Can the Theory of Planned Behaviour Inform Behaviour Change Interventions?

- TPB specifies no post-intentional processes
- Attenuation problem ($\Delta \text{intention} = a^* \Delta \text{attitudes} + b^* \Delta \text{SN} + c^* \Delta \text{PBC} + e$)
- weakly predictive of change (controlled for past behaviour)
- weakly effective for behaviour change (Hardemann et al. 2002)
Definitions

Goal intentions
• “I intend to perform behaviour Z!” or
  “I intend to achieve outcome Z!”

Implementation Intentions (IMPS)
• “If situation Y occurs, then I will initiate goal-directed behaviour z!”.

(z is an element of Z)

Meta-analysis of implementation Intentions

• Forming if-then plans facilitates the realisation of intentions.
• Positive medium-to-large effect size (d=.65).
• Evidence for IMPS to facilitate overcoming of self-regulatory problems of initiating, shielding ongoing goal pursuit from unwanted influences, disengaging after failure and conserving resources for future self-regulation.

Construct differentiation

Planning paradigms in Health Psychology differ substantially from the laboratory-based paradigms developed by Gollwitzer, Sheeran and Webb to test the effects, mediators and moderators of imps. Obvious differences include

1. in health psychology, participants are usually asked to form personally meaningful action plans, rather than being provided with researcher-specified imps,
2. most health behaviour studies test the effects of action planning on general (unconditional) levels of behaviour performance (e.g., physical activity) rather than on conditional behaviour (e.g., levels of physical given that the ‘if’ condition of the implementation intention occurs) and
3. initial experiences of enacting a personally meaningful action plan will affect learning and future performance in a way that is likely to differ from pressing keys in the lab.

As a result, planning health behaviour change will differ from imps in terms of effects, mediators and moderators.

Prospective planning in behavioural self-regulation

• There is a good evidence for planning to facilitate intended behaviour

Plans can address:

1. Antecedences of the intended and undesired incongruent behaviours (e.g., create good opportunities; deal with situations triggering unwanted responses)

2. Behaviours: Execution of target behaviours or suppression of unwanted behaviours

3. Consequences of behaviour (e.g., planning to reward successful behaviour)
Action Planning

Translating intentions into action:

☑️ when will I act?
☑️ where will I act?
☑️ how will I act?

Leventhal, Singer & Jones (1965); Gollwitzer (1993; 1999)

Coping Planning

Protecting action plans against obstacles:

☑️ anticipation of barriers and obstacles
☑️ preparation of coping strategies
☑️ mental simulation of successful scenarios
Coping Planning
Similarities to established CBT standard techniques

Anticipation of risk situations and proactive preparation of coping responses

- Prehearsal (Kanfer, 1979)
- Covert Modelling (Cautela & Kearney, 1986)
- Coping-Imagery (Hodges et al., 1978)
- Relapse Prevention (Marlatt, 1996)
Brief planning interventions for physical activity following cardiac rehabilitation

Coping Planning

Action Planning

Action Planning

Combined Planning Group:
additionally up to three coping plans

Action Planning Group:
up to three action plans for physical exercise

Control Group

Action Planning Group

Combined Planning Group

In-Patient Rehabilitation (3-4 Weeks)

Sniehotta, Scholz & Schwarzer (2006) BJHP

Action planning Sheet for physical activity

<table>
<thead>
<tr>
<th>Where</th>
<th>When</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please describe the <strong>Situation</strong> (where, with whom, etc)</td>
<td>Please describe the point of time &amp; the duration</td>
<td>Please describe the type of physical activity that you want to engage in!</td>
</tr>
</tbody>
</table>

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Oral Instruction for Coping Planning

Many patients experience problems in exercising regularly after their discharge from rehabilitation. Everyone knows that it can be hard to gather oneself.

It is beneficial, however, to anticipate possible difficulties and plan how to overcome them. What difficulties could get in the way of your exercising regularly?

Written Instruction in the Planning Sheet

Which obstacles and barriers could get in the way of your intended exercise? How can you master these situations?

Please write down your three most important plans for these critical situations. The more precise, concrete and personal you formulate your plans, the more they will help you!

Effects on self-reported Physical Exercise (IPAQ)

![Chart showing exercise intensity over time for control, action planning, and action + coping planning groups.](chart.png)

Sniehotta, Scholz & Schwarzer (2006) BJHP
Post-intentional processes: Volitional control of focal goals

Prospective control (ex situ)
- Target Behaviour: e.g., Action Planning
- Factors impeding the target Behaviour: e.g., Coping Planning
- Factors facilitating the target Behaviour: e.g., Facilitating Planning

Concomitant control (in situ)
- Action control (Negative Feedback control)
- Shielding of Action (Positive Feedback Control)
- Preparatory actions

Factors impeding the target Behaviour: e.g., Coping Planning
Factors facilitating the target Behaviour: e.g., Facilitating Planning

Control Theory
(Carver & Scheier, 1998; Baumeister et al., 1994; Kanfer, 1970; Miller, Galanter & Pribram, 1960; Carver & Scheier, 1998)

Goal
- Comparison of goal with current behaviour
  - No discrepancy: Goal attained
  - Discrepancy between goal and behaviour
  - Discrepancy reducing efforts
  - Goal Disengagement

Self-monitoring
Psychological Processes:

- Self-Monitoring
- Activation and Awareness of Standards
- Standard/Actual Comparison
- Applying Discrepancy-Reducing Means & Regulatory Effort

Model 1:
Social Cognition Model

During Rehabilitation

4 months following discharge

Sniehotta, Scholz & Schwarzer (2005) Psych & Health
Modell 2:
Health Action Process Approach

Action Control (Self-Regulation) Scale

**Awareness of own standards**
- Items:
  - During the last four weeks, I have always been aware of my intended training program.
  - During the last four weeks, I have had my exercise intentions often on my mind.

**Self-monitoring**
- Items:
  - During the last four weeks, I have constantly monitored myself whether I exercise often enough.
  - During the last four weeks, I have watched carefully that I trained for at least 30 minutes with the recommended strain per unit.

**Self-regulatory Effort**
- Items:
  - During the last four weeks, I have tried my best to act in accordance with my intentions.
  - During the last four weeks, I have really tried to exercise regularly.

Sniehotta, Scholz & Schwarzer (2005) *Psych & Health*
Modell 3:
HAPA plus Action Control

Modell 3:
Action Control predicts behaviour over and above the HAPA and partially mediates HAPA predictors

Sniehotta, Scholz & Schwarzer (2005) Psych & Health
Randomised Controlled Trial

- Planning intervention
- Planning intervention
- 6 weekly questionnaires
- In-Patient Rehabilitation (3-4 Weeks)
- Control
- Planning
- Planning + Weekly Questionnaires
- Weekly feedback of personal plans with questions about plan implementation
- Up to three action plans and three coping plans

Action Control in the Initiation of Lifestyle changes in CHD patients

Discharge

T1 Planning Intervention

W1 W2 W3 W4 W5 W6

Weekly Diaries
(in the first 6 weeks after discharge)

T2 2 month later

**Weekly diaries**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>mondays 9.30 am, wednesdays 9.30 am and fridays 10.00 am</td>
<td>I train for 30 minutes on the bicycle-ergometer</td>
</tr>
</tbody>
</table>

**How often in the described situation have you ...**

- ... acted in accordance with your plan? __ times
- ... acted in a different way? __ times

**If you have acted in a different way:**

- How often have you remembered your plan in that situation? __ times
- How often have you tried to follow your plan in that situation? __ times
- How often have you been physically active in other ways in that situation? __ times

**If you have not been physically active in that situation, ...**

- ... how often did you regret this? __ times
- ... how often has this been a conscious exception? __ times

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**No Intervention Effects on Action Planning (T2)**

![Bar chart](image)

Intervention Effects on Coping Planning (T2)

Intervention Effects on Action Control (T2)

Long-Term Effects on Physical Exercise

The Intervention Effects on Physical Exercise are fully Mediated by Effects on Coping Planning, & Action Control

Prospective beliefs
- e.g., TRA
- Attitudes
- Subjective Norms
- Self-efficacy
- Structural & allocational properties of goal systems

Prospective control (ex situ)
- e.g., Goal setting
- Action Planning
- Preparatory action
- Simulation
- Counteractive control

Executive control (in situ)
- e.g., Action Control
- Feedback control
- Self-reinforcement
- Energy activation

Target Behaviour
Factors incongruent to the target Behaviour

New routines

Old Habits

M O T I V A T I O N

V O L I T I O N

control of focal goals

decision


Sniehotta & Johnston, in prep.
### Integrative Research Strategies

#### Behaviour Change Techniques

<table>
<thead>
<tr>
<th>Behaviour change Techniques</th>
<th>THEORY</th>
<th>Social cognitions</th>
<th>Prospective control (ex situ)</th>
<th>Actual control (in situ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Behaviour</td>
<td></td>
<td></td>
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<tr>
<td>Incongruent factors</td>
<td></td>
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<tr>
<td>Incentives</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Threats</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>Action Planning</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Relapse prevention</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Reward</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Self-talk</td>
<td></td>
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<td></td>
<td>X</td>
</tr>
<tr>
<td>Cognitive restructuring</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role play</td>
<td>X X X X X X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Feedback</td>
<td>X X</td>
<td></td>
<td>X X</td>
<td></td>
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<tr>
<td>etc</td>
<td></td>
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</tbody>
</table>

#### SELF-REGUL. THEORY
- Cognitive Processes of Behaviour Change

#### Behaviour Modification Techniques

- BEHAVIOURAL THEORY
  - Operant conditioning
  - Classical conditioning

#### Behaviour Change

- Integrative Research Strategies
Challenges for accumulative evidence-based theory development

- Comparisons of theories (e.g., Weinstein, 1993; Noar & Zimmermann 2005).
- Testing causal relationships in experimental designs rather than in correlational designs (e.g., Weinstein, submitted).
- Emphasis on maintenance of behaviour (Marcus et al. 2000).
- Incorporating goal systems and hierarchies (Carver & Scheier, 1998; Kruglanski et al., 2002).
- Automatic vs. conscious control processes (e.g., Bargh, 1999).

Theory Integration and Development

Falko F Sniehotta

www.abdn.ac.uk/healthpsychology
Bridging the Intention-Behaviour Gap:
A Model of Health Behaviour Change

The Rubicon Model of Action Phases
(Heckhausen, 1987; Heckhausen & Gollwitzer, 1987)
Definitions

What is the difference between Implementation intentions and Planning?

Lab studies vs. applied studies

- Most lab study test IMPS effects with regard to their effects on the conditional probability of the planned response to occur when the specified situation is encountered (presented)
- Applied studies usually look at the occurrence of the behavioural outcome Z (e.g., how many referrals have been made, how often did the patient take the drug) rather than the occurrences of z when Y is encountered.
Understanding planning effects using the Bayes Theorem (Bayes, 1763)

\[ P(Z \mid Y) = \frac{P(Y \mid Z) \cdot P(Y)}{P(Z)} \]

\[ P(\text{Behaviour} \mid \text{Situation}) = \frac{P(\text{Situation} \mid \text{Behaviour}) \cdot P(\text{Situation})}{P(\text{Behaviour})} \]

Bayes Theorem resolved for \( P(Z) \)

\[ P(Z) = \frac{P(Z \mid Y) \cdot P(Y)}{P(Y \mid Z)} \]

\[ P(\text{Behaviour}) = \frac{P(\text{Behaviour} \mid \text{Situation}) \cdot P(\text{Situation})}{P(\text{Situation} \mid \text{Behaviour})} \]
Definitions

Goal intentions
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Implementation Intentions (IMPS)
• “If situation \( Y \) occurs, then I will initiate goal-directed behaviour \( z! \”).

\((z \text{ is an element of } Z)\)

Example

Goal intentions
• “I intend to read about the latest research in my area of work regularly \((Z)\).

Implementation Intentions (IMPS)
• “Every Friday after seeing my last patient (situation \( Y \)), I will read the online version of the BMJ and one recent paper from Medline \((z)\).

\((z \text{ is an element of } Z)\)
Evaluating the example plan

• In this example, the measure of effectiveness of the IMP is how often the doctor reads the online version of the BMJ and one recent paper from Medline (z) on Fridays after seeing patients
• And NOT how much time they spend reading recent research (Z).

Making effective plans takes more than making IMPS

• Dependent on frequency of situation Y
• Dependent on the baseline frequency of the target behaviour Z.
• Dependent on base rate of both conditional probabilities of occurrence of p(Z|Y) and p(Y |Z)
• Based on these information planning interventions could be improved and enhanced.
Most of the effect of planning on achievement of the desired outcome Z in applied planning studies is accounted for by factors outside of the IMPS framework.

Planning involves both, the identification of suitable behavioural responses and opportunities to enact them in order to achieve the desired outcomes, as well as the formation of an implementation intention linking the if and the then component