Effectiveness of Antecedent Control to Increase Tolerance to Therapy in a Client with Reduced Insight

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Acknowledgements

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Jason Bernard, Rehabilitation Therapist
Overview

- Applied Behaviour Analysis in ABI Populations
- Client
- Behaviour Plan
- Results
- Concluding Remarks
The ABCs of Behaviour

- Antecedent
- Behaviour
- Consequence
The ABCs of Behaviour

A ntecedent
- The behavioral trigger

B ehavior
- The target behaviour

C onsequence
- The response to the behaviour
Example of an ABC sequence

- An OT brings a breakfast tray to a patient and explains that she will be helping him learn how to use the modified spoon. (Antecedent)
- The patient swears at the OT. (Behaviour)
- The OT leaves the room stating that she will return in 5 minutes. (Consequence)
Changing Behaviour

Antecedent Control

- Changing antecedents to modify behaviour
  - Eliminating triggers for the target behaviour
  - Creating triggers for alternative behaviour
Changing Behaviour

Examples of Antecedent Control

- Changes to physical environment
- Changes to the interpersonal environment
- Changes to the task environment
- Changes to the patient’s internal environment
Changing Behaviour

Positive Behaviour Supports

- Enhance quality of life and manage behaviour
- Teach useful skills
- Redesign environments
- Applied behaviour analysis
  - Emphasizes antecedent control
Changing Behaviour

Modifying Consequences

- Changing your response to the target behaviour
  - Increase the likelihood of the behaviour
  - Decrease the likelihood of the behaviour
Changing Behaviour

Modifying Consequences

- Differential reinforcement of other behaviours
- Behavioural contracts
- Response cost
Evidence from the literature

- Antecedent control and modifying consequences are effective with an ABI population

- Antecedent control may be better suited to ABI populations
  - Not minimizing importance of consequences
Example Behaviour Plan

Fluharty and Glassman (2001)

- KM, 15 months post a severe brain injury
- Severe cognitive and functional impairments
- Target Behaviours
  - Refusal to do ADLs
  - Physical and verbal aggression
Example Behaviour Plan

- Intolerance for auditory and tactile stimuli
- Behaviour Plan
  - Emphasized antecedent control
  - Minimized potential for overstimulation during ADLs
  - Redirection and distraction
Example Behaviour Plan

Results

- Decrease in verbal aggression, physical aggression and refusing ADLs
- Transferred to a group home
  - Continued to require behavioural support
  - Minor behavioural problems
The Client

Demographics

- JA, age 52
- Single
- Living in Alberta
- Mover
- Limited contact with family
- Significant alcohol use
The Client

Accident and Injuries

- Pedestrian struck by a car
- Sustained a severe brain injury
- Fractures involving right shoulder and ribs, and left hip
The Client

- Cognitive and perceptual deficits
- Left sided visual field deficit
- Physical deficits
The Client

Medications

- Physical injuries and conditions
- Mood, sleep and seizure prevention
The Client

Rehabilitation Goals

- I want to go home
- I want my vision back
- I want to improve hearing
- My left shoulder and left hip hurts
- I want to exercise more and work on my balance
- I have a little trouble with my memory but it is much better than before
Behavioural Assessment

Target Behaviours

- Refusing to attend therapy, leaving sessions early
- Negative Verbalizations
Behavioural Assessment

Sources of Behavioural Information

- Medical chart
- Direct behavioural observation
- Functional analysis through interview of PT, OT, and RT
Behavioural Analysis

Purpose of Behaviours
- Escape

Contribution of Personal Characteristics
- Lack of Insight
- Low Frustration Tolerance

Contribution of Task Characteristics
- Preferred versus Nonpreferred tasks
## Physiotherapy: Preferred and Nonpreferred Tasks

<table>
<thead>
<tr>
<th>Preferred</th>
<th>Nonpreferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Pullies</td>
<td>▪ Exercise ball</td>
</tr>
<tr>
<td>▪ Nu Step</td>
<td>▪ Parallel bars</td>
</tr>
<tr>
<td>▪ Outdoor exercise</td>
<td>▪ Arms lifts with weight</td>
</tr>
<tr>
<td>▪ Weights/ladder</td>
<td>▪ Hand puddy exercises</td>
</tr>
<tr>
<td>▪ Conversations about physiotherapy</td>
<td>▪ Feedback</td>
</tr>
<tr>
<td>▪ Arm lifts with cane</td>
<td>▪ Stairs</td>
</tr>
<tr>
<td>▪ Walking exercises</td>
<td></td>
</tr>
</tbody>
</table>
### Occupational Therapy: Preferred and Nonpreferred Tasks

<table>
<thead>
<tr>
<th>Preferred</th>
<th>Nonpreferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor exercises</td>
<td>Money management exercises</td>
</tr>
<tr>
<td>Cooking</td>
<td>Tests and assessments</td>
</tr>
<tr>
<td>Card games</td>
<td>Grocery shopping</td>
</tr>
</tbody>
</table>

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*Toronto Rehab*

*Everything Humanly Possible*
## Rehabilitation Therapy: Preferred versus Nonpreferred Tasks

<table>
<thead>
<tr>
<th>Preferred</th>
<th>Nonpreferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Any outdoor exercise</td>
<td>• Visual scanning</td>
</tr>
<tr>
<td>• Social engagement</td>
<td>• Money Management</td>
</tr>
<tr>
<td>• Route finding exercises</td>
<td>• Newspaper</td>
</tr>
<tr>
<td></td>
<td>• Pen and paper exercises</td>
</tr>
<tr>
<td></td>
<td>• Receiving feedback</td>
</tr>
</tbody>
</table>
Behavioural Interventions

General Presets

- Presets to attend OT
- Proper glasses
Behavioural Interventions

Within Therapy Interventions

- Q&A at beginning and end of sessions
- Choose therapy task when possible
- Choose last therapy task
- Positive behavioural momentum
- Encourage to sign out and meet porter
- Employ meaningful tasks
Behavioural Interventions

Rationale for Antecedent Control

- Client had no interest in therapy
- Consequences for attending or not attending were not meaningful
- Restructure the environment
  - Make therapy attendance more likely
  - Make therapy participation more reinforcing
Behavioural Data Collection

Study Design
- Multiple Baselines across therapy type

Behavioural Data
- Length of therapy session (minutes)
- Time spent performing preferred and nonpreferred tasks
- Average number of negative verbalizations per 10 minutes for preferred and nonpreferred tasks
Results

The behaviour plan was effective
- Increased therapy attendance
- Increased performance of nonpreferred tasks
- Decrease in frequency of negative verbalizations

Pattern of results varied by therapy type
Percentage of Session Attended

(All sessions are 60 min.; * 30 min. PT session; ** 30 min. RT session)
### Percentage of Session Attended

<table>
<thead>
<tr>
<th>Therapy Type</th>
<th>Baseline (Mean &amp; (SD))</th>
<th>Intervention (Mean (SD))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiotherapy</td>
<td>81.00 (14.41)</td>
<td>86.04 (7.86)</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td>0.00 (0.00)</td>
<td>73.15 (25.99)</td>
</tr>
<tr>
<td>Rehabilitation Therapy</td>
<td>18.67 (25.99)</td>
<td>70.83 (18.06)</td>
</tr>
</tbody>
</table>
Physiotherapy: Time Spent Doing Preferred and Nonpreferred Tasks

![Graph showing time spent on preferred and nonpreferred tasks over sessions. Session 1 to 13 with corresponding minutes and note: *30 Min. Session, ^No Nonpreferred Task Offered.](image)
# Physiotherapy: Time Spent Doing Preferred and Nonpreferred Tasks

<table>
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<th>Task Type</th>
<th>Baseline (Mean &amp; (SD))</th>
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<tbody>
<tr>
<td>Preferred</td>
<td>27.60 (9.07)</td>
<td>21.00 (4.57)</td>
</tr>
<tr>
<td>Nonpreferred</td>
<td>15.4 (14.57)</td>
<td>21.63 (17.22)</td>
</tr>
</tbody>
</table>
Occupational Therapy: Time Spent Doing Preferred and Nonpreferred Tasks

(* Refused Therapy, ** No Preferred Tasks Offered, *** No Nonpreferred Tasks Offered)
## Occupational Therapy: Time Spent Doing Preferred and Nonpreferred Tasks

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<tbody>
<tr>
<td>Preferred</td>
<td>0.00</td>
<td>30.71 (20.26)</td>
</tr>
<tr>
<td>Nonpreferred</td>
<td>0.00</td>
<td>20.00 (20.81)</td>
</tr>
</tbody>
</table>
Rehabilitation Therapy: Time Spent Doing Preferred and Nonpreferred Tasks
# Rehabilitation Therapy: Time Spent Doing Preferred and Nonpreferred Tasks

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<tr>
<td>Preferred</td>
<td>4.00 (5.48)</td>
<td>24.88 (7.29)</td>
</tr>
<tr>
<td>Nonpreferred</td>
<td>7.20 (10.26)</td>
<td>17.43 (6.21)</td>
</tr>
</tbody>
</table>
Physiotherapy: Negative Verbalizations for Preferred and Nonpreferred Tasks

![Graph showing negative verbalizations over sessions for preferred and nonpreferred tasks.](image)

- Preferred Tasks
- Nonpreferred Tasks

Baseline (30 Min. Session, No Nonpreferred Tasks Offered)
## Physiotherapy: Negative Verbalizations During Preferred and Nonpreferred Tasks

<table>
<thead>
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<th>Baseline (Mean &amp; (SD))</th>
<th>Intervention (Mean &amp; (SD))</th>
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<tbody>
<tr>
<td>Preferred</td>
<td>.54 (.68)</td>
<td>.36 (.58)</td>
</tr>
<tr>
<td>Nonpreferred</td>
<td>5.56 (1.48)</td>
<td>1.11 (.97)</td>
</tr>
</tbody>
</table>
Occupational Therapy: Negative Verbalizations During Preferred and Nonpreferred Tasks

( * Refused Therapy, ** No Preferred Tasks Offered, *** No Nonpreferred Tasks Offered)
Occupational Therapy: Negative Verbalizations During Preferred and Nonpreferred Tasks

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<th>Intervention (Mean &amp; (SD))</th>
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<tbody>
<tr>
<td>Preferred</td>
<td>.</td>
<td>.07 (.19)</td>
</tr>
<tr>
<td>Nonpreferred</td>
<td>.</td>
<td>2.25 (3.82)</td>
</tr>
</tbody>
</table>
Rehabilitation Therapy: Negative Verbalizations During Preferred and Nonpreferred Tasks

(* Refused Therapy, ** No Nonpreferred Tasks Offered, *** 30 Min. Session)
### Rehabilitation Therapy: Negative Verbalizations During Preferred and Nonpreferred Tasks

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<tbody>
<tr>
<td>Preferred</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Nonpreferred</td>
<td>5.42 (4.45)</td>
<td>0.26 (.36)</td>
</tr>
</tbody>
</table>
Review of Results

Main effects

- Increased therapy session length
- More time spent performing nonpreferred tasks
- Decrease in the frequency of negative verbalizations
  - Spontaneously commented that being in rehab was beneficial
Effects varied with therapy type

PT  Negative verbalizations
    Time spent doing nonpreferred tasks

OT  Therapy session length
    Time spent doing nonpreferred tasks

RT  Therapy session length
    Negative verbalizations
Conclusions

- Antecedent control had a positive effect on JA’s participation in therapy
- Effects observed across a variety of therapy types and therapists
- Effect varied with therapy type
Conclusions

- Antecedent control involves changing the environment to change a behaviour
- Behaviour change can then be positively reinforced
- Positive reinforcement increases the likelihood of the behaviour reoccurring in the future.