

## Comparison of Simultaneous Prompting with Continuous Probe Sessions and Intermittent Probe Sessions

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### Abstract

*Problem Statement:* One of the effective instructional procedures for students with intellectual disabilities is simultaneous prompting (SP). In SP, there is high percentage of daily probe errors that occur and students are not able to respond independently during the training sessions, so probe trials are necessary to assess the transfer of stimulus control however, these probe trials require additional time. In order to decrease the error rate and the amount of the training time, probe trials may be carried out prior to every third or fourth training session rather than every session.

*Purpose of Study:* The purpose of the study was to compare the use of SP with the continuous probe sessions and SP with the intermittent probe sessions in terms of effectiveness, efficiency, and generalization. In addition, the acquisition of instructive feedback was examined.

*Method:* Three male students aged from 15 to 17 with intellectual disabilities participated in this study.. All students attended the eighth grade of a public special education school for students with intellectual disabilities. An adapted alternating treatments design was used and replicated across the three subjects. The dependent variable of study was the percentage of correct responses and the independent variables of study were the SP with the continuous probe sessions and SP with the intermittent probe sessions. The reliability data were collected for both the

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dependent and independent variables. Reliability data were collected for each student and each condition in at least 20% of all sessions.

*Finding and Results:* The results of the study showed that (a) SP with the continuous probe and SP with the intermittent probe were effective in teaching the product warning labels to students with intellectual disabilities, (b) SP with the intermittent probe was more effective than the SP with the continuous probe, (c) there was no significant difference in generalization of SP with the continuous probe and SP with the intermittent probe, and (d) the three students acquired the instructive feedback about the definition of product warning labels.

*Conclusions and Recommendations:* In the study, the amount of training time and the number of errors were decreased when the SP with the intermittent probe was used. In this case, since there was less training time required and the error levels were low, the SP with the intermittent probe could be the preferable and more efficient application when compared with the SP with the continuous probe.

**Keywords:** Safety skills, product warning label, simultaneous prompting, continuous probing schedule, intermittent probing schedule, instructive feedback

The reading of product warning labels and behaving in conformity with the information contained on the labels are crucial safety skills. According to data obtained from 38 health organizations in all regions of Turkey, in 5,077 child poisoning cases 80-85% were accidental. The sources of the poisoning were as follows: 43.4% from medicines, 21.8% from food and plants, 8.5% from insecticides and pesticides, 8% from carbon monoxide, 7.2% from cleaning materials, 5.4% from hydrocarbons, and 5.7% from unknown causes (Aji & İlter, 1998). It is also significant to note that in the studies held from 1996 to 2003, almost half (47-49%) of the poisoned children were aged between 1-5 years old (Hallaç et al., 1996; Aji & İlter, 1998; Öner et al., 2004). When these data are taken into consideration, it is obvious that teaching a person how to read and understand the information given on a product label is very important (Collins & Stinson, 1994-1995).

When teaching students with intellectual disabilities, safety skills are among the topics that are given priority by teachers. Although students with intellectual disabilities are encouraged to become as independent as possible, they may face potentially dangerous situations, activities, or products (Cromer, Schuster, Collins, & Grisham-Brown, 1998). Reading the product warning labels and behaving accordingly may be among the most important safety skills taught to students with intellectual disabilities (Collins & Stinson, 1994-1995).

There are various studies in the literature that examine the effectiveness of teaching safety skills to students with intellectual disabilities. For example, Collins and Stinson (1994-1995) used progressive time delay in teaching how to read product warning labels to students with intellectual disabilities. Although the results showed that the students acquired target behaviors with minimum error in a short time, the

results gathered through different environments with real products indicated that there was a need for students to be taught about generalization. Moreover, it was observed during the study that students also learned through observation. Collins and Griffen (1996) used constant time delay for primary school students with intellectual disabilities in the teaching of how to give safe responses to product warning labels. The results indicated that the constant time delay was effective in teaching how to give safe responses and can be generalized to real environments and tools. Furthermore, Cromer et al. (1998) examined the effectiveness of how to read the warnings on medicines for primary school students with intellectual disabilities. In addition, they analyzed instructive feedback acquisition. The results revealed that the students not only acquired and generalized the targeted stimuli but also gained most of the instructive feedback.

Research has established that several response prompting procedures, such as progressive time delay, constant time delay, and the system of most or least promptings have been consistently effective in teaching discrete and chained behaviors to students with intellectual disabilities. One of the response prompting procedures is simultaneous prompting (SP), which is a systematic adaptation of antecedent prompt and testing procedure and an effective teaching procedure. In SP the discriminative stimulus and controlling prompt are presented simultaneously and the student imitates the controlling prompt. In SP, the controlling prompt is presented in each trial; therefore, there is no opportunity for the student to respond. Test or probe trials are required to determine whether or not the student has acquired the behavior (Tekin-Iftar, 2008; Tekin-Iftar & Kicaali-Iftar, 2004; Wolery, Ault, & Doyle, 1992). SP uses three types of student responses: correct response, incorrect response, and no response. Numerous studies show that SP is effective in teaching discrete behaviors to students with various disabilities (e.g. Akmanoglu & Batu, 2004; Akmanoglu-Uludag & Batu, 2005; Dogan & Tekin-Iftar, 2002; Fickel, Schuster, & Collins, 1998; Griffen, Schuster, & Morse, 1998; Johnson, Schuster, & Bell, 1996; Kurt & Tekin-Iftar, 2008; Maciag, Schuster, Collins, & Cooper, 2000; Parrot, Schuster, Collins, & Gassaway, 2000; Rao & Mallow, 2009; Singleton, Schuster, & Ault, 1995; Singleton, Schuster, Morse, & Collins, 1999; Smith, Schuster, Collins, & Keinert, 2011; Tekin-Iftar, 2003; Tekin-Iftar, Acar, & Kurt, 2003; Waugh, Fredrick, & Alberto, 2009). The results of these studies indicated that SP was effective in teaching discrete behaviors and the maintenance and generalization results were generally positive.

SP has several advantages when compared to other procedures: (a) all trials are conducted in an identical manner; therefore no shift in teacher behavior is necessary, (b) since only one type of correct response is possible, there is no need to differentially reinforce correct responses, and (c) there is no wait response required by the students (Parrot et al., 2000; Schuster, Griffen, & Wolery, 1992). Despite the advantages, there are some disadvantages: (a) SP is effective, but a high percentage of daily probe errors occur (Griffen, Schuster, & Morse, 1998; Fickel, Schuster, & Collins, 1998; Parker & Schuster, 2002), and (b) students cannot respond independently during the training sessions and probe trials are necessary to assess the transfer of stimulus control, which requires additional time. For a teaching

procedure effectiveness and being efficient is also very important. Efficiency means that one teaching procedure compared to another (a) requires a smaller number of training sessions, (b) requires minimal teacher preparation, (c) completion of instruction in a shorter period, (d) exhibits a smaller number of error, and (e) allows more comprehensive learning (e.g., instructive feedback and observational learning) (Tekin-Iftar & Kircaali-Iftar, 2004). In order to increase the efficiency of simultaneous prompting, researchers are seeking new applications. Therefore, in order to decrease the error rate during daily probe sessions and the amount of training time, probe trials may be undertaken prior to every third or fourth training session rather than for every session. Comparing SP with continuous probe sessions and intermittent probe sessions is suggested by various authors (e.g., Birkan, 2005; Gibson & Schuster, 1992; Fickel, Schuster, & Collins, 1998; Kurt & Tekin-Iftar, 2008; Morse & Schuster, 2004; Parker & Schuster, 2002; Wolery, Holcombe, Werts, & Cipolloni, 1993) because of these disadvantages. There is only one published study that has compared the effectiveness and efficiency of SP with continuous probe sessions and SP with intermittent probe sessions (Reichow & Wolery, 2009).

Reichow and Wolery (2009) compared SP with continuous probe sessions and with intermittent probe sessions in teaching written words on a transportation vehicle to students with different characteristics (speech-language impairment, risk group, English language learner, and typical development). The results showed that three out of four students acquired the target behaviors under both probing conditions, and one student acquired the target behaviors only in the intermittent probe condition. Moreover, SP with intermittent probe sessions was more efficient in terms of number of errors and the total training time. Although SP was compared across different probe conditions in this research there is still a need for new studies in this field for several reasons. Firstly, new studies should involve participants with various characteristics; secondly, the research should be conducted on teaching different behaviors; thirdly, they should make use of different intermittent probe schedules (Reichow & Wolery, 2009); and fourthly, they should include a practical asset that would increase efficiency (e.g., instructive feedback).

Therefore, the present study is expected to contribute to the current literature on SP with different probe conditions. The purpose of the present study was to compare the SP with continuous probe sessions and SP with intermittent probe sessions on teaching reading and comprehension of product warning labels to students with intellectual disabilities. The following research questions were asked: (a) Is there any difference between SP with continuous probe sessions and SP with intermittent probe sessions in terms of effectiveness? (b) Is there any difference between SP with continuous probe sessions and SP with intermittent probe sessions in terms of efficiency (number of training sessions, number of training trials, percentage of errors, and total training time to criterion)? (c) Is there any difference between SP with continuous probe sessions and SP with intermittent probe sessions in terms of generalization? (d) Is there any difference between SP with continuous probe sessions and SP with intermittent probe sessions in terms of the acquisition of instructive feedback?

## Method

### *Participants*

Three male students aged 15 to 17 with intellectual disabilities participated in this study. They were all in the same eighth grade class in a public special education school for students with intellectual disabilities. Although there were four students in the class one of the students was nonverbal, and therefore was not included in the study. None of the participants had experience in learning using SP.

Faruk was 15 years old and had been diagnosed with intellectual disabilities and attention deficiency and hyperactivity disorders (ADHD); his IQ score (based on the Stanford Binet Intelligence Test) was 47. He began having convulsions at 10, and then at 18 and 24 months of age. He received medical treatment to help control the convulsions and for ADHD. He had literacy skills, he could do addition and subtraction word problems, and single digit multiplication facts. Although Faruk had no problems with self-care, communication, gross and fine motor skills, he needed to learn some daily life skills.

Hakan, a male, was 16 years old and had been diagnosed as having intellectual disabilities. He was unable to take the intelligence test because of his emotional and behavioral problems. He had literacy skills, he could do addition, subtraction, and single digit multiplication word problems. He had excessive speech. Although this student had no problems with self-care, communication, gross and fine motor skills, he needed to learn some daily life skills.

Yaman, a male, was 17 years old and had been diagnosed as having intellectual disabilities. His IQ score (based on the Stanford Binet Intelligence Test) was 67. He had had rheumatic fever and was having medical treatment to control the disease. He had literacy skills, social skills, and communication skills. He could do addition and subtraction word problems, and single digit multiplication facts. He needed to learn some daily life skills.

In order to take part in the study the participants needed to have the following prerequisite skills: (a) pay attention to an activity at least 10 min, (b) follow verbal instructions, (c) imitate the trainer's behaviors, (d) attend school regularly, and (e) select a reinforcer. To ensure that the students had the prerequisite behaviors, the students' class teacher was interviewed and then the students were observed in the classroom. Prior to the observation, the teacher was informed about the prerequisite behaviors and she was asked to provide opportunities for students to perform the prerequisite behaviors. During the opportunities provided by the teacher, all three students met the requirements.

### *Setting*

All the experimental sessions (baseline, training, probe, instructive feedback probe, and generalization) were conducted in the students' classroom. There were four rectangular desks in the middle of the classroom for the students. The teacher's table and blackboard were on the right hand side of the door and opposite the students' desks. The student coat hooks and lockers were to the left of the door and behind the students. All the sessions were conducted on a one-to-one instructional

format. The student was seated at a desk and the trainer was seated opposite the student. The first author conducted all sessions twice a day every weekday (09:00-10:00 a.m., and 12:30-01:30 p.m.).

#### *Materials*

In the study, 16-colored clipart pictures of the product warning labels were affixed to the boards ( $15 \times 15$  cm) and all the picture cards were covered with transparent plastic. Then, the definition of the product warning label was written on the back of the cards. These cards were used during all sessions except generalization. In the generalization sessions, the warning labels that are on the real products were used. A handy cam, 8 mm tapes, data collection sheets, and reinforcers also were used in the study.

#### *Screening Procedures*

In this study, the target behavior was the reading and comprehension of the product warning labels. The target behavior was selected from goals that were in the students' Individual Education Plans (IEPs). Sixteen warning labels were identified from products, and students were screened to determine if they had previously read those labels. Since none of the students were able to read the product warning labels at the end of the screening sessions all the labels were targeted for instruction. There were three screening sessions before the baseline sessions. Both the correct and incorrect responses were ignored during the screening sessions. Two training sets were prepared for each student (Table 1) with one of the sets being used for the continuous probe sessions and the other one for intermittent probe sessions. At the end of the sessions, attendance and cooperation behaviors were reinforced.

**Table 1**

*Training Sets for All Students*

Training Set 1	Training Set 2
Poisonous	Flammable
Throw it in the rubbish	Irritant
Don't throw it in the rubbish	Teeth friendly
Easy extensible cover	Consumer advisory service
Keep away from children	Don't throw in the fire
Don't throw in the toilet	Protect from sunshine
Recyclable	Edible and drinkable
Kite mark	Keep in a cool place

#### *Baseline Sessions*

Prior to the training sessions for each student, three consecutive baseline sessions were conducted. During the baseline sessions, each product warning label was probed three times ( $16 \times 3 = 48$  trials). These sessions were conducted as follows: the trainer had the materials ready and explained the rules ("Faruk, I am going to show

you some labels and you should tell me the names of the signs. If you do not know the sign, you should say, 'I don't know.'"). Then the trainer secured the student's attention by asking him whether or not he was ready to work ("Faruk, are you ready for the study?"). After receiving a positive response, the trainer presented the discriminative stimulus ("What is the name of the sign?") and waited five seconds (1001, 1002, 1003, 1004, and 1005) for the student response. A correct response from the student was reinforced ("Well done! You are right."); when the student gave an incorrect response or did not respond, this behavior was ignored. At the end of the session, attendance and cooperation behaviors of student were reinforced ("Thank you for participating.").

#### **Instructive Feedback Probe Sessions**

Before the training sessions and after the generalization sessions for each student instructive feedback probe sessions were conducted. In the instructive feedback probe sessions, each product warning label was probed three times ( $16 \times 3 = 48$  trials). These sessions were conducted in the same way as the baseline sessions. In these sessions, the meanings of the product warning labels were elicited. The correct responses were reinforced and incorrect responses or no responses were ignored. At the end of the session, the attending and cooperation behaviors of student were reinforced.

#### **Continuous and Intermittent Probe Sessions**

Probe sessions were necessary to determine if the transfer of the stimulus control had occurred. Probe sessions were conducted in the same way as the baseline sessions. The continuous probe sessions were conducted immediately prior to each training session, except for the first training sessions. The intermittent probe sessions were conducted once every three days and when the criterion was met. Each product warning label was presented three times and 24 trials were undertaken in each probe session. Each student was required to have 100% correct responses to meet the criterion. Until the criterion was met, the continuous ratio schedule (CR) was used; after the criterion was met the variable ratio schedule (VR4) and fixed ratio schedule (FR8) was used. At the end of the study, the students' attendance and cooperation behaviors were reinforced. The probe schedules used to teach the training sets for each student are presented in Table 2.

#### **Training Sessions**

In the study, SP was used to teach about product warning labels. The one-to-one instructional arrangement was used during the training session and one training session was conducted per day for each condition (continuous and intermittent probe). A verbal controlling prompt was used and the response interval was five seconds. The structure of the training sessions was as follows. The trainer had the materials ready and explained the rules ("Faruk, I am going to present you with some labels and you should tell me the name of the signs. Please wait for me and repeat the name of label after me.") The trainer secured the student's attention by asking whether or not the student was ready to work ("Faruk, are you ready? If you are ready, we will start."). After receiving a positive response, the trainer presented the discriminative stimulus ("What is the name of this label?") and immediately

provided controlling prompting ("Keep away from children."). Then trainer waited five seconds (1001, 1002, 1003, 1004, and 1005) for the student to respond. If the student responded incorrectly or did not respond, the controlling prompt was presented again. If the student responded correctly, the student was given positive reinforcement ("Well done! You are right.") Then instructive feedback was given ("This product is harmful for children."); later on, the other trial was started and the inter-trial interval was two seconds. At the end of the session, the attendance and cooperation behaviors of student were reinforced ("Thank you for participating.").

**Table 2**  
*Students, Training Sets, and Probe Schedules*

Students	Set 1	Set 2
Faruk	Continuous Probe	Intermittent Probe
Hakan	Intermittent Probe	Continuous Probe
Yaman	Continuous Probe	Intermittent Probe

#### *Generalization Sessions*

The generalization sessions were conducted to assess the generalization across the materials, in a pretest-posttest manner. The pretest occurred before training, and the posttest occurred after the students had fulfilled the criterion. These sessions were implemented in the same way as the baseline sessions. In the generalization sessions real product labels were used. At the end of the session, the attendance and cooperation behaviors of the student were reinforced.

#### *Experimental Design*

An adapted alternating treatments design was used to evaluate the effectiveness and efficiency of the SP with continuous probe sessions and SP with intermittent probe sessions for teaching the reading and comprehension of product warning labels (Sindelar, Rosenberg, & Wilson, 1985; Tekin-Iftar & Kircaali-Iftar, 2004) and was replicated for the three subjects. The dependent variable of study was the percentage of correct responses, and the independent variables were the study sessions using the SP with a continuous probe and the sessions using the SP with an intermittent probe.

In the study, the different probe conditions were implemented in the same day, one in the morning and the other in the afternoon. The order of instructional conditions was randomly identified. Both conditions were performed in equal number and balanced.

#### *Reliability*

The reliability data were collected on both the dependent and independent variables. The reliability observer recorded the students' responses and the trainer behaviors. The reliability data were collected for each student and each condition for at least 20% of all the sessions.

The dependent variable reliability was calculated using the point by point method (Tekin-Iftar & Kircaali-Iftar, 2004). The number of agreements was divided by the number of agreements plus disagreements multiplied by 100. The dependent variable reliability data collected during baseline sessions indicated a mean agreement of 100%. The percentage of agreement on student response during the continuous probe sessions was 95.5% (range = 94.8% - 96.9%). The percentage of agreement on student response during the intermittent probe sessions was 98.5% (range = 95.5%-100%). The percentage of agreement on student response during the generalization sessions was 100%.

Independent variable reliability was calculated by dividing the number of instructor behaviors observed by the number of planned instructor behaviors multiplied by 100 (Billingsley, White, & Munson, 1980). The independent variable reliability measured the following instructor behaviors: (a) delivering an attention cue, (b) giving target stimuli, (c) delivering controlling prompting (at training sessions), (d) waiting for the response (five seconds), (e) providing the correct consequences, (f) delivering instructive feedback, and (g) waiting for the interval before the inter-trial. Independent variable reliability indicated a 100% agreement for baseline sessions. For Faruk the percentage of procedural reliability was 97.2% during the continuous training sessions, 95.8% during intermittent training sessions, 98.8% during continuous probe sessions, and 100% during intermittent probe sessions. For Hakan, the values were 96.1% during continuous training sessions, 94.6% during intermittent training sessions, 97.2% during continuous probe sessions, and 100% during intermittent probe sessions. For Yaman the values were 93.5% during continuous training sessions, 95.1% during intermittent training sessions, 100% during continuous probe sessions, and 100% during intermittent probe sessions.

## Results

### *Effectiveness Data*

Figures 1, 2, and 3 indicate the percentage of correct responses during baseline and probe sessions for Faruk, Hakan, and Yaman. The figures represent the percentage of correct responses during the continuous probe sessions and the percentage of correct responses during the intermittent probe sessions. As seen in these figures, both the SP with the continuous probe and the SP with the intermittent probe were equally effective in teaching the reading of product warning labels to three participants with intellectual disabilities.

All of the students acquired the skills with 100% accuracy in both probe conditions. The data showed that the percentage of correct responses prior to instruction was zero for all the students. The introduction of SP in the intervention sessions resulted in criterion-level responding to the reading of product warning labels for all students.

### *Efficiency Data*

The data for all students and sets for both probe conditions for the number of training sessions, number of training trials, number of errors, and total training times to criterion are presented in Table 3. All of the students required a total of 35 training sessions and 840 training trials to fulfill the criterion both for the SP with the continuous probe and with the intermittent probe. The three students required an equal number of training sessions and training trials to fulfill the criterion under both instructional conditions.

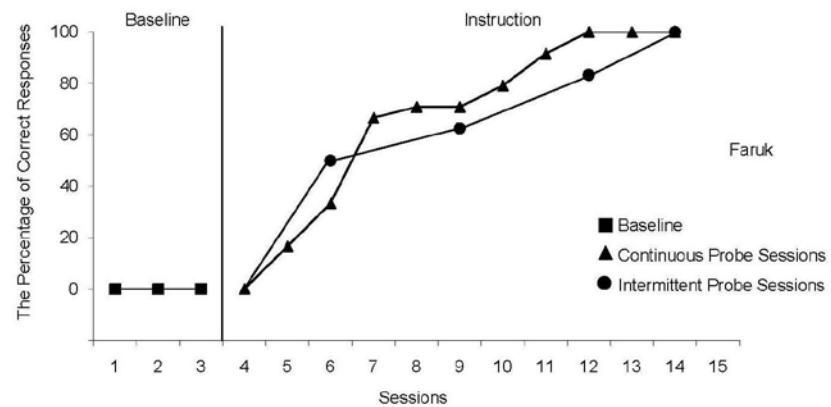


Figure 1. Percentage of correct responses during test probes for Faruk.

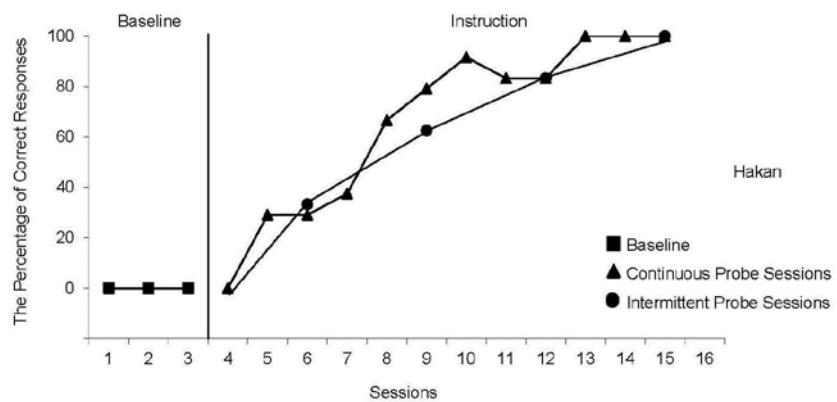


Figure 2. Percentage of correct responses during test probes for Hakan.

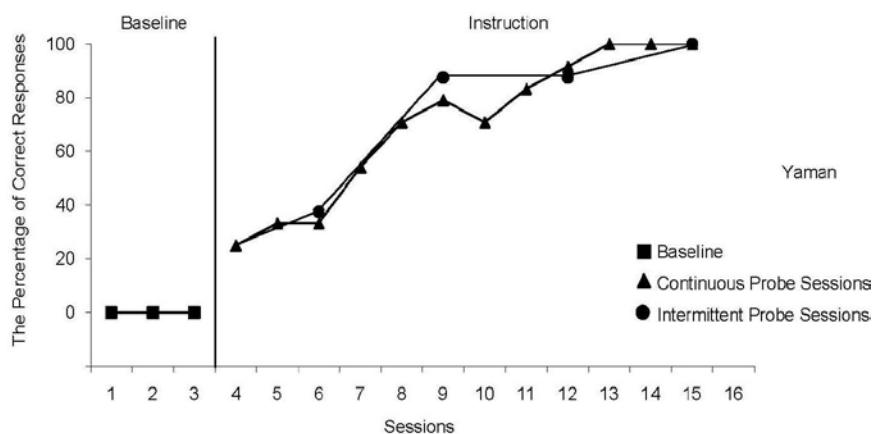


Figure 3. Percentage of correct responses during test probes for Yaman.

**Table 3**  
*Efficiency Data for Each Student and Condition*

Students & Probe Schedules	Number of Training Sessions to fulfill Criterion	Number of Training Trials to fulfill Criterion	Number of Errors to fulfill Criterion	Total Time to fulfill Criterion
<b>Faruk</b>				
Continuous probe	11	264	89	79:41
Intermittent probe	11	264	25	54:58
<b>Yaman</b>				
Continuous probe	12	288	93	87:62
Intermittent probe	12	288	19	51:47
<b>Hakan</b>				
Continuous probe	12	288	85	76:50
Intermittent probe	12	288	21	47:28

The SP with the continuous probe resulted in a total of 267 (31.7%) errors, and the SP with the intermittent probe resulted in a total of 65 (7%) errors. All students had fewer errors when SP with the intermittent probe was performed. The total training time required was 4 hr, 4 min, 33s to achieve the criterion for the SP with the continuous probe, and 2 hr, 34 min, 13s for the SP with the intermittent probe.

#### Generalization Data

The generalization data across different materials depicted that prior to the training all the students performed the target behavior with 0% accuracy. After the training was completed, the generalization data indicated that Faruk responded to intermittent probe with 62.5% accuracy and to continuous probe with 87.5% accuracy; Hakan responded to intermittent probe with 100% accuracy and to

continuous probe with 83.3% accuracy; Yaman responded to intermittent probe with 87.5% accuracy and to continuous probe with 79.2% accuracy.

#### ***Instructive Feedback Data***

Prior to the training all the students performed the instructive feedback with 0% accuracy. After the training was completed, the instructive feedback data indicated that Faruk responded to the intermittent probe with 70.8% accuracy and to the continuous probe with 79.1% accuracy; Hakan responded to the intermittent probe with 79.1% accuracy and to the continuous probe with 75% accuracy; Yaman responded to the intermittent probe with 79.1% accuracy and to the continuous probe with 83.3% accuracy.

### **Discussion**

The purpose of the present study was to compare the SP with continuous probe sessions and SP with the intermittent probe sessions in terms of effectiveness, efficiency, and generalization. The results of the study displayed that: (a) the SP with the continuous probe and with the intermittent probe were both effective in teaching the reading and comprehension of the product warning labels to students with intellectual disabilities, (b) SP with the intermittent probe was more efficient than SP with the continuous probe in terms of total training time and number of errors before the student fulfilled the criterion; however, there was no difference in number of training sessions and number of training trials, (c) for the SP with the continuous probe and SP with the intermittent probe there was no significant difference in generalization, and (d) the students acquired instructive feedback about the definition of product warning labels at about 75-81% accuracy.

SP was found to be effective in teaching the reading and comprehension of the product warning labels to students with intellectual disabilities. All the students understood the product warning labels at 100% and these findings are consistent with the previous study results showing the effectiveness of SP (Griffen, Schuster, & Morse, 1998; Maciag et al., 2000; Parker & Schuster, 2002; Singleton et al., 1999; Tekin-Iftar, Acar, & Kurt, 2003). In the study of Reichow and Wolery (2009), three out of four students acquired the target behaviors under both probing conditions, and one student acquired the target behaviors only in the intermittent probe condition. Therefore, the findings of this study indicate that SP in two different conditions was effective; this supports the findings of Reichow and Wolery (2009). Therefore, this method could be recommended to teachers using SP for teaching various chained behaviors.

The results reflect that SP with the intermittent probe is more efficient than SP with the continuous probe in terms of the total training time and number of errors before fulfilling the criterion. While the number of training sessions and training trials before fulfilling the criterion showed no difference in either SP with the continuous probe and SP with the intermittent probe, the time spent in training prior to achieving the criterion was 1 hr, 30 min less for the SP with the intermittent probe. This finding resembles those obtained by Reichow and Wolery (2009), who pointed out that SP with the intermittent probe was 15% to 20% more effective than SP with

the continuous probe. Consider that the time teachers spend in the classroom is very important, and when continuous probe sessions are used the time spent is doubled. This finding has great importance and removes the most important limitation of SP (Dogan & Tekin-Iftar, 2002). Based on the findings of previous and this study, teachers are encouraged to use the intermittent probing schedule when teaching students using SP (Reichow & Wolery, 2009).

When the results of the study are taken into consideration, there were 31% student errors in SP with the continuous probe, and 7% in SP with the intermittent probe. Errorless teaching procedures are applications that aim to decrease the error level of the students during the training. Since the number of daily probe sessions were decreased in the SP with the intermittent probe, it is observed that the error levels also decrease. In this case, since both the training time is less and the error levels are low, SP with the intermittent probe can be the preferred and more efficient application when compared with the SP with the continuous probe. However, there seems to be an inconsistency with the other study where SP was compared across different probe conditions (Reichow & Wolery, 2009).

All of the students were able to generalize the product-warning labels, which they learned using real materials at the rate of 79.2-87.5% in SP with the continuous probe, and 62.5-100% in SP with the intermittent probe. There was no significant difference in the SP with the continuous probe and the SP with the intermittent probe in the generalization. These findings contributed to the current literature on SP with different probe conditions.

Since Reichow and Wolery (2009), no different applications have been carried out in order to improve the efficiency. This study significantly contributes to the literature in terms of furnishing students with instructive feedback. The data collected related to instructive feedback reveal that all the students acquired the feedback at 75-81% in both SP with the continuous probe and the intermittent probe sessions. These findings reflect similar findings with the studies examining the acquisition of instructive feedback (Griffen, Schuster, & Morse, 1998; Johnson, Schuster, & Bell, 1996; Parrot et al., 2000; Tekin-Iftar, Acar, & Kurt, 2003). The difference between the students in terms of instructive feedback acquisition level can be explained by their age and background. The acquisition of instructive feedback increased the efficiency of SP, and the study contributed to the existing literature about instructive feedback. Therefore, teachers are encouraged to use instructive feedback to ensure comprehensive learning.

In the study by Reichow and Wolery (2009), only one intermittent probing schedule (every fourth day) was studied. They suggested that other intermittent probing schedules (e.g., every third day, every fifth day) could have been undertaken. This study has great importance in relation to fulfilling the requirement and generalization of the findings.

The current study is thought to have some limitations. The first is that maintenance data related to the study was not collected. At the very beginning of the study, it was decided to collect maintenance data about SP with the continuous probe and SP with the intermittent probe in order to determine whether or not there

was a difference about the maintenance of the acquired behaviors. However, since the study was held at the end of the term before the summer break, the data could not be collected. Second, no social validity data were collected in this study. Two different applications were implemented but no data were collected to determine which was the preferred application. Social validity data could greatly contribute to this comparative study, thus this constitutes a considerable limitation.

Furthermore, when the probe sessions were conducted, whether or not the students reached the target behavior in the SP with intermittent probe sessions could be determined in the probe sessions that were designed to be implemented every three or four days. Although the students fulfilled the criteria related to target stimulus, the researchers continued to give the instruction since they did not know whether or not the criteria had been fulfilled, and they were only able to observe this in the probe session held three or four days later. This situation also resulted in an increase in training time. Furthermore, this may also constitute a limitation in the study.

With the help of all these findings, the following suggestions are made for further study. First, since there are limited research findings related to SP with the continuous and intermittent probes and for the generalization of findings, the same study can be replicated with different subjects. Second, there is a need for studies with different researchers and observation data to discover whether or not there is a difference between the two approaches in providing the maintenance of the given behaviors replicated in the same study. Third, this study was conducted using a one-to-one instructional arrangement, so the use of small group instructional arrangement in studies with intermittent probing sessions is suggested. Fourth, this study was carried out the teacher's discrete behavior; therefore, teaching chained behavior with SP intermittent probing sessions could be investigated. Fifth, in this study social validation data were not collected; social validation should be collected from the participants. Sixth, some studies could be undertaken to determine social validity and which application the teachers prefer to use in the classroom. Seventh, different intermittent probing schedules can be recommended for future research.

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## Sürekli ve Aralıklı Yıkrama Yapıldığında Eşzamanlı İpucuya Öğretimin Karşılaştırılması (Özet)

### *Problem Durumu*

Ürün uyarı etiketlerinin okunması ve bu etiketlere uygun davranışılması önemli bir güvenlik becerisidir. 1997 yılında Türkiye'nin tüm bölgelerindeki 38 sağlık kuruluşundan alınan verilere göre 5077 çocuk zehirlenme olgusunda %80-85 düzeyinde kaza sonucu zehirlenme gerçekleştiği görülmüştür. 1996-2003 yılları arasında yapılan araştırmalarda ise, zehirlenenlerin hemen hemen yarısını (%47-49) 1-5 yaş arasındaki çocukların oluşturduğu göze çarpmaktadır. Bu veriler göz önünde bulundurulduğunda ürün uyarı etiketlerini okuma becerisinin öğretiminin yaş ve işlev düzeyi göz önünde bulundurulmaksızın öğretilmesi gereği ortadadır.

Zihin yetersizliği olan öğrencilere öğretim yapılırken de güvenlik becerileri, öğretmenler tarafından ifade edilen öncelikli konular arasında yer almaktadır. Zihin yetersizliği olan öğrenciler günlük yaşamda tehlikeli durumlar, etkinlikler ya da ürünlerle karşılaşılabilirlerdir. Dolayısıyla, ürün uyarı etiketlerinin okunması ve bu etiketlere uygun davranışları zihin yetersizliği olan öğrencilere öğretilmesi gereken önemli güvenlik becerileri arasında yer almaktadır.

Eşzamanlı ipucuya öğretim, zihin yetersizliği olan öğrencilere çeşitli becerilerin öğretiminde etkili biçimde kullanılan yöntemlerden birisidir. Eşzamanlı ipucuya öğretimde ayırt edici uyarın ve kontrol edici ipucu aynı anda sunulur. Öğrenciye tepkide bulunması için fırsat verilmemişinden öğrencinin davranışını öğrenip öğrenmediğini belirlemek üzere sınama ya da yoklama oturumlarına gerek duyulmaktadır; ancak yoklama oturumlarında gerçekleşen hata sayısı yüksek olmakta ve yoklama oturumlarının süresi öğretim süresini artırmaktadır. Alanyazında, yoklama oturumlarında gerçekleşen hata sayısını ve toplam öğretim süresini azaltmak üzere sürekli yoklama oturumu düzenlemek yerine belli aralıklarla yoklama oturumu düzenlenmesi önerilmektedir.

### *Araştırmanın Amacı*

Bu araştırmanın amacı, zihin yetersizliği olan öğrencilere ürün uyarı etiketlerini okumanın öğretiminde, sürekli yoklama oturumu düzenlendiğinde ve aralıklı yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretimi etkililik, verimlilik (ölçüt karşılaşmına uygun olarak) gerçekleştirdiği oturum sayısı, deneme sayısı, öğretim süresi ve hata sayısı), genelleme ve hedeflenmeye bilgi açısından karşılaştırmaktır.

### *Araştırmanın Yöntemi*

Araştırmaya, zihin yetersizliği olan ve yaşıları 15-17 arasında değişiklik gösteren üç erkek öğrenci katılmıştır. Öğrenciler bir özel eğitim okulunun sekizinci sınıfına devam etmektedirler ve tümü aynı sınıftadırlar. Öğrencilerin hiçbirisinin eşzamanlı ipucuya öğretimle sistematik öğretim alma geçmişleri yoktur. Araştırmanın tüm oturumları öğrencilerin sınıfında, birinci yazar tarafından gerçekleştirilmiştir. Yoklama ve öğretim oturumlarında 16 adet ürün uyarı etiketinin yer aldığı renkli

klip artlar; genelleme oturumlarında ise gerçek ürünler üzerindeki uyarı etiketleri kullanılmıştır.

Öğrencilerin ürün uyarı etiketlerini okuyup okuyamadıklarını belirlemek üzere ön eleme oturumları düzenlenmiş ve bu oturum sonunda tüm etiketler öğretim için hedef davranış olarak belirlenmiştir. Öğretim oturumlarından önce her öğrenci için üç oturum ard arda başlama düzeyi oturumları düzenlenmiş ve daha sonra öğretim oturumlarına geçilmiştir. Ürün uyarı etiketlerini okunmanın öğretiminde eşzamanlı ipucuya öğretim kullanılmıştır. Öğretim oturumlarında bire bir öğretim düzenlemesi kullanılmış ve bir günde her duruma ilişkin (surekli yoklama ve aralıklı yoklama) bir öğretim oturumu düzenlenmiştir. Çalışmada sözel kontrol edici ipucu kullanılmış ve yanıt aralığı beş saniye olmuştur. Uyarın kontrolünün gerçekleşip gerçekleşmediğini belirlemek üzere yoklama oturumları düzenlenmiştir. Sürekli yoklama oturumu, birinci öğretim oturumu hariç her öğretim oturumundan hemen önce; aralıklı yoklama oturumu, her üç günde bir ve ölçüt karşılandığında gerçekleştirilmiştir.

Öğretim oturumlarından önce ve genelleme oturumlarından sonra her öğrenci için hedeflenmeyen bilgi yoklama oturumları düzenlenmiştir. Bu oturumlarda öğrencilerden ürün uyarı etiketlerinin tanımlarını/anımlarını söylemeleri istenmiştir. Genelleme oturumları ön-test son-test modeliyle yürütülmüş ve araç gereçler arası genelleme değerlendirilmiştir. Ön-test öğretimden önce, son-test ise ölçüt karşılandıktan sonra gerçekleştirilmiştir.

Sürekli yoklama düzenlendiğinde ve aralıklı yoklama düzenlendiğinde eşzamanlı ipucuya öğretimin etkililiğini ve verimliliğini değerlendirmek üzere uyarlamalı dönüşümlü uygulamalar modeli kullanılmış ve üç denekle yinelenmiştir. Araştırmanın bağımlı değişkeni, öğrencilerin sergiledikleri doğru tepki yüzdesi; bağımsız değişkenleri ise sürekli yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretim ve aralıklı yoklama düzenlendiğinde eşzamanlı ipucuya öğretimdir. Araştırmada hem bağımlı değişkene hem de bağımsız değişkene ilişkin güvenirlik verisi toplanmıştır. Güvenirlik verileri her öğrenci için ve her durumda tüm oturumların en az %20'sinde toplanmıştır.

#### **Araştırmanın Bulguları**

Araştırmada elde edilen bulgular, hem sürekli yoklama oturumu düzenlendiğinde hem de aralıklı yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretimin zihin yetersizliği olan öğrencilere ürün uyarı etiketlerinin öğretiminde eşit derecede etkili olduğunu göstermektedir. Bulgular ayrıca, aralıklı yoklama düzenlendiğinde eşzamanlı ipucuya öğretimin sürekli yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretime göre ölçüt karşılanıncaya degen gerçekleşen oturum süresi ve hata sayısı açısından daha verimli olduğunu; ancak oturum sayısı ve deneme sayısı açısından herhangi bir farklılık bulunmadığını göstermektedir. Genelleme bulguları, sürekli yoklama oturumu düzenlendiğinde ve aralıklı yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretimin genelleme açısından önemli bir farklılık göstermediğini ortaya koymaktadır. Elde edilen bulgulara göre öğrencilerin ürün uyarı etiketlerinin tanımlarına/anımlarına ilişkin sunulan hedeflenmeyen bilgiyi %75-81 düzeyinde edindiklerini görülmektedir.

**Araştırmanın Sonuçları ve Önerileri**

Bulgulara göre, hem sürekli yoklama oturumu düzenlendiğinde hem de aralıklı yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretimin eşit derecede etkili olduğu ayrıca, aralıklı yoklama düzenlendiğinde eşzamanlı ipucuya öğretimin sürekli yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretime göre daha verimli olduğunu söylemek mümkündür. Bu doğrultuda özellikle sınıf ortamlarında aralıklı yoklama oturumu düzenlendiğinde eşzamanlı ipucuya öğretimin kullanımını önerilebilir. Ayrıca, sürekli ve aralıklı yoklama düzenlendiğinde eşzamanlı ipucuya öğretimin sınıf içinde öğretmenler tarafından uygulandığı ve öğretmenlerin sınıf içi kullanımında hangi uygulamayı tercih edeceklerini belirlemeyi (sosyal geçerlik) amaçlayan araştırmalar planlanabilir.

*Anahtar Sözcükler:* Güvenlik becerileri, ürün uyarı etiketi, eşzamanlı ipucuya öğretim, sürekli yoklama tarifesi, aralıklı yoklama tarifesi ve hedeflenmeyen bilgi