Using Sensory Stories to Promote Self Regulation

Victoria L. Nackley, MS, OTR/L
October 23, 2010

Co Author: Debbie Marr, ScD, OTR/L
Agenda

• Self-regulation
• Regulatory Issues
• Regulation and Sensory Processing
• Sensory Stories
• Sensory Stories & Self-regulation
• Research supporting Sensory Stories
Self Regulation

‘ability to monitor and control one’s own behavior in response to social expectations’

(Neisworth, Bagnato, & Salvia, 1995, p. 10).

. . . . to external and internal demands as well

http://www.bgsu.edu/colleges/edhd/cdc/page60405.html

http://www.bgsu.edu/colleges/edhd/cdc/page60405.html

In other words . . .

• Internal sense of control amidst
  – Internal mechanisms
    • Sleep, hunger, pain, discomfort, emotions . . .
  – External demands
    • Sensory stimuli, social interactions, environmental changes, time constraints . . .

• Coping with life stressors

Development of Self-Regulation

• Hallmark of early childhood (Kopp, 1982)
• Foundation for
  – how the child interacts with the world
  – how individuals interact with the child
    (DeGangi, 2000)
• Begins in the first few months of life
• Baby begins developing homeostasis
• Regulation of neuro-physiological mechanisms

First few months of life

- External regulation (parents)
- Modulate level of arousal
  - High, middle, low arousal levels
- Effective sleep-wake cycles
- Respond to environmental stimuli
- Getting needs met
- Early attempts at self-regulation (thumb or finger sucking)

http://blogs.babble.com/strollerderby/tag/newborns/
Examples of Co-regulation


http://www.bambinoland.com/photo/gallery/show/9
Sensorimotor Modulation
3 to 12 Months

• Beginning to recognize needs
• Beginning to communicate needs
• Baby acting on the environment
  – Reaching, pointing, vocalizing, emoting, gesturing, engaging
• Baby developing a sense of power and control
• Supported by neurophysiological maturation; parental responsiveness;

http://www.dorlingkindersley-uk.co.uk/static/html/features/babyskills/intro.html
Internalizing Control
12 to 18 months

- Awareness of social expectations
  - Adapting own behavior
  - Self-initiated inhibition
  - Self-initiated monitoring
    - (DeGangi, 1997)

- Indicating & acting on needs

- Supported by all areas of development: physical, sensory, cognitive, communication, social emotional . . .

An Ongoing Process

- Support from adults
- Greater internalization of control
- Development of coping strategies
- Keener awareness of social demands
- Management of the external issues
- Modeling by others -> learning
- **Lifelong Skill!!!**

Regulatory Issues

• Characteristics of the early years:
  – Inability to regulate physiological states: hunger / thirst; sleep / wake cycles; bowel / bladder needs;
  – Difficulty regulating arousal / attention
  – Negative emotional state
  – Inability to self-calm
  – Gross / fine / oral motor differences (tone & organization)

http://www.babydelton.com/category/prenatal/
Sensory Connections

- Inability to regulate incoming sensations
- Poor mastery of sensory functions
  - Over-responsivity
  - Under-responsivity
    - (DeGangi, et al 1997)
- Intolerance for positions, foods, activities, care tasks (bathing, diapering, dressing, hair care, etc.)
- Quick escalation of emotional state

http://mixuplikeconchsalad.blogspot.com/
Family Impact

- Stress
- Sleep deprivation
- Feelings of inadequacy
- Depression
- Diminished bonding
- Extremes of care taking for calming
- Marital or relationship tensions
- Social isolation


http://www.winndown.co.uk/Stress-in-the-family.html
Solutions . . .

• Recognition

• Evaluation
  – pediatrician, psychologist, occupational therapist, speech & language pathologist, physical therapist

• Intervention
  – Family support
  – Child-centered activities
  – Specific sensory experiences

http://www.foundationforfamilyhealing.com/results.htm
Sensory Stories . . . A mechanism to support self-regulation

- Designed for children with over-responsivity to sensory input
  - Who also have difficulty participating in daily activities
  - Who have ineffective routines
- Reading the Sensory Story teaches the child sensory strategies to employ
- Empowerment through knowledge
Who is the targeted audience for a Sensory Story?

- Children with over-responsive sensory modulation issues that impact their ability to engage in occupations.
Why Sensory Stories???

- Our role as parents / teachers / therapists / aides is to equip students with the knowledge, skills, and attitudes for school and for lifelong success.

- Children with sensory modulation difficulties have barriers to participation in various tasks.

- Sensory Stories: a tool to increase children’s participation in typical events.
A Sensory Story to View

Brushing Teeth

A Story for
Almost everybody has teeth.
Teeth get dirty when people eat and sleep.
Teeth need to be cleaned. The best way to clean teeth is with a toothbrush and toothpaste.
Sometimes people don’t like having their teeth brushed. I can do special things before my teeth are brushed. I can get my body ready by giving myself a big hug and doing a power push. These activities help me to relax.
I can squeeze my lips together, grit my teeth, and then push hard with my tongue against the roof of my mouth.
I can press my hand hard against my mouth. This gets my mouth ready for the tooth brush.
Then the toothpaste goes on the toothbrush. The toothbrush goes up and down in my mouth to brush each tooth.
I spit out the foam, get a drink of water, and wipe my mouth hard with a towel.
I give myself a big hug because my teeth are clean.
Who would use a story like this?

• The child who:
  – is overresponsive to sensory information
  – has an unsuccessful routine with tooth brushing
  – has negative behaviors when it comes time to brush the teeth
Directions for Use:

- Parents / therapists / teachers / aides can read the story to the child.
- The child can read the story him / herself.
- Stories can be read daily (regularly occurring events) or each time prior to . . .
- Child encouraged to implement sensory strategies and practice regularly.
- ‘What do you need to do now?’
- ‘I’m brushing my teeth. What do I do?’
Let’s see it in action . . . Videotape of a homework session  (chap 9)

• Observe the following:
  – Proximity of the father
  – Directiveness of the father
  – Activity level of the child
  – Child’s use of the action figure
  – Child’s hands with his hair
  – Child’s oral motor activity
Videotape of child following the implementation of his customized Sensory Story (chap 10-14)

• Tape 1 = before Sensory Story
• Tape 2 = week 2 of Sensory Story
• Tape 3 = week 4 of Sensory Story
• Tape 4 = week 6 of Sensory Story
• Tape 5 = week 11 no Sensory Story
• Note: the changes in routine as a result of reading the Sensory Story
• More on this study later . . .
The Aim of Sensory Stories

• To identify contextual factors that impede children’s participation.
• To teach children with sensory modulation issues to implement self-imposed sensory strategies.
• To establish performance patterns (habits) that foster participation in childhood occupations.
Theoretical background:

- Sensory Integration: Focus is the child with a modulation problem (overresponsive)
- Cognitive Behavioral: Self control through empowerment
- Teaching/Learning Process: Visual and auditory input coupled with practice
- Motor Learning: Practice within contexts
Figure 1. A New Taxonomy for the Identification of Sensory Processing Disorders

SOR = Sensory Over-Responsivity
SUR = Sensory Under-Responsivity
SS = Sensory Seeking/Craving

What is sensory modulation?

• The regulation of sensory information
• Filtering of extraneous information
• Attention to pertinent information
• Examples . . .
• Comparison with a traffic officer
• Difficulties with sensory modulation can lead to problems with attention, activity level, behavior, social skills, self-regulation, etc.
• Want to know more ? . . . ‘The Out-of-Sync Child’ by Carol Kranowitz or ‘Sensational Kids’ by Lucy Miller
• The child with sensory modulation issues (over-responsivity) lives with those unpleasant sensations on a daily basis.

• Additionally, there is variability in the way his or her nervous system interprets sensations.

• Our aim is to make daily life more pleasant for him or her AND to encourage engagement in daily activities. (chap 2)
What would it be like to experience those sensations throughout your day?
Sensory strategies for the child with over-responsivity

• Calming sensory stimuli:
  – Deep touch input
  – Linear vestibular input
  – Active resistance to movement
    • (proprioceptive input)
Calming touch input

- Self-imposed input
- Deep touch – as deep as the muscle and bone
- Try this one: light touch to arm.
- Examples of activities: Sitting & standing
Calming Balance Input

- Slow linear input
- Self-directed
- Examples of activities: Sitting & standing
Calming Proprioceptive input

- Heavy input to muscles and joints
- Active resistance to movement
- Self-imposed
- Examples of activities: Sitting & standing
Types of Sensory Input

- **Deep touch input**
  - I can push down hard on my head with my hands.
- **Linear vestibular input**
  - I can bend my knees up and down.
- **Heavy proprioceptive input (active resistance)**
  - I can push against a wall as hard as I can.
Two types of sensory strategies in Sensory Stories

1. Strategies that provide inhibitory sensory input to the child.

2. Strategies that minimize sensory input from the environment.
Environmental Modifications

- I can put on my special headphones so the noises don’t bother me.
Contexts of limited participation:

- Home
- School
- Community
Ten Sensory Stories in each contextual area:

Home
- Bathing
- Combing Hair
- Ear Cleaning
- Eating
- Getting Dressed in the Morning
- Nail Care
- Showering

- Sleeping
- Tooth Brushing
- Washing Hair
Ten Sensory Stories in each contextual area

School:
- Assemblies
- Being in Lines
- Cafeteria
- Circle Time / Floor Time
- Desk Time
- Eating Time
- Moving in the School

- Outdoor Recess
- Physical Education Class
- School Bus Ride
Ten Sensory Stories in each contextual area

Community:
- Getting a Haircut
- Going to a Restaurant
- Going to a Store
- Going to Parties
- Going to Places of Worship
- Going to the Dentist
- Going to the Doctor

- Riding in an Elevator
- Riding in the Car
- Riding on an Escalator
Another sample Sensory Story

Assemblies

A story for
An assembly is a special time in the school day when children go to a big room. There they listen and learn from special people.
Sometimes it is noisy and crowded. Some children don’t like being in crowded places. They don’t like the noise. They also don’t like being bumped.
I can do special things to make it easier to go to assemblies. Before I go to the assembly I can put on my heavy fanny pack. That helps me to be calm.
Then I might put on my headphones. That makes it less noisy.
When I get to my seat at the assembly, I can do an elbow check to make sure no one is sitting too close.
During the assembly, I can make my muscles tight like a statue. Then I take a deep breath and relax.
When I'm sitting and listening, I can push my hands down really hard on my legs and then give myself a big hug. These activities make it easier to listen.
When the assembly is over, I can stretch my arms up high and take another deep breath. Assemblies at school can be fun!
THIS Sensory Story would be used for:

- The student with over-responsive sensory modulation issues.
- Recommended to be read several times prior to the assembly.
- Read the day of the event.
- Read during the event.
- Goal: full participation in the assembly through implementation of self-imposed sensory strategies.
Comment from a parent

- She had her first assembly since starting the sensory story. Her teacher was very encouraged by how she did. They used the strategies in the story and she made it through the assembly. She didn't even mention to me that she had an assembly that day whereas before she was obsessing about it and told us repeatedly that "I don't have assembly." She would also try to stay home from school just in case there was an assembly. Thank you so much for sharing the story with us. It is the first thing that really made a significant improvement even though they have been trying to desensitize her at school all year. AND she had only been reading the story for under a week!

- (D. Mott, personal communication, June 11, 2007)
Changing *Occupational* Performance:

Note: Sensory Stories are aimed at all 3 circles

- Change the Person
- Change the Activity
- Change the Environment

Based on M. Law: Person, Environment, Occupation Model, 1996
Key Features of Sensory Stories

1. Sensory Strategies
2. Self-choice
3. Self-implementation
4. Socially acceptable strategies
5. Line drawings
6. Innate desire of children
7. Improving awareness
8. Customization
9. Specific sentence structure & sequence
Where does this all fit in?!

- One possibility to address the participation for children with whom you work.
- Opens the dialog regarding sensory processing
- Provides concrete suggestions
- Child should assimilate strategies to other areas
- Applications not only for school... Also for home and the community (A link!!!)
- Should not take the place of therapeutic intervention
- Should be used in conjunction with a sensory diet
How to get started . . .

• Make a commitment
• Read the story regularly
• Practice the strategies – give assistance
• Reinforce the intended result
• Inform others
• Include the strategies at other times
• Use reminders

Changes reported for children with Activities of Daily Living skills

- No longer tantrums at bedtime
- Sleeps better
- Trying new foods
- Stayed calm for the shower from the first day
- Wants to brush teeth more
- Now hugs self and asks parent to wash hair (previously would hit and scream)
- Better able to handle lunch time
- Willing to have nails cut with therapist
- Changes into pajamas easier
Comments from people who are using Sensory Stories

- High functioning 5th grader with autism
- Initially used cafeteria Sensory Story
- Then he helped to choose strategies that worked
- Later the therapist put his strategies onto a key chain as a concrete reminder
- Greater cognitive awareness of needs & options
- Similar situation occurred with the ‘Going to the Store’ Sensory Story (D. R., 2007)
And even more

- 9th grade girl whose desire was to go to the school dance
- Child had used Sensory Stories and asked to have one written for her about ‘Going to a School Dance’
- They enlisted various sensory strategies
- She now enjoys going to school dances (D. R., 2007)
Further Comments

• Families need support through the process
• When a need arises, families are intent on seeing change
  – Doctor’s appointment
  – Dentist visit
  – Trip to the mall
  – Worship service
  – Restaurant visit
• Consistency is the key to progress (D. R., 2007)
The good news . . .

• 12 research studies to date to support the use of Sensory Stories
• 2 projects are in process
Pilot Study: 52 Children
2003-04 Academic year

- Pre-publication version on CD-ROM
- Sensory Stories were used with 52 children
  - Mean age of 5.8 years
- Sensory Stories were used 72 times
- In 61 of 72 uses, Sensory Stories had a slight to significant positive effect.
Positive effects were more likely when . . .

- The story was read more often.
  - (3+ times per wk)
- The story was read over a longer time period
  - (2 ½ months +)
- The child had sensory modulation dysfunction
2006 Single Case Study: Customized Homework Story

- 8 year old boy on the autism spectrum
- Definite differences on the Sensory Profile
- Significant challenges completing homework in a timely manner
- Customized Homework Sensory Story read during daily homework for 8 weeks
- On & Off-task behaviors measure during pre-intervention / intervention & post phases
- Homework time was reduced by 40 minutes
- Gains persisted 8 months later
- Father’s testimony (*chap 4*)

Trend of On- and Off- Task Behaviors

![Graph showing the trend of on- and off-task behaviors over sessions. The graph includes a linear regression line for both on-task and off-task behaviors.](image-url)
Spring 2007- Single case study: Eating

- Child with autism and sensory processing difficulties
- Significant limitations in the number of food items eaten (only 16)
- Customized Eating Sensory Story that emphasized eating a variety of food items

Image from: http://www.keeperofthehome.org
• During the final A phase, he consistently chose 2-3 new food items at evening meals
• Added 5 new food items to his repertoire of 16 food items for a final total of 21
• Able to self-initiate inhibitory sensory strategies
Fall 2007 – Getting a Haircut

- Convenience sample of 18 participants
- Asked to have a haircut in their typical manner & record child’s behavior on a survey
- 9 individuals provided feedback on first haircut
- Given the Getting a Haircut Sensory Story
- Asked to read the story daily for a week and twice on the day of the haircut
- Asked to record behavior and complete survey
  – 4 surveys returned

Image from: http://blog.gracobaby.com
Responses received for 4 children

- Three of the 4 made slight gains; the 4th made significant gains;
- Positive changes were mainly noted during the haircut
- Only limited changes were noted with behavior following the haircut
- Children employed sensory strategies
- Parents reported greater knowledge of the coping process for the child

Fall 2008 – Nail Care

- Convenience sample of 10 participants
- Asked to have a nail care done in their typical manner & record child’s behavior on a survey
- 5 individuals provided feedback on first nail care experience (ages 3-12)
- Given the Nail Care Sensory Story
- Asked to read the story daily for a week and twice on the day of the nail care
- Asked to record behavior and complete survey – 5 surveys returned
Results

12 y.o. Nail Care Participant

- At first, I read it to him, then to his action figures & him, ending with him reading a page then I would read a page. He was apprehensive to read it on his own.
- Cut all fingernails and toenails.
- This was the easiest time I've ever had cutting his nails. He said the story helped him and he wanted to use it again.
- After his nails & toe nails were done, I 'cut' his action figure's nails while he told them what they could do to feel better (the activities in the story). It was great.
- He fell asleep about 30 minutes after his nails and toenails were cut. Typically it would take him an extra hour or so to calm down.
What does the research to date tell you?!?!?

- Mainly level 4 evidence according to Abreu, 2003.
- Results are generally favorable
- Findings show variation
- We continue to gather data
- You have the data to support the use of Sensory Stories
- Give yourselves a big hug!!!
References


• Marr, D. & Nackley, V. (2010, June 7). Using Social Stories and Sensory Stories in autism intervention. OT Practice, 17-20