Stages of Change and the Transtheoretical Model

(James O. Prochaska, 1985)

Purpose

The transtheoretical model (TTM) of health behavior seeks to bridge the cognitive and the behaviorist approaches by positing a series of stages in modifying behavior; in only some of these are cognitive processes pertinent. (See diagram).

Conceptual Basis

Prochaska based his approach on a set of assumptions that formed a critique of earlier approaches to behavior change. He observed, first, that a majority of at-risk people are not ready to change their behavior, and consequently will not be helped by traditional action-oriented prevention programs.

A major problem in many efforts to impact upon the smoking population is the failure to take into account the readiness of the individual smoker with respect to changing his/her smoking behavior. Most past smoking-cessation programs and techniques were designed with an explicit action-oriented strategy that assumed the individual smoker was ready to embark on the smoking-cessation venture... (1, p189)

Indeed, no single theoretical approach could address the complexities of behavioral change, and hence the notion of a ‘transtheoretical’ approach. While behavior change is complex, it does, however, unfold in a stable sequence of stages, and these form the basis for the TTM (2, p104). Furthermore, people typically apply different processes of change according to the progress they have made in changing their behavior.

The transtheoretical model drew concepts from a number of theories to develop a combined model of behavioral change, originally in the context of smoking cessation. Prochaska et al. argued that no single theory can account for the complexities of behavior change; they drew concepts from Freud, from Skinner, from Rogers and others to identify processes of behavioral change over time. In place of viewing change as a discrete event, it approached change as a process that occurs in a series of identifiable stages. At each of these stages different types of intervention are appropriate to move the person to the next stage in the process (2, p104).

Description

The model includes four main constructs: the sequential stages of change; processes which people typically use to facilitate change; decisional balance, which predicts whether change will occur; and self-efficacy, the person’s confidence they can make changes.
The six stages of change represent ‘motivational postures’ and include:

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<tr>
<th>Stage</th>
<th>Description</th>
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<tr>
<td>Precontemplation (PC)</td>
<td>The person has no intention of changing the behavior, usually within the next six months. This may be due to a lack of information, or to lack of confidence. The person is typically unmotivated and will resist discussing or thinking about making the change. They are not ready for traditional health promotion interventions.</td>
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<tr>
<td>Contemplation (C)</td>
<td>The person expresses an intention to take action within six months. They are aware of both benefits and costs of making the change, and this balance may keep them in this phase for a long time: “chronic contemplation or behavioral procrastination” (2, p100). They are not ready for an intervention that expects immediate action.</td>
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<td>Preparation (P)</td>
<td>The person intends to take action in the immediate future (commonly defined as 30 days). They typically have a plan of action (such as joining a fitness class, etc.) and have taken some preparatory action (such as obtaining information). They are ready for traditional action interventions.</td>
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<tr>
<td>Action (A)</td>
<td>The person has made specified changes to their lifestyle within the past six months.</td>
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<td>Maintenance (M)</td>
<td>The person works to prevent relapse; during this phase confidence increases that they can continue their new lifestyle. The duration of this phase varies according to the behavior; for smoking, abstinence for five years may be required before the risk of relapse becomes insignificant.</td>
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<td>Termination (T)</td>
<td>In principle, the maintenance stage will lead to a phase in which the person is no longer tempted to revert to the former behavior and the change is complete.</td>
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*Classifying People According to Stage.* People are classified into stage via questionnaires that generally provide a simple algorithm. Applied to current smokers, for example, a question might read “Are you seriously considering quitting smoking?” and the answers would include “No” (PC); “Within the next six months” (C); “Within the next month, and have quit for at least 24 hours within the past 12 months” (P). For ex-smokers, “Have quit within the past 6 months” (A); “Have quit for more than 6 months” (M) (3, p64). Staging algorithms have been proposed for exercise readiness (4), adolescent alcohol use (5), and mammography (2, p113).

The six stages were initially proposed as homogeneous groupings but empirical analyses subsequently suggested that variants exist. Velicer et al. described distinct subtypes within each stage of change. For precontemplation, they identified ‘progressing,’ ‘disengaged’ and ‘immotive’ subgroups. For contemplation and preparation, four subgroups were identified: ‘classic contemplators,’
‘early,’ ‘progressing,’ and ‘disengaged.’ The action stage was divided into ‘classic action,’ ‘progressing,’ ‘disengaged,’ and ‘risk for relapse.’ (6, pp305-309). These groups employed different processes of change. Anatchkova et al. have identified Classic, Progressing, Early Preparation, and Disengaged subtypes for the Preparation stage, based on different patterns of pros and cons (7). Likewise, Contemplators could be divided into Classic Contemplators, Progressing, Early Contemplators, and Disengaged (8).

The *processes of change* include the activities or processes that help the person in progressing through the stages of change. Prochaska et al. list ten processes, but there may be more:

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<tr>
<td><strong>Experiential processes</strong> (cognitive and emotional activities)</td>
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<tr>
<td>Consciousness raising</td>
<td>Finding facts and information that support the change in behavior; these include information on how to change and awareness of the adverse consequences of the behavior. Information comes from the therapist, the media or from reading</td>
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<tr>
<td>Dramatic relief</td>
<td>Experiencing the negative emotions that accompany the behavior, and recognizing the relief that accompanies changing the behavior. People may be moved emotionally by personal testimonies of people who have changed, or through psychodrama.</td>
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<td>Self-evaluation</td>
<td>Coming to recognize the change as a significant part of one’s identity by contrasting the image before and after the change (e.g., switching from couch potato to active person)</td>
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<td>Environmental evaluation</td>
<td>The person’s recognition of how their behavior affects those around them. This has a cognitive and an affective component and can include an understanding that they can become a role model for others.</td>
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<td>Self-liberation</td>
<td>Believing that one can change and making a firm commitment to change. Making New Year’s resolutions and public commitments can represent this process.</td>
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<tr>
<td><strong>Behavioral processes</strong></td>
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<tr>
<td>Helping relationships</td>
<td>Seeking social support for making the change; benefitting from the trust and acceptance of others. This may occur through a therapeutic alliance, buddy systems, or support from a partner.</td>
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<tr>
<td>Counterconditioning</td>
<td>Substituting healthier alternatives or safer substitutes for the problem behavior. An example would be nicotine replacement therapy</td>
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Contingency management

This implies creating consequences that will encourage the person to initiate change in a particular direction. This mainly involves reinforcing positive behavior, group recognition and reducing rewards for the negative behavior.

Stimulus control

Removing cues to the unhealthy behavior and adding cues and reminders for the desired behavior. Avoiding social situations that encourage a person to over-eat would be an example.

Social liberation

Policies and social activism is required to create environments in which the healthy alternative appear as the social norm. This is especially relevant in poor neighborhoods and with disenfranchised groups. Salad bars, smoke-free zones are examples.

These processes were then linked by Prochaska to the stages of change, suggesting that, as one progresses across the stages of change, there is a shift from internal to external influences:

<table>
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<th>Progression across the stages of change</th>
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<td>Precontemplation - Contemplation - Preparation - Action - Maintenance</td>
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Consciousness raising;
Dramatic relief;
Environmental re-evaluation

Self-reevaluation

Self-liberation
Counter-conditioning;
Supportive relationships;
Reinforcement;
Stimulus control

*Decisional balance* refers to the subjective weighting a person makes of the pros (positive images,
values and beliefs) and cons of the recommended action. An initial model proposed four categories of pros and four of cons, but a simple two component model was found adequate (2, p102). The theory held that the balance between perceived pros and cons should vary across the stages of change: people in PC will judge the pros to outweigh the cons of the behavior, while the reverse will hold for those in maintenance. The valence of pros and cons will cross in the C or P stage of change (9, p41).

Self-efficacy refers to the person’s level of confidence that he or she can manage temptations to revert to the unhealthy behavior. Temptations chiefly arise in times of emotional distress, or in certain social situations, or as a result of craving (2, p103).

Prochaska is careful to point out that the stages represent a construct and not a theory. A theory requires clear relationships between constructs, but with the TTM this has only been achieved for the stages of change and the perceived pros and cons of change (2, p105). For people in precontemplation, pros consistently outweigh cons; in the action stage, cons are consistently lower than in the contemplation stage. “These relationships suggest that to progress from precontemplation, the pros of changing must increase; to progress from contemplation, the cons must decrease; to progress to action, the pros must be higher than the cons” (2, p105). Prochaska has presented such relationships as general mathematical relationships. A relatively consistent finding is that progress from precontemplation to action involves approximately one standard deviation increase in the pros of changing. A weaker relationship holds that the same progress requires a half SD reduction in cons; in effect, progression requires twice as much change in pros as in cons (10).

Measurements. Numerous questionnaires have been developed to rate people on the characteristics relevant to the TTM. Velicer et al. have described a 20-item Temptations to Smoke inventory that records the intensity of different triggers for smoking (11, p277); a Confidence Inventory (12), and a 20-item Smoking Decisional Balance inventory that assesses the pros and cons of smoking (13). DiClemente et al. developed a 20-item Smoking Abstinence Self-Efficacy scale which records the smoker’s confidence at being able to avoid smoking in 20 challenging situations (14). A 40-item Smoking Processes of Change scale covers the frequency with which the person uses each of the ten change processes listed above (11; 15; 16, p278).

Measures of Decisional Balance have been proposed for adult smoking (13), for adolescent alcohol use (5), and for children, along with a Situational Temptations Questionnaire (17).

Validation

Conceptual Basis. Several studies have assembled empirical evidence concerning the assumptions that underlie the TTM. The existence of distinct stages of change has been widely confirmed: in an early study of smoking (18), in the adoption of HIV prevention practices (19), of contraceptive use (20), and in 12 different health behaviors (9).
Justifying the claim that a majority of people are not ready to make changes, Velicer et al. reported on three large samples of smokers, of whom 40% were in precontemplation, 40% in contemplation and 20% in preparation. The proportion in precontemplation fell with higher education (21). A similar study by Fava et al. reported 42% of smokers in precontemplation, 40% in contemplation and 18% in preparation (1, p196). In a full population sample, Nigg et al. observed that the majority of people are stably placed, either in precontemplation or in maintenance (22). In a European study, approximately 70% of smokers were in precontemplation, 20% were in contemplation and 10% were in the action stage (23). Laforge et al. reported on stages of readiness for five health behaviors in Australia and the United States. The samples included ex-smokers, and found 50% (U.S.) and 53% (Australia) to be in maintenance, and 20% (U.S.) and 24% (Australia) to be in precontemplation (3, Table 2). Figures for adopting a low-fat diet, regular exercise and for stress reduction were similar, while figures for weight loss (applied to the whole population, including those who did not need to lose weight) were 39% (U.S.) and 49% (Australia) in precontemplation, and 31% (both samples) in maintenance.

Staging algorithms were compared for exercise behavior, and showed that algorithms which used more precise definitions of exercise classified more people in the precontemplation and contemplation stage, while shorter definitions tended to stage subjects in preparation and action. Maintenance was the most consistently described stage across algorithms (4).

The validity of the association between decisional balance and the stages of change was examined by Prochaska et al. in a comparison of studies of 12 different health behaviors. Based on cross-sectional (rather than longitudinal) comparisons, the results suggest that as people progress from PC to C their appraisal of the pros of making the change rises steeply; this is followed by a decline in perceived cons as people progress from C to the P and A stages such that the pros outweigh the cons by the time that the action stage is reached (9, Figure 1). This result held across almost all of the 12 behaviors, and for a wide variety of samples of people.

Construct validation. Several studies have compared smokers in the different stages of change and show significant contrasts between people in each stage that correspond to the theoretical model. Significant differences exist between smokers in the first three stages in terms of their previous attempts to quit, their confidence in being able to stop smoking, and the number of processes they use to support change (18, Tables 2-4); (1, Tables 3, 4). Six months after being classification by stage, 8% of the precontemplation group had quit smoking, 12% of the contemplation group, and 21% of the preparation group (18, Table 5).

Velicer et al. tested a set of 40 construct predictions concerning the association between profiles of decisional balance and situational temptations to smoke and the likelihood of progression from one stage to another over 12 months (24). The analyses supported 36 of 40 predictions, showing that outcomes in terms of transition across stages were predicted by habit strength, and positive and negative evaluation strengths (24).

The processes of change have been widely examined. Factor analyses suggest these cluster into patterns such as a finding of ten main factors and two second-order factors distinguishing behavioral from experiential processes. Hoeppner et al. confirmed the fit of this model on school children and showed that the use of all ten of the processes increased across the stages of change (25). However,
an unpublished report by Rossi gave only limited support to the idea that the same set of processes applies across different behaviors: for some fewer were used while for others, additional processes not normally included in the TTM list were employed (2, p106).

Outcome evaluation. Interventions designed on the basis of the TTM have been tested in randomized trials (26-28). For smoking, typical results are that between 23% to 30% of patients progress to action or maintenance stages over a one-year period. A two-year trial of smoking cessation among adolescents achieved a two-year quit rate of 23.9% in the stage-matched intervention group, and 11.4% in the control group (29, Table 3). An 18-month trial compared ten intervention formats for delivering stage-matched interventions, against a no-intervention control group. The results confirmed that abstinence rates at 18 months were consistently higher for those in the preparation stage than those in contemplation or precontemplation. Abstinence rates for those in preparation varied from 21.6% to 35.3%. However, the abstinence rate in the control group was 31.6%: the fourth highest of the 11 groups (28, Table 1). There did not seem to be any dose-response gradient between the different intervention groups.

In a study of the uptake of mammography screening, 63.6% of a TTM stage-matched intervention group complied, compared to 58.5% of a standard intervention group, and 54.9% of a no-intervention group (30).

Alternative Forms

A computer-based expert system called the Pathways to Change system provides individually tailored advice to smokers in the form of a computer-generated written report, based on their replies to an attitude and behavioral questionnaire. It guides them through the stages of change according to their current TTM stage and provides written guidance to the person on the next step in achieving change (11; 31). It has been tested and shown to provide long-term (e.g., 18-month) smoking quit rates of roughly 20 to 25% (11; 26; 32). Equivalent efficacy results for intensive smoking-cessation clinics is about 25 to 30% at 12 months; quit rates for self-help manuals are about 15%, and about 10% for brief physician advice combined with nicotine replacement therapy (31, pp119-120).

Prochaska’s team applied the expert system to smoking, diet and sun exposure behaviors simultaneously. Smoking abstinence rates at 24 months were 22% for the expert system group, slightly higher than the 16% for the no-intervention control group (27, p508). The sun exposure outcomes were 29.7% in the intervention group and 18.1% in the control group; dietary fat reduction figures were 33.5% and 25.9% (27, Table 5). In a subsequent and much larger study, the smoking figures were 25.4% quit rate at 24 months in the expert system group and 18.5% in the control group (26, p411). Adoption of sun protection behavior was 23.4% in the experimental group and 12.5% in the control.

The TTM was extended to a nine-stage model of adolescent smoking acquisition and cessation by Pallonen et al. (33), and a similar nine-stage classification has been developed for adolescent drinking (5). Pallonen’s nine stages include three acquisition stages for non-smokers: acquisition pre-contemplation, contemplation (never smokers who were thinking about trying) and acquisition preparation stages. Current smokers are divided into four groups: recent acquisition smokers, who had been smoking for less than six months; those who had smoked for more than six months are divided...
into the conventional groups of PC, C and P. Former smokers are divided into the action group, who had quit within six months and maintenance group, who had quit for more than six months (33, Table 1). The perceived pros and cons of smoking differed systematically across these various groups (33, Figure 2).

Various other authors have modified the general idea of the stages of change. Dijkstra et al., for example, sub-divided precontemplators into “immotives,” who are not anticipating changing within the next five years (if ever) and “precontemplators” (34). The immotives were significantly less likely to make a quit attempt over the coming 14 months (34, Table 5).

Commentary
The TTM has had an immense impact on thinking about health behavior change: the familiar stages have been widely adopted into the conventional wisdom in clinical practice teaching and into experimental trials. Perhaps the main contribution of the TTM has been to point out the serious over-simplification of traditional public health approaches that delivered essentially the same message to everyone in the population. The simple recognition that only a small minority of people are ready to alter their current behavior, and yet there are effective ways to move them toward an interest in change, has been both realistic and reassuring to clinicians. And it need not be too complex to be practical: the expert system offers a cost-effective way to deliver tailored interventions that provide significant, although modest, gains over no intervention. Velicer and Prochaska argued that, because the output from the expert system can me mailed to participants, it can potentially have a greater effectiveness than other approaches that may have higher efficacy but reach smaller numbers of clients because they require the smoker to seek out a cessation program. By contrast, the expert system can be administered proactively to smokers who are not yet seeking assistance to quit (31).

The TTM idea has stimulated many similar models. A simple way of assessing readiness for change was the Contemplation Ladder proposed by Biener and Abrams in 1991 (35). Ten rungs are identified, running from “taking action to quit (e.g., cutting down, enrolling in a program)” at the top to “No thought about quitting” at rung 1. Rung 8 is labeled “Starting to think about how to change my smoking patterns”, and rung 5 is “Think I should quit but not quite ready”; Rung 2 is “Think I need to consider quitting someday.” Respondents are told: “Each rung on this ladder represents where various smokers are in their thinking about quitting. Circle the number that indicates where you are now.”

The results of the randomized trials seem to suggest strong construct validity of the stages: the 2004 report of Prochaska et al. suggest a 74% higher probability of quitting for people in contemplation compared to precontemplation (28, pp211-212). However, the evidence that the interventions can actually move people across the stages seems less convincing. In that same study, for example, which compared 10 formats for delivering the change materials, the no-intervention control group ranked fourth in terms of quit rates at 18 months and furthermore, the gradient in quit rates across stages was stronger for the control group than in almost all of the intervention groups (28, Table 2). Thus it seems that the stages have strong predictive validity, but that the smoking cessation materials based on these stages are less impressive. Evidence of effectiveness for other health behaviors appears somewhat better.
Some of the limitations of the TTM are its use of a cognitive model, which may have limited application to some addictive behaviors in which the chemical addiction outweighs reasoning or will. The original development focused on extinctive behavior changes such as smoking cessation; the application to adoptive behaviors such as eating fruit or taking exercise is less well studied. Rosen, for example, noted that the typical sequence in which cognitive and behavioral change processes differ across health behaviors (36).

References


7. Anatchkova MD, Velicer WF, Prochaska JO. Replication of subtypes for smoking cessation within the Preparation stage of change. Addict Behav 2006; 31:359-366.


