Sensory stimulation and Snoezelen in the management of people with cognitive impairment

Dr Lesley Collier
Senior Lecturer
What do we mean by sensory stimulation and Snoezelen

Snoezelen

Sensory stimulation
Development of sensory stimulation and Snoezelen

Key areas of practice

- Learning disabilities (Autism, Downs syndrome)
- Older persons mental health (Dementia, depression)
- Acute mental health settings (Stress management, Schizophrenia)
- Palliative care (pain management, end of life care)
- Maternity care (pain management, stress management)
- Neurology (acquired brain injury, sensory retraining)
## Problems identified

<table>
<thead>
<tr>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor concentration</td>
</tr>
<tr>
<td>Restlessness / wandering</td>
</tr>
<tr>
<td>Shouting</td>
</tr>
<tr>
<td>Aggressive behaviour</td>
</tr>
<tr>
<td>Severe disorientation</td>
</tr>
<tr>
<td>Unable to engage in purposeful activity</td>
</tr>
<tr>
<td>General mood disturbance</td>
</tr>
<tr>
<td>Anxiety</td>
</tr>
<tr>
<td>Inability to follow simple instructions</td>
</tr>
<tr>
<td>Severe memory loss</td>
</tr>
<tr>
<td>Loss of social skills</td>
</tr>
<tr>
<td>Physical faility</td>
</tr>
</tbody>
</table>
Sensory challenges
Environmental demand
Adapted from the model of sensoristasis

Antecedent

Neuro-physiological
psychological decline
Environmental factors
Human intervention

Sensory imbalance

High-stimulus Imbalance exceeded threshold
Low-stimulus Sensory Imbalance deprivation

Stress threshold

Psychic discomfort

Cortical sequelae

Behavioural sequelae

Agitation
Decline in activities of daily living
Decline in social functioning
Tenets of the model

• An imbalance may occur as a result of neurophysiological or environmental factors

• Too much high-stimulus activity can result in stress threshold being exceeded

• This will occur at a lower level if activity is unpleasant or processing is too fast.

• Too lower stimulus activity may lead to sensory deprivation.
Looking at skill levels

<table>
<thead>
<tr>
<th>Sensory level</th>
<th>Perception</th>
<th>Skill acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Normal development)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Cognitive impairment / decline)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sensory integration is critical for human development and function.
Five basic assumptions

- Potential for neuroplasticity
- Interaction between higher order (cortical) and lower order (subcortical) areas to modulate sensory input
- Neurophysiological development of sensory integration follows a sequential pattern
- Adaptive response – ability to adjust performance according to environmental demand
- Presence of inner drive to meet and master a challenge
Flow
Csikszentmihalyi, 1975

High cognitive demand

Challenge

Low Cognitive demand

Anxiety

Flow

Apathy

Boredom

Low Skills

High
The model of sensory processing

Dunn, 2002

Sensory processing patterns are based on how the nervous system reacts to input and how the person responds to that input.

**Nervous system thresholds** – thresholds for responding along a continuum based on sensory preference

**Self regulation strategies** - active management of sensory input
# Patterns of sensory processing assessed by the Sensory Profile

<table>
<thead>
<tr>
<th>Threshold / reactivity</th>
<th>Passive</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High threshold with low reactivity</strong></td>
<td>Low registration (Bystander)</td>
<td>Sensory seeking (Seeker)</td>
</tr>
<tr>
<td></td>
<td>Does not notice sensory events or is slow to respond</td>
<td>Looks for sensory experiences</td>
</tr>
<tr>
<td><strong>Low threshold with high reactivity</strong></td>
<td>Sensory sensitivity (Sensor)</td>
<td>Sensory avoider (Avoider)</td>
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<td></td>
<td>Readily notices sensory stimuli, may be distracted by them</td>
<td>Deliberately acts to reduce or prevent exposure to sensory stimuli</td>
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The sensory tool box

• Sight - visual
• Sound - Auditory
• Touch - Somatosensory / vibration
• Taste - Gustatory and texture
• Smell - Olfactory
• Movement - Vestibular / proprioception
The use of multisensory approaches to improve function performance of people with moderate to severe dementia.

Dr Lesley Collier
Research questions

• To what extent do MSEs influence functional performance compared with a control activity (gardening)?

• To what extent are mood and behaviour affected by MSEs compared with the control activity group?

• To what extent is the sensory profile of the individual associated with the response to the MSE?
Randomised, single blind, repeated measures design

<table>
<thead>
<tr>
<th>Pilot and Recruitment</th>
<th>Baseline</th>
<th>Intervention (sessions 1 to 12)</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline assessment</td>
<td>Randomised to:</td>
<td>1/12 after Session 12</td>
</tr>
<tr>
<td></td>
<td>▪ SMMSE</td>
<td>MSE or Gardening</td>
<td>▪ AMPS motor</td>
</tr>
<tr>
<td></td>
<td>▪ GBS</td>
<td></td>
<td>▪ AMPS motor</td>
</tr>
<tr>
<td></td>
<td>▪ Sensory profile</td>
<td></td>
<td>▪ AMPS process</td>
</tr>
<tr>
<td></td>
<td>▪ PAL</td>
<td></td>
<td>▪ NRS</td>
</tr>
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<td></td>
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<td>Post-session assessment</td>
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Assessment of Motor and Process Skills (AMPS) Fisher 2003

- Standardised observational assessment of functional performance
- Motor and Process skills in ADL performance
- Uses Rasch analysis to adjust for skill complexity, rater severity and task difficulty
- Sensitive to change
- Significant change ≥0.5 logits
### Baseline data: Recruitment sites

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<tr>
<th>Recruitment sites</th>
<th>MSE</th>
<th>Gardening</th>
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<tbody>
<tr>
<td>NHS ward Assessment ward</td>
<td>5 (29%)</td>
<td>4 (31%)</td>
</tr>
<tr>
<td>NHS ward Continuing care</td>
<td>6 (35%)</td>
<td>4 (31%)</td>
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<tr>
<td>Day Hospital</td>
<td>4 (23%)</td>
<td>4 (31%)</td>
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<tr>
<td>Private Nursing Home</td>
<td>2 (12%)</td>
<td>1 (8%)</td>
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$\chi^2(3, N = 30) = 0.6, p = 1.0$
Baseline to last treatment session

- Both Motor and Process scores improved by the interventions
- No group differences
- Scores equally improved for MSE and gardening
Mean delta AMPS motor scores

Sessions

AMPS delta scores

MSE group
Gardening group
Mean delta AMPS process scores

![Graph showing AMPS delta scores over sessions for MSE and Gardening groups.]

Sessions

AMPS delta scores

MSE group
Gardening group
Motor scores  $t(30) = 2.28, p = .030$
Process scores, ns differences
Baseline to last treatment session

- NRS scores improved (reduced) by the interventions
- No group differences
- Scores equally improved for MSE and gardening
Sensory stimulation and Snoezelen in the management of people with dementia

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What do we mean by sensory stimulation and Snoezelen

Snoezelen

Sensory stimulation
Sensory challenges experienced by people with dementia

- Sensory processing
- Environmental demand
- Just right challenge

Person with dementia
Assessment tools to assess sensory needs

• Adult sensory profile (Brown & Dunn)

• Sensory profiling tool (Rompa)

• The Pool Activity Levels occupational Profiling Tool (Pool, 2012)
Adult sensory profile
The model of sensory processing

Dunn, 2002

Sensory processing patterns are based on how the nervous system reacts to input and how the person responds to that input.

**Nervous system thresholds** – thresholds for responding along a continuum based on sensory preference

**Self regulation strategies** - active management of sensory input
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The sensory profiling tool
The Pool Activity Level Instrument
Implementing the Pool Activity Level Occupational Profiling Tool

- Life History Profile
- A Checklist of how the person carries out everyday tasks
- Activity Profile which assists the translation of understanding into practice
- Individual Action Plans for personal ADL
- Outcome Sheet for recording results
The Pal

Planed
- Complete activity
- Search for objects
- Follow simple instruction
- Can use memory prompts

Exploratory
- Complete familiar task
- Concerned about the effect of doing the task
- May not have an end result in mind
- Need activity broken down into steps

Sensory
- No thoughts regarding the purpose of the task
- Concerned with sensation
- One step at a time
- Verbal and non-verbal direction

Planed
- No aware of the environment
- Movement is in response to stimulus
- Can only process one sensation at a time
- Communication is predominately non-verbal
The sensory tool box

- Sight - visual
- Sound - Auditory
- Touch - Somatosensory / vibration
- Taste - Gustatory and texture
- Smell - Olfactory
- Movement - Vestibular / proprioception
Analysing the Snoezelen environment

- Intensity
- Amount
- Consistency
- Any competing stimuli
- Familiarity
- Level of arousal
- Environmental cues
Organising a session

- Identifying focus for the session based on assessment outcomes
- Techniques for specific needs
- Timing and the therapeutic intervention
- Measuring outcome
- Reflection on the session
Using the PAL to guide the session

- Positioning of objects – eye line, direct contact, one sense at a time

- Verbal directions – Allow time to settle and explore, guide movements, reinforce response with verbal and non-verbal cues

- Directions – Breakdown to one step at a time, session length approximately 10 minutes, one to one sessions, end session by gradually increasing light

- Activity characteristics – To arouse conscious awareness of self and immediate environment
Achieving sensory modulation within session

Balance of excitation & inhibition

**Excitation** – over-response eg. release phenomena in brain injury & stroke.

**Inhibition** – under-response, fail to notice stimulation eg. Neglect

Role of feedback system to regulate balance
# Arousal & alerting systems

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<thead>
<tr>
<th>Sensory system</th>
<th>Arousal / alerting descriptors</th>
<th>Discriminating/ mapping descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all systems</td>
<td>Unpredictable – unfamiliar, cannot anticipate the sensory experience</td>
<td>Predictable – familiar, can anticipate what will happen next</td>
</tr>
<tr>
<td>Somatosensory</td>
<td>Light touch</td>
<td>Pressure touch</td>
</tr>
<tr>
<td></td>
<td>Pain – sharp, pinch</td>
<td>Long duration stimuli</td>
</tr>
<tr>
<td></td>
<td>Temperature</td>
<td>Large body surface contact</td>
</tr>
<tr>
<td></td>
<td>Small surface contact</td>
<td></td>
</tr>
<tr>
<td>Vestibular</td>
<td>Head position change</td>
<td>Linear head movement – rocking, bouncing</td>
</tr>
<tr>
<td></td>
<td>Speed change</td>
<td>Repetitive</td>
</tr>
<tr>
<td></td>
<td>Direction change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rotary head movement</td>
<td></td>
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## Arousal & alerting systems

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<tr>
<td>Proprioception</td>
<td>Quick stretch – brisk tapping</td>
<td>Sustained tension – constant action on muscles, heavy objects</td>
</tr>
<tr>
<td>Visual</td>
<td>High intensity – bright visual stimulus</td>
<td>Pressure touch</td>
</tr>
<tr>
<td></td>
<td>High contrast – difference between stimulus &amp; environment</td>
<td>Long duration stimuli</td>
</tr>
<tr>
<td></td>
<td>Variable – changing characteristics</td>
<td>Large body surface contact</td>
</tr>
<tr>
<td>Auditory</td>
<td>Variable – changing characteristics</td>
<td>Linear head movement – rocking, bouncing</td>
</tr>
<tr>
<td></td>
<td>High intensity – loud</td>
<td>Repetitive</td>
</tr>
<tr>
<td></td>
<td>Competitive – conflicting sound</td>
<td></td>
</tr>
<tr>
<td>Olfactory / gustatory</td>
<td>Strong intensity</td>
<td>Mild intensity</td>
</tr>
</tbody>
</table>
Incorporating sensory qualities into integrated therapy programmes

Visual

<table>
<thead>
<tr>
<th>Arousal</th>
<th>Discrimination</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High intensity – to increase arousal &amp; attention</td>
<td>• Low intensity – generate searching behaviours</td>
</tr>
<tr>
<td>• High contrast – to enhance location &amp; attention</td>
<td>• Low contrast – discrimination</td>
</tr>
<tr>
<td>• Variability – Maintain alertness &amp; attention</td>
<td>• Competitive – increase tolerance and inhibitory response</td>
</tr>
</tbody>
</table>
Auditory

Arousal

- Variable – maintain arousal or interest in the task
- High intensity – Alerting, location

Discrimination

- Rhythmic – predictable / organising / orientation
- Constant – Environmental orientation
- Competitive – Orientation & tolerance
# Olfactory / Gustatory

<table>
<thead>
<tr>
<th>Arousal</th>
<th>Discriminatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Strong intensity - arousal</td>
<td>• Noncompetitive – focus attention</td>
</tr>
<tr>
<td></td>
<td>• Low intensity – generate searching behaviour</td>
</tr>
<tr>
<td></td>
<td>• Mild intensity – recognition &amp; memory</td>
</tr>
</tbody>
</table>
Sensory magic

Reduce agitation / education / increase arousal...
Sensory Magic offers the individual a safe sensory environment which is structured and predictable. The sensory room can be set according to each individual’s needs and preferences, so that each and every time the experience is identical, providing continuity and stability. In this way, anxiety levels are kept to a minimum. The MSE can be subtly and slowly altered over time to introduce new colours, images and sounds at the individual’s own pace.

• [www.rompa.com/sensorymagic](http://www.rompa.com/sensorymagic)
Simon

- 67 year old man with Alzheimer’s disease and attempted insulin overdose
- Sensory seeker using the Sensory Profile
- Sensory level using the PAL
- Graded introduction
- Sensory package for use at home
Claire

- 80 year old woman with vascular dementia and R CVA
- Sensory sensitive using the Sensory Profile
- Exploratory using the PAL
- Graded exposure and relaxation techniques
- Sensory soothing kit
Research


Research cont.


Thank you for listening

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