Stage-based theories of behaviour change

Ron Borland PhD
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The TransTheoretical Model (TTM) - Stages of change

- **Pre-contemplation**: No intention to act within 6 months.
- **Contemplation**: Intends to act within 6 months.
- **Preparation**: Intends to act within 30 days and behavioural steps already taken.
- **Action**: Overt action for less than 6 months.
- **Maintenance**: Change maintained over 6 months.

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Key Features of the TTM

- Deals with intentional behaviour change
- Views change as a process rather than an event
- The change process is characterised by a series of stages of change
- In attempting to change a behaviour a person typically cycles through these stages of change
Stages as discontinuities in “state of mind”

- From a communication perspective, what you say to a smoker depends on their psychological position or stage of change.
- Some questions change meaning and/or only having meaning from some positions.
  
  e.g. i  It makes no sense to ask a Precontemplator “How determined are you to quit smoking?”
  
  ii The question “How confident are you in your ability to quit smoking permanently?” , changes meaning:

  To a Precontemplator, it is an abstract question about ability.

  To a Preparer, it also incorporates self-assessed motivation.

  To someone in Action, it is a reflection on how they are going.

- Stages or positions are important in understanding behavior change.
Two Main Types of Change Processes

- Cognitive change processes
  - *Involve changes in the way people think about their smoking*

- Behavioural change processes
  - *Involve people developing new habits. It takes time and practice to feel comfortable acting in new ways.*
Relationship between Processes and Stages of Change

Cognitive change processes help people to move through the early (and late) stages
- Research is showing that cognition is important at all stages

Behavioural change processes help people to move through the later stages of change
i.e. from making a quit attempt to staying quit, but practice important
Decisional Balance

- Decisional balance is the importance a person gives to the perceived advantages (pros) and disadvantages (cons) of smoking, and of quitting.

- An individual’s motivation to change is affected by his/her decisional balance.

- Evidence suggests that long and short term consequences are not balanced.
Self-efficacy

• TTM empirically equates self-efficacy and task difficulty (inverse)
• Evidence is that these are two distinct, although related concepts
Transtheoretical Model Stages

Limitations

– Pre-quitting stages conceptually confused.
  • Preparation compounds intention and past action
– Post-quitting stages arbitrary.
– Not grounded in strong empirical evidence.

Critical test

• Combining groups across stage boundaries should reduce prediction
Evidence of predictive discontinuities

Prequitting

• Interested in quitting at all vs. not
• Actively thinking vs. open to possibility
• Decided quit date. vs not
• Recent quitting activity (last month)
Quitting is a major position change

• **Prequitting** the person smokes and may have thoughts about stopping and of the consequences.

• **Postquitting** the person no longer smokes, is experiencing some of the consequences and as a result may have thoughts about the challenge of persisting.

• **Typically quitting** is planned but relapse is not;
  - thus positions around intentions may be important before quitting smoking, but they are unlikely to be important post-quitting.
Tasks post-cessation

**Survival:** The week or so after quitting when withdrawal symptoms are often unpleasant.

**Consolidation:** Dealing with urges to smoke effectively

**Becoming a non-smoker:** Learning to think and act like a non-smoker
How is the Model Useful?

• Provides a framework for understanding the process of how people change

• Recognises that people in different stages of change need different types of interventions to help them progress

• Basic model needs refinement, in part in ways suggested
Blissful ignorance

Knowledge → Engagement

Engagement → Commitment

Commitment → Quitting

Quitting → (Relapse)

Disengaged

Prompts
Promise of benefit

Steps in progress towards smoking cessation
Changing nature of tasks for change

• To decide quitting is worth thinking about
• To think about it
• To decide to do it
• To implement the attempt
• To survive withdrawal
• To learn new skills and unlearn old ones
• To come to think and act like a non-smoker
Towards a reconceptualisation of change

• Where to if TTM is inadequate?
• Other gaps?
• Outline of an alternative comprehensive theory.
Ambivalence

• Short term contingencies create powerful emotionally charged incentives for use
• Long term consequences create large, but typically abstract, incentives to quit use
• Cessation is a triumph of rationality over immediate contingencies
No replacement behaviour

• If there was a harmless drug or activity that provided all the immediate benefits of tobacco use without any of the harms,
• Everybody would have already switched
• Much less harmful partial replacements are becoming available
  – Clean smokeless, including e-cigarettes
Competing priorities

- Smoking not a road block behaviour
  - *Incidental to main life goals*
  - *Sometimes seen as facilitatory*
- Strong incentives to delay dealing with it
- Interest ebbs and flows
- Need external prompts to maintain interest
Helping the ambivalent

• Go to where they are
  – Engage them in the issue

• Systems to generate engagement
  – Mass media
  – Health professionals
  – Pack warnings
  – Price etc

• Offer programs that can really help
  – Provide structures to maintain engagement
  – Discourage premature claims of success
Some puzzling findings

• The more you are motivated to quit the less likely you are to succeed, given that you try
• Recent quitting experience predicts failure next time
• We don’t understand addiction
  – *Our best measure does not predict relapse beyond the first month*
  – *Post-quit urges are predictive*
  – *Although conditions for abstinence improve, relapse is still common*
Predictors of making quit attempts

• All seven measures were predictive of making attempts when controlling for sociodemographics

• When considered as a set, key predictors are:
  – Wanting to quit
  – Prematurely stubbing out
  – ? Health concerns and Benefits of quitting (one wave each)

• Adding dependence related measures, intention to quit, self-efficacy, recent quit attempt and an index of motivation to smoke does not change this
  – All except self-efficacy were associated with quit attempts in the expected direction

• These variables are clearly important determinants of making quit attempts
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**Attempts: Adjusted Odds Ratios (95% CI’s) for Each Core Variable**

<table>
<thead>
<tr>
<th>Core Predictor Variable</th>
<th>1. Demographics</th>
<th>2. Positive motivational variables</th>
<th>3. Self-efficacy, intention to quit, quit recency &amp; motive to smoke.</th>
<th>4. HSI, daily/non-daily, longest attempt.</th>
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<td>Wave 3 to 4</td>
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<td><strong>1.23</strong> (1.13 – 1.35)</td>
<td><strong>1.22</strong> (1.11 – 1.33)</td>
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Note: Figures are odds ratios and 95% confidence intervals.

Wave 3 to 4 (n = 5064 valid + 305 missing), wave 4 to 5 (n = 4585 valid + 258 missing), wave 5 to 6 (n = 4633 + 258 missing)

Borland et al, In Press, Nicotine and Tobacco Research
Predictors of sustained abstinence

• All 7, except attitude to smoking, predict relapse
  – most consistently

• When analysed together:
  – Wanting to quit, premature butting out, and financial cost all predict relapse

• Adding dependence related measures, intention to quit, self-efficacy, recent quit attempt and an index of motivation to smoke leaves only premature butting out
  – A recent quit attempt and higher dependence also predict relapse, and higher self-efficacy was associated with success.

• Many motives driving quit attempts play no positive role in sustaining abstinence
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Note: Figures are odds ratios and 95% confidence intervals.
Wave 3 to 4 (n = 1994 valid + 127 missing), wave 4 to 5 (n = 1662 valid + 103 missing), wave 5 to 6 (n = 1638 valid + 141 missing)

Borland et al, In Press, Nicotine and Tobacco Research
How do we explain this?

• Why the possible negative effect of motivation?
  – *Could be residual confounding with difficulty of the challenge:*
    • Assumes the highly motivated who are still smoking are those with least capacity to quit
  – *Could be we are measuring abstract desire not likelihood of committing effort*

• Need to develop a coherent theory of behavioural maintenance for hard-to-change behaviours like smoking.
  – *Such a model needs to begin with consideration of the experiences of the new behaviour pattern (see Rothman, 2000, and others)*
  – *However, needs to go beyond this to provide a framework for understanding maintenance in the face of negative experiences*
  – *Needs to rethink what is meant by motivation and how motivation to act may differ from motivation to persist*
Is this perverse effect universal?

- Not finding it in Asia
- ? Cultural
- Short history of encouraging cessation
  - *Still plenty of low-moderately addicted smokers*
- OR?
# Financial stress and quitting

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>NO</th>
<th>YES</th>
<th>Multivariate OR</th>
</tr>
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<tr>
<td>Interest in quitting</td>
<td>3265</td>
<td>69%</td>
<td>83%</td>
<td>1.71 (1.19-2.46)</td>
</tr>
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<td>Quit attempts</td>
<td>3265</td>
<td>37%</td>
<td>38%</td>
<td>0.74 (0.56-0.96)</td>
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<td>Quit success</td>
<td>1160</td>
<td>31%</td>
<td>20%</td>
<td>0.52 (0.31-0.87)</td>
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Siahpush et al, In press
What does this all mean?

• We can choose to try to quit
• But we can't choose to succeed
• We can increase our chances
  – Commit yourself to put in the hard yards
  – Use the best possible help
    • Medication + Structured advice
• BUT, some of the things that motivate trying, might also get in the way of success
• Smoking is a quintessential addiction
Theories of behaviour change

• Typically assume common processes for trying and succeeding
• Often grounded in experimental studies where focus is short term outcomes and/or easy-to-change behaviours
• Good at predicting trying
• Poor for maintenance
C-Theory:
A theory of hard to maintain behaviour change
Essence of C-Theory

Contest between

• Unconscious (often), automated (including conditioned) responses to the world (Operational system);

• and

• Conscious decisions as to what is in our best interests (Executive system)
Conceptual underpinnings

• Emergent materialism
• Importance of basic, non-volitional factors
• Limits of human rationality or self-regulatory capacity
Major interrelationships between behaviour and its major determinants

- This link is actually through the OS, it parallels the sensory reactive pathway, but as it is functionally different, it is useful to depict it as direct.
The implications for behaviour of different strengths and directions of impulses to action from OS and ES
Action is generated by the OS

- in relation to environmental stimuli and input from internal states
  - Based on conditioning

Roles of the Executive System (ES)

- Analyses situation to identify problems
- Sets goals for behaviour
- Monitors behaviour in terms of progress towards goals
- Creates contexts to encourage OS to act in desirable ways
- Interprets inputs form OS as a basis of action
- Exerts self-control
A schematic diagram of the relationships between the two human systems and how they relate to both the environment and behaviour.
• Rationally generated goals need affective force to overcome affectively charged action tendencies to persist.
• Affective reactions to behaviour are retained in memory more strongly than conceptualisations of the source of the affect.
• Affective reactions both shape and are shaped by behaviours.
Main functions of self-regulation

- Identify advantageous changes in behaviour
- Use self-control to inhibit undesirable behaviours
- Support creation of contextual conditions supporting desirable alternative actions
- Change framing of understanding of reasons for behaving so the OS is more likely to choose desirable options.
- Neglected, but important role
Challenges

ES priorities do not automatically arise

- Organisation of ideas critical to eliciting them when needed
- Implementation intentions (Gollwitzer) and hierarchical organisation – help activate ES concepts when needed
  - Make reasons for staying quit salient when craving

ES needs to specify “what not to do”

- In doing so, it evokes the idea
  - Ironic Processes (Wegner), can lead to relapse
Negative affect stimulates action

- Smoking often seen as a means of reducing or managing negative affect
- Thus is a potent trigger for relapse

Can’t condition associations to absence of something

- Positive experiences of not smoking does not protect against relapse

Fear of consequences only suppress the habit

- Conditioned links remain after quitting
- Heightened risk of relapse continues for a long time

Substitutes should make quitting easier

- There have not been viable substitutes for most
Conclusions

• It is not surprising that quitting is so difficult.
• Understanding why should help us to develop better interventions.
• These may look very different to some of our current methods.
• Self-regulation is far more than self-control and the exercise of willpower
Key aspects of C-Theory

- Primacy of action with OS
  - *Requires greater focus on role of emotion*
- Takes consciousness seriously
  - *Critical role for change story (before change)*
- Reinterprets decisional balance and temporal discounting
- Explains episodic nature of change attempts
- Distinguishes between self-control and task re-evaluation as change tools
- Explains why initiation and maintenance have different determinants
- Explains the problems with “saying NO”

Thanks to numerous collaborators and colleagues and to major funders of the research that stimulated this thinking including NHMRC.
Experiences of outcomes

- Experiences after acting are more powerful than continuing expectancies
- Many effects of HTM behaviour change are not directly experienced
  - *Eg, reduced risk of disease*
- Thus motivation based on such things can be vulnerable to other factors
  - *eg. worry about future disease may not decline*
  - *Feeling better may not be linked by OS to the behaviour change*
Positive and negative experiences

• Negative experiences motivate changing behaviour
• Even non-contingent negative feelings
• Positive feelings have less motivational force for action
  – NB Anticipation of positives is a potent force for action
Components of change stories

• How we think determines how we act
• Most of the key components of change stories are parts of expectancy value theories
  – *Outcome expectancies*
  – *Self-efficacy*
  – *Task difficulty*
  – *Intention*
Outcome expectancies

• Not organised in terms of Pros and cons as are other models
• Balance is between
  – *net OS tendencies to engage in unwanted behaviour (desirable in the moment), and*
  – *ES tendencies to choose more appropriate long-term options*
Task difficulty

• Analytic assessment
  – *Influenced by past experiences*,
  – *Including observation of others*

• Determines the resources that will be committed and the need for planning

• Can be independent of self-efficacy for difficult tasks
Self-efficacy

• Conceptualised essentially as Bandura does
• But separates SE for initiation and for persistence and acceptance
Novel constructs

• **Priority**
  - *How it fits in with other life tasks*
  - *A required element of Commitment, but one that relates the task to the rest of the person’s world*

• **Commitment**
  - *More than the decision, it is operationalized in terms of the person’s script for action*
  - *Influenced dynamically by other ES as well as OS functions*
Figure 4. Simplified diagram of the determinants of the initiation of Action.
Operating system
- Non-contingent negative experiences
- Contingent Experiences

Executive system
- Task difficulty
- Priority
- Commitment
- Outcome expectancies
- Self-efficacy

Maintenance of behaviour change

Outcomes

Figure 6. Simplified diagram of the determinants of maintenance of Action.
Conceptual model of self & world

Reflections on past experiences
Perceived resources
Understanding of environment
Competing demands

Task difficulty
Self efficacy
Outcome expectancies

Goals and plans
Commitments
Priority

Decisions to act

OS inputs

Percepts
Feelings
Impulses

Active ES processing
A schematic diagram of the relationships between the two human systems and how they relate to both the environment and behaviour.

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