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# COMPASS: Finding direction for individuals with autism spectrum disorders

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## Abstract

Successfully meeting the unique behavioral health needs of individuals with autism spectrum disorders (ASD) is often a complex and daunting task for practitioners. Although evidence based practices are now available to facilitate decision-making and goal setting, few interventions have treatment protocols broad enough to span the diverse needs of children with ASD; those that do, rarely extend to outpatient, educational, or other community-based service settings. Examples of community-based approaches that may help facilitate the development of personalized, socially valid and ecologically relevant treatment plans are necessary. The Collaborative Model for Promoting Competence and Success (COMPASS) is an ecological based, systematic, decision-making framework in which specialists work in collaboration with parents, caregivers, and other community-based practitioners and educators to a) identify socially valid and functional skills to teach, b) assess personal and environmental protective and risk factors that influence skill attainment and c) create personalized intervention plans based on effective teaching methods. The purpose of this paper is to describe the COMPASS protocol and apply the framework to two real-case scenarios of children with ASD referred to an outpatient clinic. One example focuses on a child who was referred for aggression; the second example highlights a child who was referred for social skills instruction.

*Keywords:* Autism, social skills, assessment.

## Introduction

Effectively meeting the educational and behavioral health care needs of children, youth, and adults with autism spectrum disorder (ASD) remains a complex and overwhelming task for families and community based agencies responsible for services (1,2). The increased identification of children with autism (3) and subsequent growing number of parents and

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caregivers seeking services (1,4-6) creates a significant research to practice gap (7).

Programs responsible for care must be both accessible and effective. Descriptions of community-based treatment models that are not only broad enough to address the heterogeneous needs of individuals with ASD, but also sensitive enough to address the specific issues of individuals with ASD are lacking. Research has shown that a 'one size fits all' approach to autism treatment has failed (7-9), and that more personalized interventions are necessary (10-12). Although attention to interventions in ASD has increased over the last several years (13), understanding which children benefit best by what approach remains unknown (9,13).

Another challenge is that the degree to which treatment research extends and translates to outpatient or community-based service settings has been questioned (14-16). Preliminary studies show promising results of time-limited (17,18) or community based interventions for young children (19-21).The availability of treatment protocols that have demonstrated broad use within a clinic setting where youth and adults may seek services are lacking (16). Nevertheless, clinicians and practitioners are responsible for providing efficacious services to children, youth, and adults with ASD and must make attempts, themselves, to bridge the research-to-practice gap despite the lack of guidance from translational or effectiveness research (22). Often the case is that empirically supported interventions are modified by practitioners in ways that are feasible for everyday practice in outpatient settings (16,23).

The primary aim of this article is to describe a systematic decision-making and planning approach that helps address the need for more personalized interventions in ASD that can be administered within the outpatient clinical setting. The intervention planning framework focuses on a) intervention targets that are priorities to families and b) the identification of personal and environmental challenges and supports that can hinder or enhance goal attainment. An assessment and treatment planning protocol called the Collaborative Model for Promoting Competence and Success (COMPASS) (24,25) that is based on contributions from ecological, developmental, and behavioral psychological perspectives is described. The approach has been tested in schools (26) and applied in outpatient clinics (27,28). In order to successfully implement the model, however, practitioners need to be knowledgeable of the underlying impairments in ASD as well as evidence based practices. Therefore, a brief review of theories of autism and empirically supported treatment methods is provided, followed by details on COMPASS. Two case examples are presented that demonstrate both the social validity and the practical utility of the COMPASS model while upholding empirically sound practices within an outpatient treatment program. Although the case examples are based on children with ASD, the model lends itself to intervention goal setting and planning for youth and adults.

## Personal challenges

Although individuals with ASD have primary challenges across several areas of development that result in failure or delayed development of critical skills, they also have unique learning styles (7) that are essential for practitioners to understand prior to treatment planning (16). In autism, failure in development begins to take notice in infancy when joint attention or the ability to coordinate attention with a social partner is disrupted (29). Inability in creating self-initiated episodes of joint attention is hypothesized to affect the input and richness of interactive experiences with others and cause interference in development that is thought to be associated with symptoms of autism.

Three cognitive theories offer important information for understanding the differences in social and cognitive thinking and unique learning styles associated with autism: a) theory of mind, b) weak central coherence and c) executive function (7,16,30). Each theory is important to understand because of the possible links that can be made to interventions commonly used for individuals with ASD. The first, theory of mind (TOM), is the ability to understand and attribute meaning of mental states of self and others (31). Difficulty understanding the sources of thoughts, feelings, and behaviors of self and others creates challenges in social problem solving and planful future interactions with others. The second, weak central coherence (WCC), refers to

the tendency to focus on details rather than the overall meaning or global whole (32). Some have suggested that WCC could help explain problems individuals with ASD have in generalizing information from one situation to another (33). The last theory, executive function (EF), is a general term that refers to the abilities to initiate, sustain, shift, and inhibit behavior (34). EF problems can be attributed to difficulties taking in multiple types of information, making decisions quickly based on this information, and evaluating the outcomes of the situation.

Debate ensues over the universality, specificity, and uniqueness of these three theories with regard to autism, and arguments can be made on the overlap or primacy of the theories (30). Nevertheless, they offer helpful frameworks for characterizing many of the personal challenges associated with ASD, and more importantly, planning for interventions. Understanding how these theories can lend themselves to possible corresponding strategies (i.e., environmental supports) that can help compensate for the challenges (7) is essential. If only a behavioral approach is taken for intervention planning, important information that can be associated with cognitive influences goes undetected, resulting in insufficient and ineffective treatment plans (16). Clinicians who are able to understand the relationships between the underlying and accumulative effects of disordered theory of mind, executive function, and central coherence and behavioral symptoms are better prepared to create, adapt, apply, evaluate, and monitor psychosocial interventions for individuals with ASD (16).

## Empirically supported interventions

Empirically supported interventions include comprehensive approaches that target the core impairments in autism (13,35) or specific teaching methods that focus on acquisition of new or discrete skill sets (e.g.,36). Examples of comprehensive programs are the Denver Model (37), Intensive Behavioral Intervention (38), and TEACCH (10). Several sources are available that summarize these and other examples of comprehensive programs and evidence based practices (9,11,13).

Empirically supported intervention methods designed to teach targeted skills are based on single or combined theoretical frameworks such as learning or behavioral theories (e.g.,39), developmental frameworks (e.g.,12), and social cognitive models (e.g.,40). The most studied method is the behavioral model (13). Applied behavior analysis (ABA) is useful for reducing aberrant behaviors, increasing desirable behaviors, and teaching new skills (36). ABA is an operant behavioral approach that targets child responsivity to prompts and cues. Extensive data collection and ongoing monitoring of measured progress are essential elements. Measurement is often based on frequency counts of isolated behaviors. ABA is an umbrella term that can include different methods such as discrete trial training, and more contemporary approaches of incidental teaching (41) and pivotal response training (42) designed to address limitations of discrete trial training (35).

Developmental approaches are child-directed and emphasize child initiation as the primary outcome. Multiple intervention targets are emphasized during a particular activity. Measurement approaches such as videotaping and time sampling are used to free up the adult to engage with the child rather than focus mainly on data collection (12) during teaching interactions.

A third notable approach important for children with autism is structured teaching (10,43). Structured teaching is a departure from the other two predominant paradigms because the methodology incorporates cognitive social learning theory into intervention assessment, planning, and teaching. It is also based on the cognitive strengths and challenges of persons with ASD, and takes into account the role of cognitive influence on behavior.

In their final conclusions of their review of evidence based practices in autism, Rogers and Vismara (14) state that despite a limited number of published randomized controlled studies in early intervention (e.g.,44-48), general results are that as a group, children with autism benefit from interventions that are specialized to their focused needs. They remind readers of the lack of comparative research, and thus, inability to state whether one treatment method is better than another.

There now appears to be a growing consensus and general agreement that one treatment method is

inappropriate for all children or for all skills to be taught. Teaching a child to initiate will be more challenging when using an adult-directed responsive-focused intervention compared to a child-directed teaching approach; conversely, selecting a child-directed initiation-focused approach to teach a child to complete a novel task from start to finish is incongruous with the aims of the teaching outcome, and thus, an adult initiated discrete trial and / or structured teaching approach makes more sense. It is possible that each of the distinct methodologies based on behaviorism, developmental , or social cognitive approaches, when combined in a systematic fashion, may produce the best child outcomes. However, due to a lack of research, it is not known if an integrated approach using systematic, comprehensive, and intensive methods is better than a single treatment method approach. It stands to reason, though, that the selection of teaching methods when matched with both (a) the skill that is targeted for teaching and (b) the specific learning profile based on child strengths and challenges provides a unique opportunity for the development of exceptionally personalized intervention plans.

## Compass model

Given the necessity to consider the child's personal strengths and challenges as well as the environment in which the child learns and lives, a systematic decision-making and collaborative planning process is described. The Collaborative Model for Promoting Competence and Success (COMPASS) (25,26) is a comprehensive planning approach that allows for the inclusion of the efficacious techniques described above. In this decision-making model, practitioners work in collaboration with parents and caregivers to identify socially valid and important skills to teach. Challenges to learning, such as personal and environmental risk factors, as well as the essential personal and environmental supports required for achievement and learning are reviewed (see figure 1). Personal risk factors refer to the difficulties inherent to the characteristics of autism and set the stage for learning challenges, whereas environmental risk factors are those that inhibit success and may be more amenable to direct change (e.g. parents who may lack sufficient understanding of autism, lack of alternative communication methods, lack of routines, etc.). Conversely, supports are characterized as personal strengths and preferences of individuals with autism, and as environmental modifications and adaptations to compensate for challenges and risk factors. Numerous studies have lent support to the favorable impact that appropriate personal and environmental supports provide (e.g.,49-51).The COMPASS model incorporates these factors with behavioral, cognitive, developmental, and social learning techniques to enhance the skills of both children and those living or working with them (e.g., caregivers and teachers). Two case examples are provided. Both examples are based on real concerns presented by children seen in an outpatient medical setting.

## Case story one (Karl)

*Background.* Karl was a 9 year old boy who was diagnosed with autism at the age of three years by an experienced developmental behavioral pediatrician. At the time of the evaluation in 2006, Karl had non verbal (pragmatic) language deficits, his vocabulary score was below an age equivalent of 6 years 2 months. His full scale IQ on the Wechsler Abbreviated Scale of Intelligence was 83 (13th percentile); a nonverbal IQ scores using the Test of Nonverbal Intelligence, Third Edition (TONI-3), revealed a quotient of 97 (42nd percentile). His parents brought him to the university-based outpatient autism intervention program with a number of concerns related to behavioral and social difficulties.

*Assessment.* The COMPASS (25) framework served as the initial organizing approach. Karl's parents were informed that the purpose of COMPASS was to assist in the identification of interpersonal strengths and weakness as well as environmental supports and challenges that compound or impact upon Karl's ability to be resilient in his environment. The assessment revealed the following information in Table 1. Information revealed a number of personal challenges, many characteristic of children with autism, but also a number of personal strengths. Most notable was Karl's desire to make friends with other children as well as please others.

**Table 1. Karl's COMPASS Assessment**

| *Personal Challenges* | *Personal Supports* |
|---|---|
| **Behavioral**<br>• **Impulsive**<br>• **Low frustration tolerance**<br>• **Perfectionistic tendencies**<br>• **Unusual mannerisms such as hand flapping**<br>**Social**<br>• **Problems initiating and maintaining interactions**<br>• **Problems with perspective taking**<br>• **Low social reciprocity**<br>**Emotional**<br>• **Worries over many things, currently thunderstorms and tornadoes.**<br>• **Inability to expressing worries appropriately**<br>**Sensory**<br>• **Problems with being overwhelmed by sounds/crowds** | • **Is good at sciences and math**<br>• **Likes video games, animals and going on adventures.**<br>• **Affectionate**<br>• **Wants to hang out with peers and have friends**<br>• **Very observant**<br>• **Likes to do chores and help**<br>• **Motivated to have important roles such as "helper"**<br>• **Visual learner**<br>• **Likes to draw** |
| *Environmental Challenges* | *Environmental Supports* |
| • **Lack of appropriate services**<br>• **Lack of supportive peers**<br>• **Environments with a lot of extraneous stimuli such as lights, sounds and crowds**<br>• **Thunderstorms and tornadoes or threats of storms** | • **Speech language services in school**<br>• **Behavior intervention in school**<br>• **Parents as strong advocates** |

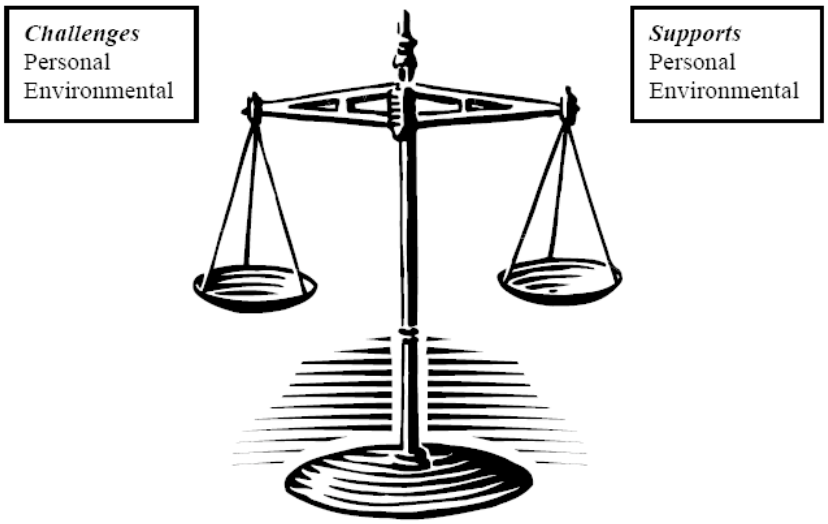


Figure 1. COMPASS Model.

In addition, important environmental challenges were also identified that included a lack of a supportive peer group and trained personnel at his school. To help counterbalance these challenges, environmental supports revealed that his parents are strong advocates, that with knowledge and training, could transfer information and skills taught during the therapy sessions to the school setting. It was clear that

in order for this to happen, a generalization plan was essential.

## Background information

*Parent/Teacher priorities*. Karl's mom reported that her major concerns were Karl's personal challenges in initiating with others appropriately and maintaining reciprocal interactions. He often holds back and plays alongside his peers because he does not know how to approach them and ask to join in play. She was becoming increasingly worried about his social isolation and lack of friendships. A second concern was his increasing fear of thunderstorms and tornadoes. Initially Karl would express worry and fear when a tornado siren went off, running off to the basement and hiding; now he was doing the same behavior if he thought a thunderstorm was approaching or observed clouds darkening the sky. These behaviors were often disruptive in school and at home. He had stopped accompanying the family to parks or other recreational activities for fear that a thunderstorm may befall them.

His teacher reported that Karl has trouble working in groups and engaging with his peers. He was often observed to play alongside his peers. She also expressed concerns regarding Karl's perfectionistic tendencies. Overall, both Karl's parent and teacher agreed that their concerns were Karl's social interaction skills with peers and worries and preoccupations with the weather.

## Child assessment

*Assessment of social skills*: Because the primary concerns focused on social issues, the TRIAD social skills assessment (52) was administered to help identify specific social targets for intervention. The assessment is a criterion-referenced evaluation of three major components of social skills: a) affective understanding and expression of emotions, b) cognitive understanding of perspective taking and problem solving skills and c) behavioral skills of initiating, maintaining and terminating interactions as well as responding to the social bids from others.

Affective understanding and perspective taking: Karl was shown several pictures of children's faces and given various pictorial scenarios that contained a problem involving two or more children. When shown the pictures, Karl was able to accurately identify the emotions on the children's faces and relate a time when he might have experienced the emotion. When asked what would make a significant other (i.e., a specific family member) experience the similar emotion, responses were often "I don't know." When shown pictures of problem situations, Karl was able to identify the problems, but had difficulty generating plausible solutions to solve the problems. Overall, he displayed challenges in taking another's perspective.

*Preferred activities:* To obtain information on Karl's social motivation (i.e., interest in interacting with other children), Karl was presented a list of activities and then asked to rate his preference in performing preferred activities with friends vs. family vs. by himself. This task involved presenting Karl with a worksheet of a list of "things to do" and "places to go" and asking him to rate how much he likes each one by circling a number that corresponded to a scale (i.e., not at all; a little; a lot). Overall, Karl reported he liked to play on a playground, play video games, play on the computer, play with toys, build things with legos or blocks, draw or paint pictures, cook or bake, and watch television or videos very much. Of these activities, he preferred to do most alone, except for playing on the playground and building things with legos and blocks, which he indicated a preference for doing with other kids. Overall, Karl appeared to be hesitant to be involved with other kids while completing preferred activities. But activities that would keep Karl's interest were identified and could be used as environmental supports.

*Role play skills*: Karl's ability to understand and perform role-plays was assessed. He was asked to interact with the examiner in role plays that dealt with possible daily situations. During the role plays, Karl demonstrated difficulties initiating appropriately. For example, he often avoided greetings and started a conversation with a direct request or comment that he had on his mind. Very soon into the role-play conversation, Karl terminated the interaction and requested to go to the toilet. He conversed with a

monotone voice quality and facial expressions were restricted; eye contact was diminished during the entire interaction.

*Treatment goals:* The COMPASS and Triad Social Skills Assessment revealed and clarified two major areas of concern: a) initiating appropriately and maintaining reciprocal interactions with peers and adults and b) managing his anxiety regarding the weather without interruption of daily activities. These two goals were targeted in a treatment plan.

## *Treatment plan*

Initiating appropriately and maintaining reciprocal interactions with peers and adults: Initiating with others involves several types of skills. For Karl's therapy plan, initiating a variety of requests with peers, giving complements, and having conversations were taught. For each of these skills, a four step procedure was used to develop the components of the intervention plan (see Table 2;16,23). First, a Social Story™ (53-55) was used to introduce the importance of the skill from another's perspective and address Karl's personal challenges in theory of mind and weak central coherence that might be related to understanding and teaching the skill. Social Stories™ provide written information that describes situations, other's perspectives about the situation, skill, and responses, and why the skill is relevant to Karl. Next, other activities were implemented that tapped into Karl's relative strength in visual vs auditory learning. First, an activity that depicts the positive skill in a concrete and visual manner was introduced. Often this is a sorting activity that breaks down the skill into its component parts. Also depicted is the correct vs. incorrect way to perform the skill; the use of picture cards (e.g., pictures from magazines, hand drawings on 3x5 cards) helps children develop a concrete depiction of the positive skill being taught (56). Third, role-plays were used to practice the skill and show a visual model of the skill. Actual situations that the child has encountered are used as part of the role-plays as much as possible. This information typically comes from parents and family members. Fourth, homework was provided to enhance the likelihood that the skill would generalize to settings outside the clinic. If parents, caregivers, or significant others are not part of the treatment session, either through observation or as part of family therapy, it is necessary that as much information as possible be shared with them. Due to the significant issues in individuals with ASD generalizing information from one context to another, it is necessary that plans for generalization such as homework and family communication about the session be in place.

For Karl, the first step of applying a social story for facilitating his understanding of the importance of initiating with other children focused specifically on initiating to give a greeting, join peers, and ask for help so that he could begin to have more friends. The concept of "social circles" was used to identify different people he encounters and the appropriate greetings that correspond to this person. Karl matched scripts of examples of specific types of greetings provided on 3x5 cards to a list of a variety of adults and peers he knew in his environment (e.g., classmates, parents, other family members, grocery clerk, teachers, neighbors, postman). Other scripts that could be used for initiating in a number of different contexts were also generated and taught, such as asking to join classmates at play, asking another classmate to join in play, offering to share toys or snacks, and offering to help. Visuals depicting the appropriate body language to use were taught to emphasize eye contact, facial expressions, posture and proximity to others. Special attention was given regarding Karl's voice intonation. The right way to initiate vs. the wrong way to initiate was also modeled for Karl. After observing the role-play, he then identified the characteristics that make up good initiations and described why this had a better consequence than examples of poor initiations. The Social Skills Picture book (57) was an excellent resource that was used to give Karl step-by-step instructions on how to successfully initiate within different contexts. Several opportunities to practice using role plays with a therapist and then peers within a group setting gave him more confidence to practice in real world settings. Each role play was followed by feedback. Different scenarios were also modeled for Karl when an attempt to initiate to play with another peer was rejected, such as asking another child to play and the child refused.

Karl was also taught compliments. Emphasis was placed on focusing on the "other." He also was taught

the various types of compliments he could pay others regarding their appearance, their personality, or how they do things. Various examples were demonstrated to Karl regarding these different compliments.

**Table 2. Four step procedure for skills teaching**

| |
|---|
| **1. Define the skill and explain why it is important** |
| **2. Demonstrate what the skill looks like (the right way vs the wrong way)** |
| **3. Perform role plays demonstrating the skill** |
| **4. Provide homework to practice the skill** |

Karl practiced complimenting with the therapist, and completed homework for practice in other settings. Naturally occurring reinforcers, such as his mom's responses to his compliments, further strengthened his resolve to compliment his peers in his neighborhood. Sorting compliments into categories were used to teach the difference between warm messages (compliments) or cold messages (insensitive/mean comments).

Karl was then taught how to have a conversation once he could join a group of peers at play. First, he was taught to approach them, wait for a pause, get their attention, give them a compliment or a warm message and then ask to join in play. Role plays used with Karl to teach the different steps, as well as how he could respond to different responses from his peers, such as when he was refused. Karl understood that refusals from peers were okay, and that they did not mean that he was disliked; he just had to keep trying. Karl was taught to show interest in other's topics or objects of interest and encouraged to ask appropriate "Wh" questions or make appropriate comments to further the interaction. He was also taught the two question rule (58). This rule emphasized "asking the same question back." If someone asked Karl about his weekend, he could respond to the question and then ask the same question back. Visuals and modeling was used to demonstrate to Karl what active listening looked like, which involved making eye contact, nodding, asking questions and making comments while the other person was speaking.

All 12 therapy sessions were observed by Karl's parents. Verbal praise and other material rewards were used to encourage appropriate responses and modeled for his parents. They played a major role in helping Karl carry over his treatment plan to naturalistic settings, giving him opportunities to practice in real life settings and making sure his teachers were aware of the strategies in place so they could help implement them and reinforce accordingly at school.

Managing anxiety and avoidance. The second area of focus for Karl involved coping with his fears. A cognitive behavioral treatment approach (CBT) was used with Karl to decrease his anxiety and increase social participation in outdoor activities and with his family. The CBT protocol based on Kendall (59) was used which provided a general framework for Karl's treatment; however, strategies from other authors were also incorporated into the treatment package (60). Specific modifications were made to the treatment outline to make it more applicable for children with autism, using the four-step procedure outlined in Table 2. However, due to the cognitive aspects of his fear of thunderstorms, the first several activities focused on identifying cognitive attributions and competing responses (helpful cognitions, relaxation strategies, and use of systematic relaxation).

To accomplish these goals, the first step involved using a social story to help Karl develop an awareness of his anxiety and the consequences of it on himself (his behaviors and his emotions) and others. A sorting task was used to help Karl identify his environmental triggers, his physical (internal) responses, his cognitions, and his behavioral (observable) responses. Karl was quite artistic and began to draw his fears/environmental triggers. He began to label these triggers as "monsters" who were trying to fight him. He was quite resolute in that he did not want to be a "scaredy cat" but wanted to be a "cool guy" and was determined to fight these fear monsters.

Karl was then taught a relaxation technique involving progressive muscle relaxation and visual imagery. Initially he required prompting to practice followed by tangible reward or praise. He learned to practice this technique on a daily basis and found that relaxing his body calmed him down.

The next step involved teaching Karl to discriminate between his "Helpful" thoughts and his "Unhelpful" thoughts. Thoughts that expected bad things to happen when a storm was on its way vs

thoughts that helped him calm down and expected him to be safe were listed. He was taught to challenge the unhelpful thoughts and replace them with helpful ones instead that would lead to more success and most importantly for Karl, be a "cool guy." Karl even drew the weapons he would use to tackle his "worry monsters."

Next, Karl created a stress hierarchy using a visual stress thermometer (61; Figure 2). He identified those activities that helped him be calm, such as art, and then he gradually identified stressful events that evolved into fear and avoidance. The lowest item (and most stressful) involved forecast of bad weather, followed by thunder clouds, heavy rain, thunder, lightening and so on. Parent interview also confirmed the order on the stress hierarchy. This set the stage for graduated exposure and parent training.

Karl's parents were counseled on how to respond to Karl's preoccupations and obsessions of the weather by reassuring him once and then redirecting him to the task. They had a specific 15 minute time period once a day called "worry time" to address his fears. Parents encouraged Karl to participate in activities involving the outdoors even when there was a forecast of rain. These activities were always paired with highly reinforcing items or activities for Karl, such as eating his favorite snacks on the trip and being chosen as mom's special "helper" with assisting his little brother. After the rain, he was encouraged to play in the puddles with his little brother. Karl was reinforced and praised every time he participated on an item identified on his stress thermometer (see Figure 2).

### *Six month follow up*

Goal attainment scaling (GAS; 62) was used to track Karl's progress. GAS is based on a 5-point scale ranging from -2 to + 2. Current symptoms and presenting concerns are rated at zero, a worsening of symptoms receive a progressive negative score downward to -2 and improvements get a positive score up to +2. After 12, 60-minute therapy session, Karl's parents rated his ability to initiate and have reciprocal interactions with his peers at a +1, indicating much improvement by almost 50% in terms of frequency of initiating and interacting in a reciprocal manner. Likewise improvements were also observed by his teacher.

A rating of +2 was obtained on his ability to handle his anxiety regarding storms and ability to continue daily activities in an uninterrupted manner. Associated fears with storms essentially disappeared. However, he had developed some fears around hand sanitizers, insisting at school to use soap and water to wash his hands when the sanitizer was available. Parents were using the same strategies to help Karl overcome this anxiety as they had regarding storms.

## Case story two (Brad)

Brad was a 10-year old male with a diagnosis of autism received at age 7 years from a licensed clinical psychologist of a local area pediatric clinic. He presented with a number of behavioral and social difficulties. A review of previous assessments indicated that Brad's expressive and receptive language skills were in the mild to moderate range of impairment, and his cognitive abilities as assessed on the Kaufman Brief Intelligence Test-II resulted in an IQ composite of 75 which is below average according to the Kaufman classification system. Brad was able to express his needs and wants in single words and phrases, and was often difficult to understand due to his articulation difficulties. His adaptive abilities as measured on the Vineland Adaptive behavior Scales indicated low to moderately low functioning in the communication, daily living, socialization and motor domains.

### *Assessment*

The ecological and whole-child approach to assessment was once again applied using the COMPASS framework. A summary of Brad's personal and environmental supports and challenges revealed the following in Table 3. While several personal challenges were identified, it was also revealed that Brad had many strengths to be included in a treatment plan. He understands work-reward routines, wants to please others, and likes to earn rewards. Also revealed were notable environmental challenges that would need to be considered in a

treatment plan. Environmental challenges included a lack of routine and structure at home, unlimited access to preferred items (that could be used a rewards for positive behavior), and changes in home routines due to his father being away on military leave.

**Table 3. Brad's COMPASS Assessment**

| ***Personal Challenges*** | ***Personal Supports*** |
|---|---|
| • **Low frustration tolerance**<br>• **Expressive and receptive language difficulties**<br>• **Problems listening and following directions**<br>• **Problems transitioning from one activity to the next**<br>• **Restricted interests**<br>• **Soils self**<br>• **Inability to self soothe** | • **Understands concept of working for a reward**<br>• **Understands concept of finished**<br>• **Likes to play with other children**<br>• **Likes to play videogames**<br>• **Likes to earn rewards and praise**<br>• **Can be affectionate**<br>• **Strong visual learning skills (compared to receptive language or listening skills)** |
| ***Environmental Challenges*** | ***Environmental Supports*** |
| • **Single parent since dad is outside the country on military duty**<br>• **Lack of structure in the home environment**<br>• **Unrestrained access to play materials.** | • **A therapist working on behavioral difficulties**<br>• **Mom who is seeking help for self and Brad and is attending a support group**<br>• **An Individualized Education Plan (IEP) and receives speech language services at school** |

Environmental supports that were in place at the time of the assessment were involvement of a behavior specialist, school support through an Individual Education plan, and his mother's pursuit of additional support for herself and her son. Identification of these environmental supports indicated that plans for collaboration with the behavior specialist, who is working with Brad at school, be included in his treatment plan as well as discussion with his mother about her own coping strategies and ways to enhance her support and sense of parental competency.

## Presenting concerns

Brad's mom was mainly concerned about tantrums and aggression that consisted of Brad throwing himself on the floor, destroying property, and hitting others. She was concerned about his safety and the safety of her other children at home during these episodes. Tantrums lasted from 15 to 20 minutes, and left both Brad and mom exhausted. She was also concerned about Brad soiling himself on a regular basis. He had both urinary and bowel accidents, although he had been fully toilet trained by age five. Consults with the pediatrician did not indicate any medical causes of the problem.

Brad's teacher, on the other hand, reported concerns about Brad's difficulties with transitioning from one activity to the next, especially when it involved transitions from a preferred activity to a nonpreferred activity. Bowel and urinary accidents also took place in school.

## Child assessment

The child assessment consisted of a semi-structured, interactive, activity-based evaluation of several aspects of social and communication development that included how well Brad initiated and responded to social bids, took turns, and made requests. With regard to Brad's communication, he spoke in short sentences and simple phrases. He was often difficult to understand due to his articulation difficulties. As soon as work tasks were presented (e.g., puzzles), Brad began to protest, saying "No", and pushed the materials away; however, when he was shown a visual

prompt demonstrating "first work" then "reward," he became more compliant. Brad followed directives and transitioned through a series of activities using a visual picture schedule and a work and reward visual prompt. When presented with an activity designed to elicit requesting (e.g., during a puzzle activity, a piece of the puzzle is withheld by the examiner), he did not ask directly for the missing piece, but looked concerned and mentioned the name of the piece. He responded to questions, but was unable to have a reciprocal conversation or initiate conversation. Brad was observed to use trial and error to arrive at right solutions, he demonstrated understanding of the concept of "finished" and "working for a reward'. He did have difficulty with waiting and became whiny when awaiting his turn to play.

Due to parental concerns focusing primarily on noncompliance and aggression, a functional assessment of the problematic behaviors was conducted (63). Over a two-week time period, Brad's mom and teacher recorded the frequency of each of three identified problematic behaviors (soiling, tantrumming, and noncompliance with transitions) and times during the day when these behaviors occurred. His mom and teacher also recorded the antecedents (what happened before the behavior) and consequences (what happened after the behavior or how the behavior was responded to). From this descriptive behavior analysis, the following information was determined and is listed in Table 4. Brad's mother reported that soiling and tantrumming occurred about equal frequency each day (one to three times) and problems transitioning more frequently, about three to five times daily. Analysis of possible functions of the behaviors indicated that soiling may be related to transitions and not wanting to stop a preferred activity. Tantrums often occurred when told no or restricted from a desired activity.

Even though problems transitioning occurred more frequently at home and at school, it was important for Brad's mom to address the other behaviors first, and she identified tantrums and soiling as her major concerns she wanted to be addressed immediately. To begin, a specific behavioral objective was identified for tantrumming: Brad will comply with directives and respond to "no" appropriately with a 50 % decrease in tantrumming behavior (and 50% increase in compliance). After the objective was established, a collaborative teaching plan was developed with input from the other behavior therapist that he was seeing as well as from Brad's mother.

## *Intervention plan*

The comprehensive intervention plan involved several components and, like Karl's plan, was based on a cognitive behavioral framework (64). It included a didactic component that addressed Brad's comprehension of his emotions and how to express them appropriately using a number of positive behavior supports including visuals and social stories. It included a differential reinforcement strategy that specifically acknowledged positive alternatives to the negative behavior, thereby enhancing and strengthening desired behaviors. Finally a generalization plan from the clinical environment into Brad's home and school environments was created and implemented. Parent support through training from modeling, corrective feedback, and rehearsal was provided to help with generalization.

To address his understanding of the problem behaviors, a social story was introduced, delineating the essentials of why it was important to stay calm and how to respond when frustrated or upset, by asking for a break, asking for help or using a strategy to calm down (e.g., breathing and counting). Visuals were created that prompted him to request these alternatives, such as an "I want a break" card and a "I need help" card. He was taught to use a 5- point scale (65) visual to help him understand how his emotions could escalate from being calm to losing control (Figure 3). The visual also addressed the environmental triggers, body responses and associated "angry" thoughts. Sorting activities were used to enhance his awareness of these different triggers that contributed to his behaviors. Brad was also taught a relaxation strategy, to breathe and count using a "count down" visual that was created by the therapist and involved a laminated card with numbers one to 10 and finally asking in written form "Am I calm?"

The next step involved teaching Brad how to use these supports effectively within the clinic setting. The assessment had indicated that Brad had worked well transitioning through different activities using a

visual schedule. Similar schedules were created using pictures from software programs such as Mayer-Johnson's Board-maker software or online from Google images.

**Table 4. Analysis of Brad's Behavior**

| Behavior | Frequency | What might the behavior communicate? |
|---|---|---|
| **Soiling (urinary/bowel accidents)** | **About 1 to 3 times a day both at home and at school, more frequently at home than at school** | **Tends to occur when Brad is too involved or preoccupied with his games or activities of high interest. May indicate difficulty halting or terminating an activity to take a bathroom break.** |
| **Tantrums (hitting others, destroying of property, screaming)** | **About 1 to 3 times a day; mostly at home** | **Most often tends to occur when a demand is placed on him; when he is told "no" or is asked to "wait."** |
| **Noncompliance with transitions (whining, saying no, pulling away)** | **3 to 5 times a day; both at home and in school** | **Tends to occur when Brad is asked to terminate an existing activity and move on to the next activity, especially if he is transitioning to a less preferred activity.** |

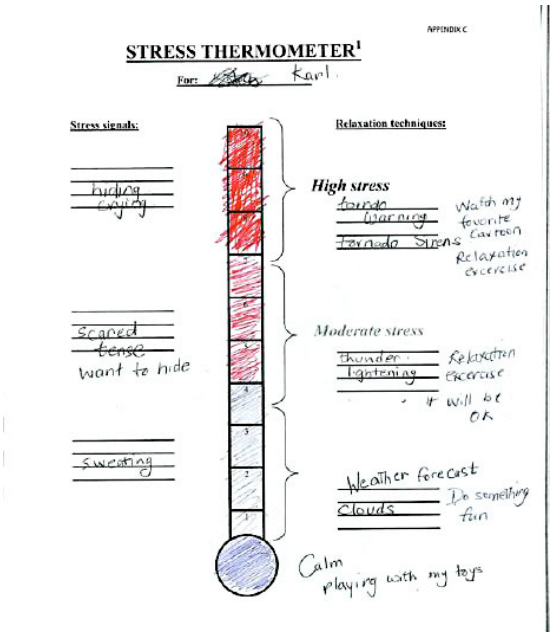


Figure 2. Stress Thermometer.

The schedule indicated when certain activities would take place and what would come next giving Brad a certain predictability about the activities of the day as well as highlighting how much work needed to be done before reinforcement (i.e., play) could occur. During tasks that were difficult, an "I need help" visual was strategically positioned on his desk that prompted him to ask for help rather than getting frustrated and having a tantrum. Soon a communication board was created that had visuals that could prompt him to "wait', "take turns," "ask for a break," or "ask for help." Every time Brad used these visuals, he was reinforced and praised for his appropriate behaviors.

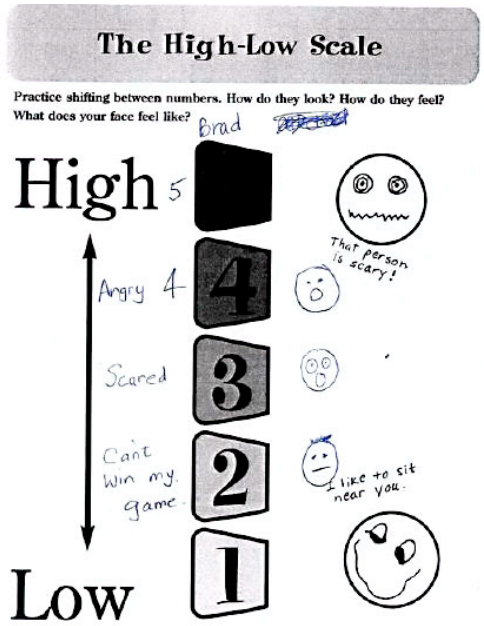


Figure 3. Emotion Scale.

Play activities that involved turn taking and waiting (to help him manage frustration) were used to teach Brad to learn to wait for his turn while playing a game or awaiting his turn to play with a favorite toy.

A reward system was introduced that involved a system of earning tokens. Each 50-minute therapy session was divided into five segments and at the end of each segment, Brad was asked to self monitor his behavior with regard to listening and staying calm. If he correctly indicated that he has been doing both positive behaviors, he earned a token. After he had earned five tokens, he could exchange the tokens for a reward.

Next came the generalization component. Brad's mom had been observing each session through a one-way mirror in the clinic. Once Brad had learned to use the supports effectively with the therapist, his mother was encouraged to use them with Brad during the session. A second set of visuals were created for mom to use at home. Practice during sessions with the therapist enabled her to use the visuals and reinforcement systems with slight adaptations for home. His mom also shared the teaching plan with Brad's teacher and behavior therapist. Visual schedules were incorporated during his day at school to facilitate transitions.

The second concern around toileting accidents was addressed through use of a visual schedule that incorporated toilet breaks on an hourly basis. At home, where these accidents mostly occurred, a timer was set to prompt Brad to use the toilet on an hourly basis. Brad was not allowed to continue with the activity unless he had taken the toilet break as indicated by the timer. This required supervision from mom initially; she was taught to use a firm, clear directive. If this directive was not followed, then she would withdraw the activity from Brad until the directive was followed. She was also instructed to state the directive in the positive, remain calm, and ignore his tantrumming. As soon as he had followed the directive, he could be rewarded with being able to resume his activity. Brad's mom also was instructed that as soon as the behavior plan was implemented, she could expect some worsening of his behaviors and was advised to continue with the plan despite the exacerbations.

### *Six month follow up*

At the end of six months and the completion of eight 60-minute therapy sessions, GAS was used to determine Brad's progress. Mom rated his tantrumming behaviors at a +1 (from a scale of -2 to +2). Tantrums still occurred, but with about 70% less frequency and intensity compared to baseline. With regard to his toileting behaviors, she rated him with a +2 as there were no further incidents of soiling once the intervention plan had been implemented.

## Conclusions

In conclusion, both case studies represent a comprehensive approach to assessment and treatment planning. A thorough understanding of the child's strengths and challenges within the broader ecological framework of COMPASS provides the essential ingredients in conceptualizing a socially valid and personalized treatment plan. Changes in behavior cannot occur in isolation. Concurrent with teaching, skill building, and use of necessary behavior supports is also the *process* by which environments are created that are conducive in sustaining and fortifying the strengths of children and families.

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