

# Skill Acquisition Following Direct Instruction of Sport Skills in Children with Autism Spectrum Disorder

## Introduction

- Children with ASD are less likely to engage in physical activity than typically developed peers. (Corvey et al., 2016; Must et al. 2015; Tyler et al., 2014)
- Sport participation has various social and emotional benefits for those with ASD, including reduction of stereotypic and disruptive behavior. (Best et al., 2010; Ryan et al., 2018)
- Perceived barriers to physical activity for children with ASD: poor motor skills, behavior problems, and lack of coaches who will teach sports skills to children with disabilities. (Must et al., 2015)
- Children with ASD can acquire motor skills through various methods of teaching: observational motor learning, direct instruction, physical prompting, visual analogies, and reinforcement. (Sato & Kayagama, 2020; Tse et al., 2021; Tse & Masters, 2020)

## Method

### Purpose

Multiple baseline design was used to see if implementation of sport practice through direct instruction and physical prompting would increase basketball skills in children with ASD.

### Setting & Participants

**Setting:** 6-week summer practicum extended school year in a school gym with access to 8 ft basketball standards.

**Participants:** 5 white non-Hispanic children with autism spectrum disorder (ASD) aged 8-11, 2 female, 3 male.

### Measures

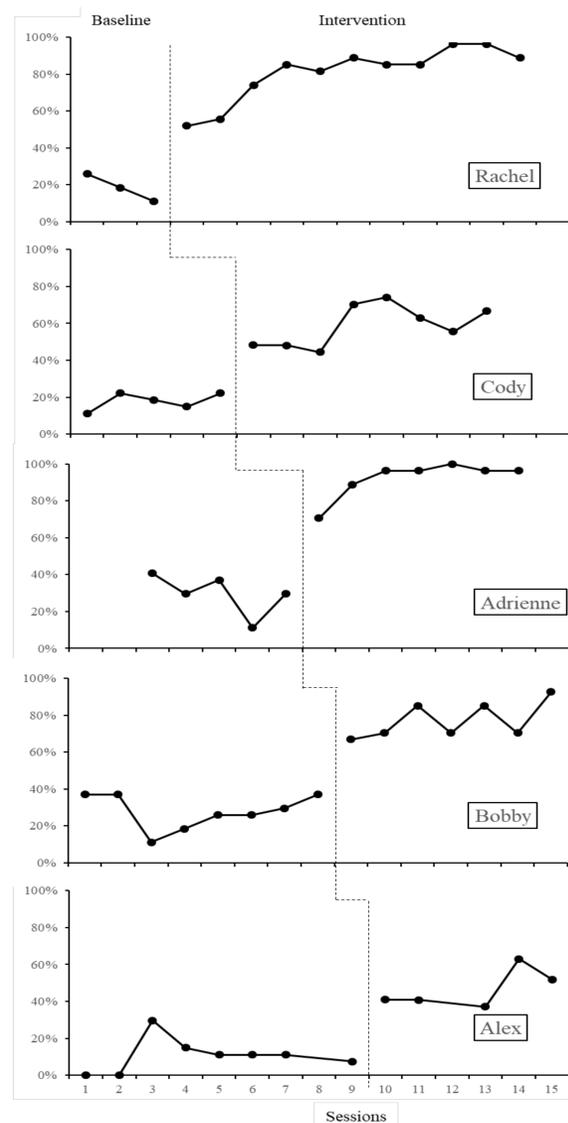
- Task analysis (TA) of important parts of each skill was created by a former NCAA Division II college basketball player.
- Skills assessed: triple threat, dribbling (stationary, while, while jogging), shooting, defensive slides.
- Skills measured based on completion of TA, at baseline, and during intervention, pre/post practice session.
- Intervention took place 4x week.
- Direct Instruction methodology used: modeling, guided practice, independent practice.
- Physical prompting was used to adjust and shape skills.
- Behavior observation taken 10 min. before/after the basketball practice in academic setting.
- Heart rate data obtained by Apple Watch Series 1.

## Research Questions

1. Can children with Autism Spectrum Disorder (ASD) acquire basketball skills through the use of direct instruction and physical prompting?
2. Does antecedent exercise decrease problem and stereotypic behaviors?

## Results

- **Rachel:** Baseline (B): 19% total skill mastery (TSM); Intervention (IV): 81% TSM
- **Cody:** B: 18% TSM; IV: 59% TSM
- **Adrienne:** B: 30% TSM; IV: 92% TSM
- **Bobby:** B: 28% TSM; IV: 77% TSM
- **Alex:** B: 7% TSM; IV: 40% TSM
- Disruptive behaviors decreased; stereotypic behaviors unaffected.
- 4/5 participants were engaging in moderate-to-vigorous exercise.



## Discussion

- Each child in the study was able to increase in mastery of basketball skill with direct instruction through modeling, guided practice, and independent practice.
- Physical prompting were used to direct the students where to correctly place hands on the basketball to perform various skills.
- Participants were able to maintain skills learned during instructional period when assessed at the end of the practice.
- Decreases in disruptive behavior occurred for all participants but could be due to the fatigue that followed participating in the intervention.
- Based on the heart rate data, 4 out of 5 participants were engaging in moderate-to-vigorous physical exercise for 45 minutes, which is 75% of their daily exercise recommendation (60 minutes).

## Implications

These findings suggest that children with ASD can acquire motor skills in order join sports programs and participate in athletics along with typically developing peers. Findings also suggest that children with ASD would benefit from antecedent exercise to decrease disruptive behaviors. Sport involvement could be utilized as a Tier 1 method to assist children with ASD to engage with their same-aged peers, increase physical activity, and might reduce the number of disruptive behaviors the child might display at home.

## References

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