Enhancing Self-regulation in Children with Autism

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Keywords: autism, self-regulation, executive functions, self-awareness, resilience

Self-regulation is the ability to purposefully direct your body, thinking and emotions in healthy and situationally-appropriate ways. Teaching children to self-regulate can establish a foundation for learning (1); that is, they can more readily translate their thinking, ideas and intentions into actions and demonstrations of learning.

Self-regulation in children with autism

The International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) (2) describes autism as:

A type of pervasive developmental disorder that is defined by: (a) the presence of abnormal or impaired development that is manifest before the age of three years, and (b) the characteristic type of abnormal functioning in all the three areas of psychopathology: reciprocal social interaction, communication, and restricted, stereotyped, repetitive behaviour. In addition to these specific diagnostic features, a range of other nonspecific problems are common, such as phobias, sleeping and eating disturbances, temper tantrums, and (self-directed) aggression.

These characteristics indicate that autism includes delays as well as significant dysregulation of behavior, thinking and emotions. Social behavior and communication skills require self-regulation to ensure the necessary flexibility and finesse. The child with autism does not easily adjust to different people and situations. He becomes over-focused or ‘stuck’ on some words, phrases, movements, routines and objects or topics and cannot readily move on. He has difficulty stopping himself from doing and thinking about some things and in planning and organizing different ways of dealing with the world and people around him. He has difficulty inhibiting some thoughts or actions, monitor changes and then adjust according to those changes.

Weak self-regulation skills are reflected in the poor outcomes for adults with autism (3, 4, 5, 6). Only a minority lives independently or semi-independently, few complete schooling and most are unemployed and without friends. A majority exhibit behavior and mental health issues. Three main reasons for these failures include (7) (a) difficulty regulating, modulating and coping with the demands of community settings, (b) problems planning, organizing and executing goal-directed activities and (c) lack of self-advocacy skills.

Difficulties with self-regulation may not explain all of the characteristics and behaviors of people with autism but well-developed self-regulation skills can have a positive impact on their academic performance (8) and participation in school (9). Children with disabilities who develop stronger self-regulation also become more independent (10), exhibit more goal-oriented behavior (11) and greater self-confidence (12). They transition more successfully after
graduating from school (13), find and hold onto a job more easily (14) and are more likely to complete post-secondary education (15).

**How to approach teaching self-regulation**

The *Self-regulation Program of Awareness and Resilience in Kids (spark*)* (16) was developed to address the high levels of dependence that continue in many people with autism (17, 18, 19). This lack of independence and self-regulation creates challenges in school. In a survey of over 700 school personnel serving students with disabilities, results indicated that disabilities, including autism, spend more than 86% of their day with a paraprofessional within 3 feet of them (20). Excessive adult can be detrimental to developing independence and self-regulation (21) at school and later in life.

Self-regulation involves learning how to consciously control executive functions. Executive functions are the “brain circuits that prioritize, integrate, and regulate other cognitive functions (22). Children with autism exhibit many features that suggest difficulty with self-regulation. Executive dysfunction is “one of the most consistently replicated cognitive deficits in individuals with autism spectrum disorders” (23). They are the key to turning thoughts into action. Five executive functions centrally important to self-regulation are:

a) **Planning and organization.** These involve looking ahead at what you intend to do and forming a plan of action. Your perceptions, thoughts, intentions and actions must be organized and integrated into a coherent plan to accomplish your goal.

b) **Inhibitory control.** This allows you to direct your attention and actions even in the presence of temptations and distractions. It helps you override external stimuli, your emotions and habitual ways of doing things and allows you to suppress irrelevant thoughts and actions that may interfere with achieving your goal.

c) **Working memory.** In order to reach a goal, you need to hold information in your mind long enough to generate and follow goals, plans and steps. Working memory makes it possible to remember instructions, consider alternatives, multi-task and relate the present to future possibilities and/or past experiences.

d) **Self-monitoring.** This is the ability to supervise your actions and thoughts to make sure they continue to be directed toward your goal. You can compare what you’re doing to a standard or to expectations and recognize the need for self-correction.

e) **Cognitive flexibility.** This is the ability to move from one situation or activity to another or shift to a different thought, a different action or perspective to coincide with changes in the context. This is a particular area of difficulty for people with autism (24).

At the present time, intervention programs and approaches focus on ‘doing to’ or ‘doing for’ children with autism. By ‘doing to’, I mean they direct the children to act and behave in certain ways (e.g. more behaviorally oriented approaches). ‘Doing for’ refers to systems for arranging the child’s environments so he can respond more readily (e.g. visual supports). These approaches are important parts of intervention and education for most children with autism but they cannot stop there. While the ‘doing to’ and ‘doing for’ intervention approaches have been quite effective at promoting skill acquisition, few interventions also take into account the development of independent functioning (25). In order to advance self-regulation and subsequent independence, children must be helped to ‘do with’ an adult while promoting ‘do it yourself’. Some key features incorporated into *spark* that work toward ‘do it yourself’ include:

- Develop behavioral self-regulation and self-calming strategies before working on cognitive self-regulation
• Solidifying behavioral and cognitive self-regulation before working on emotional self-regulation
• Helping each child understand that he is capable of regulating his behavior, thinking and emotions – the Awareness of Ability stage
• Working specifically and explicitly on generalization of each skill and strategy across multiple settings (home, school and community) – the Awareness of Need stage
• Building resilience so that the child can cope and use his skills and strategies even in challenging situations – the Resilience stage
• Teaching self-advocacy skills so each child can support his own independence and self-regulation
• Using an approach with shared participation that allows systematic removal of adult support and direction
• Focusing on the five key executive functions during activities
• Including skills and strategies that are research-based areas of need

**Behavioral self-regulation**

Behavioral self-regulation is a foundation on which the other self-regulation skills are built. Once a child can regulate his body, he is better able to move on to cognitive and emotional self-regulation. Behavioral self-regulation skills in spark* include:

• teaching the children they can control speed, intensity and manner of movement of their own bodies.
• helping them learn where and when to modulate their movements and when and where they can ‘let loose’.
• teaching and practicing self-calming strategies, eventually combining body movement and breathing in yoga-like activities.
• systematic withdrawal of adult direction while increasing self-direction by the child.
• helping each child understand that he can become more resilient and cope in more challenging situations.

**Cognitive self-regulation**

Cognitive self-regulation continues to focus on improving executive functioning, awareness of ability and need with explicit teaching of generalization, resilience and self-advocacy. Specific skills include teaching the children how to:

• focus and sustain attention
• determine and retain the most important and relevant information
• determine expectation of a task or situation
• construct meaning from information they hear
• monitor comprehension
• plan and tailor expression of thinking and ideas
**Emotional self-regulation**

Emotional self-regulation is the last of the three areas addressed. The goal with this unit is to teach the children how to extend the skills and strategies introduced and practiced in the previous units into the social realm. Skills included in this unit include teaching the children to detect, interpret and form:

- social gestures
- facial expressions
- behavior based on characteristics of settings and people in them

**Impact of teaching self-regulation skills to children with autism**

The impact of teaching self-regulation skills, using spark*, has been the subject of two research studies (27, 28). The more recent study included nine children (7 to 10 years of age) with high functioning autism. They participated in spark* for ten consecutive 1-hour sessions. spark* was administered by graduate students in school and clinical psychology and counselling in education. The graduate students were trained in the spark* philosophy and methods and supervised by experienced therapists. Skills addressed during sessions included behavioral self-regulation of hands, breathing, feet, voice, and whole body.

On completion of the ten sessions, participating children were re-assessed so that their post-intervention performance could be compared to their pre-intervention results. Pre-intervention and post-intervention results were compared on two main measures: *Autism Spectrum Rating Scale (ASRS)* to look for any changes that may occur in core autism features and *NEPSY-II* to examine the impact of spark* on neuropsychological functioning of the children.

The findings from two measures after completion of the spark* 10-week intervention indicated statistically significant changes in the following areas:

a) Behavioral rigidity (as measured on the ASRS). A Wilcoxon Signed-ranks test (see Table 1) indicated that the children showed greater tolerance for change to their routines and activities in everyday situations following intervention.

b) Inhibition (as measured on the NEPSY-II). A Wilcoxon Signed-ranks test (see Table 2) indicated that the children were able to control automatic responses and switch more readily between different ways of responding following intervention.

c) Affect recognition (as measured on the NEPSY-II). A Wilcoxon Signed-ranks test (see Table 3) indicated that the children showed increased ability to recognize different emotional expressions, like happy, sad, anger, etc., as depicted in photos of people’s faces.

**Table 1. Results of Wilcoxon Signed-ranks test of the Behavioral Rigidity subtest on the ASRS**

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### Table 2. Results of Wilcoxon Signed-ranks test of the Inhibition subtest of the NEPSY-II

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### Table 3. Results of Wilcoxon Signed-ranks test of the Affect recognition subtest of the NEPSY-II

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These results are particularly encouraging since only the Behavioral Self-regulation unit was completed within the 10-week period. It appears that, by improving behavioral self-regulation and self-calming, the children became better able to deal with change as assessed with the Behavioral rigidity scale of the ASRS. Anecdotal reports from parents indicated that the children had embraced the slow, mindful breathing and were using it effectively to self-calm in everyday life. The improvement in inhibitory control, measured on the NEPSY-II, was likely an outgrowth of the work on self-regulating speed, intensity and manner of movement along with practice in centering and calming. The result with Affect Recognition was not expected since only Behavioral Self-regulation was addressed. It appears likely that work on self-regulation with specific emphasis on executive functions impacts a larger realm. When a child is helped to focus his attention, increase his inhibitory control and improve his planning and organization and working memory, his ability to discern important information in the world around him develops.

These trends support some of the anecdotal information from therapists using spark* in their clinical practices (29). They have reported that, when children participate in spark*, they show improvement not only in specific skills but also in broader social and linguistic realms. For example, children have exhibited more attention to and modeling from others and increased participation in play and group activities. This supports the contention that executive functions and self-regulation are foundation skills to other major areas of development.

### Summary and Conclusions

The areas of most critical need for students with autism are greater self-regulation and autonomy. There needs to be greater emphasis on using well-structured approaches for increasing independent functioning, subsequently lessen the need for support from others.

Models for developing self-regulation skills, like spark*, must provide a clear framework for teaching the children, first, that they are capable of self-regulation. This explicit metacognitive (30) awareness is critical to the success of building solid skills and enhancing generalization. Too often it is assumed erroneously that children with autism know and understand things like this.
Specific work also needs to be done on the extension of skills and strategies to important settings. This helps ensure generalization.

The steps that are typically not addressed are building resilience and the ability to cope in everyday settings as well as self-advocacy. At present, intervention focuses on altering the child’s environment so that he is more successful. This is important but, at some point, the child needs to be helped to cope in the outside world. He must also learn how to keep himself calm and self-advocate if he has difficulty coping.

If each child with autism can develop these skills to the greatest degree possible along with improving his executive functions (planning and organization, inhibitory control, working memory, self-monitoring, cognitive flexibility), he will be well-prepared for learning and future challenges.

References


30 Metacognitive awareness simply means being consciously aware of what you are doing and thinking.