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THE EFFECTS OF USING VIDEO MODELING AND RECIPROCAL IMITATION ON DEVELOPING PLAYING SKILLS IN CHILDREN WITH AUTISM SPECTRUM DISORDER

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SUMMARY

Background: Play helps facilitate a child's development and learning, such as social, emotional, and cognitive skills. Delayed or abnormal development of play behaviors can inevitably influence the lifelong development of these skills. Children with autism spectrum disorders (ASD) cannot often understand and produce play actions. This study aimed to measure the effectiveness of each of the two programs: video modeling and reciprocal imitation, in teaching children with ASD play skills.

Material/ Methods: The sample consisted of 18 children with ASD aged 5 to 8 years old, and divided into two experimental groups: the first group included 9 children with ASD who received a reciprocal imitation program: their mean age is 6.2 years, standard deviation = 0.7, and their mean IQ ratio is 87.23 with a SD = of 5.6. The second group included 9 children with ASD who received a video modeling program: their mean age is 6.7 years, standard deviation = 0.9, and their mean IQ ratio is 89.10 with SD = of 6.1. The children in both groups belong to two private primary schools associated with this project in Kenitra, Morocco.

Results: The results showed that both methods improved play skills in these children with different levels of progress, according to age, autism level, and program type. There were statistically significant differences in the post-test in favor of the video modeling group. Visual stimuli are highly solicited by children with autism. The durability of the effect of training by both methods was verified by comparing the post-test scores and the follow-up measure. The follow-up measurement revealed no significant differences between post-test and follow-up for either group. In general, video modeling was more effective than reciprocal imitation in developing play skills.

Conclusions: It was found that learning by modeling the behaviors of peers (reciprocal imitation) is one of the effective methods, in teaching and training of most children with ASD for many skills, however video modeling is more effective, because it is based on the regular teaching of measurable behavioral units, and each skill is reduced to small steps.

Key words: ASD, play skills, video modeling, reciprocal imitation

INTRODUCTION

Autism Spectrum Disorders (ASD) are neurodevelopmental disorders characterized by impaired social skills and persistent deficits in communication and social interaction in multiple contexts. Examples include the inability to initiate or respond to social interactions, an impairment in facial recognition or in expression and non-verbal communication (Elhaddadi et al., 2021), difficulties in adapting behavior to various social contexts, sharing imaginative play, or making friends, and a lack of interest in peers. Also, autism spectrum disorders (ASD) are characterized by restricted and repetitive patterns of behavior, interests, or activities. Such as stereotyped or repetitive motor movements, insistence on sameness, and inflexible adherence to routines or ritualized patterns of verbal or non-verbal behavior (American Psychiatric Association, 2013). Individuals with ASD tend to have hyper- or hypo-reactivity to sensory stimuli, for example, apparent indifference to pain/temperature, adverse reaction to specific sounds or textures, excessive smell or touch of objects, visual fascination with lights or movement (Rogers & Ozonoff, 2005; Ben-Sasson et al., 2009; American Psychiatric Association, 2013). These symptoms may only become fully manifested when social demands exceed limited abilities or may be masked by strategies learned later in life. They result in clinically significant impairment in social, occupational, or other important areas of daily functioning. These autism spectrum disorders are not always associated with an intellectual disability.

Many studies have confirmed that play helps to facilitate a child's development and learning (Lantz et al., 2004; McAloney & Stagnitti, 2009; Wolfberg & Schuler, 1993), such as social, emotional, cognitive, imaginative, and creative skills. In addition, children acquire social skills such as cooperation and role-taking, social language, and self-esteem. Delayed or abnormal development of play behaviors can inevitably influence the lifelong development of these skills. Unlike normal children who naturally develop play skills, children with developmental delays cannot often understand and produce play actions (Westby, 2000). Active play is different from the abnormal and passive play. It is fun, spontaneous, purposeful, motivating, and flexible. It should involve active participation.

Autistic children's play is often centered on narrow interests and repetitive patterns, and as a result, these children have limited opportunities to interact with peers and acquire play skills. Also, these children have difficulties in producing play actions and may have an unusual interest and use of things. They may be constantly clinging to and preoccupied with parts of objects and toys, for example, preoccupied with putting objects in and out of a box, or they may line up toys in blocks or in order instead of playing appropriately or functionally. People with ASD do not follow the normal pattern of play development as their typical peers do. They do not play imaginary games or use toys to represent things in an ordinary way (Delano & Snell, 2006). Most children with ASD suffer from deficits in play skills, especially symbolic and imaginative play. They show a lack of spontaneity in play that appears in typical children during the kindergarten

years. This does not mean that they do not play, but rather that they play in their way. Their play is characterized by routine, stereotyped behavior, and weakness in social participation. Their ability to use language and gestures related to play is poor. These difficulties, experienced by most children with ASD, increase their social isolation. It imposes restrictions, forcing them to stick to the monotonous and routine activities they have become accustomed to. This deficit in play skills in children with ASD is due to the lack of attention span, the lack of imitation, and the poor ability to form and compose symbols. This leads these children to misunderstand the social cues necessary to negotiate and develop play scenarios. In addition, they have difficulties in regulating thought processes and communicating ideas to others, which leads to the predominance of sensorimotor play for them beyond the verbal mental age. If mental health, according to psychological analysis, is the ability to love and work, for the child it is the ability to love and play, so the play is the child's work. Since most children with ASD suffer from play difficulties, many researchers are interested in this area. These researchers have developed strategies to remedy these deficiencies. Two strategies are used here: video modeling and reciprocal imitation. Our aim is twofold, firstly experiment with each method to estimate its contribution to the development of play skills, and on the other hand compare them.

Videomodeling

A technique in which a visual model of target behaviors or skills is shown on video for the child to observe, perform and imitate (Nikopoulos & Keenan, 2003). In video self-modeling (VSM), individuals observe themselves performing a successful behavior on video and then imitate the target behavior. Video modeling has been used to teach many skills, including social skills, communication, and sports performance. It has shown promising results as an intervention for children with ASD. Video modeling is used to teach a variety of behaviors to people with ASD, as well as others with developmental delays or disabilities, and is derived from the idea of observational learning (Christos et al., 2007).

There are three basic types:

- *video self-modeling*, where the main actor in the video is the learner him/herself, in which he/she performs the ideal behaviors through a role-playing or imitation strategy. This is a tricky technique as it requires the child to record the behavior several times and then adjust the footage to make it appropriate and usable. But it is more effective than other models because the child likes to watch himself and his self-esteem increases.
- *peer modeling,* usually of the same age and gender as the learner and may be as familiar as a brother or friend (Reagon et al., 2006).
- *positional modeling,* where the video captures exactly what the learner will see when they perform the skill themselves. Such as only recording the hands when playing with a particular toy, making it easier for the child to focus their attention.

Reciprocal imitation training strategy (RIT)

This technique uses naturalistic behavioral strategies, modeling, elicitation, and reinforcement to increase generalized spontaneous imitation (Ingersoll, 2010b; Ingersoll & Schreibman, 2006). RIT can target object imitation, which involves imitating actions with objects, as well as gesture imitation, any physical activity involving the body without the use of objects (Ingersoll, 2010a; Ingersoll &Lalonde, 2010). Studies have also shown that RIT has an impact on wider social skills such as play, joint attention, and language. Social imitation is a key skill and is linked to the development of other social skills. Through imitation, children learn social interaction and language (Rogers et al., 2005). Imitation competence is considered to be one of the most important deficits in children with ASD. The social deficit observed in the child with ASD is only the result of his deficit in imitation skills (Ezell et al., 2012), the assessment of imitation skills informs the severity of his disorder (Rogers et al., 2005). Teaching imitation skills to children with ASD in a social context improves their social communication skills.

MATERIAL AND METHODS

The study problem

Most children with ASD suffer from impairments in play skills. They have difficulties in symbolic and imaginative play, a lack of desire to play with their peers, and a lack of spontaneity in play. This does not mean that they do not play, but rather that they play in their way, characterized by routine, stereotypy, and a lack or weakness of social participation. These and other difficulties increase the social isolation of these children. As play in the early stages of development is the best way to learn and support cognitive and social development, many researchers have tried to teach children with ASD play skills.

Video modeling and reciprocal imitation are two methods suitable for teaching children with ASD, because of their ease of use by teachers as well as parents. They help to improve play behavior in children with ASD and to generalize it. Reciprocal imitation is a direct simulation of the behavior presented by peers or adults, whereas in video modeling the behavior is filmed and then presented to children. The question that this study tries to answer is whether it is possible to develop play skills in children with ASD through the use of a modeling strategy while comparing two of these strategies: video modeling and reciprocal imitation.

The importance of the study

Our study deals with one of the most common developmental disorders today, which is ASD disorder. It investigates deficits in play skills in children with ASD and tries to remedy them by exploiting two educational/therapeutic strategies, video modeling, and reciprocal imitation.

Objectives

This study aims:

- To test the effectiveness of using video modeling as a therapeutic method for the development of certain play skills in children with ASD.
- To test the effectiveness of using reciprocal imitation as a therapeutic method for the development of certain play skills in children with ASD.
- To compare the effectiveness of the two methods, video modeling, and reciprocal imitation, in developing play skills in children with ASD.
- To develop certain play skills in children with ASD (symbolic play skills, basic play skills, individual play skills, and collective play skills).

Hypotheses

1. There will be a statistically significant difference between the mean scores of the two study groups (VideoModeling and Reciprocal Imitation) between the pre-test and the post-test on the play skills scale and its different dimensions (basic playskills,symbolic playskills,individual play skills, and collective play skills) in favor of the post-test and the video modeling.
2. There will be no statistically significant difference between the mean scores of the two experimental study groups (Video Modeling and Reciprocal Imitation) between the post-testand follow-up measures (twoweeks after the end of the training program) on the play skill scale.

Methodology

We adopted the experimental method with two experimental groups. One group used reciprocal imitation as a technique for learning play skills; the other group used video modeling. The reciprocal imitation group contains 9 children with ASD, their mean age is 6.2 years, standard deviation = 0.7, and their mean IQ ratio is 87.23 with a standard deviation = of 5.6. The video modeling group contains nine children with ASD, their mean age is 6.7 years, standard deviation = 0.9, and their mean IQ ratio is 89.1 with a standard deviation = of 6.1. The children in both groups belong to two private primary schools associated with this project in Kenitra, Morocco. Table 1 describes our sample.

Measuring tools used

We used three measurement tools:The Play Skills Scale for Children with ASD, developed by Abu el-fetouh Ahmad Omar (2012), the Raven Progressive Matrices Test (standard version), and the Childhood Autistic Rating Scale (CARS).

Table 1. Description of the groups of children with ASD

Group	Sample Size	Gender		Age		Intelligence level		ASD level
		Male	Female	Mean	S.D	Mean	S.D	
Reciprocal imitation	9	6	3	6.2	0.7	87.23	5.6	Level 2
Video modeling	9	8	1	6.7	0.9	89.10	6.1	Level 2

The play skills scale consists of 4 dimensions, with 60 items distributed as follows: The first dimension: symbolic play skills consists of 10 items, the second dimension: basic play skills consist of 15 items, and the third dimension: individual play skills consist of 15 items, and the fourth dimension: collective play skills consist of 20 items. The scale is constructed according to the Likert method: one point for rarely, two points for sometimes, and three points for always.

The CARS scale was developed by Reichler and Schopler (1971) (Schopler et al., 1980) and then translated and adapted to the French language by Bernadette Rogé (Roger, 1989). It is a tool dedicated to screening for ASD by discriminating against other behavioral disorders in children.Raven's progressive matrices are a non-verbal test for measuring fluid intelligence (Raven, 1989; Raven, 2000).

Training Sessions

In this study, we used several training techniques for children with ASD, such as reinforcement, feedback and homework. Also, we involved the children's mothers in these activities. They continue the work with their children at home. The collaboration of the mothers is an essential component of any behavioral intervention with autistic children in particular and children with special needs in general. Behavioral therapy at home results in more behavioral and developmental changes for the child, while providing parents with knowledge about what skills should be developed in the child and how these skills can present more effectiveness. We also relied on a variety of different games, illustrated by the scenes that were shown to the children. These scenes are of two types: video scenes (video modeling) and live play scenes, presented by typical children or adults (reciprocal imitation).Table 2 summarizes the learning program.

Examples of scenes used

Different scenes have been used, relating to the different types of play (symbolic, basic, individual, and collective). Some examples are given:

- A child takes a toy train out of the toy box, assembles and installs the plastic tracks, and makes it work properly.
- A child fetches the toy cubes from the toy box and builds shapes and figures.
- A child takes a car out of the box and starts it up. After a minute, he takes an airplane out of the box, turns it on, and watches the movement of the two toys on the ground.
- A girl puts a kitchen toy on the table in front of other children and asks them to eat.
- A child is playing with a car game, two other children enter the room and try to talk to him, the child leaves the game and listens to them.
- A child holding a pen and white paper and trying to draw a house and a tree.
- One child holds the hand of another child and they negotiate which game they will play.
- A child joins another child in throwing a ball.

Table 2. Sessions details (Reciprocal imitation and videomodeling)

Step	Objective	Number of sessions	Techniques used	Session duration
First	Acquaintance and agreement with parentsandapre-test	1	Interview - Discussion	60 minutes
Second	Children preparation	2	Freeplay-reinforcement	30 minutes
Third	Development of joint attention skill	5	RIT/VM-Reinforcement-feedback -homework	30 minutes
Fourth	Development of basicplayingskills/behaviors	10	RIT/VM-Reinforcement-feedback -homework	30 minutes
Fifth	Developmentofsymbolicplayskills/behaviors	10	RIT/VM-Reinforcement-feedback -homework	30 minutes
Sixth	Developmentofindividualplaying skills/behaviors	10	RIT/VM-Reinforcement-feedback -homework	30 minutes
Seventh	Development of collective playskills/behaviors	10	RIT/VM-Reinforcement-feedback -homework	30 minutes
Eighth	Post-test	1	Interview - Discussion	30 minutes
Ninth	Follow-up measurement (two weeks after the post-test)	1	Interview - Discussion	30 minutes

VM: VideoModeling; **RIT:** Reciprocal Imitation Training

For both methods, the duration of each scene is no more than five minutes. The scene is presented in front of the child and the child's attention and perception are observed, with appropriate reinforcement being provided. Twenty video scenes (Video Modeling) and twenty direct scenarios (Reciprocal Imitation) were designed, which include the four types of play (Symbolic, Basic, Individual, and Collective). At the beginning of each session, the child is prepared for five minutes by shaking the child's hand, sitting with him/her, calling him/her by name, and sharing some activities related to the game such as throwing the ball and catching it, followed by the presentation of the activity either through a video (Video Modeling) or through a scene presented by typical children or adults, with an explanation of the purpose and nature of the scene presented. The teacher or mother played the role of the child's partner in the activity. The scenes were sequentially presented to the children to facilitate their understanding and to make it easier for them to imitate them.

Table 2 summarizes the experimental program.

Study process

It took three months to implement the training sessions presented in this study, and the following steps were taken:

1. Before the start of the training sessions, a meeting was held with the children's mothers to select the participants in this study. Eighteen children with ASD

were selected (intelligence and chronological age ratios were taken into account in the selection of cases).
2. Afterwards, a series of meetings with the selected children were organized to observe them and create an atmosphere of intimacy and conviviality with the children.
3. The play skills scale was applied to children (pre-test).
4. We chose one of the rooms prepared in advance to take care of these autistic children.
5. After completing the application of the training sessions, the scale was applied again (post-test).
6. After two weeks from the end of the training, the scale was re-applied in the same way as the pre-test and post-test (follow-up).

RESULTS

Children's scores in pre-test

Before applying the remediation program, we checked the equality of play skills between the two groups, video modeling, and reciprocal imitation. The video modeling group had a mean of 68.00 with a standard deviation of 7.416, which is close to the mean of the reciprocal imitation group with 66.33, and a standard deviation of 6.928. The student's t-test was used, which did not reveal any significant difference (Table 3).

Scores of children in the reciprocal imitation group between the pre-test and the post-test. Children in the reciprocal imitation group had higher scores in the post-test than in the pretest (Table 4). The mean in the pre-test was 66.33 with a standard deviation of 6.928, while it was 114.22 with a standard deviation of 8.333 in the post-test. The Student's t-test was used. It revealed a significant difference in favor of the post-test ($t = -45.750$; $p < 0.001$). There was an important improvement in children's play skills between the pre-test and post-test.

Scores of children in the video modeling group between the pre-test and post-test. Children in the video modeling group had higher scores in the post-test than in the pretest (Table 5). The mean and standard deviation of the scores in the pre-

Table 3. Children's scores in pre-test

Underscale		Reciprocal imitation group	Video modeling group	t-value	Significance level
Symbolic playskills	Mean	15,00	15,22	-0,152	0,881
	S.D	2,179	3,801		
Basicplay skills	Mean	15,78	16,78	-0,765	0,456
	S.D	2,682	2,863		
Individualplayskills	Mean	17,11	17,00	0,130	0,898
	S.D	1,453	2,121		
Collective play skills	Mean	18,44	19,00	-0,453	0,657
	S.D	2,506	2,693		
Total score	Mean	66,33	68,00	-0,493	0,657
	S.D	6,928	7,416		

test and post-test were calculated. The mean in the pre-test was 68.00 with a standard deviation of 7.416, while it was 126.56 with a standard deviation of 10.273 in the post-test. The Student's t-test was used.It revealed a significant difference in favor of the post-test ($t = -43.879$; $p < 0.001$). There was an important improvement in children's play skills between the pre-test and post-test (Table 5).

Children's scores in post-test

At the end of the remediation program, we compared the effectiveness of the two methods, video modeling, and reciprocal imitation. The mean of the video modeling group was 126.56 with a standard deviation of 10.273, while the mean of the reciprocal imitation group was 114.22, with a standard deviation of 8.333. The student's t-test was used. It revealed a significant difference ($t = -2.797$; $p = 0.013$) (Table 6). Symbolic play skills and individual play are developed in the same way by both methods. Basic play skills and collective play are more developed by video modeling.

Progress comparison between groups

For symbolic play, there was no difference between the two methods used. For the rest of the types of play, the video modeling method was more efficient (Table 7).

Table 4. Results of the reciprocal imitation group between the pre-test and post-test

Underscale		Pre-test	Post-test	Correlation	Sig.	t-value	Sig.
Symbolic play skills	Mean	15.00	24,33	0,771	0,015	-10,058	<0.001
	S.D	2,179	4,093				
Basic play skills	Mean	15,78	28,56	0,769	0,015	-14,292	<0.001
	S.D	2,682	4,126				
Individual play skills	Mean	17,11	30,00	0,578	0,103	-12,990	<0.001
	S.D	1,453	3,571				
Collective play skills	Mean	18,44	31,33	0,700	0,036	-10,888	<0.001
	S.D	2,506	4,822				
Total score	Mean	66,33	114,22	0,932	0,000	-45,750	<0.001
	S.D	6,928	8,333				

S.D: Standard deviation; **Sig:** Significance level

Table 5. Results of theVideo modeling group between pre-test and post-test

Underscale		Pre-test	Post-test	Correlation	Sig.	t-value	Sig.
Symbolic play skills	Mean	15,22	23,44	0,956	0,000	-20,524	<0.001
	S.D	3,801	4,065				
Basic play skills	Mean	16,78	34,00	0,855	0,003	-20,759	<0.001
	S.D	2,863	4,444				
Individual play skills	Mean	17,00	33,00	0,922	0,000	-16,971	<0.001
	S.D	2,121	4,664				
Collective play skills	Mean	19,00	36,11	0,763	0,017	-19,250	<0.001
	S.D	2,693	4,076				
Total score	Mean	68,00	126,56	0,948	0,000	-43,879	<0.001
	S.D	7,416	10,273				

Table 6. Children's scores in post-test

Underscale		Reciprocal imitation group	Video modeling group	t-value	Significance level
Symbolic play skills	Mean	24,33	23,44	0,462	0,650
	S.D	4,093	4,065		
Basic play skills	Mean	28,56	34,00	-2,693	0,016
	S.D	4,126	4,444		
Individual play skills	Mean	30,00	33,00	-1,532	0,145
	S.D	3,571	4,664		
Collective play skills	Mean	31,33	36,11	-2,270	0,037
	S.D	4,822	4,076		
Total score	Mean	114,22	126,56	-2,797	0,013
	S.D	8,333	10,273		

Table 7. Progress comparison between groups

		Mean	S.D	t-value	Significance level
Symbolicplayskills	RIT	9,33	2,784	1,099	0,295
	VM	8,22	1,202		
Basic play skills	RIT	12,78	2,682	-3,644	0,002
	VM	17,22	2,489		
Individual play skills	RIT	12,89	2,977	-2,273	0,037
	VM	16,00	2,828		
Collective play skills	RIT	12,89	3,551	-2,852	0,012
	VM	17,11	2,667		
Total score	RIT	47,89	3,140	-6,289	0,000
	VM	58,56	4,003		

VM: VideoModeling; **RIT:** ReciprocalImitation Training

Table 8. Scores of children between post-testand follow-up

Group	Post test		Follow-up			
	Mean	S.D	Mean	S.D	t-value	Significance level
Reciprocal imitation	114,22	8,333	113, 67	8,307	1.048	0.325
Videomodeling	126,56	10,273	126,33	10,380	0.450	0.665

Scores of children between post-test and follow-up

No significant difference between post-test and follow-upwas found. For the video modeling group, the means of the children's scores at post-test and follow-up were 126.56 and 126.33 respectively. The t-test for paired samples did not reveal any significant differences (t = 0.450; p = 0.665). For the reciprocal imitation group, the children's mean scores at post-test and follow-up were 114.22 and 113.67 respectively. The t-test for paired samples did not reveal any significant differences (t = 1.048; p = 0.325).

DISCUSSION

The present study attempted to test the effectiveness of the use of video modeling and reciprocal imitation in the development of play skills in children with ASD. The results obtained indicated that there was a statistically significant difference between the scores of the two study groups (video modeling and recip-

rocal imitation) between the pre-test and post-test measures on the play skills scale and its different dimensions. Children in both groups improved on different dimensions of the play skills scale.

The results of this study are consistent with the findings of many previous studies that have shown the effect of video and visual stimuli on the attention, awareness and memory of children and adults with ASD (Cardon and Wilcoxon, 2011). Observational learning - which is the basis on which video modeling is based - is based on four main factors identified by Bandura (Bandura, 1965) in his theory of social cognition as follows: attention to the modeledbehavior, memory of the facts of the modeledbehavior, motor reproduction of the modeledbehavior and finally motivation to re-imitate and simulate the modeledbehavior (Nikopoulso & Keenan, 2006). Attention is an essential skill for play, as it is the psychological process that selects information for remembering, imagining, learning or thinking. As for remembering as an implicit stage of observational learning, video modeling is arguably the most appropriate educational/therapeutic strategy for most children with ASD due to the strength of their visual memory (Ozonoffet al., 1991). The video method is effective in developing imitation skills in children with ASD. Through visual stimuli, children with ASD increased their attention span and subsequently their imitation skills. In addition, the children were highly motivated and less bored. The activities depicted in the videos reduced involuntary and stereotyped movements made by the child outside the session. This study included mothers in most of the training sessions because the ability of children with ASD to remember learned behaviors is greater in positive emotional situations. Also comes the role of reinforcement which the study relied on in all stages and sessions of training by reinforcing every step the child takes to simulate and imitate the patterns presented.

Video modeling is an effective and efficient technique for teaching children with ASD several different behaviors. For example, expressive labeling, independent play, spontaneous greetings, listening comprehension, conversational speech, cooperative and social play, and autonomy skills (Charlop-Christy et al., 2000; Charlop-Christy & Daneshvar, 2003). The results of the study by Lydon, et al (2011) showed a significant increase in the number of play actions in children with ASD with the introduction of video modeling in the training environment. Video recorded scenes are brief and easy to implement, so this can be an advantage in a classroom setting (Lydon et al., 2011). Video modeling promotes the generalization of tasks across different people, settings and stimuli (Charlop-Christy et al., 2000), in contrast to traditional prompting and reinforcement procedures which fail to generalize behaviors in children with ASD (Lovaas&Schreibman, 1979; McGee et al., 1985). Video modeling compensates for the over-selectivity of cues, known in children with ASD, by zooming the camera in on relevant cues (Schreibman et al., 1982, Dowrick, 1991). Also, video modeling enhances children's motivation to watch and learn new behaviors because it is associated with leisure (Dowrick, 1986). Video modeling increases children's attention which improves the quantity and quality of learning (Bandura, 1965). It can also compen-

sate for the social interaction deficit in children with ASD. They watch the video without any demands, such as eye contact, that might distract them (Charlop& Milstein, 1989). Other studies (Hine &Wolery, 2006; Reagon et al., 2006; Lydon et al., 2011) confirm, in addition to the results of the present study, the effectiveness of the use of video modeling in developing play skills in children with ASD.

Other methods have been used to promote play skills. For example, Stahmer's (1995) study used Pivotal Response Training (PRT) to teach symbolic play behaviors to children with ASD. The children learned to perform complex and creative symbolic play actions. They generalized their play to new toys, environments, and games.

Many researches showed that children with ASD have deficits in imitation, a skill necessary for the development of social communication, including language, pretend play, and joint attention. As a result, imitation is included in early intervention programs for children with ASD (Ingersoll &Schreibman, 2006; Lainé et al., 2008a; Lainé et al., 2008b).

As imitation is a deficient skill in children with ASD, several researchers have worked on strategies for teaching imitation to this group of children. Ingersoll and Schreibman (2006) evaluated the contribution of reciprocal imitation training (RIT) to imitation learning for children with ASD. The study included five children with ASD, aged 29 to 45 months.A single-subject, multiple baseline design was conducted for all five participants. The children participated in the intervention three times a week for a total of 10 weeks. Results indicated that all participants showed significant increases in their object imitation skills and also made gains in their imitative language skills (Ingersoll &Schreibman, 2006). In the follow-up test, one month after the intervention, all five participants maintained their motor imitation skills. All five children were administered the Motor Imitation Scale (MIS) before and after treatment and showed a statistically significant increase in object imitation after treatment.

The results of our study indicate the important and positive contribution of reciprocal imitation in the development of play skills in children with ASD. These results are attributed on the one hand to the activities of the training program, with its intensive daily sessions, techniques, and tools used, which were suitable for the children in the sample. On the other hand, the children in our study had a moderate degree of ASD and did not suffer from mental retardation. This is also attributed to the fact that the sample selection criteria were met, the children did not have difficulties with balance, standing, walking, gross or fine motor skills. The Jansiewics study (Jansiewics& al., 2006) showed that the child who suffers from deficits in fine and gross motor skills also suffers from poor imitation skills.

The lack of concordance of hand movements with sight (visual and kinesthetic synergy) negatively impacts imitation competence (Ezell et al., 2012). The results of this study are consistent with other research that has also demonstrated the positive contribution of reciprocal imitation to the imitation skills of children with ASD (Laine et al., 2008a; Laine et al., 2008b; Ingersol&Schreibman, 2006).

The introductory activities at the beginning of each session increase the children's desire to participate in the training. In addition, the children continue the training at home with their parents.

The results also indicated that there were statistically significant differences in the post-test in favor of the video modeling group. Visual stimuli are highly solicited by children with ASD. This result is consistent with Cardon and Wilcox's (2011) study, which showed that imitation through video modeling is effective in acquiring and increasing imitation competence in children with ASD. On the other hand, Spurlock (Spurlock, 2011), did not find significant differences between the use of reciprocal imitation and video modeling in teaching imitation skills, but she showed that video modeling could be a new approach and a good alternative for training and teaching. On the other hand, our results are in agreement with Cardon's study (Cardon&Wicox, 2011), which showed the advantage of video modeling in the acquisition of imitation skills. Wick's study (Wick, 2010) showed the equal effectiveness of both methods in the development of imitation skills in children with ASD.

The durability of the effect of training by both methods was verified by comparing the post-test scores and the follow-up measure. There were no statistically significant differences between the post-test and follow-up scores of the two groups, video and reciprocal modeling. This can be attributed to the fact that it is the result of using appropriate and useful means for the children in our study. The behavior imitated is age-appropriate and appropriate to the characteristics of children with ASD. The children in the sample retained their skills after two weeks of the post-test.

CONCLUSIONS

Although learning by modeling the behaviors of peers (reciprocal imitation) is one of the effective methods, in teaching and training most children with ASD for many skills, video modeling is more effective. The models shown in the videos are usually prepared by typical children or adults, i.e. the skill to be taught is prepared in a way suitable for autistic children. In addition, video modeling makes it possible to repeat the training on a skill several different times in the same way, which is not always possible in the reciprocal imitation learning method. Video modeling is one of the effective strategies issues of applied behavioral analysis, which is based on the regular teaching of measurable behavioral units. Each skill is reduced to small steps.

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