Video modeling and daily living skills training in students with ASD

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Abstract

This article includes multiple case studies that aim to explore the effectiveness of using video modeling on the development of daily living skills in middle and high school students with autism spectrum disorders (ASD).

In this study we used video modeling to train five daily life skills in students with ASD. The students watched the videos according to a specific procedure.

The participants in the study were four students with ASD enrolled in special education, two boys from the 8th grade, and two students (a boy and a girl) from the 9th grade.

Data were collected by applying the Waisman Scale for Daily Living Skills (W-ADL) at the beginning and end of the intervention and the Observation Grid that was completed for each individual student, during each session/session, throughout the duration of the intervention.

The results showed that video modeling is an effective technique for teaching a wide range of daily living skills to students with autism spectrum disorders that they were able to master, achieving 100% of them on their own, some in a shorter time frame, others in a larger number of sessions.

The findings and recommendations of the study suggest that video modeling is not only an evidence-based practice to train daily living skills in students with ASD, but also that the use of video modeling is beneficial because of the reusable and portable technology.

Future research should further explore the effectiveness of video modeling on the training of both daily living skills and other activities (eg: assembling a toy, playing games with peers, evacuating in case of fire, but also activities of teaching) to pre-schoolers and young school children.

Keywords: video modeling, daily living skills, autism spectrum disorders.

Introduction

The people with Autism Spectrum Disorder (ASD), especially children, often have difficulties in performing daily living skills independently. They need assistance in performing skills such as brushing teeth, toileting, washing clothes or dishes, doing household chores, handling money. These are very important skills that children need to know how to develop at home and at school, and which concern parents and teachers alike. Parents of children with ASD have an important role in the formation of daily life

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skills and should give increased importance to this aspect, especially since the need for self-care of these children is high, requiring additional care from families (Jasmin et al., 2009, apud Meister & Salls, 2015).

The relevance of this topic can be argued by the fact that through video modeling the acquisition of functional skills independence, the increase of participation in community and increase of the quality of life of people with ASD are achieved. Teaching different daily living skills to students with ASD (eg: personal hygiene, food preparation, shopping, etc.) can encourage their independent functioning without adult supportm shaping a safe, productive, and independent life (Carnahan et al., 2009; Shiplay-Benamou et al., 2002 apud Gardner, 2015), by promoting the acquisition of skills that will enable them to live, function, and participate in the community (Wolery et al., 1992).

Video modeling (VM) is an instructional method that can help children with developmental disabilities gain functional skill independence (Gardner & Wolfe, 2013). Teaching children with ASD to achieve independence in daily living skills is essential to their independence as adults and integration into social life. Daily living skills are also taught to students in two therapies that are being studied in special education, namely Occupational Therapy and Personal Autonomy Training, but a relatively new intervention/technique that has been and is successful in teaching life skills everyday is video modeling.

VM is increasingly being used to teach skills and abilities to children with disabilities, particularly neurodevelopmental disorders, for learning a variety of daily living skills, including self-help skills, household skills and related skills. food preparation. The advantages of video modeling include immediate feedback, the ability to repeat instructions and replay the video in parts or in full, and low cost (Athorp et al., 2022; Kellems et al., 2016; Mechling, 2005).

According to Bandura's research, attention to the model and motivation are needed for a student to imitate another. A student is more motivated to follow a role model who is "competent" and similar in physique, gender, and age. (Murray &Noland, 2015). Bandura also discovered that those who observe will imitate the behaviors presented both in the presence of the model and in its absence, but also in other similar situations.

There are three distinct types of video modeling: basic video modeling (MVB), automodeling video (AMV), and point-of-view video modeling (MVP). Basic video modeling (MVB) is a learning strategy in which the student watches a video recording of an actor other than the student illustrating a specific skill or routine. The method aims to change the student's behavior, which will increase his ability to acquire a skill or routine. Behavior means "any change of an entity in relation to circumstances" (Bigelow et al., 1943, p.18 apud Murray & Noland, 2015). Self-modeling video (AMV) differs from basic video modeling in one essential way: the main actor in an AMV clip is the learner himself. If in the case of basic video modeling the student was a mere spectator, in the case of self-modeling video he is the actor. Watching a clip of yourself performing the desired behavior not only teaches the student what to do, but also increases their self-efficacy.

Point-of-view video modeling (MVP) is similar to basic video modeling, recording someone other than the student—a sibling, parent, peer, teacher demonstrating the target skill or routine. What sets this strategy apart from other forms of video modeling is that the video captures exactly what the student will see when performing the skill or routine. Because the footage illustrates the target skill from the student's perspective, the clip only includes the model's hands and other social partners necessary to demonstrate the skill or routine.

This research study applies basic video modeling as an intervention technique to modify student behavior through the acquisition of a skill or routine.

Identifying methods of developing daily life skills for children with ASD in order to increase their level of independence are vital in improving their quality of life. Video modeling has been used as a tool to support the development of various skills in people with ASD since the late 1990.

There are several reasons why video modeling is particularly successful in teaching new skills to children with ASD. The visual stimulus is perceived much faster than the auditory stimulus by people with ASD (Grandin, 2005; Quill, 1997 apud Merdan, 2020). Visually perceived information may allow easier encoding in children with ASD, who show stronger preferences for watching videos, e.g., over other tasks. Videos can be perceived by the child with ASD as a recreational activity, which increases motivation and can provide a change from the daily routine (Charlop-Christy et al., 2000). Learning with the help of video modeling could increase the attention and interest of people with autism for the complete and error-free realization of the activities proposed to them.

The benefits of this technique are multiple: improving attention during activities, improving social interaction skills, improving language and the amount of functional language, understanding facial expressions and determining the student to act appropriately in social situations, decreasing inappropriate behaviors and ease of breaking routines, imitation skills, increasing the degree of independence of some activities, increasing the ability to protect oneself (a stage difficult for an autistic student to understand if presented 1:1 in a therapy), improving functional play skills, decreasing the level of anxiety towards certain activities (Yakubova et al., 2016; Piccin et al., 2018; Park et al., 2019).

The results of studies have shown that video modeling helps to increase daily living skills (Delano, 2007; Kinney et al., 2003; Hitchcock et al., 2003), decrease the level of disruptive behaviors (Apple et al., 2005; Buggey, 2005) and causes increased social interactions and interacting with other children (Cihak et al., 2009; Nikopoulos & Keenan, 2003; Wert & Neisworth, 2003). The researchers argue that video modeling interventions are inherently motivating and naturally increase interest in various activities for children with ASD and the skills that can be taught through video modeling are diverse:, increasing attention, dress-up or recreational play, handwriting legibility, math skills, daily life skills (MacDonald et al., 2009; Sherrow et al., 2016). Charlop-Christy et al. (2000) demonstrated that video modeling results in children with ASD acquiring different skills

more quickly and generalizing more than face-to-face teaching of the same skills and helps to maintain the skills formed over time.

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7. Methodology

2.1. The research questions

To study the effectiveness of using video modeling on the training of daily living skills in middle and high school students with autism spectrum disorders (ASD), the following research question was formulated: *How will the daily living skills of students with ASD, performed at home an in society, learned through the video modeling technique improve?*

2.2. Research objectives

- O1 to identify the daily life skills that the study participants have (degree of independence/dependence);
- O2 to identify the daily life skills that must be formed by the subjects subjected to the intervention/research;
- O3 to train the daily life skills necessary for students with ASD in secondary and high school.

2.3. Research design

The method used to study the effectiveness of using video modeling on the formation of daily life skills in middle and high school students with autism spectrum disorders was that of multiple case studies.

Initially, the study participants were selected, then the Waisman Scale for daily activities (W-ADL) (Elsevier Inc., 2013) was applied with 15 items (adapted), 13 items representing daily life skills performed at home and 2 items representing skills of daily life carried out in society.

The research variables are: ASD; video modeling; the five daily life skills that students need to develop with the help of video modeling (hand and dental hygiene, making a ham and cheese sandwich, setting the table, lacing and tying shoelaces, compliance with traffic rules when crossing the street through marked and traffic lighted places or not).

2.4. Participant

The sample of study consisted of four students (three boys and one girl) aged 16 and 18 years (mean 17 years) and with $IQ \le 50$. All were diagnosed with autism by a clinical psychologist. The students are enrolled in special education, two boys are students in the 8th grade and two students (a boy and a girl) are students in the 9th grade

The four students participating in the study were selected based on the following criteria:

1) Diagnosed with ASD by a specialist and the existence of an Individualized Educational Plan (IEP).

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- 2) Have deficits in daily life skills identified by the principal and parents.
- 3) Have the ability to pay attention for 15 minutes.
- 4) Have the ability to pay attention to a visual stimulus for at least 10 minutes.
- 5) Have the ability to express oneself using oral verbal language and to understand oral verbal language.
 - 6) Have the ability to carry out at least 4 verbal instructions.
- 7) To recognize some objects necessary in the formation of daily life skills (objects for personal hygiene, clothing, crockery and cutlery).

In the selection of these students, the leading teachers from grades V-VIII and grades IX-X were involved. Thus, the 2 students from the secondary school were selected from a number of 12 students with ASD, and the 2 students from the high school were selected from a number of 8 students with ASD.

2.5. Instruments

In conducting this multiple case study we used the Waisman Scale for Activities of Daily Living (W-ADL) (Elsevier Inc., 20013) and the Observation Grid as instruments.

The Waisman scale consists of 15 adapted items, 13 items specific to daily life skills performed at home and 2 items for daily life skills performed in society.

The parents of the 4 children were given the Waisman Scale to complete. Also, the leading teachers from the classes of the 4 students completed the Scale. Following the score obtained by each individual student, I chose the five daily life skills that I tried to train them during the intervention, using video modeling. The skills chosen for the study were those in which levies score 0 points.

2.6. Procedure

Data were collected over a 7-weeks period. Each student participated 5 times a week in sessions that lasted 15 minutes. The activities took place in a specially designed classroom, where the students worked alone, under the supervision and guidance of the observing teacher. Also, household activities (preparing a sandwich and setting the table) took place in the canteen of the school unit. In order to learn traffic rules, the students took turns, accompanied by the observing teacher, on the street, in a traffic lighted intersection and on a street marked with pedestrian crossing only.

It started with the activity "making a ham and cheese sandwich", an easy activity presented in a 1-minute video. This activity took place in the kitchen of the school unit. On the workbench was a slice of bread, a box of margarine, and a plate on which were two slices of ham and two slices of cheese.

To begin with, the student had to recognize and name the objects on the table. Then he watched the entire video. After watching the entire video, the student was asked to perform the task The student watched the sequence again, then performed it. The way of working was the same until the task was completed. The activity should not exceed 15

minutes, because the student with ASD cannot stay engaged in a task for a long time. He loses interest and attention.

The way of working was the same with each individual student. The activity was carried out several days in a row, until the students were able to complete the task by themselves. After several sessions, they performed the task individually after only one viewing of the entire video, the first 30 seconds. At the end of the intervention to develop the ability to prepare a sandwich with ham and cheese, the students were able to perform the task without a prior viewing of the video.

The second daily life skill that students with ASD developed was "arranging the table". The intervention also took place in the canteen of the school unit. On a table, the students found all the objects needed to carry out this task. To begin with, the students recognized and named the objects they will use in carrying out the task: mat (napron), flat plate, bowl (bowl), spoon, fork, knife, napkin and glass.

While doing the first step, each student names the object being used, then says what step they are going to do next. Every step that the student performs incorrectly or does not know how to perform at all, is replayed on the video. Students can also be helped by receiving some brief directions from the observing teacher or helpful questions. It should be noted that, in video modeling, the actor is filmed from the front, and the student sees the image "in the mirror". So his right side is actually the left side of the performer in the video. This can be a limitation of basic video modeling compared to point-of-view video modeling.

Another target skill was "personal hygiene", during the intervention, the students learned to wash their hands, eyes and teeth. The video lasted 3 minutes and 30 seconds and featured a 6-year-old student as the main actor. The students went to the bathroom, where they found a sink, container of liquid soap, toothpaste, toothbrushes, and a towel. As with the other activities, the students identified, named and specified the utility of each object.

The fourth daily life skill learned by the students in this study was "tying and tying shoelaces". It is known that students with ASD are dependent on adults when it comes to choosing and dressing in clothes, as well as putting on and tying shoes, basketballs, etc. Therefore, the formation of this daily life skill in children with autism in this study was also a challenge for the teacher researcher/observer. The video was shot in one session with no mistakes and no need for retakes or editing. The actor was the observant teacher himself. The video was 2 minutes and 50 seconds long.

The activity took place in the classroom. This was done as in the case of the other learned skills. The students watched the entire video, then named the objects needed to perform the task: shoe, shoelace. It was checked if the students have and use concepts of spatial orientation: up-down, right-left.

The fifth daily/social life skill learned by the middle school and high school students participating in this study was "traffic rules that must be respected by pedestrians". The

first session took place in the classroom, where the students watched the entire video about the traffic rules that pedestrians must follow.

In the first 2 sessions of each activity, students received verbal and physical support from the research teacher. In the sessions that followed, only the videos replayed in full or in sequences were used, depending on the need.

2.6.1. Consolidation, generalization, follow up

In the following two weeks after the end of the intervention, monitoring/ (follow-up) sessions of the four students participating in the study were conducted both at school and at home, without the use of video modeling. Twice a week, the students were asked to perform, individually and independently, one skill from those learned during the study. Where an error was observed in the performance of the activity, the video corresponding to that skill was presented in full, without verbal instructions and without physical help from the observing teacher. In the case of students who managed to perform a skill correctly (for example: arranging the table), they moved on to perform another skill learned in the same session. Each maintenance session lasted a maximum of 10 minutes.

We also requested the support of the parents to involve the children in the household activities that they learned during the research (setting the table, making sandwiches for all family members, tying shoelaces by themselves).

After 2 weeks from the end of the study (intervention and reinforcement), Student A. was able to independently perform four of the five daily life skills learned, and for "Laying and tying shoelaces", he needed only one viewing of the sequence which showed how to make the bow.

Student B. managed to independently perform the skill "Preparing the sandwich", with video support (a complete viewing of the video) the skills "Setting the table" and "Traffic rules that must be respected by pedestrians" and with the complete viewing of the video, as well as the resumption of twice the sequences in the video for 4 steps that had to be followed for the correct execution of the skills "Personal hygiene" and "Shoe laces and tying".

Student C. independently achieved the skill of "Setting the table", with video support (a complete viewing of the video), the skills of "Preparing the sandwich" and "Traffic rules that must be respected by pedestrians" and with the complete viewing of the video, as well as the retake from May many times of the sequences in the video for 6 steps that had to be followed for the correct execution of the skills "Personal hygiene" and "Shoe lacing and tying". For the last mentioned skill, the teacher's verbal support was also needed.

Student D. independently executed the skill of "Setting the table", for "Preparing the sandwich" she needed video support only for stages 1 and 2, for "Traffic rules that must be respected by pedestrians" she needed video support and verbal support from the teacher, the student still showing insecurity in the execution of the task. For the skills "Personal hygiene" and "Stringing and tying shoelaces" he needed video support

(watching the entire video and replaying the sequences that presented 5 stages necessary

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2.6.2. Social validity

At the end of the consolidation period, informal interviews were conducted with the participants, their parents and their teachers. All participants said they enjoyed watching the videos on the LCD screen at school, but also on their tablets, to learn how to wash their hands and teeth properly, how to cross the street safely without the help of a adult, how to tie shoelaces. The four participants in the study stated that, at home, they help their parents set the table and even clean it and put the dishes in the sink, which was also confirmed by their parents. We learned from their parents that, in addition to the daily life skills learned during the study, the children began to follow and copy them in other household activities (washing the dishes, putting the laundry in the washing machine), but also some social activities (making small purchases – bread, ice cream).

for the correct execution of the task) and verbal support from the teacher.

The leading teachers observed that the students involved in the study became much more motivated to complete the tasks they receive following a physical or video presentation in relation to a personal development activity (room or classroom hygiene), especially when they are encouraged, praised and congratulated for their achievements. Lead teachers stated that they have observed the effectiveness of video modeling in teaching daily living skills to students with ASD and will also use it in their classrooms for student development and other behaviors.

To answer the research question – *How will the daily living skills of students with ASD, performed at home an in society, learned through the video modeling technique improve?* the results obtained by the four participants in the four daily life skills that they perform at home and in society will be analyzed: Personal hygiene, Setting the table, Preparing a sandwich and Lacing and tying shoelaces. The results show that all four students managed to develop these skills in 100% by the end of the 7 weeks of intervention. From the discussions with their parents it was found that, at home, the children became independent regarding the execution of the four learned skills. In addition, all four children began to perform other tasks complementary to the skill of setting the table, at the urging of their parents, such as: setting and wiping the table and washing the dishes.

Therefore, for research question, the following answer can be formulated: the daily living skills of students with ASD, carried out at home and in society, were improved by using the video modeling technique, as a structured and directed activity by the researcher/observer.

3. Results and Discussions

The purpose of this study was to observe the effectiveness of using video modeling on the formation of daily life skills in middle and high school students with autism spectrum disorders. The results confirmed to us that video modeling is a successful technique for teaching middle and high school students with ASD daily living skills, with all four study participants gaining skills in setting the table, making a ham and cheese sandwich, personal hygiene (washing hands, face and teeth). And previous studies have shown that video modeling is a useful medium for producing positive changes in the behavior of children with autism.

Thus, in the present study, during the intervention period, but also 2 weeks later, a rapid improvement in daily life skills could be observed. Student A. was able to complete the intervention in less than half the number of sessions allocated to the study. He maintained his learned skills best over time and because at home, the maternal assistant continued to train him in the learned household activities, but also in new ones: sweeping the yard, dusting the room, putting the laundry in the washing machine.

The difference between the four participants was made by the pace at which they developed all these skills, with some needing more sessions, others less. Important to note is that all students fit into the study time frame (7 weeks, 5 days/week) and showed equal success in the reinforcement sessions. Although the four children come from different social backgrounds (family, foster care), from urban and rural environments, this did not in any way influence the pace of their evolution.

The first two activities Setting the table and Making the sandwich were learned by all four participants at almost the same fast pace, the number of sessions being very close (2, 3, 4 sessions).

As the level of difficulty of the activities increased (activities 3, 4), the number of sessions, replays of the videos and certain sequences in the video was greater, and the degree of insistence of the research teacher in getting the students to perform these tasks without error was much higher.

In previous studies, it has been shown that video modeling is a useful method of teaching not only daily life skills, but also communication skills, social skills, changing the behaviors of children with autism, but also of children with learning difficulties.

Until now, in Romania, the effectiveness of video modeling on the formation of daily life skills in children with ASD has not been investigated. The results of this research demonstrated that video modeling offers many benefits to children with ASD

Following the analysis of the study "The effectiveness of video modeling for teaching daily life skills to children with autism spectrum disorder" (Merdan, Ozcan, 2020), it is possible to identify a relationship of similarity between the results of this study and the results obtained by the four participants in the current study following the application of the Waisman Scale post-test. This similarity is represented by the fact that in both studies the result was reached that video modeling is effective in training daily life skills in children with autism in middle and high school.

Through this research study that we conducted, we found a similarity with the study "Effects of video modeling with video feedback on vocational skills of adults with autism spectrum disorder" (Derek et al., 2017) regarding the effectiveness of video modeling

accompanied by the video request and the replay on sequences of videos, in order for the students to complete the more difficult stages without error.

A limitation of this research is the absence of a teacher observer distinct from the teacher researcher. Another limitation is making the videos with typical child actors close to the age of the child viewers.

Conclusions

The purpose of this study was to observe the effectiveness of using video modeling on the formation of daily life skills in middle and high school students with autism spectrum disorders. Following the obtained results, we can conclude that video modeling is an extremely effective method for teaching daily life skills to children with ASD in middle and high school.

Video modeling is an instructional method that can help children with autism gain independence of functional skills. Video modeling is a useful, easy-to-apply and cost-effective teaching method for individual education. By using this technique, the possibility of making a mistake is less and therefore makes the student more confident. Once social skills are formed through video modeling, they are maintained over time, and children with ASD gain the courage to interact with typically developing individuals.

It should be noted that video modeling has many advantages: it provides immediate feedback, the activity can be completed in smaller sequences, and these can be repeated whenever necessary so that the student can learn the correct way of working, the videos can be recorded on a portable device, the student being able to watch it independently, as often as needed, without the minimum assistance of an adult, regardless of the location (at school, at home, on the street, in the means of transport, etc.) and involves low costs. Independence in society and in everyday life is of particular importance for all children, but especially for those with autism spectrum disorders. Another advantage of using video modeling, of mobile technology in general, is that it allows for individualized intervention among multiple students (Burton et al., 2013). The same video clip can be uploaded to multiple devices.

No disadvantages were reported in the case of video modeling, only video self-modeling has a disadvantage, that the filmed video can only be used for one student, the one who was the actor. For other students, that movie can serve as basic video modeling.

Future research could further explore the effectiveness of video modeling on training both daily life skills and other activities (eg: playing games with peers, fire escape, and teaching activities) in preschoolers and school children.

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