

The effectiveness of video modelling for teaching daily life skills to children with autism spectrum disorder

Fatma Merdan, Near East University, Department of Special Education, Institute of Education, Nicosia, North Cyprus

Deniz Ozcan*, Ondokuz Mayıs University, Faculty of Education, Department of Special Education, Samsun, Turkey

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Abstract

The purpose of this study is to examine effectiveness of video modelling for teaching daily life skills to children with autism spectrum disorder (ASD). Multiple probe across subjects design from single subject research model has used as a research method. It has found that video modelling is effective on teaching common life skills to individuals with ASD. It has also demonstrated that these skills become permanent in subjects' lives and they could generalise these skills at other times with various equipment and in different contexts. Data are collected according to achieve each skill step in cooking fried eggs with garlic sausage and cooking pasta skill analysis. In future researches, teaching different daily life skills by using video modelling could be tested.

Keywords: Autism, cooking fried eggs, cooking pasta, daily life skills, video modelling.

* ADDRESS FOR CORRESPONDENCE: **Deniz Ozcan**, Faculty of Education, Department of Special Education, Ondokuz Mayıs University, Samsun, Turkey. E-mail address: deniz.ozcan@ondokuzmayis.edu.tr

1. Introduction

Using video technology is an education technique that is created according to observational learning theory. It has been used for many years in America. Supporters of observational learning theory claim that video modelling should be used as a tool to teach self-care skills and communication skills. Human beings learn behaviours by observing and modelling. Bandura's Social Learning Theory (1971) indicates that to learn any behaviours, it is necessary to imitate other people or models (Bandura, 1986). Individuals with autism spectrum disorder (ASD) may also learn some behaviours by observing their peers. They could imitate some skills through visual learning, but these behaviours are limited.

There are many special education researches in Turkey about teaching daily life skills. To start with, Ozokcu (1977) worked with eight mentally disabled individuals who have precondition skills for gaining sewing ability (buttonholing and backstitching) using alternating treatments design. Cavkaytar (1998) conducted a research with three mentally disabled children and their mothers using multiple probe design: nail cutting, peeling cucumber and ironing abilities with the first participant, using dishwasher, vacuum cleaner and lacing up with the second participant and using oven, washing machine and cooking soup with the third participant. Moreover, Esirgemez-Aykut (2007) also worked to teach backstitching and cooking instant soup with two mentally retarded students using adaptive alternating treatments design.

Researches and teaching programmes about daily life skills include many different areas of basic activities such as cooking, cleaning, self-care abilities and outside activities. There are some self-cleaning examples which are changing panty liner and tooth brushing with children who have mental disorders (Oncul & Yucesoy-Ozkan, 2010; Saygin, 2009). Furthermore, there are cooking practices with individuals who have down syndrome and ASD such as cooking pasta, preparing sandwich, hot chocolate, fruit juice and popping corn (Genc, 2010; Haliskucuk, 2007; Kaya & Yucesoy-Ozkan, 2016).

There are also some other studies about teaching household chores to participants who have special needs. Dogan (2010, 2013) and Goc (2014) have researches about mopping floor, ironing, using dishwasher, preparing and serving tea. Using money and paying enough money for something are important abilities in people's daily lives. Cattik and Ergenekon (2016) worked with three mentally retarded children for paying electric bills, ordering a meal in a restaurant and getting on the tram using multiple probe design. Teaching method with video modelling is beneficial to use with people who have ASD at home, at school and in different environments; the possibility to have instant feedback and repeatability provides efficient learning (Branham, Collins, Schuster, & Kleinert, 1999). It is also a time-efficient technique. There is no need to have a peer to teach something everytime and everywhere because of video recording (Rehfeldt, Dahman, Young, Cherry, & Davis, 2003).

There are numerous researches about using video modelling for daily life skills with many children who have special needs. Three students with autism are shown videos of future events using point-of-view modelling and their discomfortable behaviours are decreased in a very short time (Schreibman, Whalen, & Stahmer, 2000). This study may be useful to avoid future negative acts related to some specific places and situations for children with ASD. Wert and Neisworth (2003) worked with four children with ASD for the ability to request something which they want and self-modelling videos are used for that study. Children's correct reactions are grown at the end of the research (Wert and Neisworth, 2003).

Video modelling is not only used with children as a teaching method but also advantageous to work with adolescents and adults. Rehfeldt et al. (2003) have research with three mentally disordered adults to teach about preparing sandwich and they used peer model in video records. They warned participants to watch videos when they turned their eyes away and reinforced them for correct behaviours; at the end of the programme they learned the proposed ability, they protected it after one month and they could generalise this skill (Rehfeldt et al., 2003). In this research, it is aimed to use

video modelling for teaching how to cook pasta and fried eggs as daily life skills to adolescents with ASD.

2. Method

2.1. Participants

Samples of the study are three adolescent students who have precondition skills and who are diagnosed with ASD. They continue to have education from Ozel Sezgi Cem Special Education and Rehabilitation Center in Kocaeli. Due to learning if they achieve precondition skills or not, their teachers and parents are asked about these students' self-care and daily life skills.

Identified prerequisites of participation are

- a) Ability to pay attention to visual stimulus for at least 15 minutes.
- b) Ability to participate in an activity at least 25 minutes
- c) Having receptive and expressive language skills
- d) Ability to follow at least four graded verbal instructions
- e) Visual sufficiency to watch video
- f) Recognising home appliances
- g) Knowing how to understand boiled water

Participants' abilities to achieve precondition behaviours are tested by their educational performances and their attention durations are identified by observing them while they are using the computer.

2.2. Researchers

The first researcher is a Special Education Master's student at Near East University and a special education teacher. The experimental process is conducted by the second researcher. The second writer is an Assistant Professor Doctor and the Head of High Intelligents Teaching Department. She is the advisor of the study.

2.3. Context

Sessions of the study are done at the Ozel Sezgicem Special Education and Rehabilitation Center and the kitchen of the second researcher's house which is regulated according to one-by-one education system. The kitchen is 3 × 3 metres. There is an L-shaped bench in the kitchen which is suitable to work together for practitioner and student. At the shorter part of the bench, there is a stovetop with automatic gas buttons. At the longer part of the bench, there is a sink and a waste bin under the sink.

The first writer conducted the practical part of the study of cooking pasta and fried egg with three adolescents who have ASD. As a teaching tool, video recordings are done in the same kitchen.

2.4. Instruments

To identify target behaviours to upskill adolescents with ASD at the beginning of the study, strengths and weaknesses of the individuals will be searched. Information is taken from their schools, special education teachers and parents and then researchers decided skill levels of the research.

According to the skills control lists' information, requirements of the students are identified and two target behaviours are chosen. These are cooking pasta and cooking fried eggs with garlic sausage (which is a very common and popular meal in Turkey).

In the study, equipment for cooking fried eggs are stovetop, pan, chopping board, bowl, oil, spatula, fork, knife, garlic sausage, eggs, salt and a dish. Equipment of pasta are a pot, stovetop, water in a water-bottle, strainer with two handles, wooden spoon, raw pasta, oil, salt and a dish.

Furthermore, to show peer modelling video clips to participants on the teaching phase, a laptop and video CDs are used by the researcher.

According to skills analysis, skill levels are done by the peer model and these steps are recorded by the researcher.

2.5. Research model

In this research, multiple probe design **across** different **subjects** is used as a single subject research model. Video modelling is used as a teaching method and it is developed based on Albert Bandura's observational learning theory. Video modelling is watching a model that shows levels of the target behaviour (Akmanoglu & Tekin-Iftar, 2011; Bellini & Akullion, 2007; Tekin-Iftar, 2012). Various modelling styles could be used such as peer modelling, adult modelling, self-modelling and point-of-view modelling. It is an advantageous scientific technique to learn self-care abilities, academic skills and social skills (Charlop et al., 2010; Mason et al., 2013; Rosenberg, Schwartz, & Davis, 2010; Shukla-Mehta et al., 2010).

Single subject designs are popular for many fields such as in psychology, special education, social services and psychiatry (Bailey & Burch, 2005; Barlow & Hersen, 1984; Cooper, Heron, & Heward, 1987; Honner et al., 2005; Kazdin, 1982; Kennedy, 2005).

These scientific areas are used single subject designs to search for the effects of Skinner's school code of conduct on the typical and atypical development types of people (Kazdin, 1982; Kennedy, 2005; Richards et al., 1999). Kazdin (1982) introduced characteristics of Skinner's experimental analysis researches as

- a) frequency of behaviours are used as an assessment method,
- b) behavioural analysis are done for each participant separately and
- c) behaviours are recorded at the beginning, during and after intervention and so statistical analysis is not necessary (Tekin-Iftar, 2012).

Single subject studies consist of two experimental phases, which are 'baseline' and 'intervention'. In these phases, direct recording techniques are used and data are collected permanently. Reliability analysis has done to be sure about the correctness of the data.

Multiple probe design across different subjects is separated into three groups.

- a) Multiple probe design across different behaviours
- b) Multiple probe design across different subjects
- c) Multiple probe design across different contexts

As the multiple baseline designs, the multiple probe designs have two pre-requirements and these are important for experimental control. These are the independence of conditions and similarities based on their functionality (Tekin-Iftar, 2012).

2.6. Variables

2.6.1. Dependent variable

At the beginning of the study, skills analysis of the cooking of pasta and fried eggs are formed by the first and the second writer. There is skill analysis of cooking fried eggs with garlic sausage (Table 1) and cooking pasta (Table 2).

Table 1. Skill analysis of cooking fried eggs with garlic sausage

Skill levels
1.a – Take a chopping board
2.a – Take a knife
3.a – Take a garlic sausage
3.b – Slice the sausage
3.c – Put the sliced sausage into the dish
4.a – Take the bowl
5.a – Take an egg
5.b – Crack the egg
5.c – Put the egg into the bowl
5.d – Throw the eggshells into the bin
6.a – Take the salt-cellar
6.b – Put some salt into the cracked egg
7.a – Hold a pan from the handle
7.b – Take the pan
7.c – Put the pan onto the stovetop
8.a – Take some oil
8.b – Put some oil into the pan
8.c – Put the sausages into the pan
9.a – Hold the button of the stovetop
9.b – Push the button and turn it on
10.a – Take the spatula
10.b – Mix the sausages
10.c – Put the egg from the bowl into the pan
11.a – Wait for the egg to fry
12.a – Hold the button of the stovetop
12.b – Turn off the fire of stovetop
13.a – Take the dish
14.a – Take the spatula
14.b – Take the fried egg from the pan using spatula
14.c – Put the fried egg with garlic sausage into the dish
14.c – Put the dish onto the table

Table 2. Skill analysis of cooking pasta

Skill levels
1.a) Take the water bottle
1.b) Hold the tap with your other hand
1.c) Turn on the tap
1.d) Fill the water bottle
1.e) Turn off the tap
1.f) Pour water into the pot
1.g) Put the water bottle on the table
2.a) Hold the button of stovetop
2.b) Push the button and turn it on
2.c) Take your hand from the button
3.a) Hold the pot from its handles
3.b) Put the pot on the stovetop
4) Wait until water starts to boil
5.a) Take the spoon from the salt jar
5.b) Put the spoon into the jar

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- 5.c) Take some salt with the spoon
 - 5.d) Put a spoon of the salt into the pot
 - 5.e) Put the spoon into the jar
 - 6.a) Take the dish with full of raw pasta
 - 6.b) Put pasta into the pot
 - 6.c) Put the dish on the table
 - 7.a) Take the wooden spoon
 - 7.b) Mix pasta in the pot
 - 7.c) Put the spoon on the bench
 - 7.d) Wait until pasta is cooked
 - 8.a) Take the wooden spoon
 - 8.b) Take a spoon of pasta from the pot
 - 8.c) Put pasta on the dish
 - 8.d) Control pasta if it is cooked well or not
 - 9.a) Hold the pot from its handles
 - 9.b) Turn the pot to the strainer
 - 9.c) Put pasta from the pot into the strainer
 - 10) Put the pot on the stovetop
 - 11.a) Take the oil bottle
 - 11.b) Put some oil into the pot
 - 12.a) Hold the strainer from its handles
 - 12.b) Take the strainer and hold it on the pot
 - 12.c) Put pasta from the strainer into the pot
 - 12.d) Put the strainer on the bench
 - 13.a) Take the wooden spoon
 - 13.b) Hold the handle of the pot with your other hand
 - 13.c) Mix pasta in the pot
 - 14.a) Hold the button of the stovetop
 - 14.b) Turn off the fire of the stovetop
 - 14.c) Take your hand from the button
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2.6.2. Independent variable

Independent variable of this research is the teaching programme, which is prepared using video modelling.

2.7. Procedure of the programme

In the experimental process, three adolescents were practised the skill levels individually and baseline, intervention and follow-up phases were conditioned for each of them. To practice multiple probe design across different subjects for cooking pasta and cooking fried eggs skills, baseline phase data were collected.

Three types of reactions from subjects were recorded in all phases;

- a) Correct reactions: after video record has started and verbal instruction has been given, achieving the target part of the skill correctly or behaving correctly after second observation.
- b) Being unreactive: after watching video record, not being responsive.
- c) Wrong reactions: not showing correct reactions after getting verbal instruction.

In the research, subjects were reinforced by verbal appreciation because of participating in the study without looking at their reaction types (correct, unreactive or wrong). Before the intervention, the researcher gave a chance to watch the video clip from the beginning to the end to all participants. In the intervention phase, if the participant gave no reaction of wrong reaction, he could watch the particular instruction again. Intervention phases were done for the six days of the week using one-to-one, forward chaining design.

In the beginning of the intervention phase, the researcher prepared all equipment in the context. To have attention of the participant, the practitioner mentioned the topic and said 'Today, you will learn how to cook pasta/fried eggs with garlic sausage and you should watch the video before starting'. Then, she asked if he wants to watch the video or not. After he accepted, the researcher and participant watched the video record which was prepared by peer modelling. In the video, each skill level was done by the peer model but there were no verbal instructions. After the video clip had finished, the participant had been said 'It is your turn. Cook fried eggs (or pasta) as you watched in the movie'.

Verbal reinforcements such as 'congratulations' and 'you are amazing' were given to the subject for each correct reaction for skill levels. When the subject was unreactive or he reacted in a wrong way, the particular skill level was shown again. Then, the participant tried to achieve it again. When the participant completed the specific skill level correctly, the researcher put the (+) sign on the 'correct reaction' column near the written behaviour in the skill analysis form. After watching the skill level in the video again, if the participant couldn't complete the behaviour correctly, (-) had written to the "wrong reaction" column of the form by the practitioner. When there wasn't any reaction, (+) sign was put on the "no reaction" column.

This process had continued until all skill steps were finished. Participation and attention of the subject were appreciated by saying 'thank you to participate that practice'. When the participants achieved each level of the all daily intervention sessions' correctly for three days with a hundred percent success, intervention phases were completed.

2.8. Data analysis

To analyse interjudge reliability, all practices are recorded visually. Dependent variables of the study are analysed by calculating the accuracy percentage of the skill levels of cooking fried eggs and cooking pasta. Interjudge reliability and intervention reliability data are collected from 30% of the sessions and reliability results of them are found as 100%.

3. Results and discussion

In the study, teaching daily life skills is aimed using video modelling. According to the information which has gotten from participants, their parents and teachers, video modelling has been chosen as an appropriate technique to gain these abilities. The current research has been conducted to examine effectiveness of the programme using video modelling for teaching daily life skills to children with ASD. As a daily life skills, cooking pasta and fried eggs with garlic sausage are taught to adolescents.

In video modelling, teaching materials are prepared in real-life contexts and it is repeatable to increase the attention of visual and auditory stimulus (Morgan & Salzberg, 1992). Video modelling has been used in many different environments such as schools and various types of social settings and it has been found influential for generalisation of abilities (Mechling et al., 2003; Schreibman et al., 2000).

At the end of this research, three participants with autism got the skills of cooking fried eggs and pasta. Their percentages of behaviours for cooking fried eggs with garlic sausage (Figure 1) and for cooking pasta (Figure 2) are shown below.

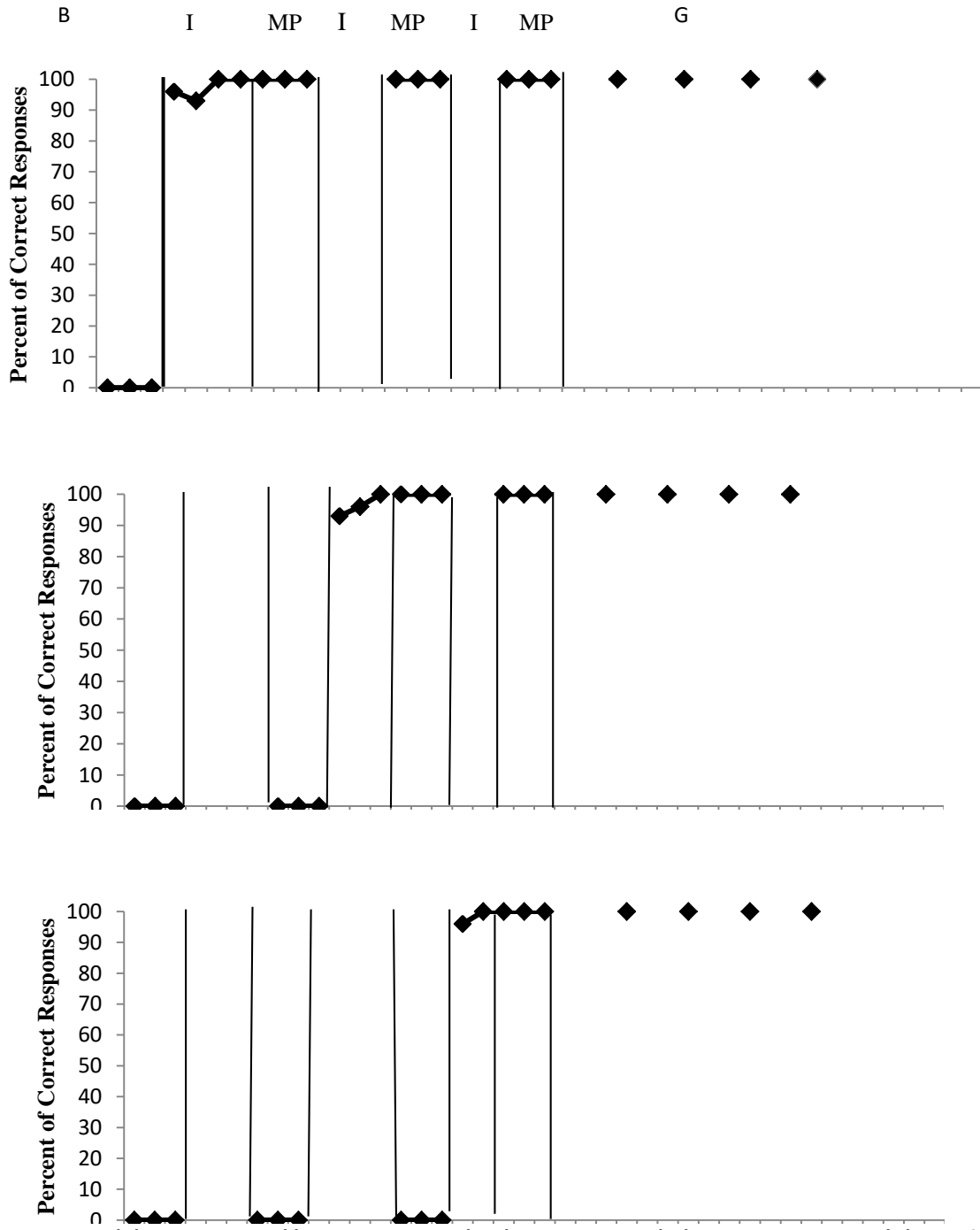


Figure 1. Baseline (B), intervention (I), multiple probe (MP), maintenance (M) and generalisation (G) data for cooking fried eggs with garlic sausage for Aybars, Ege and Kerim

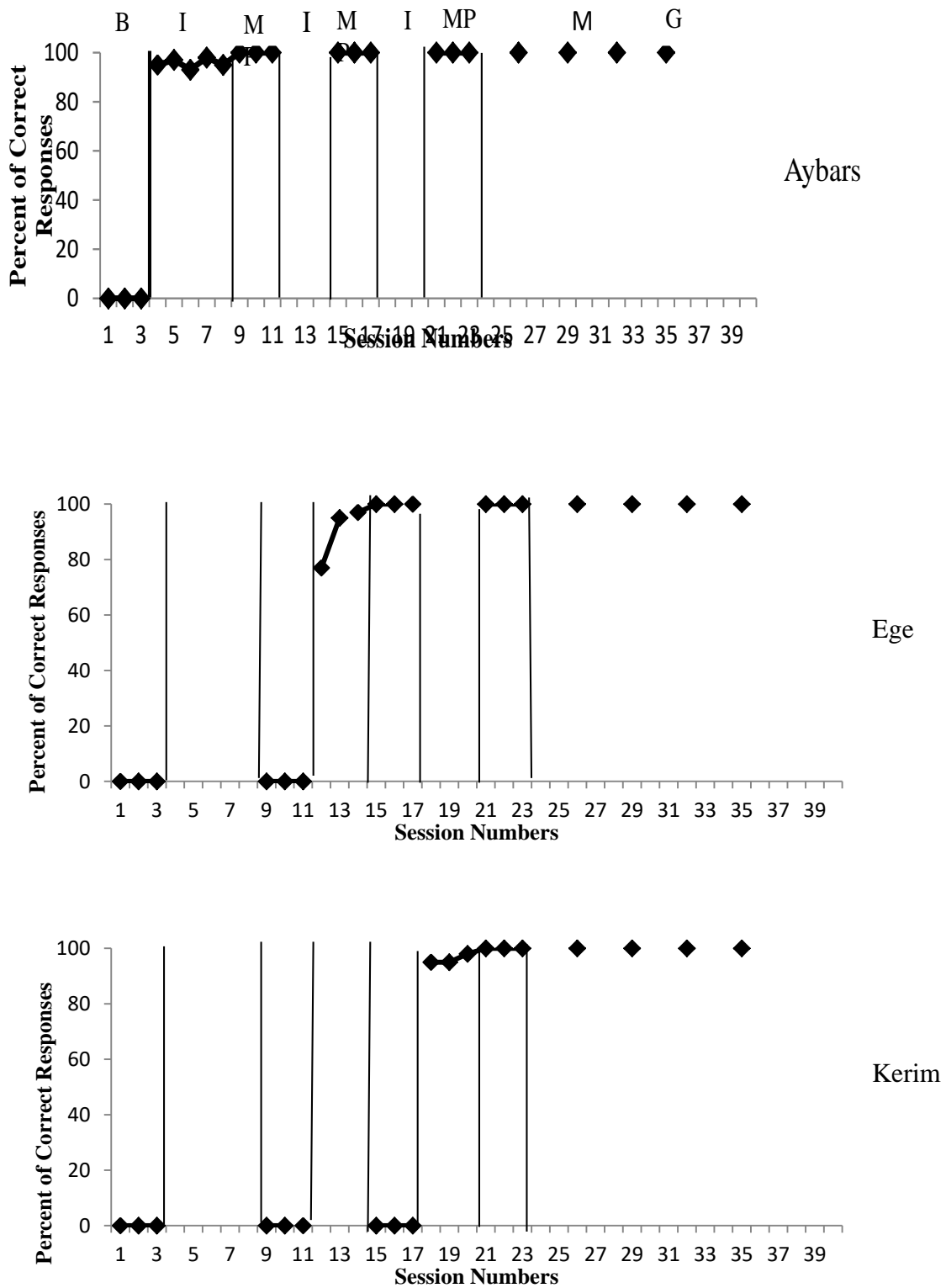


Figure 2. Baseline (B), intervention (I), multiple probe (MP), maintenance (M) and generalisation (G) data for cooking pasta for Aybars, Ege and Kerim

The first participant of the research (Aybars) has completed cooking fried eggs for seven sessions and cooking pasta for nine intervention sessions and Ege, the second participant has learned to cook fried eggs for six intervention sessions and to cook pasta for four sessions. On the other hand, the third subject, Kerim, has gained the skill of cooking fried eggs for five sessions and cooking pasta for six sessions. To accept that the participant learned the target behaviour, showing 100% correct responses has been identified as a criterion.

All of the participants have achieved each skill level correctly for both cooking pasta and fried eggs. They also showed the same success in the maintenance sessions. As a consequence, video modelling is an effective method to teach daily life skills of cooking pasta and fried eggs for adolescents with ASD. The findings of the current research are similar to the literature about the efficiency of video modelling.

3.1. Generalisation results

Generalisation data have been collected using pre-test and post-test analysis across different subjects. Generalisation sessions have been conducted by the first researcher. Pre-test analysis shows that at the beginning of the study (baseline sessions), the skills of cooking pasta and fried eggs include 0% correct responses for each subject. On the other hand, at the generalisation sessions which have done after intervention and maintenance sessions, all participants show 100% success to complete skill levels of the target behaviours (cooking pasta and cooking fried eggs with garlic sausage) across different settings, instruments and people. Generalisation sessions are significant to support the permanence of the learned skills for other contexts and conditions (Tekin-Iftar, 2012).

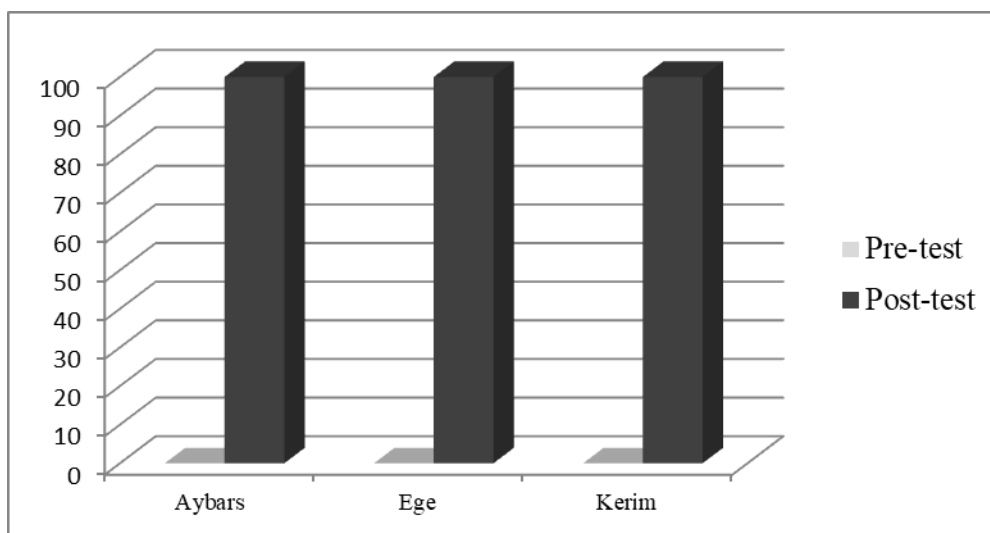


Figure 3. Percentages of correct reactions for cooking fried eggs with garlic sausage in generalisation sessions

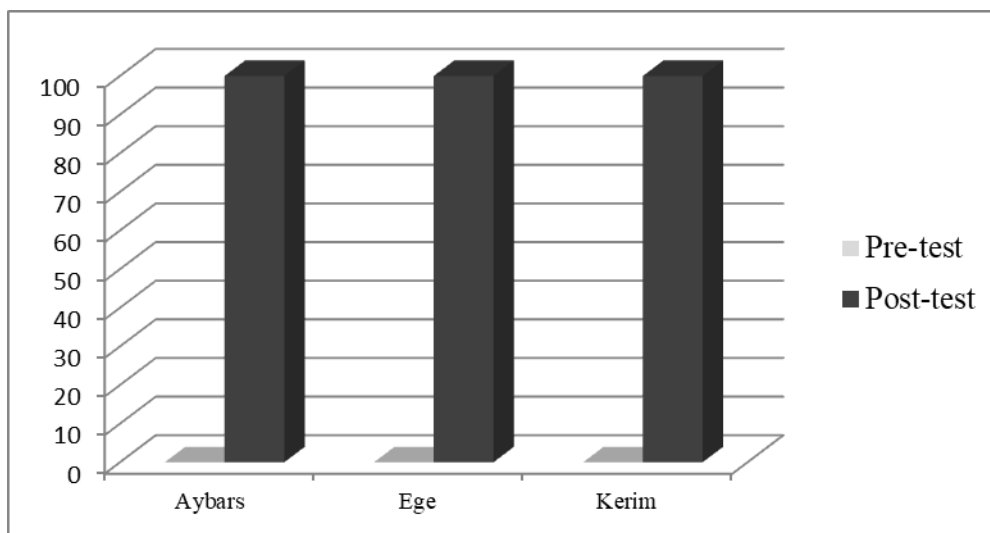


Figure 4. Percentages of correct reactions for cooking pasta in generalisation sessions

In the study, taught daily skills are chained tasks and so it is suitable with the literature about effectiveness of gaining chained tasks using video modelling (Avcioglu, 2013; Ergenekon, 2012; Lutzker & Taubman, 2002; Tekin-İftar, Kapan & Akmanoglu, 2010; Young, Cherry, & Davis, 2003).

Video modelling is beneficial for working with different subjects such as communication skills (Charlop & Milstein, 1989), playfulness and social skills (D'Ateno, Mangiapanello, & Taylor, 2003) and emotions processing (Corbett, 2003). Charlop-Christy, Loc, and Freeman (2000) used video modelling to change behaviours of children with autism and later on; it has started to be used for teaching daily life skills to young adults with mild learning disabilities (Haring, Breen, Weiner, & Kennedy, 1987; Haring, Kennedy, Adams, & Pitts-Conway, 1995).

Video modelling is useful as an important teaching method in numerous researches for many years in different countries. It has started to be used with many different diagnosed groups in our country in the last years as well.

4. Conclusion and suggestion

In the literature, it has found that visual stimulus is perceived faster than auditory stimulus by individuals with ASD (Grandin, 2005; Quill, 1997). Learning with video modelling could increase the attention and interest by watching each skill level step-by-step and it might motivate participants to complete target behaviour. People with ASD give themselves a reinforcement by eating a meal which they cooked and they improve their self-assessment abilities (Schreibman et al., 2000).

Video modelling is an easy and cost-effective teaching method. It is useful for individual education. In this technique, the possibility of making a mistake is lower and so it makes the learner more confident. According to their social skills, video modelling could increase participants' courage to interact with normally developed individuals.

Video modelling is an easy method to use and the practitioner doesn't need to know teaching techniques in detail. Therefore, teachers, teacher assistants, parents and caretakers which are related to individuals who have ASD could use it effectively and it is also beneficial in schools, rehabilitation centres and Autistic Children Education Centers (Rehfeldt et al., 2003). This teaching method could be advantageous for people who have ADHD to gain different skills in various contexts.

In future studies, researchers may try to generalise the findings of similar practices in different places or with different age groups. So, it is suggested that video modelling can be used in comparative researches with different teaching methods.

Video modelling is suitable to use with autistic people for all aspects of their developmental inadequacies such as self-care, daily life, social interaction skills and problem-focused educations which are specific for each of them. Preparing visual and written materials with video modelling is appropriate for using schools, rehabilitation centres and special education schools. Supportive education programmes could be improved to use this method more effectively. Furthermore, in special education schools, Autistic Children Education Centers (OCEM in Turkey) and public schools, training programmes for teachers to use video modelling practices and benefits might be organised by professionals.

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