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Addressing social, emotional, and organizational goals for a child with an autism spectrum disorder (ASD) using the Cognitive Orientation to daily Occupational Performance (CO-OP) approach

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Children with autism spectrum disorders (ASDs) have social, emotional, and organizational skill deficits which are frequently addressed through behavioral-based skills training. However, these approaches often do not result in generalization of skills. This case study sought to understand if the Cognitive Orientation to daily Occupational Performance (CO-OP), a problem-solving approach, is effective for addressing social, emotional, and organizational goals with a child with an ASD. Pre and post-intervention assessments indicated an improvement on all three client-centered goals, with the client transferring his goals and problem-based strategies to the community. Analysis of video recordings of the intervention sessions indicated the global strategies Goal-Plan-Do-Check were effective, with the participant spending most time in "plan." A majority of the domain specific strategies did not apply to this case study. Additionally, the participant utilized "verbal guidance by therapist" most often and spent a majority of dimension of time on task "talking about the task."

Keywords: autism spectrum disorders, cognitive strategies, social-emotional and organizational goals, case study

Introduction

According to the DSM 5 (American Psychiatric Association [APA], 2013), individuals with an autism spectrum disorder (ASD) have deficits in social communication and social interaction that span varying contexts. Children with an ASD also develop repetitive behaviors, interests, and activities that interfere with daily functioning. The child must present these types of symptoms in the early developmental period and the disturbances cannot be explained by an intellectual disability. Children with an ASD develop clinically significant impairments in social, occupational, or other pertinent areas of functioning. These impairments can lead to challenges with learning and generalizing skills (APA, 2013). The severity of autism varies, however all children with an ASD exhibit some amount of impairment in communication, socialization, and the development of restrictive, repetitive acts (Wetherby & Prizant, 2000). In addition, children with an ASD have difficulties in the areas of emotion regulation and organizational skills (Bolte, Holtmann,

Poustka, Scheurich, & Schmidt, 2007; Loveland, 2005).

The deficits associated with children with autism can have a substantial impact on occupational performance, which is the main domain of occupational therapy (American Occupational Therapy Association [AOTA], 2008). In order to address these skill deficits, occupational therapists can implement various strategies in a collaborative, client-centered way (Case-Smith & Arbesman, 2008). For example, children with an ASD often struggle with organizing morning routines, relating to others in a socially acceptable manner, and coping with strong emotions.

Current Approaches to Intervention

Currently, occupational therapists use a variety of methods to address the social, emotional, and organizational skill deficits associated with children with an ASD. Common social skills interventions include the use of Social Stories, social autopsies, comic strip conversations, mindreading, video detective, and power cards (Gagnon, 2001; Gray & White, 2002; Hilton, 2011; Hutchins & Prelock, 2006; McAfee, 2002; Williams, Gray, & Tonge, 2012). In regards to emotional regulation skills, the most common interventions include the use of emotion charades, scales, and thermometers (Buron & Curtis, 2003; Kuypers, 2011; McAfee, 2002; Williams & Shellenberger, 1996). In the area of organizational skills, occupational therapists commonly use strategies such as visual supports, practice, and positive reinforcement (Ganz, 2007; LaVesser & Hilton, 2011). Though these intervention methods are efficacious, the main drawback is that they have not been effective in promoting generalization and transfer of the skill set (Watling, Miller-Kuhaneck, & Audet, 2011).

Metacognitive strategies have recently been used to address the lack of generalization and transfer of skills in children with autism (Rodger & Vishram, 2010; Sangster, Beninger, Polatajko, & Mandich, 2005). When using metacognition, children must monitor their own performance, problem solve, and adjust their performance as needed (Deitchman, Reeve, Reeve, & Progar, 2010). In the occupational therapy literature, three main metacognitive strategies have been discussed. The first is the metacognitive model for children with atypical brain development, which focuses on the deficits that these children may face with executive functioning (Josman & Rosenblum, 2011). Second, the Cog-Fun intervention also targets executive functioning, except for children with attention deficit hyperactivity disorder (Hahn-Markowitz, Manor, & Maier, 2011). Finally, the Cognitive Orientation to daily Occupational Performance (CO-OP) approach has recently been used with children with an ASD to address goals related to social and emotional functioning (Missiuna, Mandich, Polatajko, & Malloy-Miller, 2001).

The Cognitive Orientation to daily Occupational Performance (CO-OP) approach

The CO-OP approach was initially developed to address motor difficulties in children because traditional intervention approaches were not effective in promoting generalization and transfer for children with Developmental Coordination Disorder (Missiuna et al., 2001). The CO-OP approach is metacognitive in nature and includes the use of global strategies (Goal, Plan, Do, Check) to facilitate the discovery and use of domain specific strategies. Domain specific strategies are strategies that are unique and individualized for each child and arise during the intervention sessions (Polatajko et al., 2001)

In the CO-OP approach, the therapist acts as a guide to facilitate self-discovery of strategies that promote generalization and transfer of performance to a variety of meaningful activities (Polatajko et al., 2001). This is accomplished through the process of dynamic performance analysis (DPA). In this process, the occupational therapist observes the child's performance in the specified skill areas and

assesses for the breakdown points in performance (Polatajko, Mandich, & Martini, 2000). These breakdown points are then addressed during intervention. Before beginning the intervention sessions, the child is directly taught the global strategies (Goal, Plan, Do, Check) in order to help talk themselves through their performance problems. Through this process, domain specific strategies are utilized by the child during the intervention sessions. The original domain specific strategies that were developed included body position, attention to the task, task specification/modification, supplementing task knowledge, feeling the movement, verbal rote script, and verbal mnemonic (Polatajko et al., 2001). Though most previous research focuses on the use of CO-OP with children who have motor issues related to Developmental Coordination Disorder (Banks, Rodger, & Polatajko, 2008; Bernie & Rodger, 2004; Martini & Polatajko, 1995; Miller, Polatajko, Missiuna, Mandich, & Macnab, 2001; Polatajko et al., 2001; Sangster et al., 2005; Taylor, Fayed, & Mandich, 2007; Ward & Roger, 2004; Wilcox & Polatajko, 1993), recently the approach has been used with children with autism. Children with autism have deficits in the areas of social skills, emotional regulation, motor clumsiness, and generalizing to transfer skills (Rodger & Brandenburg, 2009; Rodger, Pham, & Mitchell, 2009). Initially, the studies with children with autism also focused on motor-based goals, however the use of the CO-OP approach was expanded to include goals related to social and organizational skills (Rodger, Ireland, & Vun, 2008; Rodger & Vishram, 2010). Rodger et al. (2008) found that the CO-OP approach was effective in helping children with Asperger's Syndrome meet their social and organizational goals. In addition, the global strategy of understanding the context was added, as well as the domain specific strategies of transitional supports, affective supports, and motivational supports. Due to the limited amount of case study research in this area, Rodger and Vishram (2010) suggested that more studies be conducted in order to further assess the effectiveness of using the CO-OP approach to address social, emotional, and organizational goals for children with an ASD.

Purpose of Study

The purpose of this case study research was to further explore the effectiveness of using the CO-OP approach with a child with an ASD in the areas of social skills, emotional regulation, and organizational skills. Throughout this study, the authors sought to answer the following questions: 1. Does the CO-OP approach work for addressing social, emotional, and organizational skills for a child with an ASD? 2. How do the CO-OP assessment and evaluation tools work for social and organizational goals? 3. Does the child generalize the goals among varying contexts? 4. Does the child generalize the global and domain specific strategies within the sessions and outside of the sessions? 5. What domain specific strategies were used in the sessions? 6. Were the domain specific strategies used in the session similar to those in previous literature? 7. What type of guidance is used by the child in the sessions? 8. What dimension of time on task is utilized most often by the child? The authors anticipated that the use of the global strategies would be effective when addressing social skills, emotional regulation, and organizational issues in children with ASDs. Additionally, the authors anticipated that some of the established domain specific strategies would be used, but may need further adjustment to help children with ASDs meet their social, emotional, and organizational goals. It was anticipated that the child would meet individualized goals, transfer skills to various contexts, and develop individualized strategies for successful occupational performance in these areas.

Method

A single case experimental design (SCED) was used to explore the effectiveness of the CO-OP approach in addressing social, emotional, and organizational goals. A SCED design was selected for this study due to the limited research currently available on the use of the CO-OP approach with the ASD population. (Rassafiani & Sahaf, 2010).

Participant

Following approval from the institutional review board, using convenience sampling, flyers were sent to clinicians and autism support groups in the local area. Of the families that reported interest in participating in the study, the participant was selected based on the following inclusion criteria: (a) diagnosis of Asperger's syndrome, High Functioning Autism, or Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) per parent report, (b) between the ages of 8 and 12 years, (c) IQ of 85 or higher per parent report, and (d) wishing to address social, emotional, or organizational skill deficits. Exclusion for participation in the study included children who did not possess the communication or cognitive skills meeting the predetermined inclusion criteria.

The participant recruited was an eight-year-old male who had a diagnosis of PDD-NOS, as reported by the participant's parents. The participant was receiving additional therapy services including occupational therapy and speech therapy at the time of the study. The additional occupational and speech therapies were addressing goals different from those social, emotional, and organizational goals identified for this study, and neither therapy was utilizing the CO-OP protocol.

Measures

Based on the protocol established by Polatajko and Mandich (2004), the Daily Activity Log (Polatajko & Mandich, 2004), Pediatric Activity Card Sort (PACS) (Mandich, Polatajko, Miller, & Baum, 2004), the Performance Quality Rating Scale (PQRS) (Miller et al., 2001), and the Canadian Occupational Performance Measure (COPM) (Law, Baptiste, Carswell, McColl, Polatajko, & Pollock, 2005) were selected to assist in the process of data collection to assess for the effectiveness of the CO-OP intervention. The Social Skills Checklist (University of Washington, 2004) and the Weekly Progress Sheet, developed by the authors, were also used to gather data.

The Daily Activity Log, PACS, and the Social Skills Checklist were administered for purposes of goal setting. The information gathered from these tools during the initial session was used by the child, parents, and authors to establish client-centered social, emotional, and organizational goals.

The PQRS (Miller et al., 2001) was used as a pretest/ posttest measure, assessing performance and magnitude of change based on observation (Polatajko & Mandich, 2004). Due to the nature of the goals being social, emotional, and organizational, rather than motor-based, it was decided both the parents and the authors would score the PQRS. Parent ratings were completed based upon performance in natural context. Author ratings were completed based upon role play in the clinic setting. Part A of the PQRS includes a 10-point rating scale of performance and Part B is an 11-point magnitude of change scale. Scores on Part A can range from 1-10, indicating quality of performance, with 1 being "very poor" and 10 being "very good." Scores on Part B can range from -5, indicating that the change was five times worse, to +5, indicating that the change was five times better. Part A was completed pre and post intervention by the participant's parents and the authors during Session 3 and 12. Part B was completed by the parents during Session 12 and by the authors following Session 12.

The COPM (Law et al., 2005) was used as a pre and post -intervention assessment to assist the child in determining goals to be addressed during intervention sessions in

addition to reporting the participant's level of satisfaction and ability. The COPM (Law et al., 2005) is a 10-point rating scale that includes ratings for performance and satisfaction. A score of 1 indicates not at all satisfied/very poor performance and 10 indicates very satisfied/ high performance. It was completed during Session 1 and Session 12 through collaboration of the participant and his parents (Taylor et al., 2007).

The Weekly Progress Sheet is a form developed by the authors specifically for this study to report their child's progress towards his/her goals, and if transferring of skills learned during therapy was observed. The Weekly Progress Sheet was completed by the participant's parents once weekly throughout the 12 sessions, and once two weeks following completion of all sessions.

Video recording of Sessions 2-12 were collected using a video recording system built into the treatment room. The recordings provided the authors with a record of the child's behavior to be viewed and analyzed for global and domain specific strategies at a later date.

Intervention

Based on the protocol by Polatajko and Mandich (2004), it is recommended that intervention take place over 10 sessions. The participant and family in this study participated in a total of 12 sessions. Session 1 was held to gather baseline data from the participant and to set goals to be used during future sessions. Following the initial session, sessions 2-11 focused on intervention and emphasized teaching and implementing the Goal-Plan-Do-Check strategies to approach the goals the child selected. Post-test evaluation was completed during session 12. The participant's parents completed an additional Weekly Progress Sheet two weeks following session 12 to further assess carry-over and transfer.

Analysis of Data

The Weekly Progress Sheet narrative data was compiled week-to-week in the areas of progress towards goals, transfer of skills, and generalization of skills. Performance across goals and satisfaction ratings on the COPM were analyzed by calculating mean improvement for pre and post-test data. The PQRS data was analyzed by comparing pre-test and post-test scores given by the authors and parents for each goal.

Data analysis of the video recordings was completed using systematic behavioral observation by two raters, as described by Rodger et al. (2009). Two 5-minute sections of video recording from each of the intervention sessions were randomly selected for review (Rodger et al., 2009; Ward & Rodger, 2004). During the review of the video recordings, the child's use and frequency of global and domain specific strategies was recorded using the Global and Domain Specific Strategies Log. The type of guidance the participant used and the dimension of time on task were also recorded on the Global and Domain Specific Strategies Log during review of the video recordings.

Results

Goal Setting

Following completion of the previously described assessment tools, the participant and his parents identified the following goals: (a) I will get to the car with everything I need for school, (b) when I am sitting on the couch with mom, I will remain an arm's length away, and (c) when it's time for Mass on Sunday, I will use my coping skills.

Behavior during Intervention

The intervention sessions were all completed in the evening after the participant had a full day of school and at times, other activities. The participant struggled to stay focused and required frequent verbal re-direction during sessions. In some instances, the participant noted that he was fatigued. Therefore, the authors adapted sessions based upon his behavior and energy level. In order to encourage on-task behavior, the authors used a

visual schedule for each intervention session and included activities in the sessions that encouraged movement, active participation, and the inclusion of the participant's special interests.

Results for Intervention Goals

The Canadian Occupational Performance Measure

Figure 1a and Figure 1b present the pre-test and post-test ratings by the parents in the areas of performance and satisfaction. All COPM parent ratings indicated improvements in the areas of performance and satisfaction when comparing pretest and posttest ratings of all three goals.

Figure 1a.

Canadian Occupational Performance Measure parent pretest and posttest performance ratings

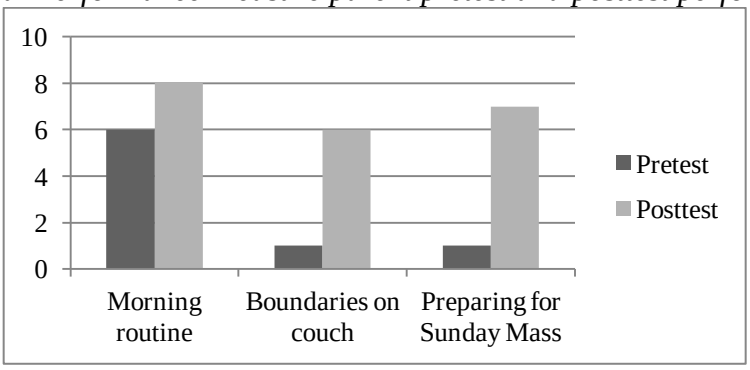
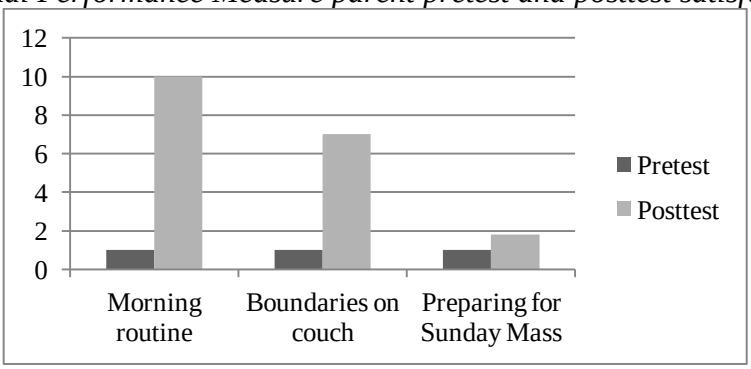


Figure 1b.

Canadian Occupational Performance Measure parent pretest and posttest satisfaction ratings



A mean improvement of 4.3 points was noted in the area of performance across goals. This indicates improvement in the performance of all three goals. Satisfaction ratings increased a mean of 7.3 points, indicating an increase in the parents' satisfaction of the performance in the three goal areas when intervening with the CO-OP approach.

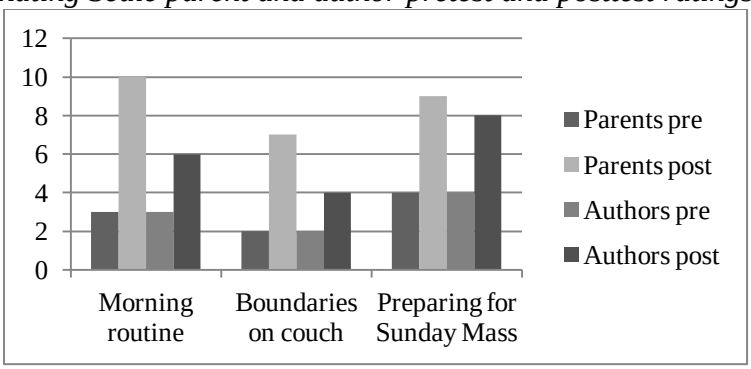
The Performance Quality Rating Scale

Figure 2 presents the parents' and authors' pre-test and post-test ratings for Part A. Table 1 presents the magnitude of change identified through completion of Part B.

Table 1.
Magnitude of change for Performance Quality Rating Scale

	Morning routine	Boundaries on couch	Preparing for Sunday Mass
Parents	+5	+2	+4
Authors	+3	+1	+4

Figure 2.
Performance Quality Rating Scale parent and author pretest and posttest ratings



All parent ratings of the PQRS increased when comparing pretest to posttest. This indicates an improvement in the child's performance in all goal areas based on the parents' perception. The authors also noted improvements in all goal areas based on their observations of the child's performance at pretest and posttest. Although both the parent and the author PQRS scores indicated improvements, the parents' ratings had a higher magnitude of change when compared to the scores of the authors. The authors hypothesize this is because performance in the natural context is different than role-playing for a child with PDD-NOS.

Weekly Progress Sheet

The participant's parents noticed him making notable progress towards his goals throughout the course of CO-OP intervention. The parents also observed generalization and transferring of CO-OP concepts. At the two week follow-up, the participant's mother indicated continued improvement in performance of all goal areas.

Dynamic Performance Analysis Record

The process of DPA (Polatajko et al., 2000) was used by the authors to iteratively assess the breakdown points in the particpant's performance. Figure 3 includes the breakdown points identified within each goal area and which steps of the goal address those breakdown points.

Figure 3.
Summary of Dynamic Performance Analysis Record

Goal: I will get to the car with everything I need for school

Breakdown Points	Plans
Initiating the activity	• Cue from Mom, "It's time to get to the car with everything you need for school"
Organizing Items	• Plan with step-by-step directions: 1. Get shoes on 2. Get my backpack 3. Ask Mom if I need my coat 4. If mom says yes, put on coat 5. Get to the car
Checking	• Mom hands him his Plan in the car with Goal Plan, Do, Check process included

Goal: When sitting on the couch with mom, I will remain an arm's length away

Breakdown Points	Plans
Recognizing Personal Space	• Education on boundaries: Remaining an arm's length away, Moving in your space • Moving to another couch if Mom says "No"
Staying In One Place	• Using "arm's length away" when on the couch • Grabbing the pillow to help keep his hands busy and his body still

Goal: When it's time to go to Mass on Sunday, I will use my coping skills

Breakdown Points	Plans
Difficulty Responding to Change in Routine	• Time warning from Mom/Dad
Identifying and Using Coping Skills	• Deciding what color he is in (Zones of Regulation) • Coping Skills in Plan: Playing Legos for 5 minutes, getting a drink of water, and sitting on the couch and counting for 37 seconds
Not highly motivated to get ready for mass	• Use of Legos (something he enjoys) as a coping skill

The breakdown points were identified by the authors throughout the intervention process by using the process of DPA. When each goal was being addressed, the authors interviewed the parents and child to further understand where the breakdowns were occurring. The authors also used role-playing and observation to further assess the break-down points.

Global and Domain Specific Strategies

To determine the frequency of global and domain specific strategies used by the authors and the child, video analysis occurred. Table 2 presents the percentage of use for each global and domain specific strategy.

Table 2.
Global and domain specific strategies use

Global Strategy	**Number of Occurrences**	**Percentage of Use**
Goal	31/358	8.66
Plan	79/358	22.07
Do	54/358	15.08
Check	35/358	9.78
Understanding Context	71/358	19.83
None	88/358	24.58
Domain specific strategy		
None	128/358	35.75
Body Position	---	---
Attention to doing/attending	68/358	18.99
Task specification	38/358	10.61
Task modification	5/358	1.40
Feel the movement	---	---
Verbal mnemonic	---	---
Verbal rote script	19/358	5.31
Supplementing task knowledge	5/358	1.40
Transitional supports	46/358	12.85
Affective supports	23/358	6.42
Motivational supports	26/358	7.26

The authors identified "none" as being the global strategy utilized most often (24.58%), followed by "plan" (22.07%), and "understanding the context" (19.83%). All of the global strategies were used at some point in the analyzed segments.

When analyzing domain specific strategy use, "none" was the most commonly used strategy (35.75%). The frequent use of "attention to doing" and "transitional supports" was unique to this participant when compared to results of previous studies. In addition, the authors found that "attention to doing" was the second most commonly used strategy (18.99%), followed by "transitional supports" (12.85%). The strategies "body position," "feel the movement," and "verbal mnemonic" were identified as not being used in the coded segments. The authors hypothesize that this is due to the social, emotional, and organizational nature of the goals.

Type of Guidance

The type of guidance utilized throughout the intervention process was analyzed by the authors through video recordings. Table 3 presents the percentage of use for each type of guidance.

Table 3.
Type of Guidance

Type of Guidance	Number of Occurrences	Frequency percentage
Verbal self-guidance	35/358	9.98
Verbal guidance (by therapist)	216/358	60.34
No guidance	107/358	28.89

The authors identified "verbal guidance by therapist" as being the type of guidance used most often (60.34%). "No guidance" was the second most often used guidance (28.89%). The participant used "self-guidance" least often (9.98%). This means that throughout sessions, the authors were the main source of guidance while carrying out the concepts of Goal-Plan-Do-Check.

Dimension of Time on Task

The frequency of dimension of time on task was assessed from the video recordings during the data analysis process. Table 4 presents the percentage of use of each dimension of time on task.

Table 4.
Dimension of time on task

Dimension of time on task	Number of Occurrences	Frequency percentage
Talking about the task	292/358	81.56
Practicing the task	12/358	3.35
Dual tasking	54/358	15.08

Discussion

The dimension of time on task occurring most often was "talking about the task" (81.56%), followed by "dual tasking" (15.08%), and "practicing the task" (3.35%). Overall, the participant spent a significant portion of the time during intervention sessions not physically practicing the goal areas, but rather talking about the goals.

Both satisfaction and performance ratings support the application of the CO-OP approach to children with ASD who are addressing social, emotional, and organizational skills. However, there are additional important findings that may assist both in future investigations of the CO-OP approach and therapists who applied this approach to children with ASD. These include implications for measures of change, global and domain specific strategies, and family participation.

The CO-OP approach utilizes the PQRS to establish pre and posttest performance. The PQRS was originally developed for motor-based goals which could be assessed in the setting and likely the performance of a motor task, such as tying shoes would be the same in the clinic and in the home. In this particular study, we were interested in social, emotional, and organizational skills which are highly contextual. While we attempted to create the true context, ultimately the performance was a role-play. Therefore, only completing the PQRS rating in the clinic setting did not seem appropriate to the child's goals. Instead, we found rating performance in the role-play and teaching the parents to rate performance in the natural context provided a better understanding of actual performance. This is a variation from the protocol that we assert should occur with these types of goals. Ideally, having a parent record the performance

in the true context would assist in gathering more accurate research data by having the therapist rate the performance.

One of the concerns regarding the application of the CO-OP approach to other populations is whether or not the global and domain specific strategies are still applicable to non-motor based goals. With regard to the CO-OP global strategies, similar to Rodger and Vishram (2010) all global strategies were used, with the most common applied in both studies being "none", "plan," and "understanding the context" supporting the application of global strategies to the emotional, social, and organizational goals of children with ASD.

In contrast to Rodger and Vishram (2010) who found "task specification" to be the most commonly used domain specific strategy, "none" was the most commonly used domain specific strategy in this study. The strategies of "affective supports" and "supplementing task knowledge" were used in both studies. Interestingly, Rodger and Vishram (2010) found that the pattern of domain specific strategy use involved a unique interaction between the child, the goal, and the therapist using guided discovery. We observed this phenomenon in this study as well, however the frequent use of "attention to doing" and "transitional supports" was unique to this participant when compared to the previous study. In terms of guidance, this study suggested "verbal guidance by therapist" to be most frequently used in comparison to "no guidance" in the Rodger and Vishram (2010) study. "Talking about the task" was the most frequent dimension of time on task in both studies. These findings suggest that while Rodger and Vishram (2010) identified new domain specific strategies for addressing organizational and social goals of children with ASD further investigation should be done to identify either the most applicable or potentially new domain specific strategies and time on task.

Finally, the protocol set forth by Polatajko and Mandich (2004) requires participation by the parents. In this case, the parents or another family member observed each session. When addressing social, emotional, or organizational goals we found this to be essential as it is difficult to understand the performance breakdown without the parents to assist in the problem solving process. We found that having the parents involved in the DPAR assisted in better addressing the breakdown, which included a breakdown in both skills and context. Interestingly, while the parents observed generalization of global and domain specific strategies to home, we did not observe this in the clinic. While we are uncertain why this occurred, it is noted that in sessions the client relied heavily on "verbal guidance by therapist"; which mean the client did not initiate his own strategies.

Limitations

There were a few limitations of the current study. First, though the authors studied the protocol before beginning the intervention sessions and referenced the manual throughout the process, the authors were not experienced with using the protocol. However, to stay to the protocol, each session was planned prior to the session and debriefing with a faculty member in regards to implementation of the protocol occurred. Second, this study was a case example of one child and cannot be generalized to an entire population. Next, performance in true context was not always observable due to the social, emotional, and organizational nature of the goals and that could have impacted the results. Due to this, the authors had to rely heavily on parent report when assessing progress related to goals. Finally, the authors deviated from the protocol of two sessions per week due to family scheduling, which required meeting only one time per week on two occasions. Also, the scoring of the PQRS was completed by the authors based off of the video recordings of performance and was not completed until after Session 3 so that the

authors had sufficient video material to base their ratings on. Additionally, the parents completed the PQRS due to the context-specific nature of the goals. This could have affected the reliability of the parents' PQRS results because the parents may have been more likely to want to present the participant's progress in an overly positive light, either for their own or the authors' benefit.

Conclusion

In conclusion, the use of the CO-OP approach was effective when addressing social, emotional, and organizational goals for a child with an autism spectrum disorder. However, due to the context-specific nature of the goals, a few changes are recommended for future studies. These include the addition of domain specific strategies that are more applicable to these goals and making slight changes to the protocol in terms of the utilization of the PQRS and the DPAR.

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