

## Mastering Social and Organization Goals: Strategy Use by Two Children with Asperger Syndrome during Cognitive Orientation to Daily Occupational Performance

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Asperger syndrome (AS) is one of the pervasive developmental disorders (PDD), a broad class of developmental disabilities (American Psychiatric Association (APA), 2000). In general, children with AS have impairments in social interactions, ability to communicate, and rigidity in their thinking and behavior (APA, 2000). Despite having an average or above average intelligence, many aspects of daily life are challenging for these children (Gutstein, 2000). These challenges span the everyday occupations of productivity, leisure/play, and activities of daily living. Furthermore, children with AS experience social difficulties related to forming and maintaining friendships, and organizational issues, such as getting ready for school and doing homework.

Interventions for children with AS are individualized and vary according to the child and family's goals. Psychological and educational interventions for children with AS include (a) individual psychotherapy to assist the child to manage the emotional impact of social situations, (b) parent coaching and education, (c) psycho-education, (d) social skills training using social stories and comic strip conversations, (e) school interventions, and (f) pharmacological interventions to manage depression, obsessive-compulsive behavior, social phobia, attention deficits, and mood swings (Attwood, 2007; Gillberg, 2002).

### ***COGNITIVE ORIENTATION TO (DAILY) OCCUPATIONAL PERFORMANCE***

Cognitive Orientation to (daily) Occupational Performance (CO-OP) is a client-centered, problem-solving and performance-based intervention approach used to enable skill acquisition of child's chosen goals. The role of the therapist is to lead the child to independently discover solutions to their occupational performance challenges (Polatajko & Mandich, 2004). The key features of CO-OP include (a) child's chosen goals; (b) cognitive behavioral structure of Global strategies, "Goal Plan Do Check" (GPDC) (Meichenbaum, 1977), which encourages the child to talk them self through the challenges of the task; (c) verbal self-instruction based on Domain-Specific Strategies (DSS); (d) guided discovery, facilitated by the therapist; and (e) parent's or significant other's involvement (Polatajko & Mandich, 2004). The Global strategies and DSS utilized by therapists and children during CO-OP are summarized in Table 1.

Two studies, each involving two children, provide preliminary data that support the effectiveness of CO-OP for children with AS (Rodger & Brandenburg, 2008; Rodger, Ireland, & Vun, 2008). Rodger and Brandenburg (2008) used the CO-OP approach to enable two children, aged 9 and 11 years, with AS to successfully master their motor-based occupational goals. Subsequently, these two children transferred their learned strategies to other contexts and situations despite the presence of rigid and inflexible thinking (Rodger, Springfield, & Polatajko, 2007). Rodger et al. (2008) demonstrated that two boys, aged 10 and 12 years, with AS mastered social and organizational goals during 10 sessions of CO-OP. This pilot study compared pre- and post-intervention scores on the Canadian Occupational Performance Measure (Law et al., 2000), the Social Skills Rating Scale (Gresham & Elliot, 1990), and the Performance Quality Rating Scale (Polatajko & Mandich, 2004). Both children showed improved quality of performance and satisfaction with performance on goals, such as getting organized in the morning, managing time to complete homework, and improving self-regulation in emotionally charged situations.

There is little understanding about how children with AS use specific interventions to target their everyday occupational challenges. Understanding of how children with

**TABLE 1.** Description of Global and Domain-Specific Strategies for CO-OP Identified with Children with AS (Polatajko & Mandich, 2004; Rodger et al., 2008).

| CO-OP strategies             | Description                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Global strategies            | The framework for problem-solving during intervention sessions.                                                                                                                                                                                                                                                                                                                                                                      |
| Goal                         | The desired outcome of an activity, which must be verbalized by the therapist or the child; may occur simultaneously with task description.                                                                                                                                                                                                                                                                                          |
| Plan                         | A plan, trick, or strategy verbalized by the therapist or the child to improve performance of an activity to reach the goal.                                                                                                                                                                                                                                                                                                         |
| Do                           | Execution of the plan (i.e., practicing the activity or task).                                                                                                                                                                                                                                                                                                                                                                       |
| Check                        | Evaluating or monitoring the task or the plan. The therapist or child verbalizes what they thought about the plan in relation to the task, how well it worked, whether it was successful.                                                                                                                                                                                                                                            |
| Understanding context        | The therapist performs dynamic performance analysis (DPA) to understand the social context without direct observation of the child's performance.                                                                                                                                                                                                                                                                                    |
| Domain-specific strategies   | The strategy used by the child to plan, do, or check; must be verbalized or obvious to an observer. Strategies are mutually exclusive but may evolve and change during a session.                                                                                                                                                                                                                                                    |
| Body position                | Refers to focus on the position of the child's body, whole or in parts.                                                                                                                                                                                                                                                                                                                                                              |
| Attention to doing/attending | Verbal cuing of the child to attend to the doing of the task (e.g., attending to themselves and their emotions, feelings, and bodily sensations).                                                                                                                                                                                                                                                                                    |
| Task specification           | Discussions regarding the specifics of the task or parts of the task.                                                                                                                                                                                                                                                                                                                                                                |
| Task modification            | Modification of the task or parts of the task, or any action to change the task or parts of the task.                                                                                                                                                                                                                                                                                                                                |
| Feel the movement            | Discussion or practice of what the movement required to complete the task "feels like."                                                                                                                                                                                                                                                                                                                                              |
| Verbal mnemonic              | Verbalization of one or two words that evoke a mental image to guide the motor performance.                                                                                                                                                                                                                                                                                                                                          |
| Verbal rote script           | Use of a pattern of words to guide a motor sequence, usually three or four words long.                                                                                                                                                                                                                                                                                                                                               |
| Supplementing task knowledge | Providing the child with more information about the task to enable them to perform it appropriately.                                                                                                                                                                                                                                                                                                                                 |
| Transitional supports        | Strategies to help manage changes/shifts or transition from one activity/context to the next.                                                                                                                                                                                                                                                                                                                                        |
| Affective supports           | Affective avoid (strategies to help the child remove himself from the emotionally charged situations/conflict/anger to prevent uncontrolled emotional outburst).<br>Affective distract (strategies used by the child to help him calm down in emotionally charged situations/conflict/anger).<br>Affective physical (strategies to manage/redirect physical intensity of emotions that enables the child discharge physical energy). |
| Motivational supports        | Strategies to assist with motivation to do.                                                                                                                                                                                                                                                                                                                                                                                          |

AS use the CO-OP approach (Polatajko & Mandich, 2004) to overcome occupational performance issues will assist therapists to plan interventions that enable children with AS to achieve social and organizational goals. The objectives of this case study were to describe the following:

1. Types of Global strategies and DSS that two children with AS used during the CO-OP intervention.
2. Type of guidance utilized during the "doing" of the task.
3. Dimensions of time on task (i.e., talking, practicing, dual tasking) observed during the intervention sessions.

## METHODS

Given the exploratory nature of this research, and consistent with other CO-OP studies (e.g., Bernie & Rodger, 2004; Rodger & Brandenburg, 2008; Rodger et al., 2008), a case-study approach was employed to describe cognitive strategy used, type of guidance, and time on task. Case studies are appropriate when the inquiry is descriptive and does not require control of behavioral events (Yin, 2003). This paper presents a secondary analysis of videotaped data collected in a previous study (Rodger et al., 2008). The previous study (Rodger et al., 2008) described the efficacy of CO-OP by comparing pre- and post-intervention measures with two boys with AS, while the current study describes cognitive strategy used during intervention sessions. Ethical approval for the study was provided by a The University of Queensland ethics committee.

### *Participants*

The participants were recruited through the Asperger Syndrome Support Network monthly newsletters and Web site. Interested parents contacted the first author and were sent participant information sheets outlining the study as well as consent forms. In total, three mothers whose children met the inclusion criteria completed the consent forms. The inclusion criteria for the study were (a) diagnosis of AS according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, TR) (APA, 2000); (b) confirmed diagnosis with an Asperger Disorder Quotient on the Gilliam Asperger Disorder Scale, (Gilliam, 2001); (c) substantial social, emotional, and organizational difficulties, as reported by primary caregiver; (d) measured intelligence within the average range or better, using a standardized assessment; and (e) age-appropriate language skills, measured on Clinical Evaluation of Language Fundamentals (Semel, Wiig, & Secord, 1995). The last criterion was important to make sure that the participants could be engaged in CO-OP, which is a language-based intervention.

One participant withdrew because of change in health status and medications. Participants' characteristics are described in Table 2. Pseudonyms are used to ensure the confidentiality of the participants.

### *Procedure*

Each child participated in weekly individual CO-OP sessions of 1-hr duration, over 10 weeks at a clinic at The University of Queensland. Each session was conducted by an occupational therapist with 28 years experience working with children and 9 years experience with the use of CO-OP. During the sessions, the Global framework was taught and skill acquisition was enhanced through the guided discovery of DSS. Prior to intervention commencement, the therapist used the Canadian Occupational Performance Measure (COPM) (Law et al., 2000) to enable the child to identify and prioritize three to five goals that would be the focus of the intervention. Over the 10 sessions, each child's goals were addressed (see Table 2), with approximate equal treatment time devoted to each goal. Specific child-developed plans, reward charts, time logs, and Social Stories® (Gray & White, 2002) were collaboratively developed and compiled during the sessions using word processing software. The CO-OP intervention protocol was based on the one described by Polatajko and colleagues (2001). All sessions were videotaped.

TABLE 2. Participants' Characteristics and Goals

| Participant | Age                   | School                       | Assessment results                                                                                                                                                                    | Child-chosen goals                                                                                                                                                                                       |
|-------------|-----------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Charlie     | 10 years,<br>2 months | First<br>semester,<br>year 5 | GADS <sup>1</sup> score—103<br><br>K-BIT <sup>2</sup> score—103<br><br>CELF <sup>3</sup> standard score—73<br>(expressive language skills =<br>91; receptive language skills =<br>81) | (1) Get organized for school in the<br>morning.<br><br>(2) Manage angry situations on<br>the playground.<br>(3) Manage time to get homework<br>done.                                                     |
| Thomas      | 12 years,<br>6 months | First<br>semester,<br>year 7 | GADS score—109<br><br>WISC-III <sup>4</sup> score—107<br>CELF standard score—111<br>(expressive language = 110;<br>receptive language = 113)                                          | (1) Manage time to get homework<br>done.<br><br>(2) Get to sleep at night.<br>(3) Manage angry situations on<br>the playground.<br><br>(4) Make his bed.<br>(5) Use knife and fork to cut meat<br>small. |

<sup>1</sup>GADS = Gilliam Asperger Disorder Scale (Gilliam, 2001) Quotient > 80 confirms AS diagnosis.

<sup>2</sup>KBIT = Kaufman Brief Intelligence Test (Kaufman & Kaufman, 1990) > 85 confirms at least average intelligence.

<sup>3</sup>CELF = Clinical Evaluation of Language Fundamentals (Semel et al., 1995) (SS = 100, SD = 15).

<sup>4</sup>WISC-III = Wechsler Intelligence Scale for Children-III (Wechsler, 1991) > 85 confirms at least average intelligence.

### Data Collection and Analysis

Systematic behavioral observation was used by both the authors to document the amount of time on task and the specific types of Global strategies, DSS, and guidance used by the participants, during the CO-OP sessions. Two 5-min segments from each intervention session were randomly selected using a random number generator. This produced a total of 100-min videotaped session of each child that was subsequently coded and analyzed by the second author.

During the coding phase, each 5-min segment was first viewed in its entirety and then divided into 15-s intervals. At the end of each 15-s interval, the coder recorded the occurrence of (a) the Global strategies, (b) the DSS (described in Table 1), (c) the type of guidance utilized in the "Do" phase, and (d) the dimension of time on task (whether the child was "talking about the task," "practising the task," or "dual tasking"). Within each of the four categories, each element was mutually exclusive; hence only one code could be provided for each 15-s interval for each of the categories. Within each category, each rater coded the strategy used for the majority of the 15-s interval. Then the percentage of total intervals spent in each category was calculated.

Both raters underwent intensive training regarding the definitions of target behaviors and principles of coding in alignment with the definition of Global strategies and DSS by Polatajko and Mandich (2004). The raters coded independently and the training continued until inter-rater agreement of at least 80% was attained (Bakeman & Gottman, 1997). When raters did not agree, discussion took place until agreement was reached. The second author coded the entire 100 min of randomly selected video footage for

each child. Inter-rater agreement was calculated for each child, for each of the four categories coded over five randomly selected intervals (25% of total analyzed time). Across the four categories, mean agreement was 96% for Charlie and 97% for Thomas. Agreement ranged from 80 to 100%, with the lowest on DSS. No further statistics on inter-rater reliability were established because of the conditional nature of the coding. For example, Global strategy was coded first by each rater (i.e., goal, plan, do, or check). If they disagreed on any of these elements, they were unlikely to agree on the type of guidance (as this was coded only during “do”, and dimensions of “time on task”), which related to talking, practising, or dual tasking, and whether the child was coded in goal, plan or check (talking), or do (practising or dual tasking).

## **RESULTS**

### ***Global Strategy Use***

Both children used all of the Global strategies at some point during their ten intervention sessions. Table 3 summarizes the percentage of intervals that Charlie and Thomas used each of the Global strategies. Charlie used maximum the Global strategy “Plan,” using it in each of his 10 sessions. A considerable amount of time involved discussions regarding “understanding the context.” Charlie was observed using it in eight of his sessions and in addressing all of his goals. In the early sessions, Charlie was often difficult to engage and would resort to irrelevant discussions around his own topics of interest. As the sessions progressed, the amount of “off task” behavior decreased. The Global strategy “goal” was observed most in the early sessions, where therapy goals were confirmed and the problem-solving framework was explained. “Check” was observed in only few sessions that involved discussions about progress during the week. Because of the nature of Charlie’s goals, “do” was observed in only three sessions (e.g., roleplaying an angry situation in the playground).

During most of the intervals, Thomas and his therapist spent maximum of the time in “understanding the context” that was used in each of his 10 sessions. This discussion served as a precursor to further discussion about plan use and was relevant to all of his goals. Thomas and the therapist also spent a considerable amount of time typing up his plan on the computer without any further discussion (coded as “none”). Thomas was observed to consistently employ “plan” in each session. Thomas’ goals of being able to make his bed and to use a knife and fork to cut meat were practised in the sessions, and thus a greater percentage of time was allocated to “do” for these tasks. Some degrees of “off task” behavior were observed in most of the sessions. “Check” was observed in only few sessions after he had executed a task, namely, bed making. Similar to Charlie, “goal” was used more in the early sessions.

### ***Domain-Specific Strategy Use***

Charlie used DSS during 42% and Thomas during 33% of the coded segments. These strategies were explicitly used when the participants were talking about their plans, doing the task, and checking if their plans worked. As both children’s goals were mainly social and organizational, there were commonalities in the DSS used. The percentage of intervals that each child utilized these DSS is displayed in Table 3. Of the DSS outlined, Charlie used all except for “body position” and Thomas used all except

TABLE 3. Global Strategies and DSS Use (% of Intervals) for Charlie and Thomas across 10 Sessions

| CO-OP strategies             | Charlie (%) | Thomas (%) |
|------------------------------|-------------|------------|
| Global strategies            |             |            |
| Goal                         | 9.5         | 3.8        |
| Plan                         | 26.0        | 12.5       |
| Do                           | 3.3         | 9.5        |
| Check                        | 7.5         | 5.5        |
| Understanding context        | 25.5        | 42.0       |
| Off task                     | 18.5        | 7.0        |
| None                         | 9.8         | 19.8       |
| Domain-specific strategies   |             |            |
| Transitional support         | 1.2         | 4.5        |
| Affective supports           | 15.4        | 10.6       |
| Motivational supports        | 13.7        | 0          |
| Body position                | 0           | 4.5        |
| Attending                    | 10.1        | 22.0       |
| Task specification           | 52.4        | 33.3       |
| Task modification            | 1.2         | 0.8        |
| Supplementing task knowledge | 6.0         | 24.2       |

“motivational supports”. Table 4 provides examples of how strategies were used for specific goals.

“Task specification” was the most frequently used strategy by both boys (Charlie 52.4%, Thomas 33.3%). This strategy was used in addressing all of their goals. Similarly, the DSS “supplementing task knowledge” was used by both boys for each of their goals. The remainder of the DSS used differed between the children. The DSS “motivational supports” was relevant to Charlie’s two goals, but was not used by Thomas. Both the participants used the DSS “transitional supports” effectively for different goals.

Managing angry situations on the playground was a goal shared by both the children. Both used four common DSS to address this goal: “affective supports,” “attending,” “task specification,” and “supplementing task knowledge.” “Affective supports” was further categorized as follows: (a) “affective avoid,” (b) “affective distract,” and (c) “affective physical.” Figure 1 summarizes the percentage of intervals that each boy used in each of these strategies.

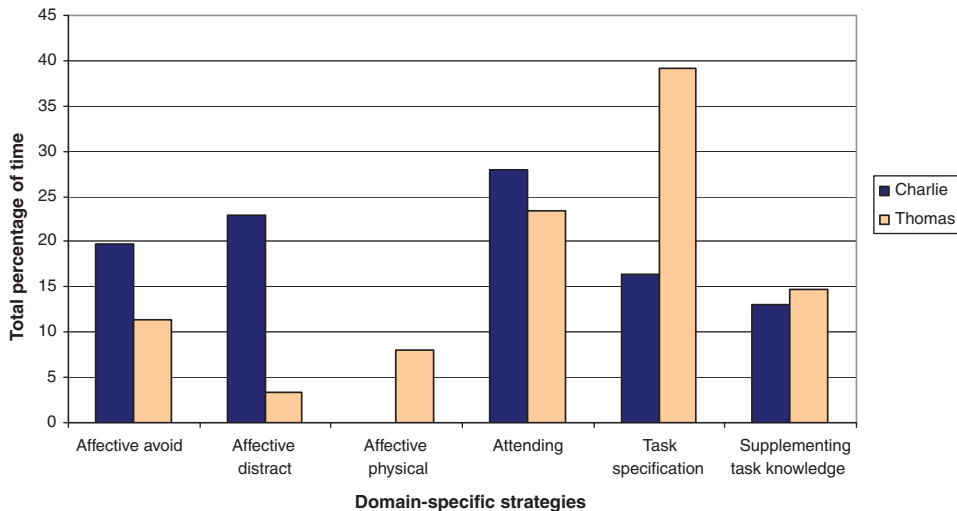
In addressing this goal, Charlie most often (27.9%) used “attending,” which involved conscious thinking about his emotions, feelings, and bodily sensations in emotionally charged situations. He also relied on “affective distract” strategies, such as walking away, and “affective avoid” strategies, such as counting to 10 (23.0% and 19.7%, respectively). Charlie also used “task specification” (16.4%) and “supplementing task knowledge” (13.1%). Examples of these specific strategies are provided in Table 4.

“Task specification,” which was a discussion around the specifics of the task, was the primary strategy employed by Thomas to address this goal (39.1%). The DSS “attending” was also utilized by Thomas on many occasions (23.5%). The therapist also used with Thomas “supplementing task knowledge” 14.7% of the time. He also used all three of the “affective supports” (Table 4).

TABLE 4. Domain-Specific Strategies (DSS) Used by Participants.

| Domain-Specific Strategies   | Relevant goal                                                                                                                                                     | Example of strategy                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transitional support         | Get organized in the morning<br>Get to sleep at night                                                                                                             | A visual chart listing what to do.<br>A visual chart, e.g., in the bathroom to use the toilet before getting into bed.                                                                                                                                                                                                                                                                                                                               |
| Affective supports           | Manage anger on the playground                                                                                                                                    | Affective avoid: walk away from a situation.<br>Affective distract: Count to 10, imagine being somewhere peaceful.<br>Affective physical: punch a bag or kick a ball hard in the yard.                                                                                                                                                                                                                                                               |
| Motivational supports        | Getting organized in the morning<br>Getting homework done                                                                                                         | Having something special for breakfast on a Monday morning.<br>Having a treat at the end of the week if they complete all of their homework.                                                                                                                                                                                                                                                                                                         |
| Body position                | Using knife and fork to cut meat small                                                                                                                            | Positioning the "pointer finger" on the blade and handle.                                                                                                                                                                                                                                                                                                                                                                                            |
| Attending                    | Managing anger on the playground                                                                                                                                  | Encouraging the child to label emotions and to associate different bodily sensations (e.g., breathing rate, heart rate, sweaty palms, tight muscles) with their emotions. Often used in conjunction with anger thermometer.                                                                                                                                                                                                                          |
| Task specification           | Getting organized in the morning<br>Managing anger on the playground<br>Getting homework done<br>Using knife and fork to cut meat small<br>Making bed             | The child lists the sequence that they need to do in order to get ready in the morning and allocates a time for each specific job.<br>Child finds the teacher and tells him/her about the problem.<br>Specifying which subject the child will complete each night.<br>Aiming to cut meat the size of a 20 cent coin.<br>Positioning the bed sheet so that the long end matches length of bed and tucking rest in.                                    |
| Task modification            | Getting homework done<br>Using knife and fork to cut meat small                                                                                                   | Child places stickers next to each correct homework question rather than a check mark.<br>Using a sharper knife.                                                                                                                                                                                                                                                                                                                                     |
| Supplementing task knowledge | Getting organized in the morning<br>Getting homework<br>Managing anger on the playground<br>- Using knife and fork to cut meat small<br>Getting to sleep at night | Teaching child about how getting organized in one context can help with getting organized in other situations.<br>Teaching child about importance of routine, trying to get a bit of homework done each day.<br>Talking to child about social rules and expectation such as not hurting people or property.<br>Explaining to the child that a placemat may prevent his/her mat from slipping.<br>Teaching the child about factors that hinder sleep. |

FIGURE 1. Total percentages of intervals spent in domain-specific strategies by each child to address the goal of managing angry situations on the playground.



### *Type of Guidance During “Do”*

Charlie engaged in “do” during three intervals, twice in role-playing to how to manage angry situations on the playground and once in learning the global framework of GPDC. These instances comprised only 3.3% of the total segments analyzed. Thomas practised his plans in therapy for two of his goals: using a knife and fork, and making his bed. These equated to 7.5% of the total intervals. Both boys used “no guidance” (i.e., neither the therapist nor the child talking about the task while doing the task) for the majority of intervals (Charlie 70.0%, Thomas 63.3%) during doing of tasks. Only Thomas was observed to be using “verbal self-guidance,” whereby he talked himself through various performance sequences of coded occasions (30.0%). For example, when making his bed, Thomas verbalized the first step of his plan to put the sheet on and vocalized the need to find the wider section of the bed sheet first. “Verbal guidance” by the therapist was observed for the remainder of the time (Charlie 30.0%, Thomas 6.7%).

### *Dimension of Time on Task*

Regardless of the goal, each child spent the majority of his time in “talking about the task” (Charlie 86.4%, Thomas 66.5%). Given the social and organizational nature of the goals and the verbal emphasis inherent in CO-OP, this result was anticipated. This high percentage of time spent in “talking about the task” was also consistent with the pattern of Global strategy use employed by both the participants. For both Charlie and Thomas, the combination of these Global strategies accounted for more than 50% of the treatment time. “Preparation/other” was assigned when the child was in the Global strategy “none.” Charlie spent 11.5% and Thomas spent 25.3% in “preparation/other.” The duration of the time spent practising the task was minimal for both the participants. Hence, “dual tasking,” which involved simultaneous talking about the task while practising, was rare.

## DISCUSSION

Each child was engaged in the CO-OP sessions in a slightly different manner. Charlie's limited attention span impacted his ability to engage in goal-directed discussions and to maintain focus on plan development and implementation. The presence of inattention meant a greater percentage of therapist's time spent in redirecting him. Thomas engaged in more open-ended conversations with the therapist about how he responded to different situations during the week. As computer-based interventions enhanced social and emotional understandings for children with AS (Silver & Oakes, 2001), both participants used word processing software to write their own plans, reward charts, time logs, and Social Stories® (Gray & White, 2002). Despite the small number of cases, it appears that some Global strategies were more likely to occur at certain stages in acquiring new skills. For example, "goal" was seen predominantly in early sessions, whereas "understanding the context" and "plan" were observed across all the sessions. This use of "goal" in early sessions is consistent with other CO-OP studies with children having Developmental Coordination Disorder (DCD) and AS (Bernie & Rodger, 2004; Rodger & Brandenburg, 2008). It suggests that the goals become implicit to the participants early in the session. In contrast to these studies, the increased time spent in "plan" and "understanding the context" appeared to be unique to this study. This was likely due to the fact that the goals were social and organizational leading to limited opportunity for "doing" during sessions. Despite this, both children improved and mastered their social and organizational skills and furthermore generalized and transferred this learning to home and school environments (Rodger et al., 2008).

For the majority of intervals, no obvious DSS use was observed. DSS use in this study may have been underrated because of the need for strategies to be verbalized or obvious to the observer in order to be coded. The pattern of DSS use appeared to be a complex interaction between the child, the goal, and the therapist guiding the discovery. This finding is consistent with the previous studies that found children used a range of different DSS even for similar goals (Bernie & Rodger, 2004; Ward & Rodger, 2004). The same therapist provided CO-OP in each study; hence, it could be possible that the pattern of DSS usage was related to this therapist. Studies involving larger numbers of therapists are needed to determine the effectiveness of CO-OP for children with AS.

The pattern of use of some of the DSS observed in this study is consistent with the findings from other CO-OP studies. The extensive use of "task specification" strategies has been found in studies of strategy use in children with DCD (Bernie & Rodger, 2004). The frequency of use of "task specification" strategies alludes to some of the underlying everyday challenges of children with AS who are often not aware of the task requirements. The extensive use of "task specification" strategies by both boys is consistent with the notion that children with AS need information about task requirements and desire structure and predictability in routines (Church, Alisanski, & Amanullah, 2000). Furthermore, use of "task specification" suggests that some of the difficulties in social and organizational tasks may stem from a lack of implicit understanding of what steps constitute the task, how to sequence the tasks, or both. "Supplementing task knowledge" was also relevant to both children's goals. A great deal of this discussion revolved around the therapist teaching the child things that they needed to know, such as social rules, to successfully master their goals. This is consistent with the view that children with AS commonly lack the understanding and skills needed to initiate and respond to various social situations (Myles & Simpson, 2002).

Both children used extensively three additional DSS to master their goals: “transitional supports,” “affective supports,” and “motivational supports.” It is unclear if these DSS, identified by Rodger and Brandenburg (2008), are specific to children with AS or whether these strategies might also be used by other children in addressing social and organizational challenges.

Many of the social challenges experienced by Charlie and Thomas parallel those associated with deficits in the “theory of mind” associated with AS. The theory of mind refers to the understanding that other people have separate thoughts and feelings and that these may be different from their own (Attwood, 2007; Baren-Cohen, 1995). These underlying deficits significantly impacted the ability of children with AS to infer the intentions of others (i.e., teasing vs. fighting) and understanding how their own behavior affected others (Myles & Simpson, 2002). Children with AS often violate social boundaries, have trouble keeping their hands to themselves, and become aggressive (Church et al., 2000). Rodger et al. (2008) recognized a consistent need for a specific thinking tool to help children calm down, regain control, or “buy the time” needed to manage emotionally charged situations. Therefore, they expanded on the DSS originally defined by Polatajko and Mandich (2004) to include behavioral strategies referred to as “affective avoid,” “distract,” and “physical.” Both boys used these three “affective supports” to manage angry situations. In addition, the strategy of “attending” was used in a modified manner to the original definition (the child verbalizing a cue to attend to the doing of the task) (Polatajko & Mandich, 2004). Instead, Charlie used the DSS “attending” as he drew and colored pictures of himself and created Social Stories<sup>®</sup> (Gray & White, 2002) to illustrate his attention to his bodily sensations and emotions on the playground, such as “[his] head [was] ready to explode.” Thomas used an anger thermometer as a visual image of being angry or “boiling hot.” This enabled him to attend to and recognize the escalation of his emotions, and to identify when calming strategies were required.

No formal guidance was observed for the majority of the time that children were practicing or executing tasks and this is consistent with the findings from other CO-OP studies (Bernie & Rodger, 2004; Ward & Rodger, 2004). The prominence of child–therapist interactions and only minimal instances of child self- or therapist-guidance is consistent with collaborative problem-solving inherent in CO-OP. The type of verbal guidance used was only coded during the “doing” of the task. However, the majority of the discussion about the specifics of the task was prior to the actual execution of the task and was therefore not coded. The plans and strategies used may have become internalized and the child may have then focused on performing the task in silence. As only a few tasks were executed in this study, no obvious trend in the amount of guidance given was observed. The minimal amount of formal guidance needed during the doing of the task may be attributed to their age (Bernie & Rodger, 2004) or to the fact that children with AS often exhibit strength in rote and eidetic memory (Gillberg, 2002).

### *Limitations*

There were three main limitations of this study. First, results of a case study with two children cannot be generalized. Further investigation, with more children with AS, into how CO-OP is used to achieve their social and organizational goals is recommended. An investigation of whether the DSS identified by Rodger and colleagues (2008) are specific to other children with AS would also be valuable.

Second, the coding system used in this study only allowed one behavior to be coded in each category in a given 15-s interval. If more than one DSS was observed in a 15-s interval, only the predominant behavior/strategy was coded. From a methodology perspective, a comparison between coding using paper-based methods versus continuous on screen coding using software, such as Noldus Observer Software® (Noldus Information Technology, 2003), would be valuable to determine whether the results are different.

Third, the nature of the social and organizational goals meant that their performance was not always possible to simulate in the clinical environment. Hence, there was limited opportunity to observe strategies used outside the clinic during the CO-OP sessions, which focused more on planning and checking progress between sessions. This may have led to under-representation of strategies to master goals. Research that examines use of strategies in natural settings would be valuable.

## CONCLUSION

This pilot study investigated Global strategies and DSS, the type of guidance, and the dimensions of time on task for two children with AS. In practice, therapists can utilize CO-OP with children with AS to assist with acquisition of social and organizational skills. In so doing therapists will benefit from understanding (a) the contexts in which skills are typically acquired, (b) child performance between sessions, and (c) the use of *supplementing task knowledge and transitional, motivational, and affective supports* in facilitating goal achievement and skill acquisition. Based on our preliminary findings, additional research is suggested to further address the utility of CO-OP as well as Global and DSS use by children with AS.

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