

# Effects of Puppetry on Elementary Students' Knowledge of and Attitudes Toward Individuals with Disabilities

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## **Abstract**

Findings from two studies investigating the effects of Kids on the Block (KOB) puppet shows on elementary school students' knowledge of and attitude toward individuals with disabilities are described. KOB is a troupe of life-size hand-and-rod puppets used to improve knowledge and change attitudes toward persons with disabilities. Results from both studies indicated that KOB performances had positive effects on both the knowledge and attitudes of second, third, and fourth grade students. Study 1 showed that the puppet show participants had more positive attitudes and more accurate factual knowledge of individuals with disabilities compared to the control group participants who did not experience the KOB puppets. Findings from Study 2 showed pretest-post test gain scores for the KOB group were larger than those for the control group. The results taken together provided evidence that a rather simple intervention was effective in terms of changing the knowledge of and attitudes toward individuals with disabilities.

**Keywords:** Elementary Students, Puppetry, Knowledge, Attitudes, Individuals with Disabilities

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## **Introduction**

The knowledge and attitudes of people in general (Scior, Kan, McLoughlin & Sheridan, 2010), and children more specifically (Nowicki & Sandieson, 2002), toward individuals with disabilities has been the focus of description and investigation for many years (Garcia, Diaz & Rodriguez, 2009; Yunker, 1988). Research shows that misunderstandings of and negative attitudes toward individuals with disabilities often interfere with their acceptance and full inclusion into school and society (Lipsky & Gartner, 1996). Research also shows that many children as young as 4 or 5 years of age have already developed misconceptions about and

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negative attitudes toward individuals with disabilities (see Favazza & Odom, 1997) and that these beliefs and understanding's continue to be characteristic of elementary school age children in the absence of any attempts to improve knowledge or change attitudes (Nowicki & Sandieson, 2002). Many different types of interventions have been used to change young children's knowledge of and attitudes toward individuals with disabilities (Donaldson, 1980; Garcia et al., 2009; Shapiro, 2000). These include, but are not limited to, awareness and knowledge transmission programs (Garcia et al., 2009), empathy-related experiences (Lockhart, French & Gench, 1998), puppet plays (Pitre, Stewart, Adams, Bedard & Landry, 2007), simulations of disabling conditions (Hutzler, Fliess-Douer, Avraham, Reitner & Talmor, 2007), and multi-media curriculum (Hazzard & Baker 1982). One intervention that has been widely used is the Kids on the Block (KOB) puppets (Aiello, 1988). KOB is a troupe of life size hand-and-rod puppets of children with and without disabilities. The goal of KOB is to dispel misconceptions and promote positive knowledge of and attitudes toward individuals with disabilities. The original puppet troupe, which has been the primary focus of research and practice, includes children with a physical disability (cerebral palsy), intellectual disability (Down syndrome), visual impairment, and hearing impairment. KOB has been performed extensively throughout Canada (e.g., Baker, 1991; Snart & Maguire, 1986) and the United States (e.g., Baker, 1994; Schumacher, 1998) as well as in more than 30 other countries (Leggett, 2005).

Studies of the effects of the KOB puppets on either or both the knowledge and attitudes of elementary age school children toward individuals with disabilities has produced mixed results (e.g., Gilfoyle & Gliner, 1985; Rosenbaum, Armstrong & King, 1986b; Snart & Maguire, 1987). Close inspection of studies of KOB indicate that the conflicting findings may be due to differences in the rigor of the research designs and data analysis methods used to evaluate the effectiveness of the puppet shows. This includes the use of different types of research designs, differences in the study sample sizes, the use of different measurement scales, and data analysis procedures. The purpose of the two studies described in this brief report was to assess differences and changes in the knowledge and attitudes of elementary school students toward individuals with disabilities. More specifically, the studies included large samples of students randomly assigned to intervention and control groups where traditional statistical analysis procedures were supplemented by effect size calculations (Thompson, 1999) to ascertain the magnitude of the influence of the KOB puppet shows on students' knowledge and attitudes.

## **Method**

### *Participants*

The participants in the two studies were 966 second, third, and fourth grade students in 40 classrooms in six elementary schools in one school district in the southeast United States. The participants in the first study included 170 second graders (83 male, 87 female), 154 third graders (84 male, 67 female), and 190 fourth graders (101 male, 89 female). The participants in the second study included 158 second graders (81 male, 77 female), 149 third graders (78 male, 71 female), and 145 fourth graders (78 male, 67 female).

### *Procedure*

The KOB puppet show performances were conducted in the manner prescribed by the KOB developers (Kids on the Block Inc., 2012). Puppeteers (early childhood professionals) received extensive training on the 4 or 5 scripts for each puppet prior to conducting the shows. Each KOB puppet described his or her disability; misconceptions associated with his or her condition; the similarities and differences between him or herself and other children; his or her interests and capabilities; and their social relationships with peers and friends. Each

puppet show lasted between 45 and 60 minutes followed by a question-and-answer period where participants had the opportunity to comment on and pose questions to any of the puppets.

A 20-item true-false knowledge and attitude scale was used to evaluate the effects of KOB puppet performances on the students' beliefs and understanding. Items on the *Children's Knowledge About Handicapped Persons Scale* (Hazzard 1983) and the *Children's Attitude Toward Handicapped Peers Scale* (Voeltz, 1980) were used to develop the 20 item scale. The coefficient alphas for the 10 knowledge items and 10 attitude items were  $\alpha = 0.88$  and  $\alpha = 0.89$  respectively. The students also completed a 6 item true-false investigator-developed familiarity-with-persons-with-disabilities scale which was used as a covariate in the analyses of the students' knowledge and attitude responses since research has found that a students' prior experiences with individuals with disabilities influences their knowledge and attitudes (e.g., Maras & Brown, 2000; Rosenbaum, Armstrong & King, 1986a). Students completing pretests did so one week before the puppet shows. The post test was administered to all students one month after the completion of the puppet shows.

#### *Method of Analysis*

Half of the six elementary schools were randomly selected for Study 1 and the other three schools were included in Study 2. In each of the two studies, one elementary school was randomly assigned to participate in the KOB puppet show (intervention group) and the other two schools were the control groups. (All students in all schools subsequently experienced the KOB puppet shows after the two studies were completed.) Study 1 employed a 2 Between Group (Intervention vs. Control) X 3 Between Grade (2 vs. 3 vs. 4) Analysis of Covariance (ANCOVA) with the post test knowledge and attitude scores as the dependent measures and the students' familiarity scores as the covariate. Study 2 employed the same research design with the pretest-post test gain scores as the dependent measures for the reason described below.

Statistical significance testing was supplemented by Cohen's *d* effect sizes (Thompson, 1999) for the mean differences between the intervention and control groups which were used for substantive interpretation of the findings. It is now a generally recommended and accepted practice to use effects sizes rather than significance testing for ascertaining the magnitude of an intervention effect (Vacha-Haase & Thompson, 2004). A Cohen's *d* smaller than 0.20 is considered insignificant, a *d* between 0.20 and 0.49 is considered a small (but important) effect, a *d* between 0.50 and 0.79 is considered a medium effect, and a *d* equal to or greater than 0.80 is considered a large effect (Cohen, 1988).

## **Results**

### *Study 1*

Table 1 shows the adjusted mean scores and standard deviations for both the intervention and control groups and both the *p*-values and Cohen's *d* effect sizes for the between group differences for both outcome measures for each grade separately and for all grades combined. The ANCOVA for the post test knowledge scores produced a significant between grade difference,  $F(2, 507) = 20.37, p = .0000$ , and a significant between group difference,  $F(1, 507) = 19.63, p = .0000$ , both of which were qualified by a significant intervention group x grade interaction,  $F(2, 507) = 5.36, p = .005$ . The effect size for the mean differences between the intervention and control groups knowledge scores was  $d = 0.41$  for all grades combined. Analyses of the group by grade interaction showed that the knowledge scores for the intervention group differed from that of the control group for Grade 2 and Grade 3 students (as evidenced by the sizes of effect) but not for Grade 4 students (as evidenced by a

insignificant effect size). This pattern of findings are shown in Table 1 in terms of both the *p* values and Cohen's *d* effect sizes for the between grade comparisons.

Table 1. Means, Standard Deviations and Effect Sizes for the Between Group Post Test Comparisons (Study 1)

Outcome Measure	Intervention Group			Control Group			Exact <i>p</i> -value	Cohen's <i>d</i> Effect Size
	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>		
<i>Knowledge</i>								
Second Grade	84	6.42	1.90	86	5.88	1.96	.0537	0.30
Third Grade	35	7.77	1.70	119	6.18	1.76	.0000	0.88
Fourth Grade	84	7.45	1.64	106	7.27	1.78	.4919	0.10
All Grades Combined	203	7.22	1.84	311	6.45	1.91	.0000	0.41
<i>Attitudes</i>								
Second Grade	84	6.36	1.62	86	6.12	1.90	.3679	0.14
Third Grade	35	7.52	1.20	119	6.50	1.88	.0016	0.61
Fourth Grade	84	7.75	1.23	106	6.97	1.69	.0016	0.47
All Grades Combined	203	7.21	1.55	311	6.53	1.85	.0000	0.38

Note. The mean scores are the adjusted averages partially out the effects of familiarity as the covariate.

The ANCOVA for the post test attitude scores produced a significant between grade difference,  $F(2, 507) = 20.24, p = .0000$ , and a significant between group difference,  $F(1, 507) = 17.71, p = .0000$ . The between grade difference showed that older students had more positive attitudes compared to younger students as evidenced by progressive increases in the attitude scores for both the intervention and control group from the second to the third to the fourth grades (Table 1).

The between group difference indicated that intervention group had more positive attitudes compared to the control group as evidenced by both a  $p = .0000$  and a  $d = 0.38$  for all grades combined. Further analysis showed the effect sizes for the differences in the students' attitude scores for the intervention and control groups were both medium for the Grades 3 and 4 mean differences but insignificant for the Grade 2 mean difference.

### Study 2

Preliminary analyses of the adjusted pretest mean scores of the intervention and control groups found that the students' knowledge,  $F(1, 472) = 14.01, p = .000$ , and attitude,  $F(1, 472) = 6.32, p = .012$ , scores differed (favouring the intervention group) and therefore each students' gain score (post test score minus pretest score) was used as the dependent measure in the analyses of the effects of the KOB puppet shows. The ANCOVAs for both the knowledge,  $F(1, 445) = 35.68, p = .0000$ , and attitude,  $F(1, 445) = 18.78, p = .0000$ , pretest-post test gain scores showed that the changes on both outcome measures were larger for the intervention group compared to those for the control group.

The nature of the between group differences are shown in Table 2 for all grades combined and for each grade separately. Both the *p*-values and Cohen's *d* effect sizes for the between group differences showed that the KOB puppet show positively influenced changes in the students' knowledge of and attitudes toward individuals with disabilities. The between group differences were medium to large for 6 out of the 8 Cohen's *d* comparisons and all the *p*-values were statistically significant except one.

Table 2. Means, Standard Deviations and Effect Sizes for the Pretest-Post Test Group Differences (Study 2)

Outcome Measure	Intervention Group			Control Group			Exact p-value	Cohen's <i>d</i> Effect Size
	<i>N</i>	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>		
<i>Knowledge</i>								
Second Grade	48	1.52	1.71	110	0.17	1.96	.0000	0.75
Third Grade	62	1.06	1.88	87	-0.16	1.92	.0001	0.68
Fourth Grade	50	0.95	1.65	95	0.38	1.55	.0707	0.32
All Grades Combined	160	1.18	1.77	292	0.13	1.83	.0000	0.58
<i>Attitudes</i>								
Second Grade	48	0.65	1.71	110	-0.13	1.91	.0099	0.45
Third Grade	62	0.59	1.42	87	-0.05	2.02	.0280	0.37
Fourth Grade	50	0.64	1.51	95	-0.15	1.52	.0099	0.45
All Grades Combined	160	0.62	1.53	292	-0.11	1.82	.0000	0.42

Note. The mean scores are the adjusted averages partially out the effects of familiarity as the covariate.

## Discussion

Findings from Study 1 suggested that the KOB puppet shows had positive influences on the study participants knowledge of and attitudes toward individuals with disabilities. This was confirmed by the results from Study 2 where both significance testing and the effect sizes for the intervention and control group mean differences both provided support for the effectiveness of the KOB puppet shows. Taken together, the largest number of intervention vs. control group mean differences (14 out of 16) favoured the students who participated in KOB performances which indicated that the puppet shows had positive effect on both the knowledge and attitudes of elementary school students.

The sizes of effect for the KOB puppet shows were mostly small or medium which was not unexpected given the fact that the intervention lasted only 45 to 60 minutes for each group of students. What is perhaps most encouraging is the fact that such a simple intervention had discernable positive effect, and that the intervention could be delivered to a larger number of students on a single occasion. Inasmuch as elementary school students generally respond favourably to puppets as a medium for delivery of factual knowledge in an entertaining way (Bernier & O'Hare, 2005), KOB puppet shows would seem warranted and indicated as part of efforts to educate students without disabilities about individuals with disabilities (Garcia et al., 2009; Shapiro, 2000).

The extent to which the positive effects of KOB puppet shows are short or long term has been the focus of a number of investigations (Baker, 1991; Snart & Maguire, 1987). Snart and Maguire (1987) found that the effects of KOB puppet shows were still discernable 6 months after the completion of their intervention, and Baker (1991) found that intervention vs. control group differences were still detectable 12 months following the completion of her intervention. These two sets of findings reinforce the fact that KOB is an effective strategy for producing immediate and relatively long-term positive changes in the knowledge and attitudes of elementary school students.

## Conclusion

Puppetry interventions in general (Binkard, 1985; Pitre et al., 2007), and the KOB puppets in particular (Aiello, 1988; Snart & Maguire, 1986), should be considered as at least one method for positively affecting changes in the knowledge and attitudes of elementary students' toward individuals with disabilities. This would seem to be especially the case in situations

where children with disabilities are included in regular and mainstream education (Flem, Moen & Gudmundsdottir, 2004; Nelson, 2000) which has increasingly become a method-of-choice for educating students with disabilities (Salisbury & Smith, 1991; Yell, 1995).

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