

School-Based Social Training with and without Dogs: Evaluation of Their Effectiveness

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ABSTRACT This study examined the effects of different training methods on social behavior, empathy, and aggression (open and relational) in children (third-graders) at several intervals. There were three experimental conditions: "Social training without dogs," "Social training with dogs," and "Dog attendance without social training." The project was carried out in three elementary schools—three classes per school (total of 230 children)—over a period of 10 weeks. The assignment of experimental conditions to classes within each school was random. There were ten training sessions (90 minutes each): one session per week. The class teachers and pupils filled in questionnaires before the start of training and after the completion of the 10-week program, and the pupils did so once again three weeks after that. Data were analyzed using analysis of covariance for repeated measures on one factor. The respective initial values were incorporated into the computation as covariates. The teacher's survey revealed a significant improvement in pupils' social behavior, irrespective of program. The pupils showed a significant increase in empathy, irrespective of program; however, the effect was not stable over time. A significant advantage with respect to open and relational aggression was demonstrated by the "Social training with dogs" program over the other two alternatives.

Keywords: aggression, animal-assisted education, children, school, social competence



Emotional and social competencies comprise a big spectrum of different abilities which are very difficult to narrow down, as there exists no consistent taxonomy of concepts. Peterman (2002) differentiates among four approaches with respect to training methods for social and emotional competence. Cognitive and emotional processes are discounted in *behavior-oriented training*. Shortcomings in skills are supposed to be remedied gradually

by practicing behavioral patterns. In *self-control training*, behavioral change results from cognitive control of inner processes. By means of improved empathizing and putting oneself in the position of the other person, behavior is to be rendered possible within the framework of *empathy training*. *Social problem solving training* generates new behavioral patterns, taking possible consequences into account. The main focus is on the accurate planning of a solution in consideration of possible impediments. Even though methods vary depending on the target group, all approaches deal with the improvement of selected social-emotional pivotal abilities, which are composed of the categories “awareness of self and others,” “positive attitudes and values,” “responsible decision-making,” and “social interaction skills” (Payton et al. 2000). Casel (2003) provides a comprehensive comparison of international training programs. Beelmann, Pfingsten and Lösel (1994), as well as Elias et al. (2000) and Greenberg et al. (2003), also provide extensive information on social competence training programs.

In addition to these manifold possibilities for promotion of social and emotional competencies, there exists a broadly based field of research which deals with the positive effects of animals on selected social-emotional pivotal abilities. Animals can provide emotional support and adopt important functions for children as playmates, conversational partners, friends, and family members (Guttmann 1981; Lookabaugh-Triebebacher 1998; McNicholas and Collis 2001). Also, a number of studies have shown that animals can serve as social catalysts and thereby facilitate the process of approaching other people (Hart 2000; McNicholas and Collis 2000). And by their presence alone, animals can help prevent aggressive behavior by reducing feelings of insecurity (Endenburg and Baarda 1995). Most notably, however, children get their training in non-verbal communication when interacting with dogs, and in doing so learn to send more precise messages to others and to better understand other people's messages. This reduces the risk of interpreting ambiguous signals as offensive and reacting aggressively. Hyde, Kurdek and Larson (1983) provide evidence of a connection between pet husbandry and empathy. However, merely possessing a pet is much less a requirement for higher empathy than is the bond with the animal (Poresky and Hendrix 1990; Vizek-Vidović, Vlahović-Štetić and Bratko 1999). The intensity of the bond depends on the species of pet, and is very pronounced in the case of dog owners (Albert and Bulcroft 1988). Previous research indicates that a connection exists between empathy with animals and empathy with people (Poresky 1990; Ascione 1992; Ascione and Weber 1996).

It is the aim of animal-assisted education to also draw benefits from the positive effects associated with the presence of animals in a scholastic setting. At present, there are still very few scientific studies which deal with the phenomenon of animals in school classrooms. Two Viennese research projects revealed the effects of the presence of dogs in the classroom on first-graders. The presence of the dogs over a period of three months was found to have positive effects on the children's field-independence, empathy, social integration, and aggressiveness (Hergovich et al. 2002). The results of the second study (Kotrschal and Ortbauer 2003) revealed, on the one hand, a reduction of noticeable problems in behavior such as aggressiveness and hyperactivity, and on the other hand less timidity—so with respect to social behavior, particularly in the case of the boys, the outcome showed a more heterogeneous pattern.

On closer examination of the different possibilities and studies for the promotion of children's social-emotional competencies, the question of whether one program is superior to others invariably comes up. Supported by the Viennese association “Tiere als Therapie” (TAT, “Animals as Therapy”) it was possible for us to conduct an evaluation of this topic. The following study compared “Social training without dogs” (Petermann et al. 1999), “Social training with dogs” (a variation of the above-mentioned social training) and “Dog attendance without social training.”

Hypotheses

We hypothesized that all programs/interventions in our study would have positive effects on social competencies, but that the effectiveness of each would be different. Since both social training and contact with animals have positive effects on social-emotional competencies, it may be expected

that the combination will be more effective than the “simple” versions as a result of positive synergies. The hypotheses of the study were as follows:

1. a) We hypothesized that from the class teacher’s point of view, children’s social behavior would improve significantly more in the group receiving “Social training with dogs” than the groups receiving the other two interventions; b) “Social training without dogs” and “Dog attendance without social training” should also result in a significant improvement in children’s social behavior in comparison with the baseline values.
2. a) It was thought that the empathy of the children would improve significantly more in the group receiving “Social training with dogs” than the groups receiving the other two interventions; b) “Social training without dogs” and “Dog attendance without social training” should result in a significant improvement in children’s empathy in comparison with the baseline values.
3. a) It was thought that open aggression would diminish significantly more in the group receiving “Social training with dogs” than the groups receiving the other two interventions; b) “Social training without dogs” and “Dog attendance without social training” should result in a significant decrease in children’s open aggression in comparison with the baseline values.
4. a) We hypothesized that relational aggressions would diminish significantly more in the group receiving “Social training with dogs” than the groups receiving the other two interventions; b) “Social training without dogs” and “Dog attendance without social training” should result in a significant decrease in children’s relational aggression in comparison with the baseline values.

For all four hypotheses, no differences between the groups “Social training without dogs” and “Dog attendance without social trainings” were assumed. With regard to gender, no specific hypotheses were made. On one hand, especially boys are keen to interact with animals (Kotrschal and Ortbauer 2003). On the other hand, there are suggestions that social training is especially effective for girls (Peterman et al. 1999).

Methods

Participants

The study was conducted at three Viennese primary schools. Three third-grade classes participated from each school. Assignment to different training programs was random. The target sample comprised 230 children and nine class teachers. One hundred and nine (47.4%) of the children were male and 121 (52.6%) female. Seventy-five (32.6%) of the children received “Social training without dogs” (39 boys and 36 girls), 79 (34.4%) attended “Social training with dogs” (35 boys and 44 girls) and 76 (33.0%) experienced “Dog attendance without social training” (35 boys and 41 girls). All children were between 7 and 10 years of age. For the “Social training without dogs” group, the mean age was 8.2 years ($SD = 0.44$). For the “Social training with dogs” group, the mean age was 8.2 years ($SD = 0.48$). The children in the group “Dog attendance without social training” had a mean age of 8.3 years ($SD = 0.50$).

The final sample sizes for analysis turned out to be lower, for various reasons. Only six of the nine questionnaires from the teachers could be utilized, because the remaining teachers (one teacher from each program/intervention) used different observation periods as a base for both surveys, and therefore the data were not suitable for comparison. In the end, 151 assessments of the teachers (71 [47%] with reference to boys and 80 [53.0%] with reference to girls) were suitable for analysis. Fifty (33.1%) questionnaires were from the group “Social training without dogs,” 52 (34.4%) from the group “Social training with dogs” and 49 (32.5%) from the group “Dog attendance without social training.”

With the pupils’ assessments, some of the children could not be taken into account, as they were not able to fill out the questionnaire reliably due to difficulties with language comprehension and

because the data did not bear up under a plausibility check. Further losses were the inevitable result of repeated measurements, as some children were ill on the day of data collection or had dropped out of the class. For the analysis of the empathy-scale data, 121 children were included: 59 boys (48.8%) and 62 girls (51.2%); 45 (37.2%) children from the "Social training without dogs" group, 39 (32.2%) children from the "Social training with dogs" group, and 37 (30.6%) from the "Dog attendance without social training" group. For the analysis of the scales on open and relational aggression, data from 183 children were used: 90 boys (49.2%) and 93 girls (50.8%); 59 (32.2%) children from the "Social training without dogs" group, 67 (36.6%) children from the "Social training with dogs" group, and 57 (31.2%) from the "Dog attendance without social training" group.

Instruments

The following measurement instruments were used in the study:

1. The complete scale "Social behavior"—from the "Beurteilungshilfen für Lehrer" (Assessment-aids for Teachers; Janowski, Fittkau and Rauer 1981) with its five sub-scales—was selected for the teacher's survey. The teachers received extracts from the instruction sheets of the scale in order to ensure that comprehension was the same for all participants. Eight behavioral patterns are listed for each sub-scale. The teachers were asked to assess their pupils with respect to how often they had noticed these behavioral patterns during the previous week. Depending on how many of the stated behavioral patterns were ascribed to the child, a value from 0 (none) to 8 (all) was assigned. Sample items from each sub-scale are: "The pupil insists on being heard by his or her classmates." (*Sub-scale "Social self-assertion behavior"*); "S/he helps someone else, if this person cannot cope with the exercise." (*Sub-scale "Socially responsible and helpful behavior"*); "S/he is responsive to the needs of other pupils." (*Sub-scale "Socially sensitive and communicative behavior"*); "The pupil likes working in groups." (*Sub-scale "Cooperative behavior"*); "The pupil speaks out actively about conflicts, e.g., s/he tries to clarify the attitudes of those who are arguing with each other." (*Sub-scale "Tolerant and constructive conflict resolution behavior"*)
2. The "Inventar zur Erfassung von Impulsivität, Risikoverhalten und Empathie bei 9- bis 14-jährigen Kindern (IVE)" (Inventory for the Assessment of Impulsivity, Risk Behavior and Empathy of 9–14 year-old children; Stadler, Janke and Schmeck 2004), which is an adapted German version of the Eysenck Impulsivity Questionnaire (Eysenck and Eysenck 1980), was used to survey the pupils. The value of the scale "empathy" was determined by means of eight items. The scale describes sensitivity to, and empathy with, the feelings and reactions of other people. The scale's reliability (Cronbach's alpha) in our sample was 0.82. The children rated all items on a five-point Likert scale: "Clearly no, is not true at all!"(1), "Rather no, is rather not true!"(2), "Undetermined, neither true nor untrue!"(3), "Rather yes, is rather true!"(4) and "Clearly yes, is true!"(5). Sample items are: "I feel sorry for children who find no one to play with" and "I can imagine very well what someone who is very lonely feels like."
3. An adaptation of the Bully/Victim-Questionnaire (Olweus 1989), which is suitable for children, was used to assess the frequency of open and relational aggression. Open aggression refers to behavior which harms other people physically or threatens somebody with such harm, including beating or kicking another person or verbal statements implying such a threat. Relational aggression is based upon the actual damage to social relationships or the threat thereof. It covers, for example, spreading mean rumors about a peer and excluding or ignoring a child (Crick and Grotpeter 1995). The children in our study were asked to rate, on a four-point Likert scale, how often these various things had happened to them during the previous week. The response categories were: "not at all" (0), "sometimes"(1), "often"(2), and "very often"(3). The scale "Victim of open aggression"

comprised three items; its reliability (Cronbach's alpha) in our sample was 0.57. The scale "Victim of relational aggression" consisted of four items; the Cronbach's alpha was 0.60. Sample items are: "How often has a classmate of yours threatened to beat you?" (Scale "Victim of open aggression") and "How often has a classmate insulted you in front of others?" (Scale "Victim of relational aggression").

Procedure

Approximately three weeks after the start of the school year the first instance of data collection took place (Time 1), the second one occurred ten weeks later, immediately after the completion of the programs (Time 2), and the third one, which only involved the children, occurred three weeks after the program ended (Time 3). At all times the survey was carried out by the same two investigators using standardized instructions. A total of six dog trainers (all female) from the association "Tiere als Therapie" (TAT, Animals as Therapy) participated with their trained and tested therapy dogs. Two dog trainers at a time visited a school and alternately attended the classes with the programs "Social training with dogs" and "Dog attendance without social training." The children were trained in the class setting. Some dog trainers brought several dogs, some only one. All in all, ten dogs of different dog breeds took part: seven female dogs and three male dogs. In addition to nine pedigree dogs (three Border Collies, two Australian Shepherds, and one each of Labrador Retriever, Golden Retriever, Berger des Pyrénées, and Berger Picard) there was also one mixed-breed dog. In the classes with the training alternative "Social training without dogs," the previously evaluated "Sozialtraining in der Schule" (Social training in school) (Petermann et al. 1999) was carried out according to the training handbook by the respective class teacher. Training programs comprised a total of ten meetings (one meeting per week of 90 minutes' duration each) over a period of ten weeks.

For "Social training with dogs," the program was modified in such a way that the dogs were involved in the program by means of self-conceived exercises during the initial phase, the closing phase, and transfer, whereas the actual working phase remained unmodified. For example, the children played a game where each child drew a card with a symbol on it representing various activities with the dog (pet the dog, throw ball to dog, brush dog, walk around with dog). Of course the children also had the opportunity to approach the animals during the breaks. Training was carried out by the class teachers with the support of the dog trainers.

During "Dog attendance without social training," the dog trainers were present with the dogs 90 minutes per week over a period of ten weeks. The children were allowed to interact (playing, feeding, petting, brushing) with the animals while arriving and leaving, and during the breaks or if they had finished their exercises ahead of time. No particular exercises were administered.

Analysis

All statistical analyses were conducted using SPSS (Statistical Package for the Social Sciences, Diehl and Staufenbiel 2002). The hypotheses were examined using a 3'3'2 analysis of covariance with repeated measures on one factor (time), a procedure of the general linear model (GLM). The three independent variables were time (Time 1, Time 2, and also for the pupils, Time 3), program ("Social training with dogs," "Social training without dogs," and "Dog attendance without social training") and sex. The dependent variables were "Social behavior" (from the teachers' questionnaires—two assessments), "Empathy," "Victim of open aggression," and "Victim of relational aggression" (from the pupils' assessments). The respective initial values of the dependent variables were taken into account as covariates.

One requirement for this procedure is multivariate normality. Multivariate normality in this study was tested using the Box-M-Test, which examines the equality of group covariance matrices. Even though the prerequisites were not fulfilled, the GLM was nevertheless used, as univariate normal distribution of the variables of interest was determined (examined using Kolmogorov-Smirnov tests) and because it is the only method available to test the hypotheses under this design. Because the prerequisite of sphericity was not fulfilled at the three assessment times (checked using the Mauchly

test), the Greenhouse-Geisser values were used, in which the adjustment of degrees of freedom occurs automatically. The alpha-level was fixed in advance at 0.05.

Results

The threefold analysis of covariance with repeated measures on one factor revealed a minor ($\eta^2 = 0.142$) significant temporal effect ($F_{(1)} = 23.78, p < 0.05$) for the dependent variable "Social behavior" ($n = 151$). None of the three interactions (program \times time, sex \times time, program \times sex \times time) were significant. Therefore, the conclusion can be drawn that in consideration of the initial values as covariates, social behavior, from the teachers' point of view, had improved from Time 1 (Mean = 3.50) to Time 2 (Mean = 3.79), irrespective of sex and program.

For the dependent variable "Empathy" ($n = 121$) a similar pattern resulted from the triple analysis of covariance with repeated measures on one factor. Here there also emerged a low ($\eta^2 = 0.054$), but significant temporal effect ($F_{(1,823)} = 6.465, p < 0.05$). The pair-wise *post hoc* comparisons showed that the second assessment (Mean = 3.79) differed significantly from the first (3.36) and third (3.40). Since none of the interactions were significant, there resulted an increase of empathy from Time 1 to Time 2, irrespective of program and sex, but the new level of empathy was not maintained after the end of the program, and levelled off at the base level at Time 3.

The analysis of covariance further showed time as a significant main effect, and there was a significant interaction between program and time for the dependent variable "Victim of open aggression." Only the interaction will be interpreted. A low ($\eta^2 = 0.034$) effect appeared specific to the program ($F_{(3,803)} = 3.140, p < 0.05$). For the mean values, which were adjusted in consideration of the covariates (at the top of Table 1) it is apparent that only in "Social training with dogs" did a reduction in open aggression take place, and in fact in such a way that the positive trend continued from Time 2 to Time 3. The values of the comparison groups did not change.

A similar pattern resulted for the dependent variable "Victim of relational aggression." Here, the significant main effect time was not interpreted; only the significant program \times time interaction was. Again, a small ($\eta^2 = 0.039$) but significant effect specific to the program ($F_{(3,830)} = 3.617, p < 0.05$) was found. By taking a look at the adjusted mean values (bottom of Table 1) it can be seen that only "Social training with dogs" brought about an explicit reduction in relational aggression, and that the positive trend also persisted at Time 3. The program "Dog attendance without social training" exhibited a similar development, although the changes were not as pronounced. The process of "Social training without dogs" did not fulfill expectations. Here there even emerged an increase in relational aggression from Time 1 to Time 2.

Table 1. Adjusted cell means for the scales "Victims of open aggression" and "Victims of relational aggression" for the three training programs at three time points.

Program	Victim of Open Aggression			Victim of Relational Aggression		
	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3
Social training without dogs ($n = 59$)	0.49	0.50	0.56	0.62	0.77	0.63
Social training with dogs ($n = 67$)	0.49	0.34	0.24	0.62	0.43	0.37
Dog attendance without social training ($n = 57$)	0.49	0.50	0.49	0.62	0.55	0.48

Notes: Time 1 represents the first assessment time, immediately before a program began; Time 2 represents the second assessment time, ten weeks later, at the end of a program; and Time 3 represents the third assessment time, three weeks after the end of the program (filled in by the children only). Higher values indicate higher levels of aggression.

Discussion

All three training alternatives had positive effects on the children's social behavior and empathy, which is consistent with previously reported positive impacts of animals and the aims of social training without the presence of animals. The hypothesis that the combination of both, social training and contact with animals would have positive effects on social-emotional competencies, was confirmed for the variables "Victim of open aggression" and "Victim of relational aggression." The expected "synergy effect" was thus partially affirmed.

Restrictions regarding the explanatory power of the outcomes are due to it being impossible, in a quasi-experimental field study, to control or eliminate all sources of disturbance, and therefore the observed effects cannot unequivocally be traced back to the treatment. Another problem is the low magnitudes of effect, which can be explained by the comparatively short duration of the project.

It is possible to deduce some implications for practice from the results of this study. On closer examination of the development across all variables analyzed, the advantage of social training with dogs is clear, because here we found improvement without exception, even on the aggression scales. However, taking the practical realization into consideration, and if the manipulation of aggressive behavioral patterns does not come to the fore, a good case can also be made for the choice of another program, as the development is very similar irrespective of the program with regards to empathy and social behavior. It should be determined whether people have a positive attitude towards dogs and if there are any objections regarding health (e.g., allergies) to their presence in schools. Altogether, the organizational effort is quite high, because either an animal trainer has to be found (the presence of a trainer is needed in any case to take care of the animal) or the duration of training is long and training costs have to be invested in the trainer's own animal, although it is not certain whether the animal is qualified on the basis of its nature. Of course there also exist alternatives such as the construction of a school zoo or the use of less demanding animals (e.g., rabbits, guinea pigs), although there is a lack of research on these. When deciding on a specific program, one has to consider how much curriculum time is intended for social learning. While social training may require 90 minutes per week, simple dog attendance can take place during regular class time. If there is some time left and there is nothing to argue against the assignment of dogs, then animal-assisted social training could be recommended, especially as the fun factor should be very high. Another positive side effect is that the children become familiar with the individual characteristics of the animals and learn appropriate conduct.

Future research could deal with the issue of designing a genuine control group. What program could be selected as an alternative which is on equal terms with an animal-assisted program with respect to all the items, not just regarding the dependent variables?

Animal attendance brings with it the difficulty that the effect of the animal can not be separated from that of the trainer, without the need to also establish visits in the alternative program. There is also the question of "dosage." How often should animal attendance take place? Is constant attendance superior to animal visits with respect to short- and long-term effects? Or would a school zoo be the best alternative? Here a comparison between the effects of different animal species (also of different breeds of the same species) under similar conditions is lacking. Initial evidence of the relevance of this question is provided, for example, by a study by Toeplitz et al. (1995), which shows that only children who have both dogs and cats exhibit higher values of pro-social behavior. It would also be interesting to analyze the effect of the same program on different groups of people. This does place high demands on the measures, but in that way it would be possible to test whether the effect is different depending on age and level of education, or one could also draw a comparison between children with and without noticeable behavioral problems.

There are enough implications for the future, and as always regarding the assignment of animals in schools, there are some bureaucratic obstacles to overcome. Moreover, the realization of such a project depends on the collaboration and the approbation of so many parties that it will not be easy to fill the gaps in the research.

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