

The Effects of “I Can Problem Solve Program” on Children’s Perspective Taking Abilities

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ABSTRACT

This study was conducted to determine the effects of I Can Problem Solve Program (ICPS) on preschool children’s perspective taking skills. Participants were 51 children who were attending two public preschool. In the study, pretest – posttest – retention test control group desing was used. There were an experimental group and two control groups in the study. As data collection tool, “Perspective Taking Test for Children (PTC)” was utilized. Firstly, PTC was applied to children as pretest. Then “I Can Problem Solve Program” was applied to children in experimental group. Children in control groups were attend the regular program. After the completing the program application PTC was implemented to experimental group and control groups as posttest. Finally, PTC was applied to experimental group as retention test after a month of posttest. At the end of the study, it was determined that I Can Problem Solve Program had a significant impact on children’s perspective taking skills. There was a statistically significant difference between experimental group and control groups in posttest, while there was no difference between the groups in prettest. Children in experimental group performed better than children in control groups in posttest. Moreover, there was no significant difference in experimental group’s scores between posttest and retention test scores.

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1. INTRODUCTION

In order to establish and maintain healthy social relationships throughout life, individuals need to understand each other correctly. Perspective-taking is the skill to predict or understand a situation from the viewpoint of another individual and has an important role in establishing successful social interactions [1]. Perspective-taking has three sub-dimensions. The first sub-dimension, perceptual perspective-taking, is described as the skill to understand how another individual sees the world. Cognitive perspective-taking is the skill to understand what another individual thinks. Emotional perspective-taking is defined as the skill to understand how an individual feels and what kind of emotional experiences an individual has [2].

Perspective-taking is particularly important due to its relation to social skills such as empathy, egocentrism, prosocial behaviors, and social problem solving. Egocentrism is one of the typical characteristics of childhood. Egocentrism causes the child to be inadequate in taking perspective towards the events with the viewpoint of others. Once the interaction of children with their parents, other adults and friends increase, their egocentric behaviors decrease and behaviors such as sharing, helping and cooperating start to develop [3].

According to Piaget and Inhelder, for a child, understanding the position of other individuals, is the key in acquiring the perspective-taking skill. With the skill of perspective-taking, the child begins to see the

same objects from different perspectives. Piaget and Inhelder examined children's perspective-taking skills with the "Three-Mountain Experiment." In this experiment, children observed a model of three mountains in different sizes, and they were asked to indicate how a doll seated in different spots would see this model by selecting the appropriate image. Children up to age nine could hardly decide how the view would look from another viewpoint and were inadequate in choosing a sight outside their own perspective. Piaget and Inhelder denoted that young children could not perceive that the world could look different when viewed from another point due to their egocentrism, therefore, could not take the perspective of other individuals in preschool years [4].

This classic study of Piaget and Inhelder led various researchers to investigate the age that perspective-taking skills developed in children. Through using a similar method, Laurendeau and Pinard [5] reached conclusions supporting the claims of Piaget and Inhelder that children start to demonstrate perspective-taking skills from the age of seven. On the other hand, several researchers claimed that the failure of young children in perspective-taking was largely due to Piaget's method. Researchers, who attempted to simplify the method used by Piaget and to render it more appropriate for the development level of children ([6], [7]), established different tests to measure children's perspective-taking skills. Studies conducted by using these tests indicated that preschool children had an understanding of other individuals' perspectives, contrary to the initial assumptions of Piaget and Inhelder [8]. Furthermore, these studies demonstrated while children at the age of two could perceive that their perspective was different from the perspective of others, children at the ages of four and five could define this perspective in more than one way [9], [10]. In addition to research based on age, various researchers examined the relationship of perspective-taking skills with different variables. Once the related studies were scrutinized, it is possible to observe that perspective-taking is in relation with variables such as gender [11], age ([12], [13], [14], [15]), intelligence [12], socio-economic level ([16]; [15]), characteristics of parents [17], mathematical skills [18], self-respect [19] and social problem solving [15].

Consequent to the findings that the perspective-taking skills emerged in children in preschool ages, several intervention studies were conducted with children to develop this skill. Along with the studies that focused on the three dimensions of perspective-taking holistically, there existed studies that comprised applications aimed at improving only one dimension of perspective-taking [1]. These studies indicated that thematic imaginary game ([20], [21], [22]), dramatic play and building games ([23], [2]), educational drama applications ([24], [17]), storytelling techniques ([25], [26], [27]), empathy education programs [1] supported the development of perspective-taking skills in children.

According to Piaget, children were socially motivated since birth. This motivation leads children to social situations with their peers and adults who do not share similar perspectives or cognitive skills. These situations incline children to "cognitive conflicts", hence these conflicts should be resolved for the continuity of the constructive social development and positive interaction experiences [2]. The "Interpersonal Cognitive Problem Solving Program" or the "I Can Problem Solve" Program developed by Shure [28] was intended to promote the development of problem solving skills that are of great importance and that guide the individual's behaviors and habits throughout life, in early childhood. I Can Problem Solve (ICPS) Program aims to teach children basic thinking skills that would help them to prevent "human-induced" problems and to solve the problems occurring within their environment. The ICPS program was developed in three different models for preschool, primary and secondary school students. I Can Problem Solve Program, which was prepared for the preschool students, consisted of two main parts. The first part included activities that were intended to deliver the children the skills to solve the problems that emerged, and the second part comprised activities aimed to deliver problem solving skills [29].

Kargı [30] investigated the effectiveness of the I Can Problem Solve (ICPS) Program on preschool children. In the study that employed the experimental method, it was determined that the ICPS program was effective in improving the problem-solving skills and in reducing the problem behaviors in children at the age of four. Moreover, Tangül Özcan [31] concluded that "lack of attention," "social withdrawal," and "aggressive behavior" problems of children who were diagnosed with Attention Deficit and Hyperactivity Disorder (ADHD) were reduced due to ICPS education, in her study focusing on the effects of oppositional defiant disorder in children diagnosed with ADHD.

In the present study, the effect of the I Can Problem Solve (ICPS) Program, which aims to improve interpersonal problem-solving skills, on the perspective-taking skills of preschool children.

2. RESEARCH METHOD

2.1. Participants

The sample was consisted of 51 children from two kindergartens in the center of Adana, Turkey. There were one experimental and two control groups. Experimental group was consisted of 19 children,

whereas control 1 group and control 2 groups consisted of 16 children. Table 1 shows demographic characteristics of children and their parents.

Table 1. The Distribution of Children and Their Parents' Demographic Characteristics.

Demographic Characteristics		Groups					
		Experiment		Control 1		Control 2	
		n	%	n	%	N	%
Gender	Girl	11	58	7	43	9	57
	Boy	8	42	9	57	7	43
	Total	19	100	16	100	16	100
Attending preschool	Less than one year	14	74	11	69	12	75
	Two years	5	26	5	31	4	25
	Total	19	100	16	100	16	100
Number of children in the family	Single child	6	32	3	19	9	56
	Two children	11	58	13	81	4	25
	Three children	2	10	0	0	3	19
	Total	19	100	16	100	16	100
Child's birth order	First-born	15	79	6	38	12	75
	Second-born	3	16	10	62	3	19
	Last-born	1	5	0	0	1	6
	Total	19	100	16	100	16	100
Family structure	Core family	17	90	16	100	15	94
	Extended family	2	10	0	0	1	6
	Total	19	100	16	100	16	100
Family type	Conventional two parents family	18	95	16	100	15	94
	Divorced parents	1	5	0	0	1	6
	Total	19	100	16	100	16	100
Family income	Low (500\$ and less)	3	16	1	6	0	0
	Middle (501\$-3000\$)	16	84	15	94	16	100
	Total	19	100	16	100	16	100
Mother education	Primary school	1	5	1	7	1	6
	High school	4	21	5	31	4	25
	College	4	21	3	19	2	13
	Graduate	9	48	7	43	9	56
	Master	1	5	0	0	0	0
	Total	19	100	16	100	16	100
	Secondary school	1	5	0	0	2	13
Father education	Lise mezunu	5	27	5	31	1	6
	High school	2	10	2	13	4	25
	College	10	53	8	50	8	50
	Graduate	1	5	1	6	1	6
	Total	19	100	16	100	16	100

There were 11 girls and eight girls in the experimental group, seven girls and nine boys in the control 1 group and nine girls and seven boys in the control 2 group. In each group, most of the children were attended to preschool for less than a year. Children mostly came from middle-income, core and conventional two parents families. Educational levels of children's parents in each group also showed similar attributes. In the both group of experimental, Control 1 and control 2 groups, most of mother were university graduates whereas most of father were college graduates.

2.2. Data Collection Tool

In the present study, "Perspective-taking Test for Children (PTC)," which was developed by Aslan and Köksal-Akyol [32] was used to evaluate the children's perspective taking skills.

Perspective-taking Test for Children (PTC)

The Perspective-taking Test for Children (PTC) is composed of three theoretical dimensions, namely "Perceptual Perspective-taking," "Cognitive Perspective-taking," and "Emotional Perspective-taking" and 24 items. The perceptual perspective-taking and the cognitive perspective-taking dimensions are composed of four items each. The emotional perspective-taking dimension, on the other hand, is composed of 16 items, four for each of the emotions (happiness, sadness, anger, fear). The abovementioned items cover various situations related to perspective-taking that preschool children could come across in everyday life and

the perspective-taking of the protagonist in the picture is required to be predicted. The child gets a score of “1” if s/he correctly predicts the perspective of the protagonist and a “0” if predicts incorrectly. The highest score that could be obtained from PTC is “24” and the lowest is “0” [1].

The validity and reliability study of the measurement tool was conducted by Aslan and Köksal-Akyol [35]. The study for the development of the measurement tool was carried out with 236 children in ages of three, four and five, and candidate items that could be included in the PTC and their drawings were prepared by the researcher. In order to assess the appropriateness of drawings and guidelines preschool education specialists were consulted. The “Perspective-taking test (PTT)” developed by Şener [2] and the “Empathy Scale for Children (ESC)” developed by Köksal-Akyol and Aslan [33] were utilized for the criterion validity of the measurement tool. It was determined that there was a highly significant positive correlation between PTC and ESC ($r=.73$, $p=.001$) and between PTC and PT ($r=.80$, $p=.001$). The internal consistency reliability coefficient of the test was determined as .71 and the test-retest reliability was calculated as .91.

2.3. Intervention

I Can Problem Solve Program

I Can Problem Solve: The Interpersonal Cognitive Problem Solving Program was developed by Shure in 1992 to provide children with thinking skills that could help them solve the problems they faced and help them solve the problems that emerged. Öğülmüş [34] adopted the program in Turkish both linguistically and culturally. This educational approach was designed particularly for young children and was primarily focused on different thinking skills as social participation and adjustment tools for children. The most important characteristic of the approach was to teach how to contemplate within a problem-solving process rather than teaching what to do or think [35].

There are three versions of the program designed for preschool, primary and secondary school students. The ICPS program prepared for the preschool stage consists of two main parts. The first part includes the activities that teach the necessary pre-skills to solve problems and the second part includes the activities that deliver the problem-solving skills.

Activity program

Pre-skills to solve problems:

- 1 Activities from 1 to 10: Children are taught the expressions IT IS, SOME-WHOLE, NOT, OR, AND, SAME, DIFFERENT in the ICPS program.
- 2 Activities from 11 to 18: Help children learn to recognize the emotions correctly when themselves and others felt HAPPINESS, SADNESS and ANGER,
- 3 Activities from 19 to 22: Encourage the children to develop their listening and attention skills,
- 4 Activities from 23 to 28: Introduce the children the concepts of WHY, BECAUSE, and MAYBE, POSSIBLE in the ICPS program
- 5 Activities from 29 to 31: Teach the children to ask others what they like (do you like?) and encourage children to recognize individual differences so that they could learn other individuals' preferences.
- 6 Activities from 32 to 33: Help the children to understand what is FAIR and what is NOT FAIR; in the meantime, it is aimed to demonstrate that being fair sometimes might mean to wait.

Problem-solving skills:

- 1 -Activities from 34 to 38 (Alternative Solutions): Help the children to understand what a problem is and learn how to create a large number of possible solutions.
- 2 -Activities from 39 to 50 (Possible Outcomes): Help the children to learn sequential thinking as a prerequisite of grasping cause and effect relationships and help them to think in sequences in everyday life,
- 3 -Activities from 51 to 59 (Matching possible solutions with possible outcomes): Aimed to provide the children an individual application opportunity to see the links between a possible solution and a possible outcome [35], [34]).

2.4. Data Collection

Primarily, school administrators and parents were informed, and their permissions were received for the implementation of the present research. The data were obtained through individual interviews with children in a quiet classroom of the school. PTC was implemented as a pre-test for all participants. Consequent to the completion of the pre-tests, the I Can Problem Solve (ICPS) Program, consisting of 59 activities, was administered to the children in the experimental group for three months, four days a week. At the periods when I Can Problem Solve (ICPS) Program was not administered, the children in the

experimental group continued their regular program in classes. Children in the control group followed the regular program in their class without any intervention. While each activity in the ICPS Program is recommended to take 15 to 20 minutes, the sessions were conducted in an average of 40 to 50 due to the entirely game-based nature of the content including preparation, warm-up, application, and evaluation processes.

The multi-purpose workshop in the school yard was utilized for the application of the ICPS program. The workshop was equipped by the researcher with the necessary materials before each class session. At the start of the application, a ICPS board was set up with the children, and it was intended that this board would contribute to the reinforcement of the activities and the children's knowledge building as the class sessions progressed, through adding the words, pictures, alternative thoughts, solution ways that the children produced to the board.

After the completion of the I Can Problem Solve (ICPS) Program, PTC was applied as a post-test to the children in the experimental and control groups. Almost a month after the post-tests were applied, PTC was administered to the children in the experimental group as a retention test.

2.5. Data Analysis

Data obtained as the results of the present study were analyzed through descriptive statistics and normality test results. According to the Shapiro-wilk normality test results, it was determined that the pre-test/post-test and retention test scores of the children from PTC were normally distributed. Therefore, scores from PTC were evaluated using parametric statistics. Analysis of variance was used to determine whether there existed a significant difference between the PTC pre-test and post-test average scores, for children in the experimental and control groups. In addition, Tukey Post Hoc analysis was utilized to establish the difference between PTC post-test scores of children in experimental and control groups. The t test was used to determine whether there was a significant difference between the PTC posttest and retention test scores of the children in the experimental group.

3. RESULTS AND ANALYSIS

In this part findings about children's scores in pretest, posttest and retention test are presented. Table 2 informs the results of variance analysis about the children's scores in the pretest.

Table 2. Results of Variance Analysis About The Children's Scores in The Pretest.

Source	Sum of squares	df	Mean square	F	p
Between groups	18.220	2	9.11	0.807	.452
Within groups	541.819	48	11.288		
Total	560.039	50			

A variance analysis was conducted to compare the scores of children in experimental group and control groups in pretest. It was found out that there was no meaningful difference existed among the experimental and the control groups in the pretest ($F(2,48)=0.807, p>.05$). This finding demonstrated that the groups showed similar perspective taking abilities prior to the experiment. Table 3 demonstrates pretest and posttest means for experimental group and control groups.

Table 3. Pretest and Posttest Means for Experimental Group and Control Groups

Groups	N	Pretest		Posttest	
		\bar{X}	Sd	\bar{X}	Sd
Experimental	19	10.42	3.27	19.84	2.67
Control 1	16	11.62	3.89	14.43	3.28
Control 2	16	11.81	2,80	14.81	3.01

The mean of experimental group increased highly from pretest to posttest. The experimental group's posttest mean was 19.84, whereas pretest mean was 10.42. The mean of the control groups also increased from pretest to posttest, but the increase was quite small. The control 1 group's posttest mean was 14.43, whereas pretest mean was 11.62 and the control 2 group's posttest mean was 14.81, whereas pretest mean was 11.81. Table 4 shows the result of variance analysis about the scores children got from the posttest.

Table 4. The Results of Variance Analysis About The Children's Scores in The Posttest.

Source	Sum of squares	Df	Mean square	F	p
Between groups	325.608	2	162.804	18.305	.001
Within groups	426.901	48	8.894		
Total	752.510	50			

It was found that there was a statistically significant difference among the groups' scores in the posttest ($F(2,48)=18.305$, $p<.01$). The effect size for this analysis was medium ($d=.43$). Tukey post hoc analysis was done in order to define the source of the difference. The results of Tukey analysis showed that there was a significant difference among the experimental group and control 1 and control 2 groups in favor of the experimental group. The results of Table 3 ve Table 4 showed that "I Can Problem Solve Program" had a significant effect on children's perspective taking skills. Table 5 demonstrates the mean PTC scores for experimental group in post and retention test.

Table 5. Mean PTC Scores for Experimental Group in Post Test and Retention Test.

Test	N	\bar{X}	Sd	df	t	p
Posttest	19	19.84	2.67	18	-1.336	.198
Retention test	19	20.47	2.73			

As a result of the independent samples t test, we found that no meaningful difference existed between experimental group's post test and retention test scores [$t_{(18)}=-1.336$, $p>.01$]. This finding demonstrated that the effects of "I Can Problem Solve Program" on children's perspective taking skills continued from posttest to retention test.

This research was conducted in order to determine the effects of the I Can Problem Solve Program on the perspective-taking skills of five years old children. This section covers the discussions on the findings of the research.

As a result of the present study, it was determined that there was no significant difference between the pre-test mean scores of Control 1 and Control 2 groups, who continued to regular education curriculum and the pre-test mean score of the experimental group, to which I Can Problem Solve Program was applied. Accordingly, the children in the experimental and control groups were found to be similar to each other in terms of perspective-taking skills before the experimental process. This is considered to be a result of having similar development and environmental characteristics.

It was determined that there was a significant difference between PTC post-test scores of children in the experimental group, to which the "I Can Problem Solve Program" program was applied, and the PTC post-test scores of children in Control 1 and 2 groups. According to this result, it is possible to state that the ICPS program has a positive effect on the increase of children's skills to take perspective. It is as well possible to assert that the increase in the perspective-taking skills of children in the experimental group was largely influenced by the problem situations that require the use of social skills within the context of the program, that the children were guided towards multidimensional thinking through activities such as games, storytelling and role playing. I Can Problem Solve is a training program based on cognitive approach and acquisition of interpersonal problem-solving skills. The program includes two basic stages. The words taught in the first stage are very important for the development of way of thinking that helps to solve the problem in the latter process. Activities help the children to understand what they and other individuals feel, to recognize emotions and to understand that different individuals might have different emotions. One of the main objectives of the program is to deliver the children a problem-solving way of thinking, thus the children could achieve a more advanced social adaptation with their surroundings. In this respect, children become familiar with emotions and feelings of other individuals through experiences such as sharing, waiting for their turn, co-operation, etc. [34]. The ICPS program includes a wide range of activities, since it is a program that allows children to acquire targeted skills based on game play. Storytelling, game, role playing methods are examples to these activities. Children need to engage in peer-sharing in the collaborative building activities, which facilitates production of things from several objects, and peer-sharing process helps them to better comprehend the thoughts and emotions of their peers. Several research ([23], [36], [37], [2]) concluded that collaborative building activities improved the children's perspective-taking skills. Socio-drama plays provide children with better understanding of different social roles through imitation and with the development of alternative thinking skills through adopting different roles. Burns [26] determined that socio-dramatic play increased the level of perspective-taking skills of children significantly. Similarly, Burns and Brainerd [36], Akin and Önder [17] and Dege [38] concluded that dramatic activities improved the children's

perspective-taking skills. Storytelling, within the scope of the ICPS program, contributes the development of skills such as to tell stories, contemplating on the events and outcomes of the story, to provide alternative solutions to conflicts and problems in the story and in this process, storytelling becomes an activity that supports the development of perspective-taking skills through better perceiving the emotions and thoughts of different individuals. Laible and Song [39] found that talking about emotional experiences and storytelling supported children's emotional perspective-taking skills. Similarly, Tenenbaum et al. [25] concluded that telling emotional scenarios and delivering explanatory talks about the protagonist's emotions within these scenarios helped children to develop emotional perspectives. Grazzani and Ornaghi [40] identified that storytelling that included emotional terms and playing games that encourage children to use these terms after storytelling led to an increase in children's emotional perspective-taking skills. Ornaghi et al. [27] indicated that storytelling that included intellectual terms and having conversations and playing language games that encourage children to utilize intellectual terms consequent to storytelling had positive effects on children's cognitive perspective-taking skills. According to Ünüvar [41], augmented language activities contribute significantly to the development of children's perceptual, cognitive and emotional perspective-taking skills.

Approximately one month after the post-test were applied, the children in the experimental group were tested for retention and it was determined that there was no significant difference between the post-test scores and the retention test scores of the children in the experimental group. This finding suggests that the I Can Problem Solve Program continued to have effect on the children's perspective-taking skills, thus the effect could be considered as permanent. Several intervention programs that included similar activities were also identified to have permanent effects on the children's perspective-taking skills. Dege [38] determined that the dramatic play activities given through illustrated story books were effective on the perspective-taking skills of six-year-olds, and this effect persisted in the retention test. Gözün-Kahraman [42] revealed that the intellect-based training program had a significant effect on the cognitive perspective-taking skills of the 48-60-months children, and the retention test that they performed a month later revealed that the effect remained the same. Cigala et al. [43], in their study focusing on the effects of ecology education on perspective-taking skills, demonstrated that the effect continued through a measurement carried out six months after the completion of their study.

4. CONCLUSION

We found that there was no significant difference between the PTC pre-test scores of the children in experimental, control 1 and control 2 groups. However, consequent to the completion of the ICPS Program, the scores of the Perspective-taking Test for Children (PTC), administered as a post-test to the experimental, control 1 and control 2 groups, indicated a significant difference on behalf of experimental group. Perspective-taking skills of the children in the experimental group increased significantly. In this respect, I Can Problem Solve Program was effective on the perspective-taking skills of preschool children. Furthermore it was determined that there was no significant difference between the PTC post-test scores and retention test scores of the children in the experimental group. In this regard, it could be asserted that the effect of the ICPS program on the perspective-taking skills of preschool children was permanent.

In the light of these results, we give some suggestion to educators and researchers. Preschool teachers could be informed about the supporting approaches in developing the children's perspective-taking skills during the preschool period. For that purpose, they could participate in in-service training activities, seminars, conferences, workshops. Teachers could plan and implement activities that would help children to develop their perspectives. They could also read informative material and try to become a role model for the children. Collaboration with parents would be useful to support the perspective-taking skills of the children. Present research focused on the effects of ICPS Program on the perspective-taking skills of five-year-old children. Further research could focus on different age groups in preschool period. Different applications, methods and techniques could be scrutinized to support the development of the perspective-taking skills of children.

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