

The Effects of Picture Cues and Self-Instruction in Teaching Cooking Skills to Children with Intellectual Disabilities

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Abstract

Literature consists of studies in which picture cues are used for teaching cooking skills. The purpose of this study is to investigate the effect of using the self-instruction strategy and picture cues together in teaching food preparation-cooking-skills to stu-

dents with intellectual disabilities. Three students with intellectual disabilities participated in the study. The study applied a multiple probe design across participants. Using picture cues and self-instruction strategies together was found to be effective in teaching food preparation skills to students with intellectual disabilities. Participants maintained the targeted skills after 4 months of participating in the study. Findings were discussed and suggestions are presented for future research in this article.

Keywords: Pictorial cues; Self-instruction; Cooking skills; Moderate intellectual disabilities.

Zihin Yetersizliği Olan Öğrencilere Yemek Pişirme Becerilerinin Öğretiminde Kendine Yönerge Verme Öğretme Stratejileri ile Resimli İpuçlarının Etkililiği

Öz

Alanyazında; resimli ipuçlarının kullanılarak yemek pişirme becerilerinin öğretildiği çalışmalar bulunmaktadır. Bu çalışmanın amacı, zihinsel yetersizliği olan öğrencilere yemek hazırlama-pişirme becerilerini öğretmede resimli ipuçları ile kendine yönerge verme öğretim stratejilerini birlikte kullanmanın etkililiği araştırmaktır. Çalışmaya zihinsel yetersizliği olan üç öğrenci katılmıştır. Araştırmada denekler arası çoklu yoklama modeli kullanılmıştır. Resimli ipuçlarını ve kendine yönerge verme öğretim stratejilerini birlikte kullanmak, zihinsel yetersizliği olan öğrencilere yemek hazırlama becerilerinin öğretilmesinde etkili olduğu bulunmuştur. Çalışmada yer alan katılımcılar hedef becerileri 4 ay sonrada sürdürmüşlerdir. Elde edilen bulgular tartışılmış ve gelecekteki araştırmalar için bu makalede öneriler sunulmuştur.

Anahtar Kelimeler: Resimli ipuçları; Kendine yönerge verme; Yemek yapma becerileri; Orta derecede zihinsel yetersizlik.

Introduction

Self-management and picture cues are both scientifically proven methods in children's education. Self-management strategies are effective and productive training strategies that guide students with intellectual disabilities to be more independent. An educational setting may not present the necessary opportunities for teachers to present cues or reward students continuously, which would make them responsible for their behaviors. Students who have self-management skills can learn by themselves and behave appropriately without external control (Apple, Billingsley and Schwartz, 2005; Gureasko-Moore, DuPaul and White, 2007; Koegel and Frea, 1993; Lannie and Martens,

2008; Newman, Buffington and Hemmes, 1996; Pierce and Schreibman, 1994; Reid, Trout and Schartz, 2005; Reinecke, Newman and Meinberg, 1999; Stahmer and Schreibman, 1992). Therefore, students should be taught self-management strategies to help them assume responsibility for their behaviors (Schloos and Smith, 1994). Use of picture cues in combination of self-management strategies might provide opportunities and necessary cues to students to work on developing their skills in tasks with multiple steps. Crucial point in teaching complicated skills to the individuals with intellectual disabilities, speculatively, is also helping them on becoming independent learners and reducing the need for help of another adult. Self-management is an umbrella term that involves several strategies to develop and modify the behaviors of individuals (Agran, King-Sears, Wehmeyer and Copeland, 2003). In general, the use of five self-management strategies might commonly be observed. Self-management strategies include those five strategies: antecedent cue regulation, self-instruction, self-evaluation, self-reinforcement, and self-monitoring skills (Agran, King-Sears, Wehmeyer and Copeland, 2003; Alberto and Troutman, 1995; Boyle and Hughes, 1994; Browder and Shapiro, 1985; Koegel and Koegel, 1990; Schloos and Smith, 1994).

Antecedent cue regulation, one of the self-management strategies, enables students to perform the desired behavior by presenting a stimulus that initiates the target behavior (Agran et al., 2003; Mechling and Stephens, 2009). These stimuli can be visual (Cihak, Alberto, Taber-Doughty and Gama; 2006; Connis, 1979; Mechling and Gustafson, 2009; Mechling and Stephens, 2009; Wacker, Berg, Berrie and Swatta 1985), auditory (Davis, Brady, Williams and Burta, 1992; Grossi, 1998; Taber, Seltzer, Heflin and Alberto, 1999) and tactile (Amato-Zech, Hoff and Doepke, 2006). Picture cues among visual cues provide hints to initiate and finish the skill by analyzing every step of sequenced skills visually (photograph or picture) or presenting the photo or the picture of a completed task (Mechling and Gustafson, 2009). Using picture cues is an appropriate way to teach sequenced skills like food preparation skills (Mechling and Gustafson, 2009). Using picture cues, a strategy to give stimulus to oneself as an antecedent, is a frequently used approach to teach daily living skills, including meal preparation skills (Lancionie and O'Reilly, 2002). Mechling (2007) reviewed 17 studies based on picture prompts as visual supports. The interventions based on picture cues target multi-step tasks, and those which sequence activities through a schedule. Based on the review, Mechling (2007) summarized that picture cues as a form of light tech assistive

technology can increase skills for independently participating in activities whether it involves: a) performance of multi-task behavior, b) initiation, participation, or sustained participation in an activity, c) participation in a wider variety of activities without reminders or prompts from others; or d) decreased dependency on adults. Mechling (2007) pointed out that all of those points are important issues to be considered in the education of students with intellectual disabilities.

Self-instruction, another self-management strategy, is a process used to control one's own behavior by using language and verbal directions. Self-instruction comprises self-talk as a direction and doing the task (Agran et al., 2003; Alberto and Troutman, 1995; Scholss and Smith, 1994). Self-instruction is an effective self-management strategy to teach academic skills like reading and mathematics (Case, Harris and Graham, 1992; Chan, 1991; Johnson and Cuvo, 1981) to reduce misbehaviors (Hogan and Prater, 1993) and to teach sequenced skills (Taylor and O'Reilly, 1997).

Individuals with intellectual disabilities exhibit several difficulties in a variety of developmental areas. Functioning independently in life might be considered as the ultimate goal for an individual with intellectual disabilities. Therefore, the intervention methods chosen by the interventionists must help those individuals to become more independent in life.

Use of self-management and picture cues combined is a promising approach that improves the independency of individuals with intellectual disabilities. The literature provides limited examples of the use of this approach in the past. Connis (1979) examined the effectiveness of sequential pictorial cues, self-recording and praise on the task sequencing of individuals with intellectual disabilities. The results yielded that the combined approach was effective in functioning more independently in a job setting. Martin, Rusch, James, Decker and Trtol (1982) examined the effectiveness of picture cues in establishing self-control in the completion of complex meals by individuals with intellectual disabilities. The study showed that the participants rapidly improved in completing the meal preparation independently. Sowers, Verdi, Bourbeau and Sheehan (1985) examined individuals with intellectual disabilities' use of picture cues and self-monitoring to initiate a series of tasks varying in type and order. According to the researcher, the participants quickly learned to use the picture cue system. Also, the results showed that participants were able to initiate independently after only minimal training, suggesting that

the use of the picture cue system had become generalized skills. Thierman and Martin (1989) provided evidence that the self-management package combining picture cues yielded more effective results than a prompting system.

Even though there are several studies that provided evidence on effectiveness of use of self-instruction and picture cue systems, there is no study in the literature in which picture cues and self-instruction strategy are used together. Thus, the purpose of the study was to examine the effectiveness of teaching self-stimulation (picture cues) as antecedent cue regulation and self-instruction strategy together to train students with intellectual disabilities in food preparation skills.

Methods

Participants and Setting

Participant Selection

The participants were recruited from a school founded for students with intellectual disabilities. To recruit, personal interviews had been conducted with the teachers of the school. They were asked to identify the students with visual ability to follow a picture-book, fine motor ability to operate small kitchen appliances, putting marks on a book with a pen and turn the pages of a book, ability to imitate a visual cue, and verbal skills to repeat certain sentences. All three participants were able to name the tools and model the actions the on the pictures.

Seyfullah 13-year-old, is a male participant with mild/moderate intellectual disability. He was able to perform several daily living skills such as dressing up, eating by using utensils by himself independently. The participant was also able to model fine and gross motor skills, follow verbal directions, and not able to read or write. He also was able to express himself by using 3-4-word sentences. He had no other disability.

Sevda 13-year-old, is a female participant with mild/moderate intellectual disability. She was able to perform daily-living skills independently. The participant was also able to model fine and gross motor skills, follow verbal directions, and not able to read or write. She also was able to express herself by using 3-4-word sentences. She had no other disability.

Bekir 15-year-old, is a male participant with mild/moderate intellectual disability. His abilities were similar to other participants' skills. He was able to perform well in daily living skills, and model fine and gross motor. His

verbal skills were similar but he was able to express himself with 2-3 word sentences. He had no other disability.

Table 1. Student Characteristics

Student	Age	Diagnoses	IQ
Sevda	13	Intellectual Disability	55*
Seyfullah	13	Intellectual Disability	50*
Bekir	15	Intellectual Disability	50*

**The diagnoses of the students were provided by Research and Guidance Centers of Turkey where an office for Ministry of National Education for educational evaluation of students with disabilities, and the Centers used Stanford-Binet Intelligence Scale for IQ measurement.*

The students were selected for several reasons which include, for example, no experience with the tested method in this study. Also, teacher and parent interviews were completed before the study, and both sides expressed that the students had no cooking experience beforehand. Furthermore, none of the participants had another disability or had participated in a study related to picture cues or self-instruction strategies. The participants' families were contacted and their informed consent was obtained prior to the study.

Tasks, Settings and Materials

The study aimed to teach pilaf cooking to the participants. Pilaf, especially rice pilaf, is considered as one of the traditional dishes made locally, also, it is a dish that is frequently cooked and served in many homes. The researchers considered that rice pilaf skills is a functional skill to help the individual develop more independent living at home and social relationships with others.

The task analysis was conducted by one of the researchers who was proficient in targeted task, after numerous observations of another proficient person completing the task. Cooking a rice pilaf consists of 12 steps. The task analysis used is shown in Table 2. Each step of the skill was photographed. Only the arms and hands of the person completing the task are present in the pictures demonstrating the step. The pictures were printed as 20x30 cm, and a total of 12 colored photographs, one for each step of the task, constituted the picture recipe cards for rice pilaf cooking skills. Laminated 4 in. X 7in. single photographs were used to present the steps of the task.

All phases of the study were conducted individually in the kitchen of the school that the participant attended. There was a table, a refrigerator, a countertop, a sink and an electric cooker in the kitchen. The study sessions were held each day of the week between 10 am and 11 am.

Table 2. Task Analysis for Cooking Rice**Steps in The Task Analysis**

1. Turn on the cooker.
2. Put the pot on the selectric cooker.
3. Put a tablespoon of butter into the pot.
4. Add 1 glass of rice into the pot.
5. Roast the rice until the rice turns pale white.
6. Add two bottles of water into the pot.
7. Add a teaspoon of salt into the pilaf.
8. Stir the pilaf with a wooden spoon.
9. Close the lid of the pot.
10. Turn stove dial low.
11. Wait until it bubbles.
12. Turn off the oven.

Response Definitions and Data Collection

All data were camera-recorded. Event recording was used to record the number of task steps each student completed correctly. The reactions of participants during each session were recorded as a correct or wrong reaction. A reaction was recorded as correct when the subject initiated the step in the picture within 3 seconds and completed the step within 1 minute independently as described in the recipe. The other 4 possible reactions recorded as a wrong reaction were latency (failure to initiate a step within 3 seconds), duration (failure to complete a step within 1 minute), topography (failure to complete the step correctly), or sequence (failure to complete a step in the order designated in the picture recipe book).

Experimental Design

The study used a multiple probe design across all three participants. Experimental control was established as increased correct reaction in the participants who have started treatment procedures, no change in participants who have not started treatment procedures, and repetition of this effect in the next participant diachronically.

Reliability

Two investigators collected inter-observer agreement and procedural reliability data. Inter-observer agreement was calculated by dividing the number of agreements of students' responses by the number of agreements plus disagreements and multiplying by 100. Inter-observer agreement ranged from 95 to 100%, with a mean of 97% agreement. The mean percent inter-observer agreement for each student was as follows: Sevda, 99%; Seyfullah, 98%; Bekir, 95%.

In order to calculate procedural reliability, the researchers developed and used a form which summarized expected behaviors from the researchers who managed the intervention phase. The procedural reliability level was calculated by dividing the number of observed teacher behaviors by the number of planned teacher behaviors, the result of which was then multiplied by 100. The procedural reliability ranged from 99% to 100%, with a mean of 99%. The mean procedural reliability for each student was as follows: Sevda, 100%; Seyfullah, 100%; Bekir, 99%.

Procedure

The participants were evaluated on their ability of cooking related tasks when given a verbal task direction (baseline condition) prior to the start of the comparison condition.

The experimental phase of the study consisted of baseline, treatment procedure, probe conditions, and maintenance sessions. Only one researcher conducted the sessions.

Baseline Procedures

Prior to the comparison condition, students' ability to complete cooking-related tasks were evaluated until data stabilized (Tawney and Gast, 1984). Each session consisted of one trial of pilaf cooking. A verbal task direction to start the cooking was provided and the student was given 3 s to initiate the task. The student was allowed to complete as many steps as possible in determined task analysis. The students received no other verbal direction in order to make them complete the steps.

Treatment Procedure

The treatment procedure started with an introduction of the picture recipe book and was followed by training the participants on how to use the recipe book. The treatment procedure of the study consisted of two steps: introduction of the picture recipe book (the material) and training of the participant to cook rice pilaf using the material.

Introduction of Picture Recipe Book

At this step the purpose of the researcher was introducing the picture recipe book. The researcher started with modeling the use of the picture recipe book. While modeling the book, the researcher provided verbal directions to the students. The researcher modeled using the picture recipe book by going through each page and asked the participant to do the same afterwards.

At this step the purpose of the researcher was introducing how to use picture recipe book while working on the targeted task. Introduction started with showing the book to the students in one-to-one session. The researcher explained the book will be used in completing the steps of cooking rice pilaf. Then page by page the researcher completed all the pages in those steps and talked herself by telling the steps in this order: I look at the picture, I see what's modeled on the picture, I do the same, I mark the corner when finished the task, and I turn the page. After finishing on modeling how to use the recipe book, the researcher asked the students to do same. While the students were working on the pages, the researcher reminded the self-talk steps if the students needed it.

Cooking the Rice Pilaf

Prompting sessions began for each student after the baseline sessions were complete or when data stabilized. Each session started with the verbal task direction identical to the ones used during baseline. The student was then shown a static picture of the task. The student was given 3 s to initiate the task and the students were given 30 s to finish the each task. Failure to initiate the task, failure to complete the task within 30 s, or incorrect performance of the task resulted in the researcher presenting the next static picture.

Maintenance Sessions

Maintenance sessions were carried out 4 months after completion of the treatment procedures and conducted in the same manner as the baseline sessions.

Results

The study combined antecedent cues and self-instruction strategies to teach cooking pilaf to students with intellectual disabilities. Figure 1 illustrated the percentage of tasks completed correctly by the participants. During the baseline sessions, none of the participants were able to complete any steps of the cooking test and had no skills. In the treatment sessions, the students were able to complete the tasks independently. Overall, the use of the treatment package resulted in the highest percentage (100%).

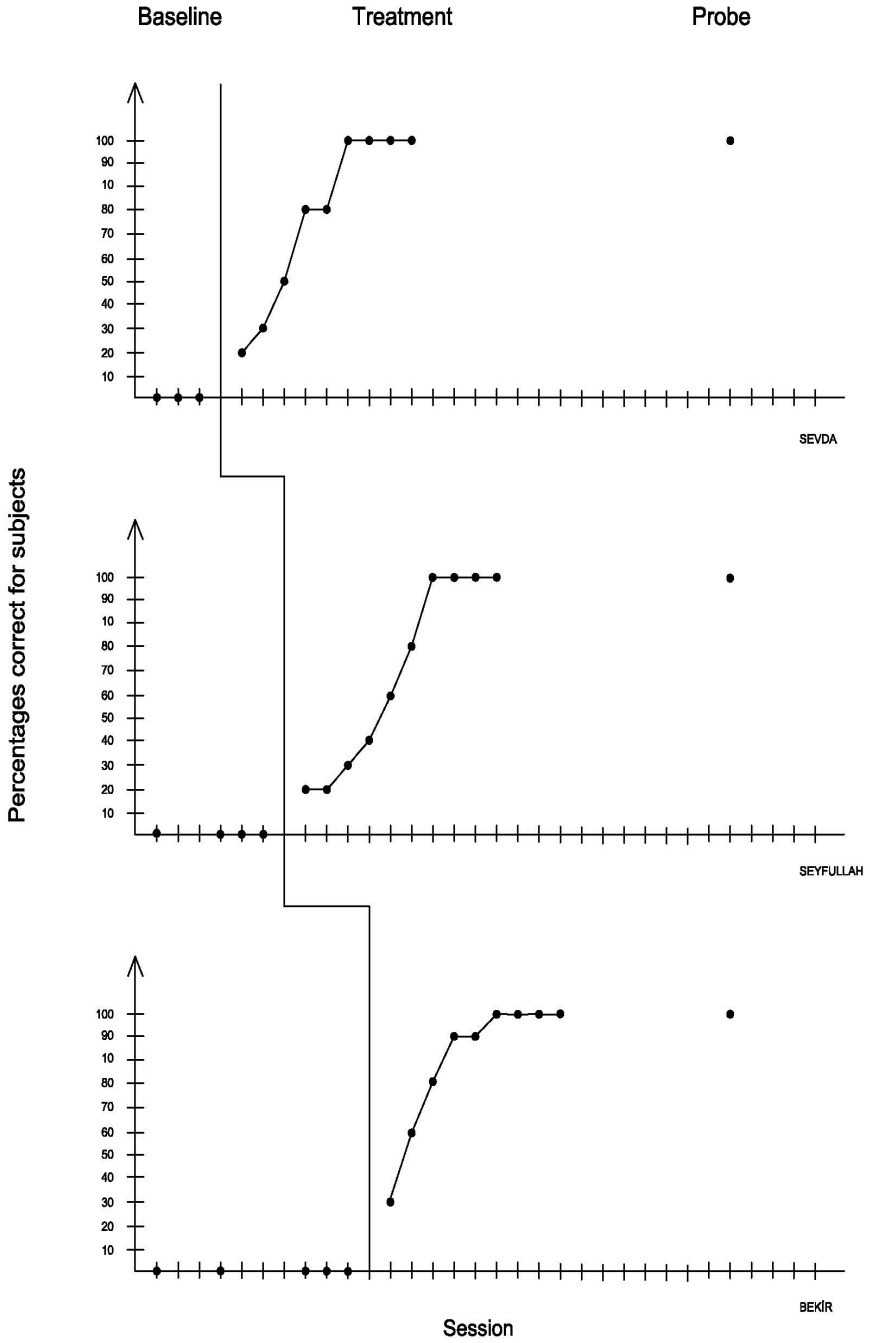


Figure 1. Subject's Performances across all conditions of the investigation.

Based on the research teams' observations, the participants showed high engagement in completion of the cooking pilaf exercise. After receiving verbal direction, the participants immediately engaged with the task, and they expressed their thoughts in different ways. The participant named Sevda frequently expressed how easy it was cooking rice pilaf, and Seyfullah claimed he would cook pilaf for his family.

Following the completion of the study, the researchers conducted sessions to examine the maintenance level of the students. All of the participants were able to maintain the skills four months after the training was completed.

The data also was examined to calculate effect-size values by using a percentage of the non-overlapping data method. The researchers yielded 3 effect-sizes with the average of %100.

Discussion

This study focused on the effects of using antecedent cue regulation and self-instruction combined. The results of the study were promising. Evidently students with intellectual disabilities were able to work on cooking skills independently. Also, the maintenance data showed that students maintained the skills even four-months after the completion of the study.

The literature provided limited evidence for the effectiveness of combined use of self-management and picture cues in the past (Connis, 1979; Sowers, Verdi, Bourbeau and Sheehan, 1985; Thierman and Martin, 1989). The participants of those studies, similar to this study, were successful in learning targeted skills. Also, in similarity to Sowers, Verdi, Bourbeau and Sheehan (1985) study, the participants of this study also learned how to use picture cues quickly. Self-instruction as one of the self-management strategies has proven its worthiness when it is used with picture cues.

Recent studies have provided examples for comparing the use of picture cues and video training in developing cooking skills (Mechling and Gustafson, 2009; Mechling and Stephens, 2009). Studies by Mechling and Gustafson (2009) and Mechling and Stephens (2009) indicate that video training is more effective than picture cue use in developing target behaviors. Also, Mechling and Gustafson speculated that visual prompting has its advantages against use of verbal prompts. Therefore, it might be concluded that presentation of both verbal and visual stimulus in video training might have had an impact on its

superiority over picture cues. This study respectively provided different conclusions. Use of self-instruction as in form of verbal prompting with pictures cues also yielded effective results.

Future studies can compare picture cues to video training again by combining picture cues with other strategies or cues, as done in this study. In terms of the limitations of the study, it might be speculated that presenting the recipe book during baseline, probe, and maintenance sessions in the room was the limitation of this study. Future studies can analyze the effectiveness of the treatment procedure in developing independency among participants when all of the stimuli are removed from the environment. All of the participants were successful in demonstrating the target skills using the picture recipe book throughout the independency and maintenance sessions but none of them demonstrated the thinking out loud behavior.

References

- Agran, M., King-Sears, M., Wehmeyer, L. M. and Copeland, S. R. (2003). *Student-directed learning*. Baltimore: Paul H. Brookes Publishing Co. Inc.
- Alberto, P. A. and Troutman, A. C. (1995). *Applied behavior analysis for teachers* (3rd edition). New York: Macmillian Publishing Company.
- Amato-Zech, N. A., Hoff, K. E. and Doepke, K. J. (2006). Increasing on-task behavior in the classroom: extension of self-monitoring strategies. *Psychology in the Schools*, 43, 211-221.
- Apple, A. L., Billingsley, F. and Schwartz, I. S. (2005). Effects of video modeling alone and with self-management on compliment-giving behaviors of children with high functioning ASD. *Journal of Positive Behavior Interventions*, 7, 33-46.
- Boyle, J. R. and Hughes, C. A. (1994). Effects of self-monitoring and subsequent fading of external prompts on the on-task behavior and task productivity of elementary students with moderate mental retardation. *Journal of Behavioral Education*, 4, 439-457.
- Browder, D. M. and Shapiro, E. S. (1985). Applications of self-management to individuals with severe handicaps: a review. *Journal of the Association for Persons with Severe Handicaps*, 10, 200-208.
- Case, L. P., Harris, K. R. and Graham, S. (1992). Improving the mathematical problem-solving skills of students with learning disabilities. self-regulated strategy development. *The Journal of Special Education*, 26, 1-19.
- Chan, L. K. S. (1991). Promoting strategy generalization through self-instructional training in students with reading disabilities. *Journal of Learning Disabilities*, 24, 427-433.
- Cihak, D. F., Alberto, P. A., Taber-Doughty, T. and Gama, R. I. (2006). A comparison of static picture prompting and video prompting simulation strategies using group instructional procedures. *Focus on Autism and Other Developmental Disabilities*, 21, 89-99.
- Connis, R. T. (1979). The effects of sequential pictorial cues, self-recording, and

- praise on the job task sequencing of retarded adults. *Journal of Applied Behavior Analysis*, 12, 355-361.
- Davis, C. A., Brady, M. P., Williams, R. E. and Burta, M. (1992). The effects of self-operated auditory prompting tapes on the performance fluency of persons with severe mental retardation. *Education and Training in Mental Retardation*, 27, 39-50.
- Grossi, T. A. (1998). Using a self-operated auditory prompting system to improve the work performance of two employees with severe disabilities. *Journal of the Association for the Severely Handicapped*, 23, 149-154.
- Gureasko-Moore, S., DuPaul, G. J. and White, G. P. (2007). Self-management of classroom preparedness and homework: Effects of school functioning of adolescents with attention deficit hyperactivity disorder. *School Psychology Review*, 36, 647-664.
- Hogan, S. and Prater, M. A. (1993). The effects of peer tutoring and self management on on-task, academic, and disruptive behaviors. *Behavioral Disorders*, 18, 118-128.
- Johnson, B. F. and Cuvo, A. J. (1981). Teaching mentally retarded adults to cook. *Behavior Modification*, 5, 187-202.
- Koegel, R. L. and Koegel, L. K. (1990). Extended reductions in stereotypic behavior of students with autism through a self-management treatment package. *Journal of Applied Behavior Analysis*, 23, 119-127.
- Koegel, R. L. and Frea, W. D. (1993). Treatment of social behavior in autism through the modification of pivotal social skills. *Journal of Applied Behavior Analysis*, 26, 369-377.
- Lancione, E. G. and O'Reilly, F. M. (2002). Teaching food preparation skills to people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 15, 236-253.
- Lannie, A. L. and Martens, B. K. (2008). Targeting performance dimensions in sequence according to the instructional hierarchy: Effects on children' math work within a self- monitoring program. *Journal of Behavioral Education*, 14, 356-375.
- Martin, J. E., Rusch, F. R., James, V. L., Decker, P. J. and Trtol, K. A. (1982). The use of picture cues to establish self-control in preparation of complex meals by mentally retarded adults. *Applied Research in Mental Retardation*, 3, 105-119.
- Mechling, L. C. (2007). Assistive technology as a self-management tool for prompting students with intellectual disabilities to initiate and complete daily tasks: A literature review. *Education and Training in Developmental Disabilities*, 42(3), 252-269.
- Mechling, L. C. and Gustafson, M. (2009). Comparison of the effects of static picture and video prompting on completion of cooking related tasks by students with moderate intellectual disabilities. *Exceptionality*, 17, 103-116.
- Mechling, L. C. and Stephens, E. (2009). Comparison of self-prompting of cooking skills via Picture-based cookbooks and video recipes. *Education and Training in Developmental Disabilities*, 44(2), 218-236.
- Newman, B., Buffington, D. M. and Hemmes, N. S. (1996). Self-reinforcement used to increase the appropriate conversation of autistic teenagers. *Education and Training in Mental Retardation and Developmental Disabilities*, 31, 304-309.

- Pierce, K. L. and Schreibman, L. (1994). Teaching daily living skills to children with autism in unsupervised settings through pictorial self-management. *Journal of Applied Behavior Analysis*, 27, 471-481.
- Reid, R., Trout, A. L. and Schartz, M. (2005). Self-regulation interventions for children with attention deficit/hyperactivity disorder. *Exceptional Children*, 71, 361-377.
- Reinecke, D. R., Newman, B. and Meinberg, D. L. (1999). Self-management of sharing in three pre-schoolers with autism. *Education and Training in Mental Retardation and Developmental Disabilities*, 34, 312-317.
- Schloss, P. J. and Smith, M. A. (1994). *Applied behavior analysis in the classroom*. Boston: Allyn and Bacon.
- Sowers, J., Verdi, M., Bourbeau, P. and Sheehan, M. (1985). Teaching job independence and flexibility to mentally retarded students through the use of a self-control package. *Journal of Applied Behavioral Analysis*, 18(1), 81-85.
- Stahmer, A. C. and Schreibman, L. (1992). Teaching children with autism appropriate play in unsupervised environments using a self-management treatment package. *Journal of Applied Behavior Analysis*, 25, 447-459.
- Taber, T. A., Seltzer, A., Heflin, L. J. and Alberto, P. A. (1999). Use of self-operated auditory prompts to decrease off-task behavior for a student with autism and moderate mental retardation. *Focus on Autism and Other Developmental Disabilities*, 14, 159-166.
- Taylor, I. and O'Reilly, M. F. (1997). Toward a functional analysis of private verbal self-regulation. *Journal of Applied Behavior Analysis*, 30, 43-58.
- Tawney, J. W. and Gast, D. L. (1984). *Single subject research in special education*. Columbus, OH: Merrill.
- Thierman, G. J. and Martin, G. L. (1989). Self-management with picture prompts to improve quality of household cleaning by severely mentally handicapped persons. *International Journal of Rehabilitation Research*, 12(1), 27-39.
- Wacker, D. P., Berg, W. K., Berrie, P. and Swatta, P. (1985) Generalization and maintenance of complex skills severely handicapped adolescents following picture prompt training. *Journal of Applied Behavior Analysis*, 18, 329-336.