



LEARNING DOLLAR UP TECHNIQUE BY A PARTICIPANT WITH DOWN SYNDROME

UČENJE DOLAR UP STRATEGIJE ISPITANIKA SA DAUNOVIM SINDROMOM

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ABSTRACT

It is stated that people with intellectual disabilities (ID) have self-regulation difficulties when being compared to typically developing people. Process of planning self-regulated strategies for people with ID involves defining the goal, choosing the right strategy that would allow the person to achieve the predetermined goal, goal realization process and evaluating the outcomes. Therefore, the aim of this study was to examine the effectiveness of implementing self-regulated strategies into achieving the goal of dollar up technique usage for independent shopping for a 28 year old participant with Down syndrome and moderate ID. We defined the goal as recognition and use of 100 dinars bills. The set goal had four phases and for each phase the baseline probes were conducted, as well as materials for independent use by the participant were made. The results indicate that the participant mastered the first phase with 40% success, second one with 100% success, third one with 90% success and the fourth and final stage with 100% success. Even though the participant did not master the first phase in the required percentage, this did not disrupt the mastering of the final goal. This study extends the research regarding dollar up strategy implementation, by providing evidence that people with ID can benefit from self-regulation procedures and proves that they are able to learn them on their own when given the right materials, therefore obtain better community skills and obtain full participation in the society they live in. Study limitations and possible procedure modifications were discussed.

Key words: Dollar up, money management, self-regulation, Down syndrome, intellectual disability.

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SAŽETAK

Smatra se da osobe sa intelektualnom ometenošću (IO) imaju teškoće samoregulacije u poređenju sa osobama tipične populacije. Proces planiranja samoregulacionih strategija za osobe sa IO uključuje definisanje cilja, odabira strategije koja bi omogućila osobi da ostvari postavljeni cilj, proces realizacije cilja i evaluacije ishoda. Stoga je cilj ove studije bio da ispita efektivnost implementacije samoregulacione strategije za ostvarivanje cilja koji se odnosi na primenu dolar ap strategije radi usvajanja veština samostalne kupovine od strane 28 godišnjeg ispitanika sa daunovim sindromom i umerenom IO. Cilj je definisan kao prepoznavanje i upotreba novčanica od 100 dinara i on se sastojao od četiri podfaze, od kojih je za svaku sproveden predtest i za koje su dati ispitaniku materijali za samostalnu upotrebu. Rezultati su ukazali na to da je ispitanik ovladao prvom fazom sa 40% uspešnosti, drugom sa 100%, trećom sa 90% uspešnosti i četvrtom i finalnom sa 100% uspešnosti. Iako ispitanik prvom fazom nije ovladao u potpunosti, to nije onemogućilo usvajanje finalnog cilja. Ova studija pruža uvid u mogućnosti primene dolar ap strategije i ukazuje na to da osobe sa IO mogu da imaju koristi od primene samoregulacionih strategija, kao i da je moguće da samostalno uče ukoliko imaju pristup adekvatnim materijalima. Na taj način ove osobe mogu usvojiti veštine neophodne za participaciju u zajednici. U zaključnim razmatranjima su diskutovana ograničenja studije, kao i date preporuke za modifikaciju procedure.

Ključne reči: Dolar ap, upravljanje novcem, samoregulacija, daunov sindrom, intelektualna ometenost.

INTRODUCTION

Some authors define self-regulation as a capacity of an individual to resist the need for obtaining present pleasures in order to achieve a predetermined more complex goal (Mischel, Ebbesen & Raskoff Zeiss, 1972), while others define it as a conscious direction of one's own cognitive, affective and behavioral capacities towards achieving a predetermined goal (Ursache, Blair & Raver, 2012). It is stated that people with intellectual disabilities (ID) have self-regulation difficulties when being compared to typically developing people (Eisenhower et al., 2007). Process of planning self-regulated strategies for people with ID involves defining the goal, choosing the right strategy that would allow the person to achieve the predetermined goal, goal realization process and evaluating the outcomes (Dučić, 2017). Therefore it is necessary that we provide them with help in the primary phases, such as giving them the right sub goals and providing them with right materials in order for them to achieve it, because self-regulated learning leads to better outcomes (Niemi, 2002) and persons with Down syndrome are unable to develop their own strategies (Lanfranchi et al., 2010) due to different deficits related to their ID compared to typically developing people (Dučić, 2012).

It is important to teach functional life skills to people with ID, especially the skills needed for community participation (Alwell & Cobb, 2009). Functional life skills refer to skills or tasks that contribute to the successful, independent functioning of an individual in adulthood (Cronin, 1996). The ability to function independently within community settings increases when students acquire purchasing skills (Colyer & Collins, 1996). There are some studies that focused on teaching adults with ID money managing skills by using a dollar up strategy (Denny & Test, 1995; Test, Howell, Burkhart & Beroth, 1993), which is a strategy that teaches the participant to give more than one bill when being told the amount.

Therefore, the aim of this study was to examine the effectiveness of implementing self-regulated strategies into achieving the predetermined goal of dollar up technique and independent money use for a participant with Down syndrome and moderate ID.

RESEARCH METHODOLOGY

Participant and setting

The participant was a 28 male diagnosed with Down syndrome and moderate intellectual disability. The participant attended an adult day care center for people with intellectual and developmental disabilities and he was there for eight hours every week day, except on weekends, when he was with his family. The group that he attended had several people with disabilities, but mostly consisted of people with mild and moderate intellectual disabilities that did not exhibit behavioral problems. During his time in the day care center, the day was structured, so the participant had organized transportation to there, following breakfast, creative workshops, then lunch followed by going home by the same organized transportation.

Goal setting process

The goal setting process involved the participant telling his aspirations, which was independent living. The participant was not sure in which area he would like to acquire more skills, but he emphasized that he is fond of mathematical skills. He stated that he knows how to calculate, but in order to check this, we conducted a short assessment of the prerequisite skills necessary for shopping. Firstly, the participant was asked to write a series of numbers and to read a series of numbers, which he performed unsuccessfully. Secondly, we asked the participant to tell us the amount of money needed to buy certain items, which he also did not know. Finally, we wanted to check his reading abilities, and we discovered that the participant does not know how to read.

We then defined the goal as recognition and use of 100 dinars bills. The set goal had four phases.

- 1- Differentiating by color the 10, 20, 50, 100, 200, 500 and 1000 dinars bills.
- 2- Identifying the basic groceries that can be bought with a 100 dinars bill.
- 3- Knowing the value of numbers from one to nine while comparing them.
- 4- Strategy 100 dinars up.

The criteria for mastering each phase was as follows. After the successful realization of the first phase, the participant could differentiate between previously mentioned bills by a color and their value. After the successful realization of the second phase, the participant would be able to name certain groceries that can be bought by using only one 100 dinars bill. After successful completion of the third phase, the participant would be able to successfully compare the value of numbers one to nine and state which number is smaller and which one is bigger.

After successful completion of the fourth phase, the participant would be able to give the appropriate amount of 100 dinar bills when given a number (for two-digit numbers he would give one 100 dinar bill and for three-digit numbers he would give one bill more than the amount, for example for the amount of 738 dinars, he would give eight 100 dinar bills).

Materials

For each phase of the goal achievement, the participant was given a poster that had all information necessary for phase implementation. The poster served as the instruction manual for the realization of each task. The poster was folded and placed in a workbook one page before the tasks (quiz). The tasks were also given for each phase that the participant would do on his own after lunchtime every day. The tasks gradually became more difficult. All materials were in Cyrillic because the participant could not read Latin alphabet.

The first phase included a poster with pictures of bills and their written value of 10, 20, 50, 100, 200, 500 and 1000 dinars. Each bill is colored differently, hence we added a colored square matching the bill next to each other. The first type of tasks following the poster was to match a colored square to a black and white picture of the dinar bill. On the back of the quiz solutions were written and the participant could check if his responses were correct, if needed. The second type of tasks following a poster included black and white printed bills and the participant was supposed to color the presented bill in the corresponding way. This task had no solutions written on the back of the paper as we wanted the participant to go through the basic materials again if needed.

The second phase included a poster with a one hundred bill on top and below were pictures of some of the groceries that can be bought with that bill. When presented with the poster, the participant was asked to name all the groceries, which he completed successfully. The tasks following the poster included the paper with pictures of certain groceries that were present on the poster and the ones that were not, so the participant was expected to circle the ones that can be bought with one 100 dinars bill.

The third phase materials included a poster where nine trees were presented in different ascending sizes and in the treetop there were written numbers (from one to nine) also in ascending order. Below the trees we represented the written number in mathematical summation in a form of addition of number one (for example for number three it was written $1+1+1$). The tasks following the poster included written request of the task in the form of a sentence 'Circle bigger number / circle smaller number' and below were pictures of two trees of different sizes with the one circled (bigger or smaller depending on the request), if the participant had difficulty reading with numbers written below, so the participant should circle the requested number.

The final phase materials included a poster with 100 dinars bill in a form of a scale, where under the first 100 dinar bill there were written tens from 10-90, followed by hundreds and next to each hundred there was the appropriate number of bills. The tasks following the poster involved writing the task request in a form of a sentence that stated 'If something costs this amount of money, how many 100 dinar bills should you give?' and the amount represented in numbers. Below were pictures of twelve hundred dinar bills, so the participant should circle the required amount. The required amount never exceeded 10 bills.

After we presented a material workbook to the participant, we explained its use and the participant was asked to repeat it, in order to ensure the possibility of him using it independently.

Motivation materials

As a means of motivating the participant, we used a clipart black and white picture of an apartment, which would help the participant to visualize his final goal, which was independent living. The picture was placed on top of the workbook, so every time the participant opened it, it would remind him of his goal.

Reinforcements

For successful completion of each phase, the participant was given a reinforcement. For the first phase, the selected reinforcement was a diploma, for the second phase was a medal and for the final two was a goblet.

Planned support

For the people that could support the participant in everyday activities on the goal achievement and if he came across any trouble we selected another participant from his group in the day care center he attended. The participant that was selected as a support, was successful in all of these phases and he implied that he was willing to help. Another person selected for the support was a special educator that worked in the group that the participant attended. Both of them were told that they cannot do the assignments instead of the participant. Their role was only to provide support if they see that the participant needs guidance.

RESULTS AND DISCUSSION

Baseline

The participant's prerequisite abilities were probed during baseline.

Prerequisites for successful completion of the first phase included the participant having the ability to discriminate between different colors that correspond to the bill (brown, green, purple, blue, yellow and red) and we established that the participant was successful (100%). We also asked the participant to name the value of each bill (10, 20, 50, 100, 200, and 1000) and he was unsuccessful (0%).

Prerequisites for successful completion of the second phase included the participant responding to questions regarding the price of certain groceries that can be bought with 100 dinars bill. Given groceries and participants answers were as follows: lollipop 200 dinars, toothbrush 1 dinar, chips 250 dinars, smoki 120 dinars, chocolate 200 dinars, pie dough 250 dinars. All of those answers were incorrect (0%).

For the third phase, the prerequisite was that the participant knew how to count until 10 and the participant was successful. Then the participant was asked to compare the value of certain numbers and state which one is bigger or which one is smaller. From all the given examples, the participant did not answer correctly to neither one (0%).

For the final stage (Strategy 100 dinars up), we did not conduct baseline, because all the previous phases serve as a prerequisite for mastering this phase and the results from previous three testing indicated that the participant did not possess any.

Intervention

The questions designed to measure the level of mastering the first phase involved asking the participant to verbalize the value of presented bills. *Table 1* represents the bills presented to the participant and his answers.

Table 1. Results for phase one

Bill presented	Participants answer	Correct + / incorrect -
200	200	+
100	100	+
10	10	+
50	500	-
500	50	-
20	200	-
200	2000	-
1000	1000	+
10	100	-
20	200	-

The participant gave 40% of correct answers used to evaluate the mastering level of phase one. As presented in the Table 1, we can see that the participant gave incorrect answers more frequently as the tasting progressed, which can be explained by lack of concentration due to mental fatigue, which is frequently exhibited by people with ID (Marković, Taranović, Vasić, Tomić & Marković, 2012). Also, the participant exhibited difficulties in discriminating bills that begin with the same number (such as 20 and 200) and the previous research (Glumbić, Kaljača & Jovanović, 2003) conducted in our region found that people with moderate ID, such was the case with our participant, also had visual discrimination difficulties.

The questions designed to measure the level of mastering the second phase involved firstly the participant verbalizing some groceries that can be bought with one bill of 100 dinars. Table 2 represents the groceries that the participant named and if the answer was correct or not.

Table 2. Results for the first test in phase two

Groceries named by the participant	Correct + / incorrect -
Margarine	+
Smoki (snack)	+
Milk	+
Bread	+
Onion	+
Plazma (biscuit)	+
Yoghurt	+
Eggs	+
Newspapers	+
Cookie	+

The participant gave all the correct answers in the first test for phase two achievement by having 100% of correct answers (Table 2).

The second test for examining the results for mastering the second phase involved the authors asking closed yes and no questions to the participant about certain groceries and if they can be bought individually by using a one 100 dinars bill. Table 3 represents the list of questions asked and participant's answers.

Table 3. Results for the second test in phase two

Question asked	Participants answer	Correct + / incorrect -
Can you use a one 100 dinars bill to buy a TV?	No	+
Can you use a one 100 dinars bill to buy a fridge?	No	+
Can you use a one 100 dinars bill to buy a carpet?	No	+
Can you use a one 100 dinars bill to buy an apple?	Yes	+
Can you use a one 100 dinars bill to buy a jacket?	No	+
Can you use a one 100 dinars bill to buy an orange?	Yes	+
Can you use a one 100 dinars bill to buy flour?	Yes	+
Can you use a one 100 dinars bill to buy sugar?	Yes	+
Can you use a one 100 dinars bill to buy a cookie?	Yes	+
Can you use a one 100 dinars bill to buy a computer?	No	+

The participant mastered the test conducted for probing the second phase also with 100% success. This result can be expected, since the participant had the opportunity to come into contact with all of those groceries and items in his home environment.

In order to test the mastering level for the third phase, the participant was asked questions regarding comparison of two numbers in order to tell which number is bigger and which one is smaller from those two. Table 4 represents the list of questions asked and participant's answers.

Table 4. Results for the phase three

Question asked	Participants answer	Correct + / incorrect -
Which number is smaller, one or eight?	one	+
Which number is bigger, one or three?	three	+
Which number is bigger, five or seven?	five	-
Which number is smaller, two or nine?	two	+
Which number is bigger, two or seven?	seven	+
Which number is smaller, four or five?	four	+
Which number is bigger, two or nine?	nine	+
Which number is smaller, six or eight?	six	+
Which number is bigger, three or five?	five	+
Which number is smaller, eight or four?	eight	+

The participant mastered the third phase in 90% of the probes. Each person wants to avoid the feeling of disappointment that can emerge due to lack of improvement (Higgins, 1987), therefore we believe these results are because the participant felt distressed because of the baseline results regarding this phase, therefore he made greater effort into mastering it.

In order to test the mastering level for the fourth and final phase, the participant was asked questions regarding the quantity of 100 dinar bills needed in order to buy a certain item and then he was expected to give the right amount of bills. *Table 5* represents the list of questions asked regarding price of items and participants answers regarding the amount of bills given and if the answer was correct or incorrect.

Table 5. Results for the phase four

Question asked	The number of bills given	Correct + / incorrect -
If the price of sunglasses is 350 dinars, how many 100 dinar bills should you give me?	4	+
If the price of a bag is 700 dinars, how many 100 dinar bills should you give me?	7	+
If the price of a box is 780 dinars, how many 100 dinar bills should you give me?	8	+
If the price of a cup is 200 dinars, how many 100 dinar bills should you give me?	2	+
If the price of a juice is 260 dinars, how many 100 dinar bills should you give me?	3	+
If the price of a necklace is 488 dinars, how many 100 dinar bills should you give me?	5	+
If the price of headphones is 867 dinars, how many 100 dinar bills should you give me?	9	+
If the price of a notebook is 74 dinars, how many 100 dinar bills should you give me?	1	+
If the price of a T-shirt is 937 dinars, how many 100 dinar bills should you give me?	10	+
If the price of a bowl is 550 dinars, how many 100 dinar bills should you give me?	6	+

The participant mastered the final phase in 100% of the probes. We believe that having the ability to automatically count until ten partially influenced this result, as well as the successful completion of the previous two phases.

Therefore, we can establish that the participant mastered all four phases in the average of 82.5% (Figure 1).

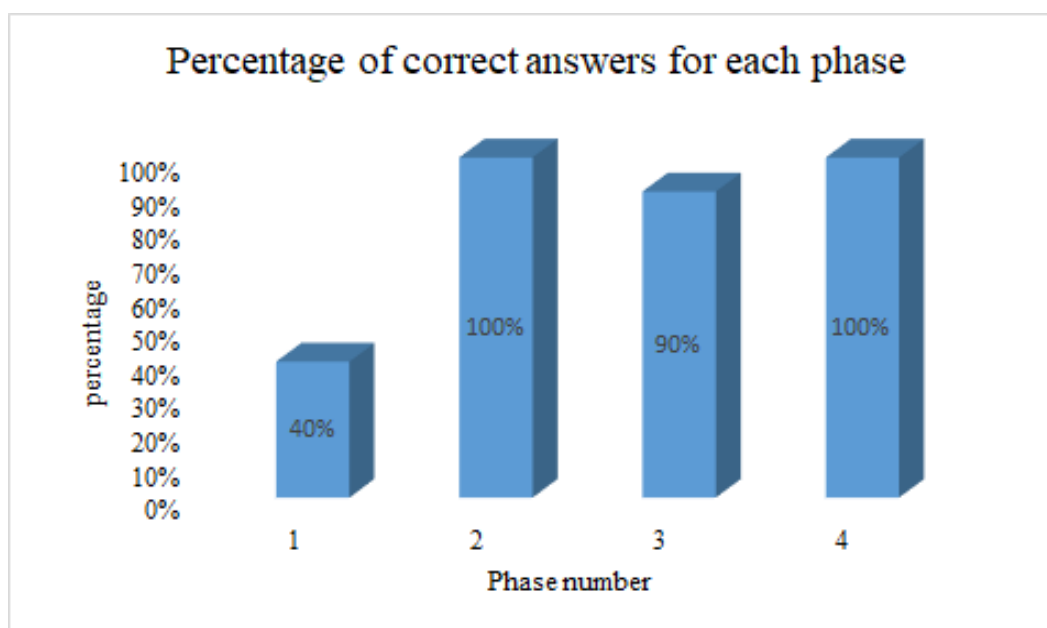


Figure 1. Percentage of correct responses for each phase

CONCLUSION

Following the implementation of self-regulated strategy, the participant mastered the set goal in 82.5% for all four phases. The biggest achievement is that the participant mastered the final phase in 100%, which was the set goal, while all the previous phases served as a prerequisite skills for this final phase of the goal. Even though the participant did not master the first phase in the required percentage (only 40% of the correct answers), this did not disrupt the mastering of the final goal. Therefore, we indicate that future research does not have to include this phase in order to teach the participant dinar up strategy (dollar up), because it proved to be not necessary.

We believe that giving the participant the picture of the apartment in the beginning of the workbook induced greater effort from his part in order to master the tasks given, because motivating the participant is a prerequisite for learning (Weinstein, 1987). People with ID are more motivated externally with some type of rewards, even though they can be also motivated internally (Harter, 2001). It is proven that people with ID will value more prizes that are not related to money and will select symbolic prizes that will provide them with feeling of value (Kaljača & Dučić, 2016), therefore we decided to provide reinforcement for successful task completion in a form of acknowledgement, which we believe was effective, since the participant managed to finalize all tasks successfully.

The participant stated that working on this goal was very interesting and he stated that he did not experience any difficulties and that he would like to participate again in similar projects. The special educator working with the participant implied that the participant exhibited great motivation while working on the set goal and that she would like to implement similar strategies with all the participants in the day care center.

The biggest limitation of this study is the fact that none of the maintenance and generalization probes were conducted.

The day care center where the study was conducted could not obtain parental consent in order to implement generalization probes in the real environment, which would allow the participant with the opportunity to practice a newly acquired skill in the real shopping situations.

To date there is not enough research that addresses independent implementation by the participant with ID regarding dollar up strategy, therefore this research extends the research regarding dollar up strategy implementation, by providing evidence that people with ID can benefit from self-regulation procedures and proves that they are able to learn them on their own when given the right materials, therefore obtain better community skills and obtain full participation in the society they live in.

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