Social Competence as a Mediating Factor in Reduction of Behavioral Problems

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The main purpose of the present study was to explore how social competence reduces behavioral problems. Based on previous findings, we assume that increased social competence can be regarded as a mediating factor in reducing behavior problems. All participants (children and adolescents, $n = 112$) received an intervention intended to increase social competence: Aggresion Replacement Training (ART). Social competence and problem behavior were assessed twice before the ART intervention and then twice afterwards. Both measures improved following the training period, but no changes occurred during the pre-training period. Further, behavioral problems continued to reduce notably in follow-up probes after the training period. More detailed analyses indicate that in youngsters, increased social competence (e.g., improved self-control and cooperation) mediates the effect of ART on behavioral problems, but important moderating factors (e.g., age, individual levels of social competence, and problem behavior) need to be taken into consideration.

Keywords: behavioral problems, social competence, children, adolescents

More than a decade ago, Webster-Stratton and Hammond (1998) showed that children low on social competence have elevated odds for demonstrating concurrent conduct problems. A number of other studies have demonstrated a negative correlation between social competence and behavior problems (Najaka, Gottfredson, & Wilson, 2001). The interpretation of this relation is not obvious, but some studies indicate that the co-occurrence of low social competence and behavioral problems represents a causal relation, in that low social competence results in behavioral problems (e.g., Lansford et al., 2006). The pathway from low social competence to behavioral problems might be associated with the individual's limited access to socially acceptable behavioral responses to challenging social situations. In such situations, the person might therefore resort to socially unacceptable behavior.

Given the negative correlation between social competence and behavior problems, it is reasonable to assume that training in social competence will reduce socially unacceptable behavior. Indeed, a number of studies have demonstrated that social skills training programs intended to increase social competence in young people result in both increased social

competence and reduced behavioral problems (Najaka et al., 2001; Wilson, Lipsey, & Derzon, 2003). In this context it is important to distinguish between social competence and social skills. The term "*social skills*" refers to specific behavior classes, which a person should master in order to be able to interact successfully in social settings (e.g., standing up to group pressure, asking for help, and solving problems). *Social competence*, on the other hand, includes a broader understanding of the effect the behavior has on the person's surroundings (Bellack, Mueser, Gingerich, & Agresta, 1997) and the person's awareness of the needs of the interaction partner (Phillips, L'Abate, & Milan, 1985). This indicates that social competence training programs should focus not only on social skills but also on the individual's social understanding and reasoning in applying these skills in a variety of situations.

On the face of it, a causal relation between increased social competence and reduced behavioral problems is probable. If programs designed to improve social competence do in fact increase social competence, a correlated decrease in behavioral problems must be due to this increased competence or to other correlated third variables. However, given that such training programs explicitly aim at increasing the individual's access to socially acceptable behavioral responses to challenging situations, thereby increasing the individual's social competence, we find it plausible that change in this repertoire is an important causal factor in the reduction of behavior problems.

The purpose of the present paper was to explore the assumed association between increased social competence and reduced behavior problems as result of participation in a multimodal training program within a design that allowed for conclusions about mediational relations as well as moderating effects. We wanted to investigate if changes in behavioral problems that occur as a result of a multimodal social competence training program are mediated by changes in social competence, and, if so, which social competence factors are changing in association with changes in behavioral problems. Further, we wanted to explore which factors moderate changes in behavioral problems as a result of such training.

A simple mediational hypothesis might assume that behavior-problem reduction is mediated by increased social competence in close conjunction, while a more refined assumption might be that other factors cause this mediation to be more or less pronounced. Such factors may be termed *moderating* variables because they alter the strength of a given relation (Baron & Kenny, 1986). More generally, such moderating effects represent interaction effects in the sense that a main effect is affected by other causal factors. Information about such moderating variables is of great interest both theoretically and for practical purposes.

In principle, a number of variables may moderate the assumed causal link. In the present context, we focus on individual differences as possible moderating variables. Gender and age are obvious candidates. Previous studies have demonstrated a moderating role of age on the effect of social competence training interventions on behavioral problems (Wilson et al., 2003). However, there is no available research that has tested the possible moderating effect of age in a Scandinavian school setting with age-adapted training programs. As the Scandinavian school system is different from the British and American systems, age-related findings in a Scandinavian school setting may allow for a generalization of findings beyond school-related age factors.

We might also assume the importance of other individual characteristics as moderating variables. One prime source of moderating variables relates to the very variables that are assumed to be dependent factors. Thus, whether a person is low or high in social competence at the outset of the program may be important for the outcome both in terms of social

competence gain and behavioral problem reduction. Similarly, whether the person is low or high in behavioral problems at the outset may affect the beneficial outcome of the intervention. For example, providing social competence training to an individual already scoring high on social competence and low on behavioral problems may indicate a poor outcome; providing the same training to an individual low on social competence and high on behavioral problems may indicate a much better outcome.

If social competence is a mediating variable in reducing behavioral problems, we may then ask whether there are specific attributes of that competence that are associated with problem-behavior reduction. For example, social competence as measured by the Social Skills Rating Scale (SSRS: Gresham & Elliot, 1990) includes four sub-domains, which address somewhat different attributes of social competence (Cooperation, Assertiveness, Self-Control and Empathy). If social competence is a mediating variable in reducing behavioral problems, one or two of these sub-domains may be more strongly associated with behavior problem reduction than the others. If so, this might illuminate *how* social competence affects behavior problem reduction.

In the present context, we explore these ideas by measuring concurrently changes in social competence and behavioral problems before and after an experimental intervention aimed at increasing social competence. Such a design has important advantages over correlational designs, as training of social competence under experimental conditions allows for stronger causal inferences about changes in social competence and correlated change in behavioral problems. Firstly, evidence for a possible mediational role of social competence can be obtained by examining the relation between these two measures. Obviously, a mediational model would require that an increase in social competence under these conditions should be accompanied by decreased behavioral problems. Similarly, no change in social competence would imply no change in behavioral problems (see Figure 1 for hypothesized mediating factors).
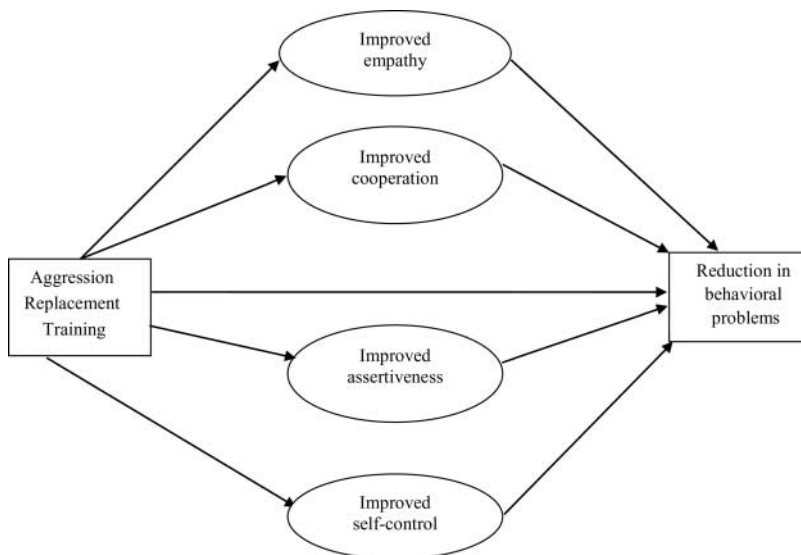

Figure 1. Hypothesized path diagram, mediating effects.

Secondly, broad predictions about mediating factors should be refined by the effects of moderating variables. For example, since social competence and behavioral problems are found to be more stable in older children than younger ones (Sorlie, Hagen, & Ogden, 2008), a less marked effect of social competence training should be expected in older children. We also know that gender may be a relevant variable, either directly or indirectly. For example, research has shown that girls demonstrate higher social competence and a lower degree of behavioral problems than boys (e.g., Smart & Sanson, 2001). This means that gender and age may act as moderating variables (see Figure 2 for hypothesized moderating factors). Also, pre-training levels of social competence and behavioral problems might act as moderating factors. For example, it may be assumed that individuals will benefit differently from social competence training according to whether they are low or high on empathy (e.g., Mavroveli, Petrides, Sangareau, & Furnham, 2009; Petrides, Furnham, & Frederickson, 2004). If true, such moderating factors could be included in an analysis of the effect of social competence training on social competence and behavior problem reduction. Even though aggression is strongly linked to problems with social competence (Coie, 1990; Coie & Dodge, 1998), increased attention is now being given to the fact that some children considered successful and popular can also appear aggressive (Hawley, 2003). In some studies (Newcomb, Bukowski, & Pattee, 1993; Rodkin, Farmer, Pearl, & VanAcker, 2000), children who are socially competent have similar high scores on measures of aggression to those with social difficulties, i.e., with low social competence scores, implying that the negative association between social competence and aggression might not count for all subgroups of children. It will therefore be of special interest to explore how the intervention will affect those who score high on both social competence and problem behavior at the onset of the program.

A premise for an analysis of the mediating role of social competence in behavior-problem reduction in the present context is that the intervention actually creates changes in social competence and/or behavior problems. We therefore examined these issues using Aggression Replacement Training (ART) as a method of improving social competence in a sample of youngsters. Aggression Replacement Training is one of the best-known multi-modal programs aimed at aggressive and antisocial youths (Polaschek, 2006). The program consists
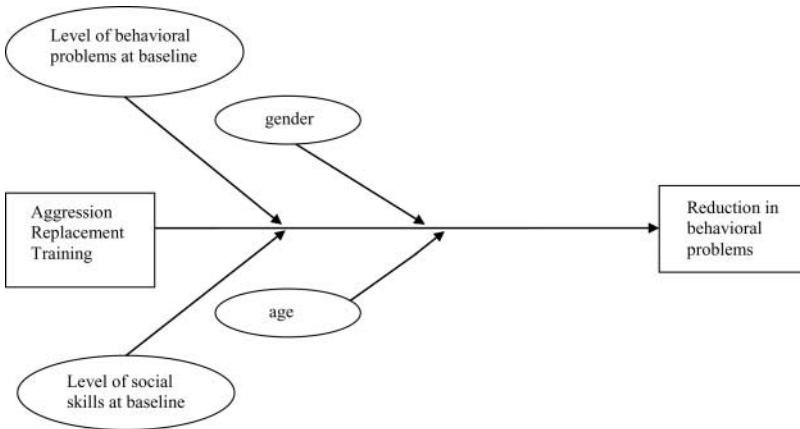

Figure 2. Hypothesized path diagram, moderating effects.

of three separate modules (social skills training, anger control training, and moral reasoning training) and thus addresses not only social skills, but also the wider concept of social competence. The main focus of the anger control module is to address reactive aggression related to encoding and interpretation of cues (Dodge, 1986), to control dysregulated anger, and to identify non-aggressive reactions to triggering situations. In social skills training, participants learn to adapt and develop their behavior in different social situations, while the aim of the moral reasoning module is, through dilemma discussion, to improve the participants' reflection on how their own choices produce consequences for their social partners and society. Studies in England and North America have concluded that ART results in reduced behavioral problems in youngsters (Barnoski & Aos, 2004; Nugent, Bruley, & Winimaki, 1999). Our own studies indicate that this also applies to Scandinavian youngsters (Gundersen & Svartdal, 2004, 2010). Training takes place in groups with five to eight participants. Groups are composed with regard to age, similarity of behavioral challenges, and friendship between participants. Elliot and Gresham (1991) also recommend the inclusion of group members with a higher level of social competence as positive role models. Two trainers conduct ART sessions. Rules and consequences for infractions are clearly defined. Participation is voluntary and the use of positive reinforcement and small games are highly recommended to secure the motivation of trainees. There is a firm structure in the program, including defining the theme of the session, demonstration, role-playing, questioning where and when to use the skill, feedback/evaluation, and homework. The purpose of feedback to the youths is primarily to shape proper behavior. All participants have different observation tasks. Goldstein et al. (Goldstein, 1998) recommend that all three components (skill streaming, anger control training, and moral reasoning training) are scheduled for training at least once per week over a period of 10 weeks. In order to transfer and maintain skills, it is important to establish contact with important individuals (family members, teachers, club leaders, etc.) in the participants' environments.

Given a positive outcome of the ART intervention, the present project attempted to explore the possible mediating role of social competence in the reduction of behavior problems. In addition, the possible effects of moderating variables on behavioral problems were addressed.

Testing Mediating and Moderating Variables

The possible role of social competence in mediating social competence training and behavior problem reduction can be inferred from the following pattern of findings (Baron & Kenny, 1986): (1) The social competence training should be associated with an overall increase in social competence and a correlated reduction in behavior problems; (2) For participants receiving social competence training who did *not* demonstrate a change in social competence, we expect *no* change in behavioral problems; and (3) For participants who demonstrated no reduction in behavior problems, no increase in social competence should be expected either. Requirement (1) is the traditional finding that the intervention has significant effects on social competence and behavior problems. Furthermore, changes in social competence and in behavior problems should be negatively correlated. Requirements (2) and (3) are easily tested: For participants who do not demonstrate an increase in social competence, no reduction in behavior problems should be expected, and for participants who do not show a reduction in behavioral problems, no increase in social competence is to be expected.
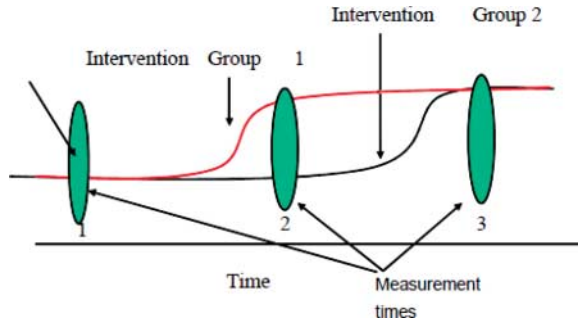
Figure 3.   Design of the study.

To explore the role of moderating variables on the social competence mediation, we focused on the following factors at the outset of the intervention: (1) gender; (2) age; (3) levels of overall social competence, and (4) behavioral problems. In addition, we focused on a more specific social competence factor that has been found to moderate the results of social competence training on behavior problems in children, for example empathic skills as measured before the onset of social competence training.

We utilized a multi-baseline experimental design (Figure 3) to examine the effects of the ART intervention. Experimental control was achieved by introducing the program at different times for two independent groups. Participants were randomly allocated to these groups. One group received the ART intervention at the outset of the project period, while the other group waited four weeks before the ART intervention occurred. In this manner, all participants received the ART intervention and could therefore be included in subsequent analyses of mediating and moderating factors. All participants were evaluated for social competence and behavioral problems before and after the ART intervention. Because the groups had the intervention at different times, this allowed for a comparison between the groups at a stage when one had completed the ART training and the other had not yet started it. In this way we could assess the possible effect of ART in a group comparison (ART versus "control") without losing the control group in subsequent analyses of mediating and moderating factors—the "control" group later received the ART intervention and was thus included in the ART condition.

Methods

Participants

Participants were 112 primary and secondary school pupils from 18 ART groups from all over Norway; the ART groups were composed by students in a Social competence postgraduate educational program, in cooperation with the participants' teachers. Participants were randomized into two groups of equal numbers. Subjects were not referred to the groups because of typical behavioral problems. At pre-test, teacher-rated mean for internalizing problems was 1.01 (SD = .56) and 1.09 (SD = .68) for externalizing problems, which is within the normal range. See Table 1 for figures on response rates and Table 2 for pre-test scores on social competence.

Table 1

Respondents and Missing Values

	Participants	Parents	Teachers
	SSRS	SSRS	SSRS
Before waiting period	39	41	32
Before ART	73	63	73
After ART	69	53	59
After follow-up	14	17	12

Instruments and Procedure

For this study the SSRS was selected to measure social competence and behavioral problems. The SSRS measures social competence and behavioral disturbances in the domains of Cooperation, Assertion, and Self-Control, as reported by teachers and parents. Additional scales assess parent-rated responsibility and student-rated empathy. The SSRS does not assess subjects' more complex social understanding and reasoning, but since it does include a rating scale for empathy, the rating system can be employed as a measure for social competence as well. Two other SSRS subscales assess teacher-rated and parent-rated externalizing and internalizing problems.

The validity and reliability of the subscales of social competence and behavioral problems have been assessed in several studies (Demary et al., 1995; Gresham & Elliot, 1990), supporting the utility of the instrument both in clinical and research settings. The validity and reliability of the Norwegian version of the SSRS is satisfactory (Ogden, 2003), and this also applies to its electronic version (Sæstad & Kyrrestad, 2007).

Half of the subjects ($n = 56$) were asked to participate in a study condition including a measurement four weeks before baseline measurement ("pre-pre-measurement"). The other half of the subjects ($n = 56$) were assigned to a condition that included a "post-post-measurement" (four weeks after completing the training). Thus, all 112 subjects and their parents and teachers were to deliver a pre- and post-measurement. In addition, half of them were to deliver a pre-pre-measurement, the other half a post-post-measurement.

The participants' parents and their class teachers filled out parent and teacher versions of the SSRS at pre-test, up to one week before the start of the training period. At post-test, less than two weeks after completing a 12-week ART program, all informants again completed the SSRS. All data were collected online by asking informants to log on to a data server and then to fill out an electronic version of the questionnaire. Post-test was performed within two weeks of finishing the ART. Pre-pre-test and post-post-test included the same online assessment procedure as pre-test and post-test (Figure 3). The problem behavior score was derived from the SSRS externalizing behavioral problem scale.

We computed aggregated scores as mean scores of both parents and teachers on all social competence scales. Parent-teacher interrater reliabilities for the SSRS behavior problem subscales and behavioral skill subscales at pre-test were significant and of medium size (Cohen, 1988) (social skills aggregated score: .38, $p = .000$; behavioral problems: .43, $p = .000$). At post-test, pre-pre-test and post-post-test correlations between teacher-rated and parent-rated social competence and behavioral problems aggregated scores were non-significant (see Table 3 for subscale interrater correlations).

Table 2

Means and Standard Deviation of Pre-test Scores on Behavioral Problems and Social Competence Measured by SSRS

$N = 42$		Parent-rated internalised problems	Parent-rated externalising problems	Participant-rated cooperation	Participant-rated asssertiveness	Participant ssrs empathy	Participant ssrs self control
N	Valid	27	27	41	41	41	41
	Missing	15	15	1	1	1	1
Mean		1.01	1.09	1.80	1.62	1.49	2.04
SD		.57	.68	.55	.44	.43	.57
Minimum		.17	.00	.10	.40	.40	.30
Maximum		2.83	2.83	2.90	2.50	2.40	3.00

These relatively low correlations between informants are consistent with previous research (Achenbach, McConaughy, & Howell, 1987; Briggs-Gowan, Carter, & Schwab-Stone, 1996; Ferdinand, van der Ende, & Verhulst, 2007; Gresham, Elliot, Cook, Vance, & Kettler, 2010; Israel, Thomsen, Langeveld, & Stormark, 2007). Teachers and parents observe participants in different situations in which different types of social competence are required. As such, data from different informants can supplement each other and an overall score of social competence in which both teacher and parent observations are included might represent a best-fitting broad observation of the participants' competence at a certain measurement point. Therefore, we computed an aggregated *social competence score* (Agg-Soc-Comp) for each measurement time by computing the mean scores of the teacher and parent SSRS-subscale scores Cooperation, Assertion, and Self-Control. Due to the fact that 'Responsibility' was rated by only one of the informants (parents), we chose not to include this subscale in the aggregated social competence score. The parent and teacher versions of the SSRS do not assess empathy. Therefore, in an attempt to obtain a measure of changes in empathy during the social competence training, we included participant ratings of their own empathy in our evaluation. In order to pool information from teachers and parents on externalizing problem behavior, we constructed an aggregated behavior problems score (Agg-Behav-Probl) by computing means of teacher and parent scores on this SSRS subscale for each measurement point.

Results and Discussion

Overall Effect of the Intervention

Using repeated measures ANOVA's, we found a significant increase in the participants' aggregated social competence score, mean pre-test = 1.69; mean post-test = 1.83; $F(1, 88)$ = 21,31, $p = .000$, and a corresponding reduction in behavioral problems, mean pre-test = .94; mean post-test = .81; $F(1, 87) = 4.98$, $p = .03$. As predicted, no significant changes were found during the pre-training period. In the post-training period, the Agg-Behav-Probl scores decreased significantly, mean 1 = .73; mean 2 = .56; F(1,11) = 14.31 p = .000). Agg-Soc-Comp did not show any significant changes (see Table 4).

Table 3

Interrater Reliabilities Social Competence Sub-Scores

		Participant at same measurement	Teacher at same measurement
Cooperation	Participant pre-pre	1	
	Teacher pre-pre	.64**	1
	Parent pre-pre	.50**	.53**
	Participant pre	1	
	Teacher pre	.30**	1
	Parent pre	.15	.27*
	Participant post	1	
	Teacher post	.44**	1
	Parent post	−.02	.12
	Participant post-post	1	
	Teacher post-post	.62	1
	Parent post-post	.38	.00
Assertion	Participant pre-pre	1	
	Teacher pre-pre	.57**	1
	Parent pre-pre	.44**	.46*
	Participant pre	1	
	Teacher pre	.34**	1
	Parent pre	.23*	.40**
	Participant post	1	
	Teacher post	.32**	1
	Parent post	.46**	.39**
	Participant post-post	1	
	Teacher post-post	.37	1
	Parent post-post	.44	.37
Self control	Participant pre-pre	1	
	Teacher pre-pre	.37*	1
	Parent pre-pre	.11	.54*
	Participant pre	1	
	Teacher pre	.22*	1
	Parent pre	.21	.40**
	Participant post	1	
	Teacher post	.04	1
	Parent post	.13	,23
	Participant post-post	1	−.06
	Teacher post-post	−.06	1
	Parent post-post	.71	−.39

Note: *) significant at p?.05 **) significant at p?.001.

Thus, the social competence training intervention was associated with an overall increase in social competence *and* a reduction in externalizing behavioral problems, giving support to the first part of premise (1), above, indicating the mediating role of social competence in the relation between social competence training and changes in behavioral problems.

Table 4

Repeated Measurements ANOVA Aggregated SSRS Scores for Social Competence and Behavioral Problems

	Dependent variable	Df	Independent Variable	F	Sign	Effect size (part. squared eta)
Pre-pre-test versus	Agg-soc-comp *	1,41	Time	1.40	.24	.03
	Agg-behav-probl**	1,41	Time	2.65	.11	.06
Pre-test versus	Agg-soc-comp*	1,88	Time (intervention)	21.31	.00	.23
	Agg-behav-probl**	1,87	Time (intervention)	4.98	.03	.02
Post-test versus	Agg-soc-comp*	1,11	Time	.20	.66	.02
Post-post-test	Agg-behav-probl**	1,11	Time	14.31	.00	.56

Note. *Aggregated parent- and teacher-rated score for social competence; **score for externalizing behavior problems.

Specific Effects of the Intervention on Social Competence

During the social skills training intervention, the following social competence factors changed significantly: Participant-reported Empathy, $F(1,73) = -3.01$, $p = .00$; Assertion, teacher-rated: $F(1,82) = 4.76$, $p = .00$, parent-rated: $F(1,61) = -4.01$, $p = .00$; and Self-Control, teacher-rated: $F(1,82) = -5.57$, $p = .00$, parent-rated $F(1,61) = -3.07$, $p = .00$).

Association Between Changes in Social Competence and Changes in Behavioral Problems

To test whether changes in behavioral problems were associated with overall changes in social competence (the second part of premise 1), we computed a Pearson correlation between changes in the aggregated social competence score for parents and teachers and changes in parent- and teacher-rated externalizing behavioral problems. Here we found a medium-level negative correlation ($-.29$, $p = .001$), lending support to the second part of premise (1).

To further illuminate the possible mediating role of social competence considering the effect of ART on behavioral problems, we performed an analysis of variance in which change in behavioral problems was treated as a dependent variable and changes in separate SSRS sub-domains as continuous predictor variables. We found significant effects of changes in the sub-domains Cooperation, $F(1,83) = 4.79$, $p = .03$, and Self-Control, $F(1,83) = 3.94$, $p = .05$, but not of changes in the sub-domain Assertion, on changes in behavioral problems. Correlations between changes in behavioral problems and changes in the social competence sub-domains Cooperation and Self-Control were of medium size (Cohen, 1988) (see Table 5).

Moderator Effects

Gender.

Firstly, girls tended to demonstrate an overall higher level of social competence and a corresponding lower level of behavioral problems at pre-test. Secondly, both genders seemed to

Table 5

Pearson Correlations Between Changes in Problem Behavior and Changes in Social Competence Before and After ART

		Changes in empathy reported by participants	Changes in social competence factor cooperation Same rater	Changes in soc competence factor assertion Same rater	Changes in soc competence factor self-control Same rater
Teacher reports	Changes in externalizing problem behavior (n = 82)	−.09 (.50)	−.24 (.03)	−.03 (.79)	−.39 (.00)
Parent reports	Changes in externalizing problem behavior (n = 62)	.03 (.84)	−.28 (.03)	−,10 (.43)	−.41 (.00)

Note. All *p*-values are two-sided.

profit well from the training, as social competence increased significantly between pre- and post-test, $F(1, 89) = 10.04$, $p < .005$. Separate analyses indicated that this effect was significant for both genders ($p < .005$ for both). For behavioral problems, there was an overall significant reduction, $F(1, 89) = 11.80$, $p < .001$. Separate analyses indicated that this effect was significant for the boys, $F(1, 89) = 14.13$, $p < .001$, but not for the girls, $F(1, 89) = 1.58$, $p = .21$. The latter result may at least partially be interpreted as a floor effect as girls demonstrated a low level of behavioral problems before the intervention (mean aggregated scores for behavioral problems at pre-test for girls: .82 (SD = .49) and for boys: 1.06 (SD = .55).

We found no significant interactional effect of gender on the effect of the intervention on agg-soc-comp, nor on the effect of the intervention on agg-behav-probl (Figure 4).

Thus, overall, the effect of gender as a moderating variable must be considered as low. If the difference in competence and problem levels between the genders is taken into account, we conclude that gender only affects the behavior problem score, and even this conclusion must be moderated because of possible floor effects.

Age.

An overall repeated measures ANOVA between pre- and post-measurements indicated significant effects of age on change in social competence but not on change in externalizing behavioral problems (Table 4).

As is apparent from Figure 5, the effect of the intervention program was beneficial for the younger participants (primary school level), as they significantly increased social competence and reduced behavioral problems between pre- and post-measurements. For the older participants (secondary school level or older), there was no change in social competence and only a marginal reduction in behavioral problems between pre- and post- measurements.
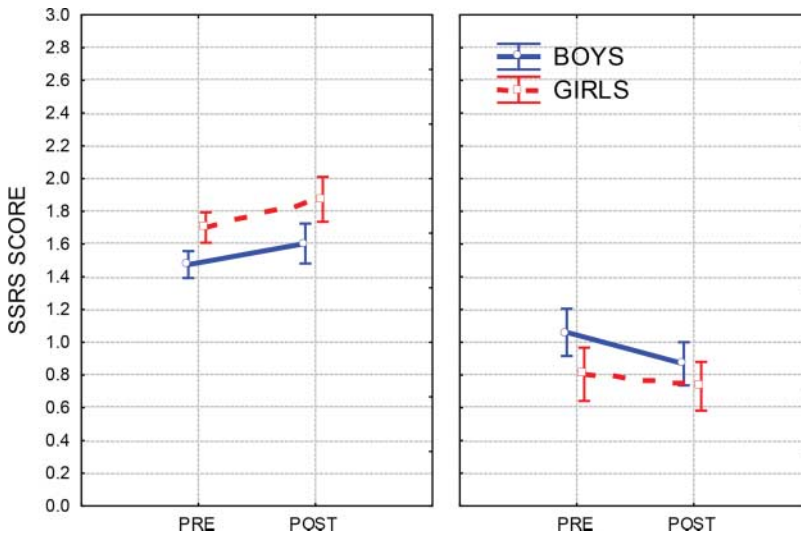
Figure 4.   Moderator role of gender on the effect of ART training on social competence and behavioral problems.

Age level thus seems to play a significant role as a moderating variable. For the younger participants, positive effects of the intervention were observed both on the social competence measure and on the behavioral problem measure. In contrast, no effect appeared on these measures for the older participants. Supported by the results of the analysis of variance in which age was treated as independent variable (Table 4), we therefore conclude that age moderates the effect of the ART intervention on social competence, with younger participants showing most improvement in social competence as a result of the training.

Empathy.

We hypothesized that those pupils high on empathy at pre-test already possess a satisfactory level of social competence and a low degree of behavioral problems and would thus present lower degrees of change in social competence and behavioral problems than pupils with intermediate or low levels of empathy.

However, when the different levels of social competence and behavioral problems as a function of high versus low level of empathy are taken into account, we found no evidence that this factor significantly affects the outcome of the ART intervention. Apart from a relatively low effect on the pre- versus post-competence measure in the low-empathy group, the effect on behavioral problem reduction was similar between the groups.

Level of Pre-Test Social Competence and Behavioral Problems.

The levels of social competence and behavioral problems at pre-test were found to significantly moderate the effect of the intervention on these variables (Table 1). To gain an impression of the size and direction of the effect of individual differences in social competence and behavioral problems, we divided the sample in two for each variable (scores at pre-test; criterion for group division = median score) and ran an ANOVA with group
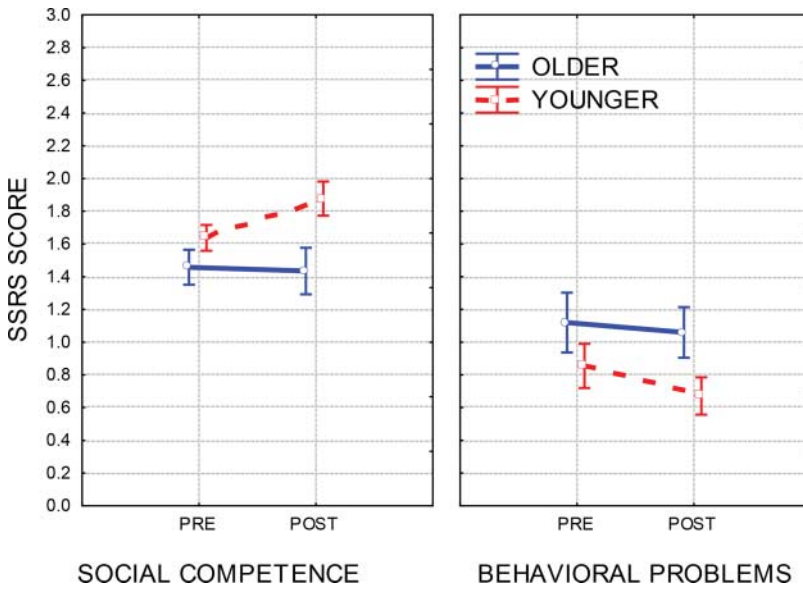
Figure 5.   Moderator role of age on the effect of ART training on social competence and behavioral problems.
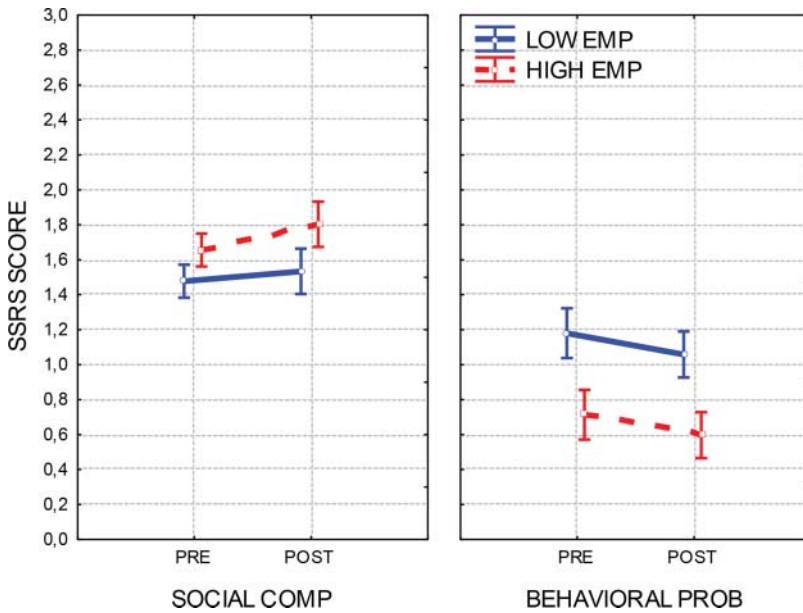

Figure 6.   Moderator role of empathy on the effect of ART training on social competence and behavioral problems.

division (high versus low social competence) as an independent variable and with the change scores in social competence and behavior problems as the dependent variables. The pattern of results is shown in Figure 7. Note that the horizontal line at Y value 0 indicates no change. Overall, positive social competence change scores and negative behavioral problems scores indicate improvement.

As is apparent from the Figure, the predicted changes appeared for all participants with low social competence at pre-test. For participants with high social competence at pre-test, the outcome was more complex; if participants had low problems at pre-test, there was no change in behavioral problems (possibly due to a floor effect), but a marked increase in social competence scores. If participants had high problems at pre-test, there was no change in the social competence score but a marked decrease in behavioral problems.

Discussion

Following a repeated measurements multi-baseline experimental design, we found that, after a 10-week social competence training program, social competence was significantly improved, and, concurrently, behavioral problems decreased significantly. During a waiting period before commencement of the training program, no changes in social competence and behavioral problems were found. During the follow-up period after the training, improvement in behavioral problems was more apparent than during the training period. This delayed improvement in behavioral problems indicates that this effect is more than a "Hawthorne effect," i.e., that the behavior of participants is impacted by the fact that they
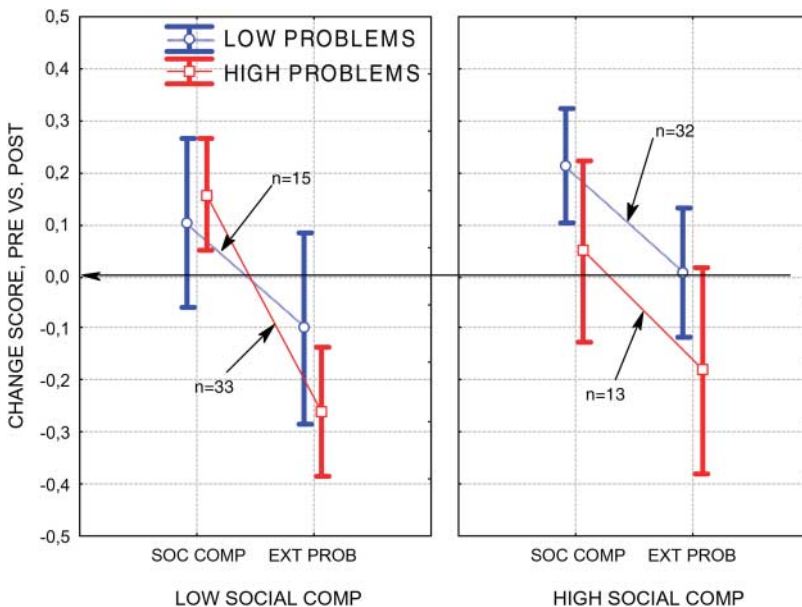

Figure 7. Moderator role of social competence on the effect of ART training on social competence and behavioral problems.

are being observed. A "Hawthorne effect" would start during the pre-treatment observation period, which was not the case in our study.

Both the temporal sequence of the most profound changes in social competence (firstly) and in behavioral problems (secondly) and our findings in support of the mediating role of social competence in the relation between the training program and changes in behavioral problems are indicative of the idea that the effect of ART on behavioral problems proceeds via improved social competence.

The specific social competence factors most clearly associated with a decreased level of behavioral problems were self-control and cooperation. Studies (Brannigan, Gemmel, Pevalin, & Wade, 2002) have shown a clear negative relation between pro-social behavior, including self-control, and conduct problems such as aggression in children. Reduced self-control might be a more or less temporary effect of emotional family turmoil or other forms of emotional strain resulting in an increased level of behavioral problems. Our study supports the view that self-control is not a stable trait, but rather a characteristic that can be trained following a social competence training program with a strong emphasis on anger control training, such as ART. The pathway to a reduction in deviant behavior will in this respect partly be mediated by increased self-control and partly by extension of access to alternative social skills. The significant association between an increase in ratings of cooperation skills and a decrease in behavior problems might be an indicator of this, suggesting a possible explanation of cooperation as a mediating factor. Thus, improved self-control can be learned, leading to a reduction in behavioral problems.

Salmon (2003) adheres to the view that empathy failure can increase the risk of, inter alia, the implementation of aggressive acts against peers by adolescents. We did not find an association between increased self-reported empathy and reduced levels of behavioral problems. However, we did find that levels of empathy increased significantly during the training period, ruling out the possibility that this apparent lack of association was related to the participants' levels of empathy not improving. Participants in our study were recruited from a mixed population with respect to behavioral problems. As mentioned previously, the majority of participants exhibited behavior within the normal range of problem levels. Some authors (Cairns & Cairns, 1991; Sutton & Swettenham, 1999) suggest that there are no differences in perception of other people's intention and feelings between deviant and non-deviant youths. However, deviant youths have mechanisms such as cognitive distortions, which prevent them from feeling ashamed or guilty for their wrong acts (Camodeca & Goossens, 2008). Even though empathy in the ART program is both a part of the moral reasoning program and also has certain elements in the social skills and anger control programs, stable egocentric patterns associated with empathy might be difficult to change through a 30-hour program. As a consequence, a possible association between improved empathy and lowered levels of behavioral problems will be less salient in our sample. Further, the time-span between increased empathy and decreased behavioral problems might be longer than the time frame of our study. Finally, the training curriculum in our study does not explicitly aim to increase empathy. An intervention with a stronger focus on empathy skills training might reveal a clearer association between increased empathy and a reduction in behavioral problems. However, since these arguments are rather tentative, our conclusion must be that our study does not demonstrate any association between changes in cooperation and empathy as measured by the SSRS and changes in behavioral problems.

We found that age moderates the effect of the social competence training program on social competence: Primary school participants in the training program demonstrated a

greater improvement in social competence after the training. Thus, the ART program in its present form seems to be most effective regarding social competence in pupils under the age of 12–13. This finding is in line with previous research from other countries with school systems that differ from the Norwegian system. The age at which children start and finish primary schooling, and the number of years spent at primary school, may differ from one Western country to another. Our finding that this social competence training program is most effective in the same age group as has been found in studies in other countries with different educational systems might indicate that the moderating effect of age is more related to psychosocial developmental factors than to school system factors (primary versus secondary school). Thus, in social competence training, as in most other areas of behavioral functioning, early intervention is indicated.

Pre-treatment levels of behavioral problems and social competence moderate the effect of the actual social competence training program on these measures. Those with high levels of pre-treatment behavioral problems and low levels of social competence benefited most from the training. Other studies have also shown that those with the highest levels of pre-treatment behavioral problems improved most after social competence training (e.g., Hemphill & Littlefield, 2006). Such findings may, at least in part, be related to floor and ceiling effects or regression effects.

Still, it is noteworthy that those who gain the most from social competence training are the children with significant deficits in their pre-training levels of social competence. The positive change in the group scoring high in the pre-test both on social competence and also on problem behavior is of special interest. At pre-test, these participants were probably well aware of social rules but they were also able and willing to act instrumentally against social acceptable rules to obtain specific goals. This seems to be prominent in pupils with instrumental aggression and is also associated with bullies (Brown, Atkins, Osborne, & Milnamow, 1996). It has been suggested that this group will not benefit from training in social competence, or that training will make them even more devious in manipulating others (Ogloff, Wong, & Greenwood, 1990; Rice, Harris, & Cormier, 1992). Our results, indicating a reduction of behavior problems also for those with a high score on social competence and a high score on behavior problems at the outset, might indicate that the inclusion of moral reasoning training in the ART program is especially important for this group (see also (DeRosier, 2004).

Participants were recruited from regular Norwegian schools, not from special education classes. The mean of the participants' level of behavioral problems was within the normal range (Table 1). Consequently, our findings might be generalized to the non-deviant child and adolescent population. However, due to possible selection bias, caution is warranted. Training of social competence is a viable approach to reduce behavioral problems in children and adolescents. However, in the further development of ART and other multimodal social-competence training programs, developmental factors could be given more consideration, allowing for different age-adapted, and thereby more effective, versions of the training curriculum.

Strengths and Weaknesses

The relatively high number of participants, the multi-informant registration and the wide array of institutions and schools at different locations in Norway may contribute to the validity of result generalization. The high numbers of non-responders at the measurements

before the waiting list period and after the follow-up period represents a weakness of this study.

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