137.

Caprara, G. V., Alessandri, G., & Eisenberg, N. (2012). Prosociality: The contribution of traits, values, and self-efficacy beliefs. *Journal of Personality and Social Psychology, 102*(6), 1289–1303. https://doi.org/10.1037/a0025626.

Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological Science, 11*(4), 302–306. https://doi.org/10.1111/1467-9280.00260.

Carter, E. W., Lane, K. L., Crnobori, M., Bruhn, A. L., & Oakes, W. P. (2011). Self-determination interventions for students with and at risk for emotional and behavioral disorders: Mapping the knowledge base. *Behavioral Disorders, 36*(2), 100–116. https://doi.org/10.1177/019874291103600202.

Catalano, R. F., Berglund, L. M., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2002). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *Prevention and Treatment, 5*(15), 98–124. https://doi.org/10.1037/1522-3736.5.1.515a.

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*(1), 74–101. https://doi.org/10.1037/0033-2909.115.1.74.

Department for Education. (2018). Mental health and behaviour in schools. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/755135/Mental_health_and_behaviour_in_schools__.pdf.

Dirks, M. A., Dunfield, K. A., & Recchia, H. E. (2018). Prosocial behavior with peers: Intentions, outcomes, and interpersonal adjustment. In W. M. Bukowski, B. Laursen, & K. H. Rubin (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 243–264). Guilford Press.

Durlak, J. A., Taylor, R. D., Kawashima, K., Pachan, M. K., DuPre, E. P., Celio, C. I., … Weissberg, R. P. (2007). Effects of positive youth development programs on school, family, and community systems. *American Journal of Community Psychology, 39*(3), 269–286. https://doi.org/10.1007/s10464-007-9112-5.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x.

Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2006). Prosocial development. In W. Damon, R. M. Lerner, & N. Eisenberg (Eds.), *Handbook of child psychology, volume III: Social, emotional, and personality development* (6th ed., pp. 646–718). Wiley.

Eisenberg, N., VanSchyndel, S. K., & Spinrad, T. L. (2016). Prosocial motivation: Inferences from an opaque body of work. *Child Development, 87*(6), 1668–1678. https://doi.org/10.1111/cdev.12638.

Eisenman, L. T., & Chamberlin, M. (2001). Implementing self-determination activities: Lessons from schools. *Remedial and Special Education, 22*(3), 138–147. https://doi.org/10.1177/074193250102200302.

Flynn, E., Ehrenreich, S. E., Beron, K. J., & Underwood, M. K. (2015). Prosocial behavior: Long-term trajectories and psychosocial outcomes. *Social Development, 24*(3), 462–482. https://doi.org/10.1111/sode.12100.

Franck, E., de Raedt, R., Barbez, C., & Rosseel, Y. (2008). Psychometric properties of the Dutch Rosenberg self-esteem scale. *Psychologica Belgica, 48*(1), 25–35. https://doi.org/10.5334/pb-48-1-25.

Gagné, M. (2003). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion, 27*(3), 199–223. https://doi.org/10.1023/A:1025007614869.

Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior, 26*(4), 331–362. https://doi.org/10.1002/job.322.

Greenberg, M. T., & Abenavoli, R. (2017). Universal interventions: Fully exploring their impacts and potential to produce population-level impacts. *Journal of Research on Educational Effectiveness, 10*(1), 40–67. https://doi.org/10.1080/19345747.2016.1246632.

Gresham, F. M., & Elliott, S. N. (2008). *Social skills improvement system: Rating scales manual*. NCS Pearson.

Gresham, F. M., Elliott, S. N., Vance, M. J., & Cook, C. R. (2011). Comparability of the social skills rating system to the social skills improvement system: Content and psychometric comparisons across elementary and secondary age levels. *School Psychology Quarterly, 26*(1), 27–44. https://doi.org/10.1177/0963721412470687.

Harter, S. (1985). *Manual for the self-perception profile for children*. University of Denver.

Heatherton, T. F., & Wyland, C. L. (2003). Assessing self-esteem. In S. J. Lopez, & C. R. Snyder (Eds.), *Positive psychological assessment: A handbook of models and measures* (pp. 219–233). American Psychological Association.

Het ABC Onderwijsadviseurs. (2015). ABC competency training. https://www.hetabc.nl/.

van den Heuvel, M., Bodden, D., & Miers, A. (2017). *Social skills improvement systems: jongeren versie voor 13–18 jarigen*. Utrecht University & Trimbos Institute.

Howe, G. W., Beach, S. R. H., & Brody, G. H. (2010). Microtrial methods for translating gene-environment dynamics into preventive interventions. *Prevention Science, 11*, 343–354. https://doi.org/10.1007/s11121-010-0177-2.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118.

Kındap-Tepe, Y., & Aktas, V. (2019). The mediating role of needs satisfaction for prosocial behavior and autonomy support. *Current Psychology, 1–13*. https://doi.org/10.1007/s12144-019-00466-9.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). The Guilford Press.

Laible, D. J., Murphy, T. P., & Augustine, M. (2014). Adolescents' aggressive and prosocial behaviors: Links with social information processing, negative emotionality, moral affects, and moral cognition. *Journal of Genetic Psychology, 175*(3), 270–286. https://doi.org/10.1080/00221325.2014.885878.

Leijten, P., Dishion, T. J., Thomaes, S., & Raaijmakers, M. A. J. (2015). Bringing parenting interventions back to the future: How randomized microtrials may benefit parenting intervention efficacy. *Clinical Psychology: Science and Practice, 22*(1), 47–57. https://doi.org/10.1111/cpsp.12087.

Leijten, P., Weisz, J. R., & Gardner, F. (2021). Research strategies to discern active psychological therapy components: A scoping review. *Clinical Psychological Science, 9*(3), 307–322.

Martela, F., & Ryan, R. M. (2016). Prosocial behavior increases well-being and vitality even without contact with the beneficiary: Causal and behavioral evidence. *Motivation and Emotion, 40*(3), 351–357. https://doi.org/10.1007/s11031-016-9552-z.

Memmott-Elison, M. K., Holmgren, H. G., Padilla-Walker, L. M., & Hawkins, A. J. (2020). Associations between prosocial behavior, externalizing behaviors, and internalizing symptoms during adolescence: A meta-analysis. *Journal of Adolescence, 80*, 98–114. https://doi.org/10.1016/j.adolescence.2020.01.012.

Mesurado, B., Guerra, P., Richaud, M. C., & Rodriguez, L. M. (2019). Effectiveness of prosocial behavior interventions: A meta-analysis. In P. A. Gargiulo, & H. L. Mesones Arroyo (Eds.), *Psychiatry and neuroscience update: From translational research to a humanistic approach – volume III* (pp. 259–272). Springer.

de Mooij, B., Fekkes, M., Scholte, R. H. J., & Overbeek, G. (2020). Effective components of social skills training programs for children and adolescents in nonclinical samples: A multilevel meta-analysis. *Clinical Child and Family Psychology Review, 23*, 250–264. https://doi.org/10.1007/s10567-019-00308-x.

Mishara, Brian L., & Ystgaard, Mette (2006). Effectiveness of a mental health promotion program to improve coping skills in young children: Zippy's Friends. *Early Childhood Research Quarterly, 21*(1), 110–123. https://doi.org/10.1016/j.ecresq.2006.01.002

Muthén, B., Brown, C. H., Masyn, K., Jo, B., Khoo, S. T., Yang, C. C., Wang, C.-P., Kellam, S. G., Carlin, J. B., & Liao, J. (2002). General growth mixture modeling for randomized preventive interventions. *Biostatistics, 3*(4), 459–475. https://doi.org/10.1093/biostatistics/3.4.459.

Muthén, L. K., & Muthén, B. O. (1998–2015). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Nantel-Vivier, A., Pihl, R. O., Côté, S., & Tremblay, R. E. (2015). Developmental association of prosocial behaviour with aggression, anxiety and depression from infancy to preadolescence. *Journal of Child Psychology and Psychiatry, 55*(10), 1135–1140. https://doi.org/10.1111/jcpp.12235.

Nelson, D. A., & Crick, N. R. (1999). Rose-colored glasses: Examining the social information processing of prosocial young adolescents. *Journal of Early Adolescence, 19*(1), 17–38. https://doi.org/10.1177/0272431699019001002.

Nelson, S. K., Della Porta, M. D., Jacobs Bao, K., Lee, H. C., Choi, I., & Lyubomirsky, S. (2015). 'It's up to you': Experimentally manipulated autonomy support for prosocial behavior improves well-being in two cultures over six weeks. *The Journal of Positive Psychology, 10*(5), 463–476. https://doi.org/10.1080/17439760.2014.983959.

Ng, J. Y. Y., Ntoumanis, N., Thøgersen-Ntoumani, C., Deci, E. L., Ryan, R. M., Duda, J. L., & Williams, G. C. (2012). Self-determination theory applied to health contexts: A meta-analysis. *Perspectives on Psychological Science, 7*(4), 325–340. https://doi.org/10.1177/1745691612447309.

Pakaslahti, L., Karjalainen, A., & Keltikangas-Järvinen, L. (2002). Relationships between adolescent prosocial problem-solving strategies, prosocial behaviour, and social acceptance. *International Journal of Behavioral Development, 26*(2), 137–144. http://www.tandf.co.uk/journals/pp/01650254.html.

Partnership for Children. (2007). Zippy's friends. http://www.partnershipforchildren.org.uk/.

Paulus, M. (2014). The emergence of prosocial behavior: Why do infants and toddlers help, comfort, and share? *Child Development Perspectives, 8*(2), 77–81. https://doi.org/10.1111/cdep.12066.

Pavey, L., Greitemeyer, T., & Sparks, P. (2011). Highlighting relatedness promotes prosocial motives and behavior. *Personality and Social Psychology, 37*(7), 905–915. https://doi.org/10.1177%2F0146167211405994.

Penner, L. A., Dovidio, J. F., Piliavin, J. A., & Schroeder, D. A. (2005). Prosocial behavior: Multilevel perspectives. *Annual Review of Psychology, 56*, 365–392. https://doi.org/10.1146/annurev.psych.56.091103.070141.

van Petegem, S., Soenens, B., Vansteenkiste, M., & Beyers, W. (2015). Rebels with a cause? Adolescent defiance from the perspective of reactance theory and self-determination theory. *Child Development, 86*(3), 903–918. https://doi.org/10.1111/cdev.12355.

Raykov, T. (2005). Analysis of longitudinal studies with missing data using covariance structure modeling with full-information maximum likelihood. *Structural Equation Modeling, 12*(3), 493–505. https://doi.org/10.1207/s15328007sem1203_8.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. The Guilford Press.

Ryan, R. M., Patrick, H., Deci, E. L., & Williams, G. C. (2008). Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. *The European Health Psychologist, 10*, 2–5.

Schmidt, N. B., Capron, D. W., Raines, A. M., & Allan, N. P. (2014). Randomized clinical trial evaluating the efficacy of a brief intervention targeting anxiety sensitivity cognitive concerns. *Journal of Consulting and Clinical Psychology, 82*(6), 1023–1033. https://doi.org/10.1037/a0036651.

Sklad, M., Diekstra, R., Ritter, M. D., Ben, J., & Gravesteijn, C. (2012). Effectiveness of school-based universal social, emotional, and behavioral programs: Do they enhance students' development in the area of skill, behavior, and adjustment? *Psychology in the Schools, 49*(9), 892–909. https://doi.org/10.1002/pits.21641.

Soenens, B., & Vansteenkiste, M. (2005). Antecedents and outcomes of self-determination in 3 life domains: The role of parents' and teachers' autonomy support. *Journal of Youth and Adolescence, 34*(6), 589–604. https://doi.org/10.1007/s10964-005-8948-y.

Spence, S. H. (2003). Social skills training with children and young people: Theory, evidence and practice. *Child and Adolescent Mental Health, 8*(2), 84–96. https://doi.org/10.1111/1475-3588.00051.

Teeuw, B., Schwarzer, R., & Jerusalem, M. (1994). Dutch general self-efficacy scale. Retrieved from http://userpage.fu-berlin.de/~gesund/publicat/ehps_cd/health/dutch.htm.

Teixeira, P. J., Carraça, E. V., Markland, D., Silva, M. N., & Ryan, R. M. (2012). Exercises, physical activity, and self-determination theory: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity, 9*(1), 1–30. https://doi.org/10.1186/1479-5868-9-78.

Topper Training Foundation. (2007–2020). *Handleiding kanjertraining basisonderwijs*. Topper Training Foundation.

Twenge, J. M., Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Bartels, J. M. (2007). Social exclusion decreases prosocial behavior. *Journal of Personality and Social Psychology, 92*(1), 56–66. https://doi.org/10.1037/0022-3514.92.1.56.

Van Petegem, S., Beyers, W., Vansteenkiste, M., & Soenens, B. (2012). On the association between adolescent autonomy and psychosocial functioning. *Developmental Psychology, 48*(1), 76–88. https://doi.org/10.1037/a0025307.

Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. *Advances in Motivation and Achievement, 16*, 105–165. https://doi.org/10.1108/S0749-7423(2010)000016A007.

Veerman, J. W., Straathof, M. A. E., Treffers, A., Van den Bergh, B., & Ten Brink, T. L. (1997). *Handleiding competentiebelevingsschaal voor kinderen (CBSK)*.

Vliek, L. (2015). *Effects of Kanjertraining (topper training) on emotional problems, behavioural problems and classroom climate*. University of Utrecht.

Vliek, L. (2019). Minder kinderen gepest op ervaren Kanjerscholen. Onderzoek naar langetermijneffecten. *Tijdschrift voor Orthopedagogiek, 58*(3), 38–43. https://www.kanjertraining.nl/wp-content/uploads/2019/06/Publicatie-L.-Vliek-Tijdschrift-voor-Orthopedagogiek-jaargang-58-03-2019.pdf.

Vliek, L., Overbeek, G., & Orobio de Castro, B. (2014). "I want to behave prosocially and I can choose to do so": Effectiveness of TIGER (Kanjertraining) in 8- to 11-year-olds. *European Journal of Developmental Psychology, 11*(1), 77–89. https://doi.org/10.1080/17405629.2013.811405.

Vliek, L., Overbeek, G., & Orobio de Castro, B. (2019). Effects of topper training on psychosocial problems, self-esteem, and peer victimization in Dutch children: A randomized trial. *PLoS One, 14*(11), Article e0225504. https://doi.org/10.1371/journal.pone.0225504.

Weare, K., & Nind, M. (2011). Mental health promotion and problem prevention in schools: What does the evidence say? *Health Promotion International, 26*(1), 29–69. https://doi.org/10.1093/heapro/dar075.

Weinstein, N., & Ryan, R. M. (2010). When helping helps: Autonomous motivation for prosocial behavior and its influence on well-being for the helper and the recipient. *Journal of Personality and Social Psychology, 98*(2), 222–244. https://doi.org/10.1037/a0016984.

Wentzel, K. R., & McNamara, C. C. (1999). Interpersonal relationships, emotional distress, and prosocial behavior in middle school. *The Journal of Early Adolescence, 19*(1), 114–125. https://doi.org/10.1177%2F0272431699019001006.

Yagmurlu, B. (2014). Relations among sociocognitive abilities and prosocial behavior. *Journal of Child and Family Studies, 23*(3), 591–603. https://doi.org/10.1007/s10826-013-9726-1.

Zuffianò, A., Alessandri, G., Kanacri, B. P. L., Pastorelli, C., Milioni, M., Ceravolo, R., Caprara, M. G., & Caprara, G. V. (2014). The relation between prosociality and self-esteem from middle-adolescence to young adulthood. *Personality and Individual Differences, 63*, 24–29. https://doi.org/10.1016/j.paid.2014.01.041.