



Behaviour Regulation and Language: A two-way street?

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Imagine the following scenario:

After a long day at work, you head to the grocery store. You've finished your shopping and proceed to the check-out area, where you notice a series of long line ups. You choose a line and wait for a while, observing the other lines in an attempt to determine whether they are moving faster than your line up. You decide to switch lines, thinking you've noticed a faster cashier. Now in your new line, you wait...and wait...and wait...soon realizing that this new line up is no faster than your original line. You decide to check your phone for email messages and clear out your inbox. When that's complete, you begin to fidget, becoming impatient that the line isn't moving more quickly. It's finally your turn to unload your groceries onto the conveyor belt. The belt is full of your groceries but they are not moving closer to the cashier. Something is holding things up. The customer ahead of you is arguing about the price of one of her items. The cashier calls for a price check. Several minutes later, a young man appears with a duplicate of the customer's item, as well as the correct pricing. That problem solved, your groceries begin to move along the conveyor belt. After waiting in line for a total of fifteen minutes, the cashier finally greets you by saying "Hello, how are you today?". Your response: "I'm fine thanks, how are you?".

Interestingly, most of us would respond like this, instead of providing a more accurate answer to the cashier's question, such as "Well, I'm frustrated", or "This store needs to hire more cashiers", or "I've been waiting here for 15 minutes!". What is it exactly, that allows us to tolerate such scenarios without completely losing it?

It's called behaviour regulation.

What is behaviour regulation?

There are many terms that are used interchangeably with behaviour regulation, such as "self regulation", "effortful control", "emotional regulation", "self control" or "inhibitory control" (Schmitt, Justice, & O'Connell, 2014). But what these terms are all referring to are the cognitive processes that enable us to "engage in mindful, intentional, and thoughtful

behaviours” (Bodrova & Leong, 2008, p. 1). This includes processes that allow us to both engage in appropriate behaviours and inhibit inappropriate behaviours, such as focussing amidst distractions, paying attention to the most important information, taking turns, waiting, following rules, delaying gratification, adapting to new situations, complying with social expectations, suppressing anger outbursts, and taking on challenges. The ability to regulate one’s behaviour develops during childhood. In fact, behaviour regulation is often thought to “represent the observable manifestation of a child’s executive function” (Schmitt et al, 2014, p. 5).

Why is it important for speech and language professionals to know about behaviour regulation?

There are many reasons that speech-language professionals need to be very familiar with this concept. Behaviour regulation allows children to:

- manage and focus during structured environments, like speech therapy
- switch easily between tasks
- ignore distractions and attend to what is important
- determine what information is important and what can be disregarded
- persist with challenging activities
- focus on linguistic cues
- attend to and engage with others for extended periods of time (Schmitt et al, 2014)

It’s clear from this list that a child’s behaviour regulation can have a major impact on his or her ability to benefit from a therapeutic environment. A child’s ability to stay focussed, determine what’s important, engage with the clinician, and attend to cues is dependent on his or her ability to self-regulate.

The connection between behaviour regulation and language

Besides allowing children to participate in and benefit from our intervention, there is another reason speech and language professionals should be concerned with behaviour regulation. Strong associations between children’s behaviour regulation and their language outcomes have been identified in typically-developing and at-risk populations (Schmitt et al, 2014). For example, Vallotton & Ayoub (2011) found that children’s prior vocabulary and concurrent vocabulary predicted their level of self-regulation. McClelland, Cameron, Connor, Farris, Jewkes, & Morrison (2007) found that the reverse relationship was also true. That is, preschool children’s behaviour regulation significantly and positively predicted their emergent literacy, vocabulary, and math skills.

The relationship between language and behaviour regulation has received little attention with regard to children with language delays...until now. Two new articles explore this topic:

- “Vocabulary Gain among Children with Language Disorders: Contributions of Children’s Behavior Regulation and Emotionally-Supportive Environments” (Schmitt et al, 2014), explores the influence of children’s behaviour regulation on their vocabulary outcomes during language intervention

- “Associations between Toddler-age Communication and Kindergarten-age Self-regulatory Skills” (Aro, Laakso, Määttä, Tolvanen, and Poikkeus, 2014), explores the influence of children’s early language skills (including children with early delays) on their later executive functions and behaviour regulation

What emerges from these two studies is that the relationship between behaviour regulation and language may be a two-way street, each having an influence on the development of the other.

Study 1: Vocabulary Gain among Children with Language Disorders: Contributions of Children's Behavior Regulation and Emotionally-Supportive Environments

Schmitt et al’s (2014) study explored how children’s behaviour regulation and the emotional support provided during language therapy impacted their language outcomes. They hypothesized that:

- children with better behaviour regulation would demonstrate more gains in vocabulary
- the emotional support that children receive from their SLP during therapy would have a positive influence on the extent to which they benefit from therapy
- emotional support would moderate behaviour regulation, meaning that children participating in therapy sessions with high emotional support would gain equally in vocabulary, regardless of their individual behaviour regulation skills. But they suspected that behaviour regulation would exert more of an influence on the extent of vocabulary gain for children in therapy sessions with low emotional support.

Schmitt et al studied 121 kindergarten and first grade students with language disorders who were receiving language therapy in their public schools. Some of the children (21%) had comorbid disorders such as autism, hearing loss, or cognitive impairment. They assessed the children’s vocabulary and behaviour regulation in the fall and the spring of the school year, and the children’s parents also filled out questionnaires about the home environment and their child’s behaviour regulation. Schmitt et al (2014) did not examine how the children’s differing language profiles or the SLPs’ different intervention approaches influenced the relationship between behaviour regulation, emotional support, and vocabulary outcomes.

Results

Schmitt et al (2014) found the following:

- **children with higher behaviour regulation made more gains in vocabulary than their peers with lower behaviour regulation, even after controlling for fall vocabulary scores**
- **no significant relationship between emotional support and vocabulary gain**
- **no significant interaction between behaviour regulation and emotional support on vocabulary outcomes**

As this was a correlational study, the authors couldn't speak to causal influences. But they hypothesized that children with better behaviour regulation are more capable of ignoring distractions and focusing on meaningful information from their SLP. Or, they questioned whether behaviour regulation and vocabulary have a reciprocal influence on each other – as children's behaviour regulation improves, they are better able to attend during therapy, which would promote their vocabulary. As vocabulary improves, children would have more resources to regulate their behaviour further. Therefore, these two factors may work together to impact development.

In terms of their lack of a significant result regarding the influence of emotional support, Schmitt et al explain this could be due to the restricted range of emotional support in their sample (on average, emotional support ranged from average to high, with no low emotional support observed). Or, they suggest that perhaps the children didn't spend enough time in therapy (approximately one hour per week) for the emotional support during sessions to alter their trajectory.

Schmitt et al (2014) summarize that their findings “highlight the importance of SLPs considering children's behaviour regulation when planning and implementing therapy” (p. 2).

Study 2: Associations between Toddler-age Communication and Kindergarten-age Self-regulatory Skills

This study by Finnish researchers (Aro et al, 2014) examined the association between different profiles of early expressive language development and children's later executive functions and self-regulation at kindergarten age. They followed 185 children from age 6 months to 4 ½ years. The children's parents completed the Infant/Toddler Checklist (ITC), which is part of the Communication and Symbolic Behaviour Scales (CSBS-DP) (Wetherby & Prizant, 2002) seven times between ages 6 months and 24 months. The children were grouped into three subgroups based on their social communication, speech, and symbolic behaviour scores on the ITC:

- **expressive delay (ED group)** – these children had slower than average development in expressive language skills, but typical development in other areas on the ITC. These children would be considered Late Talkers.
- **broad delay (BD group)** – these children had either slower than average development in all three areas on the ITC (social communication, speech, and symbolic behaviours), or had speech skills that were within normal limits but increasing delay in symbolic behaviours and social communication on the ITC. Therefore, these children had more significant and persistent expressive language problems than the children in the expressive delay group, such as children with Specific Language Impairment (SLI).
- **typically developing children (TD group)**

None of the children in the study had ASD, ADHD, or other mental development or psychiatric diagnoses (Aro et al, 2014).

Aro et al followed up with the families when the children were 4 years 7 months. Parents were provided with a new questionnaire which evaluated the children's executive functions and regulatory skills, including:

- directing, sustaining, and shifting attention
- internalizing problems (negative behaviours directed towards oneself, such as social withdrawal, anxiety, depression) and externalizing symptoms (negative behaviours directed towards others, such as disruptive or aggressive behaviours) (Liu, 2004)
- regulation of behavioural activity
- hyperactivity/impulsivity
- inhibition
- executive function (planning one's actions, execution of actions, evaluation)
- motor restlessness
- social skills like cooperation, assertiveness, responsibility

Results

Aro et al (2014) found the following:

- **children in the expressive delay group (late talkers) had poorer executive function and regulative skills in kindergarten than children in the other two groups** – this result surprised the authors, who were anticipating internalizing problems (based on Late Talker literature) but less significant difficulties overall than the children with SLI in the Broad Delay group).
- **children in the broad delay group (SLI) had poorer executive function and regulatory skills than the TD group, but better skills than the expressive delay group** – their difficulties were mostly with social skills and attentional/executive functions. The authors were expecting to see deficits in several executive and regulatory skills (i.e., attentional/executive, emotional, behavioral, and social)

The authors' finding that the TD children had better executive function and regulatory skills than the children in the other two groups was expected. However, they were surprised to find that parents of late talkers (ED group) perceived that their children had more widespread difficulties in executive functions and self-regulation than parents of children with broad delays (SLI). Aro et al (2014) hypothesize that there could be different underlying mechanisms behind these associations: "For the ED group, self-regulatory skills in kindergarten-age may to a higher extent be moderated by parental perceptions and interactional processes, whereas for the BD group, regulative problems may be more directly linked to neurocognitive mechanisms and deficient concurrent language skills" (p. 27). They propose that there may be factors related to parental concerns, child temperament, parental perceptions, or interactional processes that mediate the relationship between language and self-regulation/executive functions.

In conclusion, Aro et al explain:

"The findings provide support for the argument that the executive and regulatory development of children with language delays should be

followed up in clinical practice. Children's difficulties in engaging in interactions with their parents, and parental responses to these difficulties, may disrupt the process of language learning" (p. 29).

Furthermore, they suggest that:

"...detection of a subtle delay in early communication and language development warrants follow-up of [the] child's self-regulative development" (p. 23)

Considering behaviour regulation in our intervention

By promoting young children's communication skills, we are actually providing children with an important tool they need to learn self-regulation. The old adage "use your words" is no joke – children's communicative symbols, especially spoken words, are mental tools which help them exert "control over [their] own thoughts, emotions, and behavior, and perhaps [their] environment" (Vallotton & Ayoub, 2011).

But as researchers are discovering, not only does language influence self-regulation, but self-regulation seems to influence children's language outcomes. Therefore, speech and language professionals should promote this "two-way street" if we are to optimize outcomes for the children on our caseloads.

While advice for addressing behaviour regulation is scarce in our field, there are many suggestions that come from the field of early childhood education and psychology, including the following principles:

- **adults in the child's life should model self-regulation** – during everyday activities, adults can model words, actions, and "self-talk" (language that verbalizes your thoughts and feelings) that demonstrates self-control and self-regulation (Perry, n.d.). For example, when playing a board game, the SLP/T can model impulse control: "I'll let you pick the game this time since I picked last time". If a toy is broken, the SLP/T could model "Oh, that's disappointing. I was really looking forward to playing with that toy. Hmm...let's see if we can find something else to play with". Or if an activity is challenging, the SLP/T can model the process of problem solving and taking on challenges ("Hmm...this is tricky. What if we try just doing this part first?").
- **target abstract language and vocabulary** – model language that children can use to express their thoughts and emotions. Early developing emotion words include "happy", "mad" and "sad", or more abstract words like "feel", "think", "upset", or "calm", may be appropriate for children at later stages of language development.
- **observe, wait, and listen** – Stuart Shanker, a professor of philosophy and psychology at York University in Toronto, advocates "being a detective", trying to

figure out a child's stressors, what helps the child to stay calm and alert, and what causes a child to become hypo- or hyper-aroused. We can do this by observing and listening to children, and waiting to see their reactions to different situations and activities. By really getting to know and understand a child, we can minimize the stressors during intervention so that the child has more resources available to focus, attend, and learn (Shanker, n.d.).

- **create routines, structure and predictability** – most speech and language professionals are experts in creating structured therapeutic environments for children. Children with poor behaviour regulation have less control over their behaviour and emotions when expectations are unclear or they don't know what is coming next. Using visual cues, schedules, lists, warnings about transitions, timers, or any other tools that provide children with routine and structure can help children anticipate and plan ahead (Groves Gillespie & Seibel, 2006).
- **consider children's behaviour regulation skills when planning small groups** – while it may be tempting to see children for individual therapy if they have difficulties with behaviour regulation, there are benefits to seeing them in a small group. By grouping children who have good self-control with those who lack those skills, it provides peer modeling for the children who lack self-regulation (Perry, n.d.).
- **use pretend play as a context to promote self-regulation** – pretend play creates conditions in which young children need to use more mature mental functions and demonstrate self-control. During pretend play, children practice delaying gratification, suppressing their impulsive behavior to stay in role, abiding by rules, planning and acting out different emotions and scenarios and their consequences, and coordinating their ideas with those of other children (Leong & Bodrova, n.d.).
- **teach children to play games with rules** – the ability to follow rules, set rules, and apply rules to oneself is all part of the development of self-regulation (Bodrova & Leong, 2008). Therefore, we can encourage both language and self-regulation with these types of games in our intervention, and encourage parents to play simple games with rules at home.
- **consider the nature and order of activities during a therapy session** – many of our intervention activities require a lot of self-regulation. Children have to focus, face challenges, and follow rules. Therefore, when planning a session, consider the level of self-regulation required for your activities. Try interspersing activities requiring much self-control with self-directed play, sensory-based play, physical games or other activities in which the child gets a "self-control break". Providing choices of activities also allows children some control over their environment.
- **don't forget about those Late Talkers!** – while it may be tempting to discharge Late Talkers, research indicates that many of those children are at risk for continued speech and language difficulties (see Cindy Earle's article "Do Late Talkers Really "Grow out of it?" for an elaboration). According to the work of Aro et al (2014), late talkers who appear to catch up to their peers on formal language testing may continue to have behaviour regulation problems and be perceived by their parents

to have continued delays in language. These factors put them at risk for academic difficulties. Therefore, this group of children requires careful monitoring and follow-up of their language and behaviour regulation skills.

If language and behaviour regulation are a two-way street, then we really can't overlook how children self-regulate when we plan our intervention. Both Schmitt et al (2014) and Aro et al (2014) suggest that we consider children's behaviour regulation when thinking about their language development. In doing so, we can maximize how much children benefit from our intervention, provide them with ways to express their thoughts and feelings, and promote this two-way street that will encourage both their language skills and self-regulation.

For more information about self-regulation, visit the Canadian Self-Regulation Initiative (CSRI) website at <http://www.self-regulation.ca/about-us/canadian-self-regulation-initiative-csri/>

View a parent friendly version of this article at: <http://www.hanen.org/Helpful-Info/Articles/What-Is-Behaviour-Regulation--And-What-Does-It-Hav.aspx>

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