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Evaluating Behavioral Skills Training to Improve Individual's with Intellectual and Developmental Disabilities Bowling Form

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Evaluating Behavioral Skills Training to Improve Individual's with Intellectual and
Developmental Disabilities Bowling Form

by

Margaret Green

A thesis proposal submitted in partial fulfillment
of the requirements for the degree of Master of Science
Applied Behavior Analysis
Department of Child and Family Studies
College of Behavioral and Community Sciences
The University of South Florida

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Keywords: Behavioral Skills Training, Reinforcement, Sports Performance, Bowling

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ABSTRACT

This study evaluated the effectiveness of behavioral skills training (BST) as an intervention to improve bowling form. Three individuals with mild to moderate intellectual disability participated. A multiple baseline design was used to evaluate the changes in each participant's bowling form. Each of the participant's bowling form improved after BST was introduced. Two of the three participant's performance increased with BST alone. The third participant showed minimal improvement after BST, however with the addition of a reinforcement component, the participant's form increased substantially from baseline. The results of this study suggest BST is an effective intervention to use for improving bowling form.

Keywords: applied behavior analysis, behavioral skills training, bowling, sports performance, reinforcement

CHAPTER ONE:

INTRODUCTION

Bowling is a common leisure activity for many individuals. There are several reasons why people may find themselves in a bowling alley; enjoying a family outing, attending a birthday party, being a part of a bowling team for school, or participating in a community bowling league. Although bowling is a leisure activity that can be enjoyed by people of all ages and levels of ability, it is also a sport as it involves physical activity and skill and results in a score that can be used in competition. Often, sports are recommended to individuals as a way to improve physical health, an opportunity to meet friends, or a potential stress reliever. Individuals with intellectual or developmental disabilities can benefit from engaging in sports. There are a few areas some individuals with intellectual or developmental disability could improve, such as, social skills, obesity, community outings, etc. There are various ways a person can learn how to play a sport; some informal (friends, family) and some formal (from a coach as part of a team). To teach a sport most effectively, it is important the individual teaching the activity use an effective teaching method.

Researchers have studied the effects of behavioral interventions with many different sports, such as football, gymnastics, tennis, soccer, yoga, and bowling (e.g. Allison & Ayllon, 1980; Downs, Miltenberger, Biedronski, & Witherspoon, 2015; Luyben, Funk, Morgan, Clark, & Delulio, 1986; Zhang, Cote, Chen, & Liu, 2004). Allison and Ayllon (1980) found a behavioral coaching package produced better outcomes than standard coaching. Luiselli et al. (2011) support this finding within their literature review suggesting behavioral coaching methods are successful in increasing skill acquisition and performance during sports. In an effort to enhance sports performance and skill acquisition, researchers continue to evaluate the effects of different

types of interventions, such as various forms of feedback (e.g., Downs et al., 2015; Kelley & Miltenberger, 2016; Quinn, Miltenberger, & Fogel, 2015), antecedent approaches (Allison & Ayllon, 1980; Cannella-Malone, Mizrachi, Sabiely, & Jimenez, 2013), behavioral skills training (e.g., Tai & Miltenberger, 2017) and combined procedures (Boyer et al., 2009; Brobst & Ward, 2002; Scott, Scott, & Goldwater, 1997). Of the interventions that have been evaluated, feedback is often chosen. Feedback involves the teacher commenting on the learner's execution of the targeted skill in a way that will help the learner improve (Downs et al., 2015; Harrison & Pyles, 2013; Kelly & Miltenberger, 2016; Stokes, Luiselli, & Reed, 2010).

Feedback is a common teaching method that has been used by coaches and researchers with a variety of sports (Downs et al., 2015; Harrison & Pyles, 2013; Kelly & Miltenberger, 2016; Stokes, Luiselli, & Reed, 2010). Variations of feedback suggested to be effective in increasing sports performance and skill acquisition are verbal feedback, auditory feedback, and video feedback. Verbal feedback involves the coach discussing the athlete's performance with the player immediately after the performance and has been effective increasing skills and performance during sports such as football, gymnastics, tennis, and track (Allison & Ayllon, 1980; Shapiro & Shapiro, 1985; Smith & Ward, 2006). Auditory feedback is another form of feedback that is supported by the literature as an effective teaching method. Quinn et al. (2015) described auditory feedback as a procedure referred to as teaching with acoustical guidance or TAGteach; this procedure involves delivering some form of an acoustical stimulus immediately after the correct execution of the target behavior. Harrison and Pyles (2013) used auditory feedback, in the form of a beep from a megaphone, paired with verbal instruction to improve the tackling skills of three linebackers. Quinn et al. (2015) used a click from a hand-held clicker as an intervention to increase the dance skills. Video feedback consists of the coach presenting the

learner with a video of the learner engaging in the behavior and providing praise for successful performance and further instruction to correct unsuccessful performance. Kelly and Miltenberger (2016) evaluated video feedback as an intervention to improve horseback riding skills. After each of the four female participants completed a behavior being targeted, the researcher immediately walked up to the rider while she remained on the horse and showed her a video of herself performing the skill. Providing the immediate video feedback was effective in increasing the horseback riding skills.

Allison and Ayllon (1980) examined the effect a behavioral coaching package had on improving skill acquisition in football, gymnastics, and tennis. The steps in the coaching package included; delivering the instruction of what was expected and the consequence, judging execution (correct skill performance = no interruption and delivery of praise. Incorrect performance = coach yelling "freeze" and the player freezing his position), describing incorrect position, modeling correct position, having the player imitate coach's position. This intervention increased all participants' skills for all three sports. Shapiro and Shapiro (1985) conducted a replication of Allison and Ayllon and found the behavioral coaching method increased all three participants track skills. This behavioral coaching method is similar to behavioral skills training. Miltenberger (2012) describes BST as a learning approach used to teach individuals a variety of skills. Researchers have used the four components of BST (instructions, modeling, rehearsal, and feedback) to teach important skills such as abduction avoidance, gun safety, and how to avoid peer pressure (Beck & Miltenberger, 2009; Himle, Miltenberger, Flessner, & Gatheridge, 2004).

There have been just two studies conducted to evaluate BST for improving sports performance (O'Neill & Miltenberger, 2017; Tai & Miltenberger, 2017). Tai and Miltenberger (2017) studied the effects of using BST to teach safe tackling skills to six football players, ages

10 and 11-years-old, and to decrease the number of unsafe tackles. First, the researcher provided instructions explaining how each step of the task analysis should look. Second, the researcher modelled the correct tackling skill; this allowed the participant to see what the correct execution of the skill looked like. Next, the researcher gave the player a chance to practice performing the skill. Lastly, the researcher delivered descriptive feedback to the player. The results of this study indicate that BST was effective in teaching the players to execute safe tackles during practices and generalize these skills to games. O'Neill and Miltenberger (2017) evaluated BST to increase adolescents' field hockey shot performance. The researchers found this intervention to be effective for each participant.

Currently, few studies have examined the effects of behavioral teaching methods for improving sports performance for individuals with intellectual disability (Cannella-Malone, Mizrachi, Sabiely, & Jimenez, 2013; Bord, Sidener, Reeve, & Sidener, 2017; Luyben, Funk, Morgan, Clark, & Delulio, 1986). These studies utilized procedures involving feedback, prompting, and video modeling. One study evaluated procedures for teaching bowling skills to an individual with disabilities. Zhang, Cote, Chen, and Liu (2004) found a constant time delay (CTD) procedure and a least-to-most prompting strategy to be an effective teaching method to help a 39-year-old mentally challenged individual increase his bowling skills. Due to the lack of literature pertaining to using behavioral teaching methods to teach sports, and bowling skills in particular, to individuals with intellectual disabilities, the purpose of this study is to evaluate the effectiveness of BST in increasing the bowling form of individuals with intellectual disability.

CHAPTER 2:

METHOD

Participants and Setting

Three men with mild to moderate intellectual disabilities participated in this study. Pseudonyms were used for the participant's names to protect their identities for confidentiality purposes. Ryan was 31-years-old with mild intellectual disability. Corey was 36-years-old with moderate intellectual disability. Bryce was 37-years-old with moderate intellectual disability. Each participant was recruited from a local facility that serves individuals with disabilities who have access to leisure activities such as bowling. Participants were asked to volunteer if they were interested in bowling and learning to bowl better. There was not a requirement for prior bowling experience. Each participant had minimal bowling experience prior to participating in the study.

Before meeting with the participants, the researcher conducted a phone interview with the caregiver regarding any medical and or physical disability the participant may have that could possibly make them ineligible to participant. The researcher met with each participant in person, explained the study, and had the participants sign the consent forms. The researcher also conducted a pre-assessment that required the potential participant to hold the bowling ball by his side for 5s as well as walk to the start line while holding the ball. This purpose of the pre-assessment was to determine if the individual was physically capable of participating. The researcher made sure to select the lightest weighing bowling ball that comfortably fit the

participants' fingers. Once the researcher completed the pre-assessment and confirmed that the individuals were eligible to participate, the researcher conducted baseline sessions with each participant at a bowling alley closest to the participant's home and at the time most convenient for that individual.

Dependent Variable

The dependent variable was the percentage of correctly demonstrated steps of the 19-step task analysis (TA) for Bryce and Corey, and the 18-step TA for Ryan of bowling form (see appendix A and B). The TA was created by the researcher and then reviewed and approved by a bowling coach. The pins were reset after each bowl (one roll of the ball down the lane). A secondary measure in the study was the number of pins knocked down with each bowl. Bowling form was defined as all the steps that start with picking up the ball from the ball return to rolling the ball down the lane toward the pins.

Materials and Equipment

The participants used the equipment available to them at the bowling alley including the lane with pins and ball return, bowling shoes, and a bowling ball. The researcher helped each participant choose a ball appropriate for him in terms of weight and size of finger holes. Ryan used a 12lb ball, Corey used a 10lb ball, and Bryce used an 8lb ball. The researcher used a video camera for recording the target behavior.

Data Collection

A video camera was used to record the participant's performance during each baseline and intervention assessment. A trial consisted of the participant standing near the back of the lane and the researcher saying, "Bowl the ball," or "Your turn to bowl." The trial consisted of the participant independently picking up the bowling ball, approaching the lane and releasing the

ball down the lane. For purposes of treatment integrity data collection, the video camera was also used to record the researcher's performance of implementing the intervention.

Interobserver Agreement

A second individual reviewed the video recording of at least 33% of assessment trials and used the TA to score each step in the task analysis. Training the second observers involved showing them a video of the researcher performing the skill both correctly and incorrectly and allowing them to practice scoring the TA with feedback until they achieve 90% to 100% agreement with the researcher for five consecutive videos. Interobserver agreement (IOA) was calculated by dividing the sum of agreements on steps in the task analysis by the number of steps. An agreement was defined as both observers providing a check mark (for a correct response) next to the same step of the TA or both leaving the step blank (for an incorrect response or absence of the response). For Ryan, IOA was scored on 38% of trials with a mean of 92% during baseline and a mean of 96% during intervention (ranging from 88% to 100%). IOA was calculated on 53% of trials for Corey and resulted in a mean of 96% for baseline and 99% for intervention (ranging from 79% to 100%). For Bryce, IOA was calculated on 45% of trials with a mean score of 94% for baseline and 97% for intervention (ranging from 78% to 100%).

Treatment Integrity

Each step of the intervention was checked off using a treatment integrity checklist to assess whether each intervention session was completed correctly (see appendix C). Treatment integrity was calculated by dividing the number of steps observed by the number of steps in the checklist. Interobserver agreement on treatment integrity was assessed by having a second observer record treatment integrity for at least 33% of treatment sessions. IOA was calculated by comparing each observer's data collection and dividing the sum of agreements by the number of

steps in the checklist. Treatment integrity IOA was calculated 42% of the time for Ryan, 40% of the time for Corey, and 40% of the time for Bryce. Treatment integrity results indicate the researcher implemented BST correctly 100% of the time for Corey and Ryan and 93% of the time for Bryce. The researcher scored a 93% on treatment integrity for Bryce due to two instances of the researcher failing to wait to move on to the next step before correct performance of the previous step.

Social Validity

Each participant completed a social validity questionnaire about the intervention with items rated using a 5-point Likert scale (see appendix D). The results of this scale provided information pertaining to how enjoyable and effective the participants felt the intervention was. A second social validity measure included a bowling expert and a high school bowling coach watching videos, in random order, of the last baseline assessment and the last intervention assessment, and rating the correctness of the participant's bowling form (see appendix E).

Experimental Design and Procedures

A multiple baseline across participants design was used to evaluate the effects of behavioral skills training on bowling form.

Baseline. Data were collected on each participant's performance of the skill prior to the intervention as described in the data collection section. Each baseline session consisted of three to 12 assessment trials. The researcher did not provide feedback to the participant during this time. The only communication between the participant and researcher was the researcher delivering the instruction, "Bowl the ball," or "Your turn to bowl," and then providing praise for participating ("Thank you for showing me how you bowl the ball.").

Behavioral skills training. The researcher implemented BST to teach each step of the TA to the participant in the lane of a bowling alley. The researcher purchased time in the lane at the bowling alley for all assessment and intervention sessions. First, the researcher said to the participant, “Ok, I am going to teach you how to bowl with better form.” The researcher then directed the participant to the bowling lane and explained that the first three steps are to approach the ball return, pick up the ball with two hands, and walk back to the start line. Next, the researcher said, “watch me” and then she modeled these steps for the participant. The participant was then given a chance to demonstrate these steps. After the participant demonstrated these steps correctly, the researcher delivered specific praise (“great job getting the ball and going to the start line!”). If the participant did any part of the steps incorrectly, the researcher provided instructions for improvement, modeled the steps again, and had the participant practice again. After the participant demonstrated the first three steps, the researcher provided instructions for the fourth step in the task analysis (“Okay, now that you have the ball at the start line, the next step is to put the tip of your toes on the line.”). The researcher then modeled this step, had the participant rehearse it and provided praise and or corrective feedback. After the participant mastered the fourth step, the researcher taught each of the next steps in the TA in order. She waited until the participant mastered a step before moving to the next one. For example, the researcher did not provide instructions on how to complete step five until step four was mastered. The researcher instructed the participant to start the chain of steps from the beginning before the next step in the chain was introduced. The researcher said, “show me what you have learned so far” and once the participant stopped on the previously mastered step, the researcher delivered praise and then provided instructions for the next step in the TA (“Now that you are at the start line, put your fingers in the holes like this.”) while modeling the behavior. The researcher

continued this routine of delivering detailed instructions, modeling the step, allowing the participant to practice, and providing feedback until the participant completed the entire chain independently or when the duration of the BST session reached the allotted time (20-30 minutes). Assessment sessions, identical to baseline assessments, were conducted following BST sessions. The researcher conducted three assessment trials following each BST session. Data collection on the researcher's performance was completed using the treatment integrity checklist.

Maintenance. The researcher met Corey and Ryan one week after the completion of intervention data collection and conducted three more assessments to measure how well they maintained their bowling form. The maintenance assessments were identical to the baseline trials. The researcher recorded their performance after instructing them to, "bowl the ball."

Reinforcement. A reinforcement component was added for Bryce in effort to increase performance and decrease variability in the data. This component involved the researcher having Bryce identify a reward he wanted to earn after completing the bowling session. The researcher explained to Bryce that he would only gain access to the reward if he demonstrated the steps taught during BST. When Bryce completed the correct steps, the staff member who accompanied Bryce to the bowling alley delivered the reinforcer, a soft drink and tour of the area behind the pins at the bowling alley following completion of assessment trials.

CHAPTER THREE:

RESULTS

The results are displayed in figure 1. Each participant's bowling form improved after BST implementation. Ryan and Corey's performance improved after BST alone. Bryce's performance showed variable improvement after BST alone. The researcher added an incentive to increase Bryce's performance and decrease variability in the data. The promise of, and delivery of reinforcement lead to an increase in the stability and accuracy of performance. Ryan and Corey maintained their bowling form a week following intervention. Bryce was not available for a follow-up assessment. The researcher calculated the mean of the last six baseline trials and the last six intervention trials for each participant and compared the results to evaluate the effect the intervention had on the participant's performance.

Ryan's performance increased from 74% correct during baseline trials to 96% in intervention. Ryan's average score during maintenance was 96%. Corey's performance increased from 58% correct during baseline trials to 85% in intervention with an average score of 89% during maintenance. The average percentage correct for Bryce was 36% during baseline assessments and 57% after BST alone. The mean of Bryce's performance during BST plus the incentive was 83%. The secondary measure in this study was the average number of pins knocked down with each bowl. The purpose of this measure was to determine if an improvement in bowling form would result in an increase in the number of pins knocked down. Ryan knocked down an average of four pins during baseline and four during intervention. Corey knocked down

an average of two pins during baseline and two during intervention. Bryce knocked down an average of four pins during baseline and two during intervention. Bryce knocked down an average of three pins during the BST plus reinforcement phase.

Feedback on the social validity measure was positive. Each participant circled the highest-ranking response for each question, indicating they enjoyed the intervention, would recommend it to another individual and felt that their bowling form had improved after participating in the study. The social validity questionnaire completed by a professional indicated no improvement to minor improvement from baseline to intervention. The professional rated Ryan's baseline performance a 3 out of 10, and his performance following intervention a 3 out of 10. Corey's performance was rated a 2 out of 10 during baseline and a 2 out of 10 after intervention. Bryce's bowling form was rated a 1 out of 10 during baseline and a 2 out of 10 following BST plus the incentive. The social validity questionnaire completed by a high school bowling coach indicated some improvement. The bowling coach rated Ryan's baseline performance a 7 out of 10 during baseline and an 8 out of 10 following intervention. Corey's performance was rated a 5 out of 10 during baseline and a 4 out of 10 after intervention. Bryce's bowling form was rated a 4 out of 10 during baseline and a 4 out of 10 following BST plus the incentive. The changes during intervention were perhaps too subtle for the raters to notice, or the changes were related to aspects of the task analysis the raters did not focus on in their evaluation or did not find as important in their view of correct bowling form.

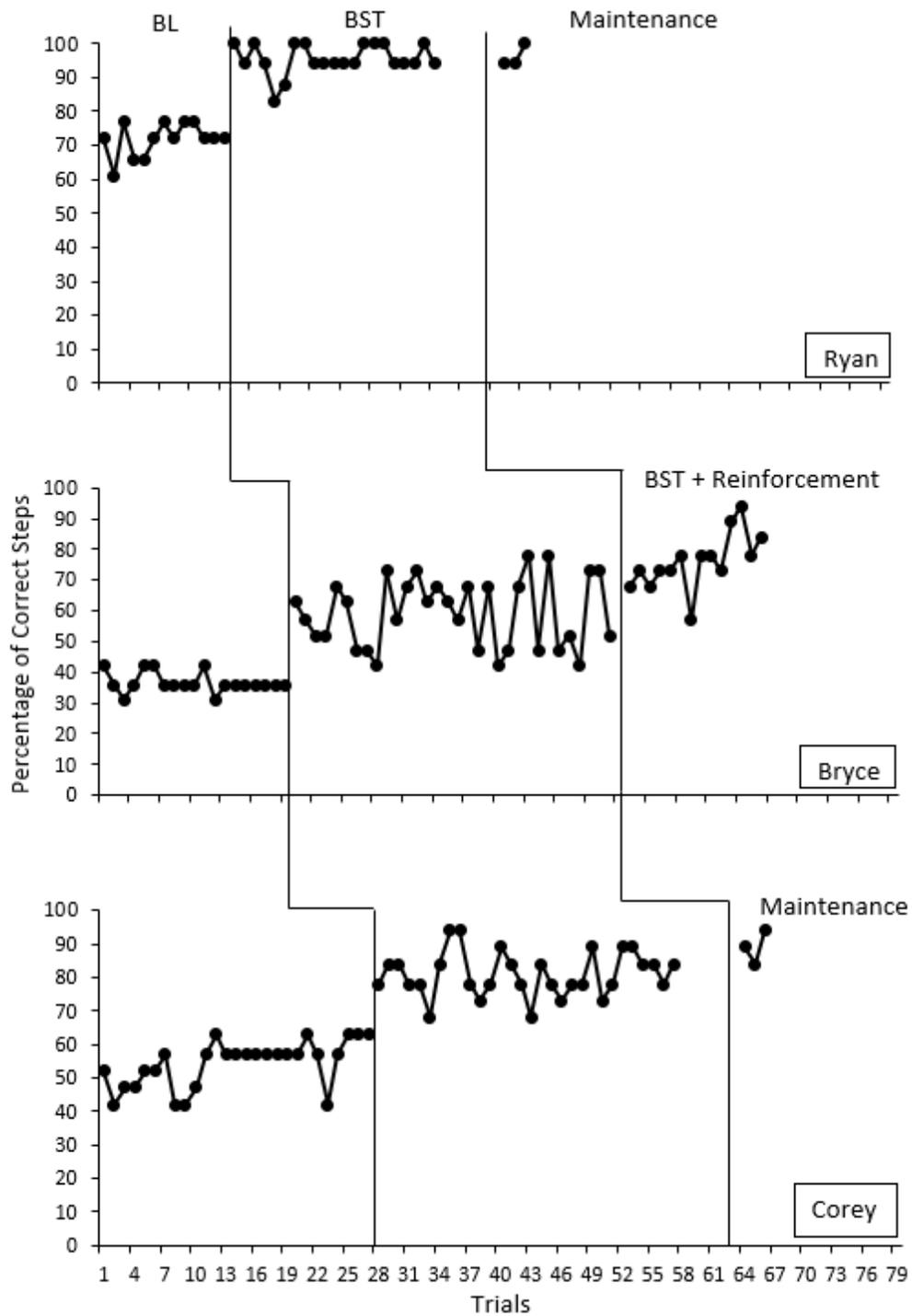


Figure 1. Results of each participant's performance during baseline, intervention, and maintenance phases.

CHAPTER 4:

DISCUSSION

The goal of this study was to assess whether BST is an effective intervention to use to increase bowling form. Consistent with other studies evaluating BST to increase sports performance (O'Neill, 2017; Tai & Miltenberger, 2017), these results suggest BST was effective for improving sports performance for each participant. For Corey and Ryan, BST alone produced a substantial increase in performance. For Bryce, BST alone produced a more modest and variable increase in performance. With the addition of tangible reinforcement to BST, Bryce's performance increased substantially. The need for tangible reinforcement for Bryce to achieve higher performance suggests that the social reinforcer used in the BST procedure may not have been powerful enough to strengthen his performance. In future research on BST for sports performance, especially with individuals with disabilities, researchers should consider the use of tangible reinforcers to achieve maximum benefit.

Results from the secondary measure on the number of pins knocked down did not suggest the increase of the participant's bowling form made a difference in Corey or Ryan's score, however there was a minimal decrease in Bryce's score after intervention began. The researcher hypothesized that knocking pins down was highly motivating to Bryce (as opposed to correcting his bowling form), resulting in Bryce choosing to perform similarly during intervention assessments as he performed during baseline assessment. In baseline, Bryce held the ball with two hands between his legs and rolled it underhanded down the alley. It is a possibility that

Bryce received more enjoyment bowling between his legs because the bowling ball usually rolled down the middle and knocked down more pins. Bowling the correct way by swinging one arm and releasing the ball down the lane resulted in the ball going into the gutter more often. It is not clear why the participants did not knock down more pins when they adopted a more correct bowling form. We speculate that it would take more sustained practice of the correct form before it resulted in a better outcome in terms of the number of pins knocked down. Unfortunately, we were not able to continue to study for an extended time frame to see if the participants eventually knocked down more pins.

The social validity results showed that the participants enjoyed participating in the study and believed their bowling form improved. Unfortunately, results from the second social validity assessment evaluating the bowling skills from baseline and intervention assessments did not indicate improvement for two of the three participants. Apparently, the improvement in task analysis steps did not result in noticeable improvement bowling form as judged by an expert bowler.

One limitation to this study was the environment. The bowling alley seemed to be very distracting for Bryce. The researcher needed to prompt Bryce to pay attention many times. Bryce seemed easily distracted by the TV monitors hanging above the ball return and by people who walked by. Many times, the researcher observed Bryce engaging in distracted behavior, such as looking and pointing to other items of individuals. When the researcher turned around to address Bryce after modeling the skill for him, she often found him looking at other things, which may be one reason for Bryce not reaching a higher level of performance following BST alone. One session with Ryan was briefly interrupted by individuals Ryan knew from a social outing. Corey was sometimes distracted by the music the bowling alley played and often began dancing when a

preferred song came on. Future research should attempt to limit the distractions of the environment by possibly teaching the skill at the bowling alley during a less popular time so fewer people were present or at participants' homes and then testing for generalization by taking the participant to the bowling alley.

A second limitation to this study was the pre-assessment to determine if the potential participant was capable of participating. Each participant comfortably held the ball by his side and walked to the start line with zero issues, however, during the first BST session with Bryce, he asked to switch from a 10lb ball to an 8lb ball. It is possible that the pre-assessment used in the current study did not provide enough information to determine which ball the participant felt comfortable bowling with. Future studies should also have the potential participants alternate bowling with a couple of balls a few times to determine which ball works best for them. Determining the participant's physical ability to perform each step of the TA may require more than just a phone interview with the participant's caregiver. During BST sessions with Corey and Bryce, the researcher noticed difficulty putting most of their body weight on one leg by lunging forward. Future studies should have potential participant's practice lunging forward and holding that position for a few seconds to make sure they are cable of completing that step of the TA.

Another possible limitation to this study was the stimulus control the researcher had on the participants' compliance during BST sessions. The researcher struggled getting compliance from Bryce during BST and sometimes could not fully implement BST, specifically having Bryce start from the beginning of the chain. During the reinforcement component, Bryce's caregiver joined the session to control access to the reward Bryce chose to work for. During this session, when Bryce failed to comply with the researcher's instruction, the caregiver delivered

the instruction and compliance was much better from Bryce. Future studies should consider requesting the caregiver to join each session for support if compliance becomes an issue.

The results of this study suggest BST is an effective intervention to use when teaching bowling skills to individuals with mild to moderate intellectual disability. In addition, results from the social validity measure indicate each participant enjoyed the intervention. This is one of the few studies to evaluate behavioral procedures for enhancing sports performance for adults with disabilities. More research is needed to establish which procedures are likely to be most effective for a variety of sports with individuals with disabilities. Enhancing sports performance, especially when it constitutes a leisure activity such as bowling, has the potential to enhance the quality of life for individuals with disabilities.

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APPENDICES

Appendix A: Task Analyses for Target behavior for Corey and Bryce

Bowling Form Task Analysis	
Step	Definition
1. Yes or no	Walk to the ball return
2. Yes or no	Use both hands to pick up the ball from the return
3. Yes or no	Walk from the ball return to the starting line
4. Yes or no	Place both feet in front of the start line so that the toes on each foot are touching the line
5. Yes or no	Put the weight of ball in the left hand
6. Yes or no	Insert fingers on right hand into the ball
7. Yes or no	Feet are on the start line, body is facing towards the pins
8. Yes or no	Put the weight of the ball in the right hand
9. Ye or no	Use left hand to balance the ball
10. Yes or no	Take a step with right foot
11. Yes or no	push the ball forward by extending your arm
12. Yes or no	Step with left foot
13. Yes or no	let your arm drop to the right side of your body
14. Yes or no	Step with right foot
15. Yes or no	Swing your right arm back (keep body forward and arm straight)
16. Yes or no	Step with your left foot
17. Yes or no	Lunge forward

18. Yes or no	Swing your straight right arm forward
19. Yes or no	Release the ball

Appendix B: Task Analyses for Target behavior for Ryan

Bowling Form Task Analysis	
Step	Definition
1. Yes or no	Walk to the ball return
2. Yes or no	Use both hands to pick up the ball from the return
3. Yes or no	Walk from the ball return to the starting line
4. Yes or no	Place both feet in front of the start line so that the toes on each foot are touching the line
5. Yes or no	Put the weight of ball in the left hand
6. Yes or no	Insert fingers on right hand into the ball
7. Yes or no	Feet are on the start line, body is facing towards the pins
8. Yes or no	Put the weight of the ball in the right hand
9. Yes or no	Use left hand to balance the ball
10. Yes or no	Step with left foot
11. Yes or no	Step with right foot
12. Yes or no	Push the ball forward by extending your arm
13. Yes or no	Let your arm drop to the right side of your body
14. Yes or no	Swing your right arm back (keep body forward and arm straight)
15. Yes or no	Step with left foot
16. Yes or no	Lunge forward
17. Yes or no	Swing your straight right arm forward
18. Yes or no	Release the ball

Appendix C: Treatment Integrity

Treatment Integrity Checklist	
1. The researcher provided clear instructions to the participant.	Yes / No
2. The researcher modeled the target behavior for the participant.	Yes / No
3. The researcher gave the participant an opportunity to practice the target behavior.	Yes / No
4. The researcher provided praise to the participant for the correctly demonstrated steps.	Yes / No
5. The researcher provided suggestions for improvement.	Yes / No
6. The researcher focused on the first three steps and then focused on one step at a time	Yes / No
7. The researcher moved to another step only after correct performance of the previous step	Yes / No

Appendix D: Social Validity

Social Validity Questions for the participant				
1. I enjoyed this training.				
1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
2. I feel like this training helped my bowling form.				
1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3. I enjoy bowling more than I did before the training.				
1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
4. I feel like this training helped my bowling score increase.				
1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree
5. I would invite my friends to do this training.				
1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Appendix E: Expert Rating

Social validity question for an expert.										
1. How good was this participant bowling form?										
1	2	3	4	5	6	7	8	9	10	
Poor										Excellent

Appendix F: USF IRB Approval Letter



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX(813)974-7091

2/4/2019

Margaret Green
ABA-Applied Behavior Analysis
10901 BRI BY BLVD NE APT 8312
ST PETERSBURG, FL 337163452

RE: Expedited Approval of Amendment

IRB#: Ame2_Pro00036952

Title: Evaluating Behavioral Skills Training to Improve Individual's with Intellectual or Developmental Disabilities Bowling Form

Dear Ms. Green:

On 2/1/2019, the Institutional Review Board (IRB) reviewed and **APPROVED** your Amendment. The submitted request and all documents contained within have been approved, including those outlined below, as described by the study team.

The protocol, consent and main application were revised to reflect the changes being made within the amendment. The researcher would like to add a reinforcement component to the study should BST alone not cause the participant's bowling form to improve. The researcher will deliver the reinforcer contingent on the participant demonstrating the skills taught during the BST session. The researcher is targeting bowling "form" not bowling score. Because the big reinforcer while bowling is knocking down the pins, the participant may easily go back to bowling the way they feel will knock down the most pins instead of demonstrating the steps of the task analysis taught during BST. It is the researcher's hypothesis that if there is a reinforcer provided contingent on demonstrating steps learned during BST sessions, the participant may do the correct steps to show better bowling form during assessments instead of resulting back to baseline bowling form during assessment.

Approved Item(s):

Protocol Document(s):

[IRB Study Protocol V2 012919 clean.docx](#)

Consent Document(s)*:

[SB Adult Minimal Risk Consent Form Version 3 012919 Clean.docx.pdf](#)

[SB LAR Consent version 3 012919 clean.docx.pdf](#)

[Adult SB Assent Form Version 3 012919 clean.docx**](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab on the main study's workspace. Please note, these consent/assent document(s) are valid until they are amended and approved. **verbal assent forms are unstamped

The IRB does not require that subjects be reconsented.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with USF HRPP policies and procedures and as approved by the USF IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) business days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in blue ink that reads "Melissa Sloan". The signature is written in a cursive style with a large loop at the end of the last name.

Melissa Sloan, PhD, Vice Chairperson
USF Institutional Review Board