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The Effects of Video Priming on Facilitating the Transition of Children with Autism Spectrum Disorder between Activities and Settings*

Otizm Spektrum Bozukluğu Olan Çocukların Etkinlikler ve Ortamlar Arası Geçişlerini Kolaylaştırmada Hazırlayıcı Videoların Etkililiği

Emrah GULBOY** **Serife YUCESOY-OZKAN*****

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ABSTRACT: Preschool children with disabilities spend more time when transitioning between activities and settings than their typically developing peers. Extended transition duration leads to reducing the time spent on teaching. Various antecedent-based transition strategies are used to increase independent transition and decrease the transition duration of children with autism spectrum disorder. One of these strategies is video priming. This study aimed to examine the efficacy of video priming, an antecedent-based transition strategy, on increasing independent transitions of children with autism spectrum disorder and decreasing the time these children spent in transitions. Also, identifying opinions of parents of and teaching staff for participating children regarding the acceptability of video priming was aimed. Four children with autism spectrum disorder between the ages of 4 and 6 participated in the study. An ABAB design was used to evaluate the effects of video priming. Results indicated that video priming effectively increased all children's independent transitions and decreased transition duration. The results also showed that the parents and teaching staff had a highly positive opinion about the video priming and its acceptability. This study provided additional evidence that video priming can facilitate children's transition with autism spectrum disorder. The implication for future research and practice were discussed.

Keywords: Autism spectrum disorder, video priming, transition duration, transition strategies.

ÖZ: Okul öncesi dönemdeki özel gereksinimi olan çocuklar, etkinlikler ve ortamlar arası geçişler sırasında akranlarına oranla daha fazla zaman harcamaktadır. Uzayan geçiş süreleri de öğretim için ayrılan sürenin kısalmasına neden olmaktadır. Alanyazında, otizm spektrum bozukluğu olan çocuklara bağımsız geçiş davranışlarını kazandırmak ve çocukların geçişlerde harcadıkları süreleri kısaltmak üzere çeşitli öncül temelli geçiş stratejileri bulunmaktadır. Bu geçiş stratejilerinden birisi de hazırlayıcı videolardır. Çalışmanın amacı, öncül temelli bir geçiş stratejisi olan hazırlayıcı videoların, otizm spektrum bozukluğu olan çocukların bağımsız geçişlerini artırma ve geçişlerde harcadıkları süreyi kısaltmadaki etkililiğini incelemektir. Ayrıca, hazırlayıcı videoların kabul edilebilirliğini ortaya koymak üzere katılımcı çocukların ebeveynlerinin ve öğretmenlerinin görüşlerinin belirlenmesi amaçlanmıştır. Çalışmaya, yaşları 4-6 arasında değişen, otizm spektrum bozukluğu tanısı olan dört çocuk katılmıştır. Hazırlayıcı videoların etkililiğini değerlendirmek için ABAB deseni kullanılmıştır. Bulgular, otizm spektrum bozukluğu olan çocukların bağımsız geçişlerini artırma ve geçişlerde harcadıkları süreleri kısaltmada hazırlayıcı videoların etkili olduğunu göstermektedir. Sosyal geçerlik bulguları da ebeveynlerin ve öğretmenlerin hazırlayıcı videoların kabul edilebilirliği hakkındaki görüşlerinin oldukça olumlu olduğunu göstermektedir. Sonuç olarak, çalışmanın bulguları hazırlayıcı videoların otizm spektrum bozukluğu olan çocukların geçişlerini kolaylaştırabileceğini ortaya koymaktadır. Çalışmada, ileri araştırmalara ve uygulamalara yönelik öneriler sunulmuştur.

Anahtar kelimeler: Otizm spektrum bozukluğu, hazırlayıcı video, geçiş süresi, geçiş stratejileri.

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** *Corresponding Author*: Dr., Ondokuz Mayis University, Samsun, Turkey, emrah.gulboy@omu.edu.tr, https://orcid.org/0000-0002-7802-6839
*** Prof. Dr., Eskisehir Osmangazi University, Eskisehir, Turkey, serife.yozkan@ogu.edu.tr, https://orcid.org/0000-0002-0529-0639

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Transitions occur naturally in daily living and educational settings. For many children, especially children with disabilities, it is challenging to complete timely transitions without challenging behaviors (Sullivan et al., 2017). Due to the less structured nature and unclear behavioral expectations than instructional activities, transitions may lead children to exhibit more challenging behaviors (Angell et al., 2011; Waters et al., 2009). Challenging behaviors during transitions increase transition duration and reduce the instructional time allocated for children with disabilities and their peers with typical development (Banda & Kubina, 2006; Hume et al., 2014; Lequia et al., 2015; Sterling-Turner & Jordan, 2007). Previous studies indicated that children with disabilities, including autism spectrum disorder (ASD), spend more time during transitions than peers with typical development (Ergin & Bakkaloglu, 2019; Rakap, 2019; Sainato et al., 1987).

Children with ASD have difficulty transitioning and adapting to changes as they demonstrate adherence to specific routines (Cihak, 2011; Lequia et al., 2015). Flannery and Horner (1994) hypothesized that transitions' unpredictability might make them incredibly difficult for children with ASD. Studies have demonstrated that when transitions' predictability is enhanced, transition duration (Hine et al., 2015), challenging behaviors, and dependency on the adult decrease (Schreibman et al., 2000; Sterling-Turner & Jordan, 2007), and instructional time as well as academic success increase (Banda & Kubina, 2006; Hine et al., 2015). Thus, various transition strategies enhance the predictability of transitions for children with ASD (Banda & Grimmett, 2008; Graber-Juhnke, 2015; Gülboy & Yücesoy-Özkan, 2017; Hume et al., 2014). One of these strategies is antecedent-based transition strategies (Banda & Grimmett, 2008; Graber-Juhnke, 2015; Hume et al., 2014). Antecedent-based transition strategies are used before or during transitions to facilitate transitions and create a positive transition climate by enhancing predictability for children experiencing problems due to changes in activities, routines, or settings (Bambara & Kern, 2005; Kern & Clemens, 2007; Mechling & Savidge, 2011).

Several studies have investigated the efficacy of different antecedent-based transition strategies to facilitate transitions for children with ASD. These studies revealed that antecedent-based transition strategies, such as visual schedules (Dettmer et al., 2000; Macdonald et al., 2018; Pierce et al., 2013), finished boxes (Dettmer et al., 2000), timers (Dettmer et al., 2000), behavioral momentum (Banda & Kubina, 2006; Fisher et al., 2018; Hu et al., 2021), and transition songs (Graber-Juhnke, 2015; Kern et al., 2007; Mercurio et al., 2021) are effective on increasing independent transition behaviors and decreasing transition duration between activities and settings in children with ASD. Another strategy used to facilitate the transitions for children with ASD is video priming (Hume, 2008).

Priming is a way to manipulate antecedent events or set up establishing operations; a child previews future events to become more predictable (Flannery & Horner, 1994; Schreibman et al., 2000). Video priming is a strategy that presents a video clip displaying the next activity or setting to the child and then starts the transition shown in the video clip (Schreibman et al., 2000). Video priming allows children to prepare for an upcoming and unfamiliar situation by making it more predictable (Humphrey-Rush, 2020). Video priming has excellent potential to prepare children with ASD for a new experience before it occurs (Gardner & Wolfe, 2019). Video priming

also contributes to acquiring timely and appropriate transition behaviors (Jot, 2020; Sterling-Turner & Jordan, 2007). It lets students know what will happen before they experience it, potentially reducing anxiety and uncertainty (Humphrey-Rush, 2020). Several studies have indicated that video priming may be used effectively to prepare children with ASD for different or new situations, including toilet training (Bainbridge & Smith-Myles, 1999), oral/dental assessments (Cuvo et al., 2010a), physical exams (Cuvo et al., 2010b), air travel (Ruddy et al., 2015), and paid employment (Humphrey-Rush, 2020; Jot, 2020). To date, one study has examined the effectiveness of video priming in facilitating transitions of children with ASD.

Schreibman et al. (2000) investigated the effectiveness of video priming to reduce or eliminate challenging behaviors during transitions in community settings in three young children (3-6 years) with ASD. Researchers prepared 1-4 min-long video clips for each child individually based on their strengths and needs. The video clips consisted of transitions from one setting to another, and no models appeared in these clips (point-of-view) to control the effect of priming rather than modeling. Before each transition, the child watched the video clip and was immediately taken to the transition situation shown in the video clip. The results indicated that video priming was effective in reducing challenging behaviors during transitions for all children. Moreover, this reduction typically generalized to untrained transition and was maintained one month later.

The preliminary findings revealed that video priming is a potential intervention for facilitating transitions and decreasing challenging behaviors of children with ASD during transitions. In the light of the knowledge that children with ASD spend much time in transitions and can benefit from video technology, video priming might be an effective intervention in reducing transition duration by increasing the predictability and familiarity (Flannery & Horner, 1994; Schreibman et al., 2000). Koegel et al. (2003) found that providing video priming the upcoming display transition led to a reduction in challenging behaviors and increased academic response for students with ASD. For these reasons, additional research on video priming is needed to address the facilitating transition (Sterling-Turner & Jordan, 2007). The current study aimed to examine the effectiveness of video priming on increasing independent transition behaviors of young children with ASD and decreasing the transition duration. Moreover, the opinions of the parents and teaching staff for participating children on the importance of the study, acceptability of the intervention, and significance of the findings were investigated. Research questions guiding the present study were as follows:

1. Is video priming effective in improving independent transition behaviors of children with ASD during transitions between activities and settings?
2. Is video priming effective in reducing the amount of time children with ASD spend in transitions between activities and settings?
3. What are the opinions of parents and staff about the importance of the study, acceptability of the intervention, and significance of the results?

Method

Experimental Design

Since this study's dependent variables (independent transition and transition time) were reversible behaviors, and all participants were in the same class, an ABAB design was used to evaluate the effectiveness of video priming. The procedure consisted of five phases, including the first baseline (A_1), the first video priming (B_1), the second baseline (A_2), the second video priming (B_2), and generalization (Kazdin, 2011; Rakap, 2021; Tekin-İftar, 2019). Phase change decisions were made based on the number of independent transitions. When all the participants completed 90% or more of their transitions independently for two consecutive sessions, the intervention was withdrawn, and the second baseline phase was implemented. The experimental procedure was carried out simultaneously with the whole group.

In the current study, the design standards recommended by Kratochwill et al. (2013) were followed to assess the quality of the design. Considering these standards, care was taken to ensure that the study included at least four phases and at least three data points in these phases. In addition, this study was conducted with four children, and care was taken to ensure that the number of replicates was greater than three. In this direction, it can be said that the study meets the necessary standards for the ABAB design.

Participants

Recruitment and Ethical Procedure

The first author is a research assistant at the university-based research center, where children with ASD and developmental disabilities receive special education services. The first author observed the classroom where children were spending a long-time during transitions by exhibiting challenging behaviors such as escaping, refusing or resisting transitions, lying down, and yelling/crying during transitions between activities and settings. Then he conducted observations for two weeks in this classroom as an assistant teacher. Four children with ASD attended group training in the same classroom at the center between 9.00 am and 12.00 pm every weekday. After identifying the potential participants for the study, he informed the participants' parents about the intervention. He asked for their written informed consent for their children to participate in the study. He obtained ethical approval (decision no 121430 dated 25/11/2016) from the Ethical Board of Anadolu University.

Child Participants

Four boys with ASD participated in the study. Owen and Ethan were four years old; Thomas was five years old, and Michael was six years old. All children's names are pseudonyms. Before the study, the Anadolu–Sak Intelligent Scale [ASIS] (Sak et al., 2016), Gilliam Autism Rating Scale-2 Turkish Version [GARS–2] TV (Diken et al., 2012), and Gazi Early Childhood Assessment Tool [GECAT] (Temel et al., 2005) were administered by the researcher to obtain detailed information about the children's intellectual and developmental characteristics. The ASIS scores indicate that Owen, Thomas, and Michael had a mild intellectual disability, and Ethan had a moderate intellectual disability. The GARS–2 TV scores indicated that all four children were

more likely to be affected by ASD. Moreover, the GECAT scores indicated that all four children have developmental delays. Table 1 presents child characteristics and assessment results.

Table 1

The Children's Characteristics and Assessment Results

	Owen	Ethan	Thomas	Michael
Age	4:9	4:9	5:6	6:3
Gender	Male	Male	Male	Male
Diagnosis	ASD	ASD	ASD	ASD
Autism Rating				
GARS-II TV Score	92	101	112	118
GARS-II TV possibility	High	High	High	High
Intelligence Assessment	Mild	Moderate	Mild	Mild
ASIS score	72	54	60	68
General development areas				
GECAT PD total of theme	50	53	69	71
GECAT PD T Score	06	09	27	42
GECAT CD total of theme	34	36	50	52
GECAT CD T Score	13	15	22	29
GECAT LD total of theme	36	42	58	55
GECAT LD T Score	03	09	45	22
GECAT SED total of theme	43	44	52	54
GECAT SED T Score	18	19	17	37

Note. GARS-II TV: Gilliam Autism Rating Scale-2 Turkish Version; ASIS: Anadolu Sak Intelligence Scale; GECAT: Gazi Early Childhood Assessment Tool; GECAT PD: GECAT psychomotor development; GECAT CD: GECAT cognitive development; GECAT LD: GECAT language development; GECAT SED: GECAT social-emotional development

Owen complies with three-word instructions that specify two actions and expresses himself with one word. He participates in recreational and structured group activities, works on the activity for 2-3 minutes, takes turns, waits in line, sits and waits, and puts toys away when prompted. He expresses his anger, unhappiness, and sadness with gestures and facial expressions.

Ethan follows three-word instructions that specify two actions and expresses himself with one word, accepting what he wants and rejecting what he does not wish to. He participates in recreational and structured group activities, working on the exercise for 2-3 minutes, taking turns, and sitting and waiting when prompted. He shows his emotions with gestures and facial expressions.

Thomas follows four-word instructions that specify two actions and expresses himself with two words. He participates in recreational and structured group activities, works on activities for 3-4 minutes, takes turns, waits in line, sits and waits, and puts toys away when asked. Follows directions, communicates with friends through gestures, sounds, or words, says thank you, and answers questions. He expresses his feelings through gestures and facial expressions expresses his wishes in two or three terms.

Michael follows four-word instructions that specify three actions and expresses himself using three words. He participates in recreational and structured group activities, works on activities for 3-4 minutes, takes turns, waits in line, sits, and waits when asked. He follows directions and communicates with friends through gestures, sounds, or words. He expresses his emotions through gestures and facial expressions.

Instructors

Two teachers and a researcher participated in the study as instructors. The lead teacher and assistant teacher had primary responsibility in the children's classroom. The lead teacher (42 years old) is a special education teacher with bachelor's and master's degrees in special education. She had 19 years of professional teaching experience with children with disabilities and ten years of experience working with children with ASD. The assistant teacher (26 years old) is a preschool teacher with two years of professional experience working with children with ASD. The first author (28 years old) acted as the second assistant teacher during the intervention. He had a bachelor's degree in special education and two years of professional experience working with children with ASD. The first author was an instructor in the baseline and intervention sessions, while the lead teacher was an instructor during the generalization.

Parents and Teaching Staff Participants

Social validity data were collected from the parents (three mothers and one father) of participating children and 26 teaching staff employed at the institution. Mothers' ages ranged from 30 to 42 years (M=34.5). One mother had a high school degree, while the other parents were college graduates. The teaching staff consists of 10 research assistants, five teachers, five assistant teachers, and six practicum students. Of these, 19 were female, and seven were male; six were high-school graduates, nine had bachelor's degrees, 10 had master's degrees, and one had a doctoral degree. The ages of the teaching staff ranged from 20 to 42 years (M=28). They had two to 20 years of teaching experience. All parents and teaching staff volunteered and gave written approval to collect social validity data.

Settings and Materials

The sessions were conducted in the classroom, playroom, kitchen, restroom, and halls the children used throughout the day at the center between 9.00 am and 12.00 pm every weekday in small groups. Separate video clips were created for each transition during the school day. A video camera, a laptop computer, and video editing software were used to make video clips, a video player program, and a tablet (9.7" iPad) to play the video clips. The fixed camera system was used in the classroom for transitions between activities, and a mobile handheld video camera was used for transitions between settings. The materials also include event recording to collect the independent

transition data, duration recording to collect data on the transition duration (Yücesoy-Özkan, 2021), and a questionnaire form to collect social validity data.

Video Clips

The types and number of transitions performed during each school day were determined when creating video clips for video priming. There were 17 transition opportunities in the classroom during a school day, including ten transitions between activities (e.g., greeting, gross motor activity, leisure, and circle time) and seven transitions between the settings (e.g., classroom, kitchen, playground, and restroom). Next, the problematic transitions were identified based on the participants' challenging behaviors, observations, and teachers' opinions. The scenarios were then prepared based on the participants' behavior before the study, and the related video clips were created in natural settings using classroom materials. The point-of-view was used in video clips. Video clips did not include any narration or instruction. The average duration of video clips was 20 s (range=6-37 s). The video clips were presented shortly before the transition between activities and settings. For instance, when children completed the painting activity, the researcher took all children's attention to a video about the next activity (e.g., circle time). All children watched the video clip together.

Dependent Variables

Independent Transition

An independent transition is the initiation of a transition within 10 s of receiving the transition instruction, with behaviors such as nodding, verbal confirmation, or following classmates and ending the transition between activities and settings. The transition between activities or settings was completed when the children started the new activity or arrived in the new setting at the predetermined time. Independent transition should be completed within 30 s and 2 min between activities and setting, respectively. This time was determined to be an appropriate timeframe to complete transitions based on previous studies (Ergin & Bakkaloglu, 2019; Sainato et al., 1987; Schmit et al., 2000) and classroom observations. If a child did not initiate the transition within 10 s after transition instruction or did not complete the transition within a predetermined time, his behavior was recorded as a non-independent transition—the independent transition data was collected using controlled event recording (Alberto & Troutman, 2013). To calculate the percentage of independent transitions, the number of independent transitions was divided by the total number of transitions during the day and multiplied by 100 (Alberto & Troutman, 2013).

Transition Duration

The transition duration is defined as the time passed between the transition instruction and participants' completing the transition. The duration of the video clip watching (video priming) is also included in the transition duration. Duration recording was used to determine the length of transitions (Alberto & Troutman, 2013). Duration data were recorded by a fixed camera system in the classroom during transitions between activities and a mobile handheld camera during transitions between settings. The time spent in transitions was divided by the total time spent at school during the

day and multiplied by 100 to calculate the percentage of time spent in transitions (Alberto & Troutman, 2013).

Procedures

Baseline Sessions (A_1 and A_2)

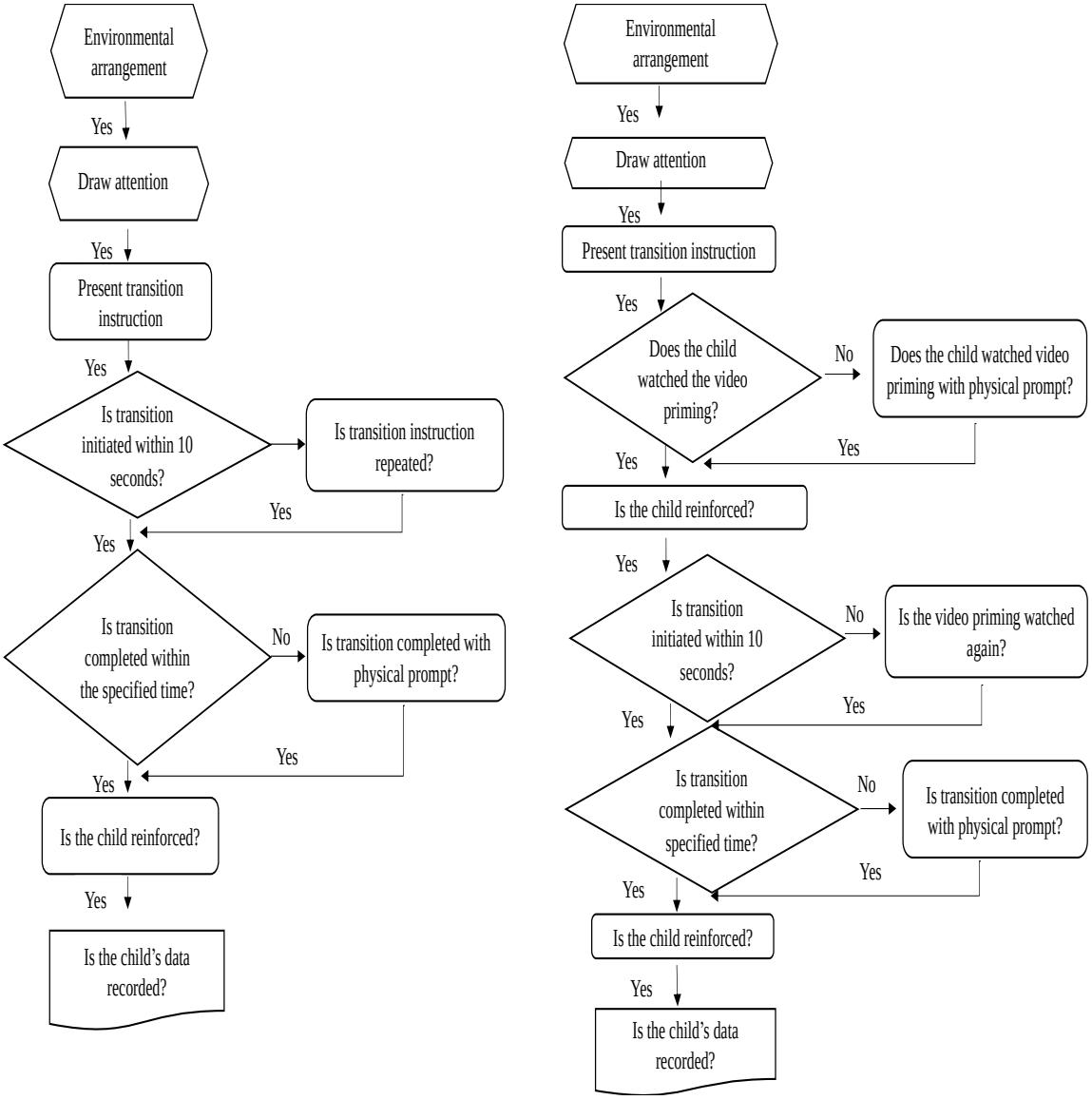
During the baseline sessions, the researcher arranged the environment and provided instruction for transition to all children simultaneously. If a child-initiated the transition within 10 s and completed the transition within the predetermined time, his behavior was recorded as an independent transition and praised verbally. The children who had completed the transition independently continued with the next activity. The researcher repeated the instruction if a child did not initiate the transition within 10 s. If a child did not start the transition within 10 s after the second transition instruction or did not complete the transition within the predetermined time, his behavior was recorded as a non-independent transition. If a child did not complete the transition by himself, the researcher had the children complete the transition using a physical prompt. The independent transition and transition duration data were collected for each child. Procedures used during A_1 and A_2 conditions were identical.

Video Priming Sessions (B_1 and B_2)

In video priming sessions, the researcher drew children's attention to the transition (e.g., "Children! Activity is over. Before we start a new activity, we are going to watch a video.). When children were ready (e.g., Finishing the activity and collecting activity materials or watching the iPad), the researcher provided instructions to them for watching the video (e.g., "Watch the video!"). Following the instruction, the researcher started the video. All children watched the video clip together, and the researcher praised the children's watching behavior when the video was over. When a child did not watch the video clip (e.g., Watching around), the researcher used a physical prompt to redirect the children's attention to the video clip. The researcher presented a transition instruction (e.g., "Go to the kitchen for a snack") when children completed watching the video clip. When a child initiated the transition within 10 s and completed the transition within the predetermined time, his behavior was recorded as an independent transition and praised. The lead teacher began the new activity with children who completed the transitions independently. If the transition was not initiated within 10 s after the transition instruction, the researcher had children re-watch the video clip and give transition instruction for a second time as an error correction. If a child did not start the transition within 10 s after the second transition instruction or did not complete the transition within the predetermined time, his behavior was recorded as a non-independent transition. If a child did not complete the transition by himself, the researcher had the child complete the transition using a physical prompt. The independent transition and transition duration data were collected for each child. Challenging behaviors such as refusing or resisting transitions yelling/crying exhibited by children during transitions were ignored. Children were brought back to the setting when they exhibited escaping behaviors. Procedures used during B_1 and B_2 phases were identical. The flow of intervention and baseline sessions is shown in Figure 1.

Figure 1

The Flowchart of Baseline (on the left) and Video Priming Sessions



Generalization

The same procedures as in the intervention (video priming) condition were followed during the generalization. In this condition, the lead teacher presented the transition instructions, provided the video priming intervention, praised the children who completed the transition independently, and prompted those who did not complete the transition independently. The researcher was not involved in this condition. The purpose of this condition was to transfer the intervention procedures to the classroom teacher to ensure that video priming was used as a proactive strategy to increase independent transitions and decrease transition duration in natural settings.

Social Validity

To determine the social validity, opinions of the parents and teaching staff on the importance of the study, acceptability of the intervention, and significance of the findings were investigated. The social validity data were collected from parents (n=4) of participating children and from research assistants, teachers, assistant teachers, and practicum students (n=26) who provided training in the research center, using a

questionnaire form developed by researchers (1=strongly agreed, 5=strongly disagreed) consisting of 10 items. To develop the social validity questionnaires, publications in the literature on acceptability and social validity were examined (Calvert & Johnston, 1990; Carr et al., 1999; Olive & Liu, 2005). Based on previous research, questions were developed regarding the importance of the purpose of the study, the acceptability of the strategy used in the study, and the significance of the findings obtained as a result of the research. The possible questions developed were sent to three experts with doctoral degrees in special education to assess their appropriateness. The statements in the social validity questionnaire were revised and rearranged based on the experts' opinions and suggestions, and the forms were put into final form.

The social validity questionnaire is seen in Table 2. All parents were invited to observe their children during the study using the observation room adjacent to the classroom in which the study took place. At the end of the study, parents and teaching staff watched the videos of the children's performance during baseline (A_1 and A_2) and video priming (B_1 and B_2) conditions. The researcher explained how to fill out the questionnaire, and then the parents and staff completed the questionnaire based on the children's performance in transitions.

Reliability

Interobserver agreement (IOA) and treatment integrity (TI) data were collected by a doctoral student in special education who holds a master's degree in Applied Behavior Analysis in Autism. The observer is 32 years old and has seven years of experience working with children with ASD. The IOA data were collected at least 20% of all sessions for each condition and child. The IOA data were collected from the video recording by a secondary observer. The different formulas were used to calculate the IOA for each dependent variable. The IOA for the independent transition was calculated by using the "[Agreement / (Agreement + Disagreement) x 100]" formula (Kazdin, 2011; Yücesoy-Özkan, 2021), and IOA for transition duration by using "[(Smaller duration / Larger duration) x 100]" formula (Kazdin, 2011; Yücesoy-Özkan, 2021). The IOA was analyzed separately for each participant across each condition and for each dependent variable. Mean IOA was 99% (range=98-100%) overall and 100%, 98% (range = 94-100%), 99% (range = 97-100%), and 100% for Owen, Ethan, Thomas and Michael respectively for independent transitions. Mean IOA was 96% (range=95-96%) overall and 96% (range 92-99%), 96% (range=92-99%), 95% (range=90-99%), and 96% (range=91-99%) for Owen, Ethan, Thomas, and Michael respectively for transition duration.

The TI data were collected to determine whether the independent variable was implemented as planned. The TI data were collected for each condition and each child for at least 20% of the sessions by the same observer who collected the IOA data. The TI was calculated by dividing the number of observed instructors' behaviors by the number of planned instructors' behaviors and multiplying by 100 (Alberto & Troutman, 2013; Gülboy & Yücesoy-Özkan, 2017). For the baseline (A_1 and A_2) and video priming sessions (B_1 and B_2), the planned instructor's behaviors are shown in Figure 1. TI data were analyzed separately for each participant and each condition. The TI percentage scores were 100%, 100%, and 96% (range=81-100%) for the baseline, video priming, and generalization conditions.

Table 2

Social Validity Questionnaire

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Importance of the Study					
1. I think, my child/student;					
a) needs support during transitions.	☐	☐	☐	☐	☐
b) spends a lot of time during transitions.	☐	☐	☐	☐	☐
c) shows challenging behaviors during transitions.	☐	☐	☐	☐	☐
Acceptability of the Intervention					
2. I think, I;					
a) need support to make my child's/student's transition more manageable.	☐	☐	☐	☐	☐
b) can easily create/prepare the video priming.	☐	☐	☐	☐	☐
c) can easily use video priming.	☐	☐	☐	☐	☐
d) can recommend to other parents/teachers the use of video priming.	☐	☐	☐	☐	☐
Significance of the Findings					
3. I think, the video priming;					
a) increased my child's/student's independent transitions.	☐	☐	☐	☐	☐
b) shortened the time my child's/student's spent during transitions.	☐	☐	☐	☐	☐
c) reduced the challenging behaviors of my child's/student's during transitions.	☐	☐	☐	☐	☐

Data Analysis

The effects of video priming on independent transition and transition duration were examined via visual analysis. The visual analysis allows a comparison of changes in level, trend, and variability within and across consecutive phases (Kazdin, 2011). Although visual analysis is the primary method for evaluating treatment effect in single-case experimental designs, researchers have suggested using effect size estimates as additional result interpretation aides for evaluating treatment effect in single-case experimental designs (Parker et al., 2011; Rakap, 2015, Rakap et al., 2020; Yucesoy-Ozkan et al., 2020). In the current study, the Tau-*U* statistic was calculated to determine the effect sizes using the web-based online calculator (Parker et al., 2011). Tau-*U* effect size values are between 0 and 1. Tau-*U* effect size scores were interpreted as follows: an effect size was considered very effective if .80 or above, effective when in the range of .60 to .79, moderately effective when in the range of .20 to .59, and mildly effective if less than .20 (Rakap, 2015, Rakap et al., 2020; Vannest & Ninci, 2015). To calculate Tau-*U*, each A-B condition was compared individually. The data on the social validity of the research were analyzed quantitatively through descriptive analysis.

Results

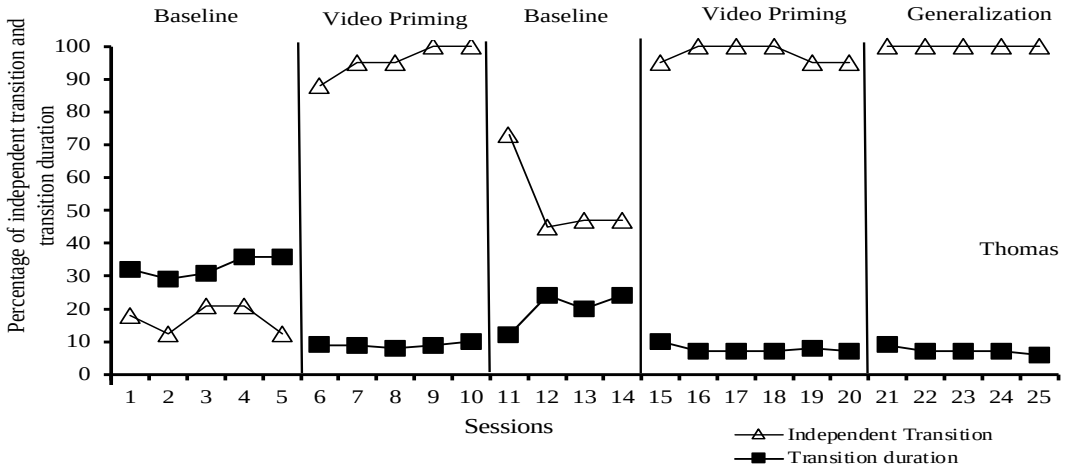
Effectiveness Results

A total of 17 transitions were determined in line with the children's daily routines. Some of these transitions were not carried out in the baseline sessions due to the time spent in transitions. For this reason, values for both independent transition and transition duration in the baseline sessions were calculated according to the transition opportunities performed during the day. All transitions during the video priming sessions were carried out as planned. The number of sessions is not equal for each child for the baseline and video priming phase, as children cannot attend school on some days due to health problems.

Thomas independently performed an average of 18% (range=12-21%) of transitions in the A_1 and 94% (range=88-100%) of transitions in the B_1. He independently performed an average of 53% (range=45-73%) of the transitions in the A_2 and an average of 98% (range=95-100%) of transitions in the B_2. In the generalization phase, he carried out transitions with 100% independence. On average each school day, Thomas spent 34% (*M*=45 min) of his time in transitions during A_1, 10% (*M*=12 min) during B_1, 20% (*M*=30 min) during A_2, and 10% (*M*=12 min) during B_2. Thomas spent 7% of each school day (*M*=10 min) in transitions during the generalization phase. Tau-*U* was 1.0 between baseline and intervention phases for independent transition and the transition duration. The percentages of independent transitions and transition duration for Thomas are shown in Figure 2.

Figure 2

Percentages of Independent Transitions and Transition Duration for Thomas

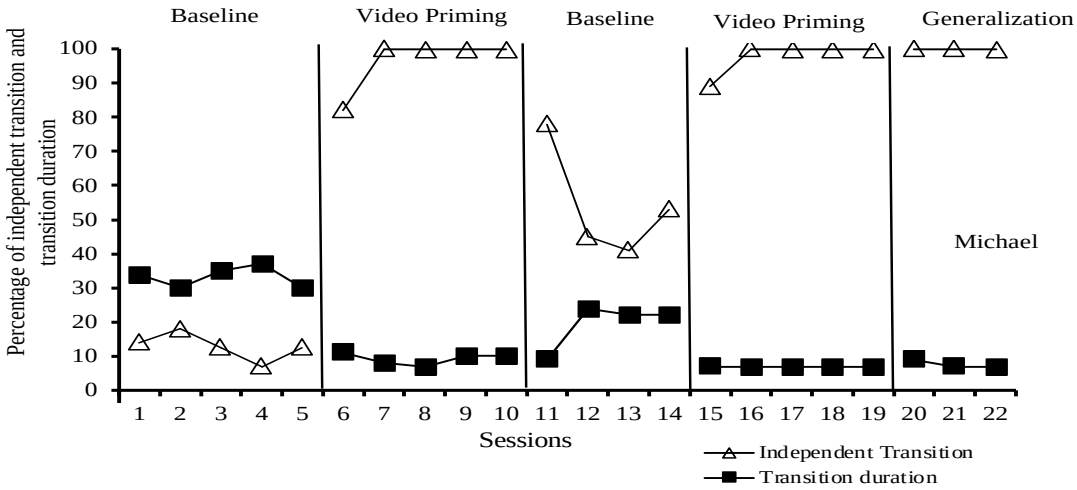


Michael independently performed an average of 12% (range=7-18%) of transitions in the A_1 and 98% (range=82-100%) of transitions in the B_1. He independently performed an average of 54% (range=41-78%) of the transitions in the A_2 and an average of 95% (range=89-100%) of transitions in the B_2. In the generalization phase, he carried out transitions with 100% independence. On average each school day, Michael spent 33% (*M*=43 min) of his time in transitions during A_1, 9% (*M*=12 min) during B_1, 19% (*M*=28 min) during A_2, and 7% (*M*=12 min) during B_2

phase. Michael spent 9% of each school day (*M*=10 min) in transitions during the generalization phase. Tau-*U* was 1.0 between baseline and intervention phases for independent transition and the transition duration. The percentages of independent transitions and transition duration for Michael are shown in Figure 3.

Figure 3

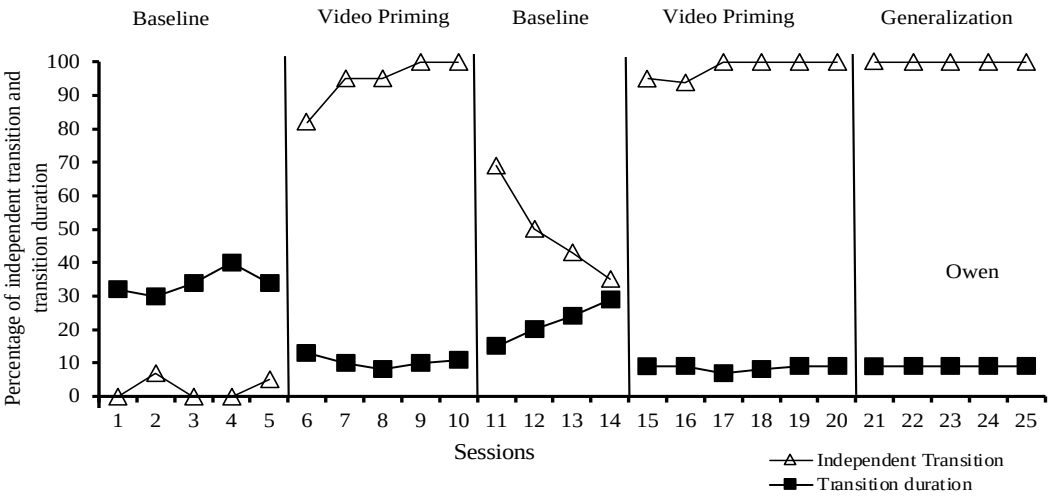
Percentages of Independent Transitions and Transition Duration for Michael



Owen independently performed an average of 2% (range=0-7%) of transitions in the A_1 and 94% (range=82-100%) of transitions in the B_1. He independently performed an average of 49% (range=35-69%) of transitions in the A_2 and 98% (range=94-100%) of transitions in the B_2. In the generalization phase, he carried out transitions with 100% independence. On average each school day, Owen spent 34% (*M*=45 min) of his time in transitions during A_1, 11% (*M*=14 min) during B_1, 22% (*M*=33 min) during A_2, and 9% (*M*=11 min) during B_2. Owen spent 9% of each school day (*M*=12 min) during the generalization phase in transitions. Tau-*U* was 1.0 between baseline and intervention phases for independent transition and the transition duration. The percentages of independent transitions and transition duration for Owen is shown in Figure 4.

Figure 4

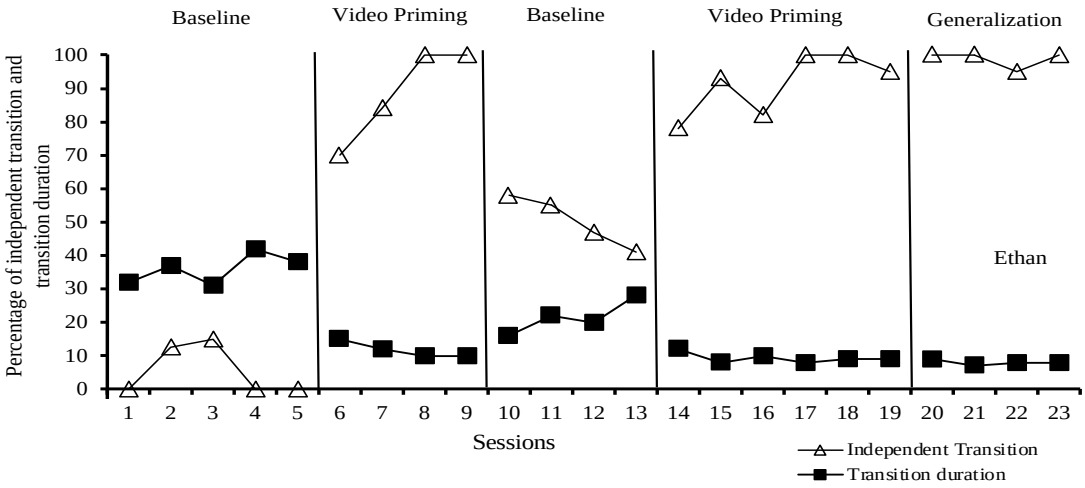
Percentages of Independent Transitions and Transition Duration for Owen



Ethan independently performed an average of 6% (range=0-15%) of transitions in the A_1 and 88% (range=70-100%) of transitions in the B_1, and he independently performed an average of 50% (range=41-58%) of the transitions in the A_2 and an average of 91% (range=78-100%) of transitions in the B_2. In the generalization phase, he transitioned with 99% (range=95-100%) independence. On average each school day, Ethan spent 36% (*M*=54 min) of his time in transitions during A_1, 12% (*M*=14 min) during B_1, 22% (*M*=33 min) during A_2, and 10% (*M*=14 min) during B_2. Ethan spent 8% of each school day (*M*=12 min) in transitions during the generalization phase. Tau-*U* was 1.0 between baseline and intervention phases for independent transition and the transition duration. The percentages of independent transitions and transition duration for Ethan are shown in Figure 5.

Figure 5

Percentages of Independent Transitions and Transition Duration for Ethan



Social Validity Results

All parents (100%) and teaching staff stated (100%) that children spent significant amounts of time during transitions, and therefore they needed support during changes. All parents (100%) and 93% of teaching staff stated that they needed support to facilitate children's transition, so they found the study's findings meaningful. Most parents (75%) and teaching staff (85%) responded positively to the use of video priming, and all parents (100%) and teaching staff (100%) reported that the treatment was acceptable. They could recommend video priming to other parents or colleagues. All parents (100%) and teaching staff (100%) expressed their opinions on the significance of the findings, emphasizing that video priming increased participants' independent transitions and decreased transition duration.

Discussion

This study aimed to determine the effectiveness of video priming on increasing independent transition behaviors of young children with ASD and decreasing the transition duration. Moreover, the opinions of the participating children's parents and teaching staff on the importance of the study, acceptability of the intervention, and significance of the findings were determined. The findings indicate that video priming was effective in increasing independent transitions and decreasing transition duration

for all four children. The results also demonstrated that parents' and teaching staff's opinions concerning the importance of the study, acceptability of the intervention, and significance of the results were highly positive.

Findings demonstrated that all four children independently performed nearly all of the transitions. This finding is consistent with previous studies that showed that antecedent-based transition strategies such as visual schedules (Dettmer et al., 2000; Pierce et al., 2013), finished boxes (Dettmer et al., 2000), timers (Dettmer et al., 2000), behavioral momentum (Banda & Kubina, 2006), and transition songs (Graber-Juhnke, 2015; Kern et al., 2007). Acquiring independent transition behavior helps children with ASD to benefit more effectively from general education settings. Children with ASD often have difficulty changing activities and transitioning to new settings that cause interruptions in their access and participation in the general education curriculum. When children with ASD learn independent transition behaviors, they will need less adult assistance and have more time to engage in the general education curriculum activities, which will increase their success in school (Hine et al., 2015). Also, considering the increased use of technology (e.g., tablets, computers) to mediate instruction for children with ASD (e.g., Bewley, 2017; Hine et al., 2015), the findings of the current study contribute to the growing body of literature by examining the effect of video priming on increasing independent transitions within the school setting.

The study indicated that video priming is effective in decreasing the transition duration of young children with ASD. Time spent in transitions decreased for all children during video priming intervention. This finding supports a previous study indicating that antecedent-based transition strategies, such as finished boxes and transition songs, effectively decrease transition duration (Dettmer et al., 2000; Graber-Juhnke, 2015). This finding is consistent with previous studies investigating the length of time children spent in transitions (Ergin & Bakkaloglu, 2019; Sainato et al., 1987; Schmit et al., 2000). Moreover, an increase in the quality and quantity of instructional activities was observed after the video priming intervention was implemented. Sometimes some activities could not be performed due to prolonged transition duration. With the implementation of the video priming intervention, all scheduled activities were completed. For example, the daily classroom schedule included 17 activities, and during the initial baseline, 14 were completed. In addition, teachers' motivation increased because of the increased time available for instructional activities. During the first video priming phase, the lead teacher stated, "We are making less effort during the day, and positive progress in children's behaviors make us happy," which supported this observation.

The final finding is that parents' and teaching staff's opinions regarding the study were very positive, indicating high social validity. A limited number of studies have collected social validity data related to the effectiveness of transition strategies on increasing independent transitions of children with ASD and decreasing transition duration (Kern et al., 2007; Massey & Wheeler, 2000; Pierce et al., 2013), and no social validity findings were found in studies that examined the effectiveness of video priming. Therefore, the current study differs from previous studies because we collected social validity data on the acceptability and efficacy of video priming; thus, the study contributes to the literature.

Since the video priming was administered in the group instructional arrangement, both the efficiency and social validity increased (Gardner &Wolfe, 2019). All four participants were in the same classroom, the video clips were shown to the children simultaneously, and they carried out the transitions together. The intervention was efficient in exerting this effort only once. It helps expose children to the intervention without separating them from their peers. It is consistent with the idea that teachers working with children with ASD prefer interventions that can be used with all children at the same time rather than interventions that require individualized attention to each child (Harlacher et al., 2006)

The study was carried out in a natural setting during scheduled transitions. The children were not taken out of their natural settings during the study, and no modifications were made to the teaching settings. The current study's findings confirm that practices implemented in natural settings support the acquisition, maintenance, and generalization of new behaviors (Taylor et al., 2004; Westling & Fox, 2004).

The study has some limitations that should be considered when interpreting the findings. The first limitation is that video priming was not faded at the end of the study. We transferred the intervention to the teacher to ensure that video priming was used as a proactive strategy to increase independent transitions and decrease transition duration in a natural setting. However, incorporating the fading process in the study could facilitate maintenance and generalization, reduce prompt dependency, and supports newly acquired behaviors (Jowett et al., 2012; Sigafoos et al., 2006). The second limitation is that videos were presented to all children simultaneously, so they may have learned transition behaviors by observing each other. We could not control this limitation because we offer a class-wide intervention and expect all children to facilitate transitions simultaneously. Third, the current study included four children with ASD in a research institution, and, therefore, the results should not be overgeneralized.

Based on the current study's findings, several suggestions for future practice and research can be made. In further studies, the effectiveness of video priming should be examined individual cases. Video priming can be used in community settings to inform and prepare children who have difficulty during transitions. Future studies could compare the effectiveness of video priming and other transition strategies. While video clips are created for video priming in natural settings, different viewpoints and narrations can be added to video clips. The effects of other transition strategies and video priming can be examined. Future studies should also compare the effectiveness of video priming and different transition strategies.

Conclusion

The study's findings suggest that video priming effectively increases independent transition behaviors and decreases transition duration. However, students have decreased their transition duration between classroom activities and setting and increased independent transition behaviors due to video priming. However, further studies are needed to investigate the effectiveness of this strategy. The video priming strategy should be replicated with different student characteristics and ages to strengthen effects and generalization. Although further studies are recommended to confirm the results of this study, it can be said that video priming is a promising transition strategy to regulate students' transition behavior.

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Statement of Responsibility

Emrah Gulboy and Serife Yucesoy-Ozkan contributed equally to the design and implementation of the research, the analysis of the results, and the writing of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Author Bios

Emrah Gulboy is a research assistant at Ondokuz Mayis University, the Department of Special Education. He has a doctoral degree in Special Education from Anadolu University. His research interests are applied behavior analysis, behavior management, professional development, single-case studies, and effective teaching.

Serife Yucesoy-Ozkan is a professor at Eskisehir Osmangazi University, the Department of Special Education. She has a doctoral degree in Special Education from Anadolu University. Her research interests are applied behavior analysis, single-case studies, meta-analysis, evidence-based practices, behavior management, professional development, and effective teaching.

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