Decision Making in the Transtheoretical Model of Behavior Change

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Decision making is an integral part of the transtheoretical model of behavior change. Stage of change represents a temporal dimension for behavior change and has been the key dimension for integrating principles and processes of change from across leading theories of psychotherapy and behavior change. The decision-making variables representing the pros and cons of changing have been found to have systematic relationships across the stages of change for 50 health-related behaviors. Implications of these patterns of relationships are discussed in the context of helping patients make more effective decisions to decrease health risk behaviors and increase health-enhancing behaviors. ***Key words:*** *stages of change; pros and cons of changing; health behavior changes.* ***(Med Decis Making 2008;28:845–849)***

The primary purpose of this article is to illustrate how research on decision making driven by a theory of behavior change, such as the transtheoretical model (TTM), can advance science-based treatments for patient populations who were historically understudied and underserved because they were noncompliant, unmotivated, resistant, or not ready for our sciences and services. The TTM was designed to integrate principles and processes of change from across leading theories of psychotherapy and behavior change.[1] The core integrating dimension of the model is stage of change, which was discovered in naturalistic studies of smokers struggling to get free from their addictions without medical care.[2,3] The stage dimension defines behavior change as a process that unfolds over time and involves progress through a series of stages: precontemplation, contemplation, action, maintenance, and termination. A traditional action paradigm construed behavior change as more of an event, such as smokers suddenly quitting smoking and becoming nonsmokers. Medical decisions that are more like events, such as prescribing and giving a patient a flu shot, require minimal behavior change on the part of patients. Medical decisions that start a behavior change process, such as prescribing a statin for managing cholesterol that requires patients to acquire the behavior of daily adherence, are much more the focus of TTM research. The TTM is particularly helpful with patients in the early stages of change who historically were labeled noncompliant, unmotivated, resistant, or not ready for our help. To better understand the success and failures of medical decisions, such as prescriptions for such patients, we need to briefly examine the stages of change.

Precontemplation is the stage in which the individual is not intending to take action in the foreseeable future (usually measured as the next 6 months). The individual may be at this stage because he or she is uninformed or underinformed about the consequences of a given behavior. Or he or she may have tried to change a number of times and has become demoralized about the ability to do so. Individuals in both categories tend to avoid reading, talking, or thinking about their high-risk behaviors. In other theories, they often are characterized as noncompliant, resistant, unmotivated, or not ready for treatment. In fact, traditional treatment programs were not ready for such individuals and were not motivated to match their needs. Prescribing a prescription for a statin for a patient in precontemplation is likely to fail and not be filled.

Contemplation is the stage in which people are intending to take action in the next 6 months. This stage is characterized by considerable ambivalence, such as the love-hate relationship that addicts can

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have with their substance of choice. The rule of thumb here is ''when in doubt, don't act.'' It is the rule of Wall Street: ''When in doubt, don't invest!'' Without professional treatment, less than 50% of smokers in contemplation of intending to quit for good in the next 6 months will quit for 24 hours in the next 12 months.

Preparation is a stage in which an individual intends to take action in the immediate future (usually measured as the ensuing month). Such a person typically has taken some significant action within the preceding year. He or she generally has a plan of action, such as participating in a recovery group, consulting a counselor, talking to a physician, buying a self-help book, or relying on a self-change approach. It is these individuals who should be recruited for action-oriented treatment programs.

Action is a stage in which the individual has made specific, overt modifications in his or her behavior within the preceding 6 months. Because action is observable, behavior change often has been equated with action. But in the transtheoretical model, action is only 1 of 6 stages. In this model, not all modifications of behavior count as action. An individual must attain a criterion that scientists and professionals agree is sufficient to reduce the risk of disease. In smoking, for example, only total abstinence counts. With alcoholism and alcohol abuse, many believe that only total abstinence can be effective, whereas others accept controlled drinking as an effective action. With medication compliance, the criterion is consistently taking the medication as prescribed.

Maintenance is a stage in which the individual is working to prevent relapse but does not need to apply change processes as frequently as one would in the action stage. Such a person is less tempted to relapse and is increasingly confident that he or she can sustain the changes made. Based on temptation and self-efficacy data, it has been estimated that maintenance lasts from 6 months to about 5 years.

Termination is the stage at which individuals have zero temptation and 100% self-efficacy. No matter what situation they face, they are confident they will continue with their healthy behavior and not relapse to unhealthy alternatives. Ideally, their healthy behavior has become automatic, such as always taking their medication at the same time and same place—no decisions and no struggle, they just do it, like brushing their teeth. It is as if they never acquired the habit in the first place. In a study of former smokers and alcoholics, fewer than 20% of each group had reached the stage of no temptation and total self-efficacy.[4] Although the ideal is to be cured or totally recovered, it is important to recognize that, for some patients with some barriers, a more realistic expectation is a lifetime of maintenance.

The stages of change are dynamic variables that are both stable and changeable, just as chronic health behaviors, such as smoking and inactivity, are both stable and changeable. The earlier stages, such as precontemplation and contemplation, and the later stages, such as maintenance and termination, are the most stable. The middle stages of preparation and action are the most changeable, in which individuals are very likely to progress or regress, depending in part on the help they receive. Effective decision making is an important determiner of how people can progress through the stages of change.

DECISION MAKING ACROSS STAGES OF CHANGE

Originally, we drew on Janis and Mann's theory of medical decision making.[5] On the basis of clinical interviews, Janis and Mann identified 8 decision-making constructs: 1) instrumental benefits to self, 2) instrumental benefits to others, 3) approval from self, 4) approval from others, 5) instrumental costs to self, 6) instrumental costs to others, 7) disapproval from self, and 8) disapproval from others.

When developing decision-making measures for changing a new behavior, we recommend including adequate items representing each of these 8 constructs. But almost always the principal component or factor analysis would result in just 2 constructs: the pros and cons of changing. This structure has been found across about 50 health-related behaviors.[6] In this meta-analysis, Hall and Rossi[6] also found that there was very little correlation between the pros and cons of changing behaviors ($r = .05$).

When integrated across the stages of change, these decisional balance variables have very clear and consistent relationships. Figure 1 illustrates that with decision making in the precontemplation stage, the cons of changing clearly outweigh the pros.[16] The opposite pattern is apparent from the preparation stage on, with the magnitude of the difference greater at each stage. With decision making in the contemplation stage, the pros and cons are essentially equal, reflecting the profound ambivalence and doubt that characterize this stage.

This pattern of relationships is found, however, only when standardized scores are used for the pros and cons. Raw scores are transformed into standardized T scores, with a mean of 50 and a standard

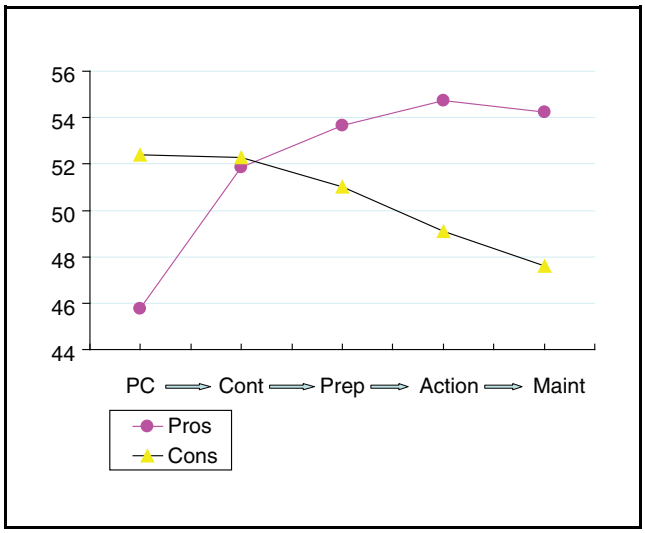

Figure 1 The pros and cons of changing across the stages of change for 50 health-related behaviors. PC, precontemplation; Cont, contemplation; Prep, preparation; Maint, maintenance.

deviation of 10. If raw scores are used for smoking, for example, the pros of quitting smoking are greater than the cons at every stage of change. One of the things that standardized scores control for is the ease of responding. It is easier for most smokers to agree with the benefits of quitting smoking than the costs of quitting. It is easier, for example, to rate the pros of preventing cancer and heart disease as more important than the cons of missing cigarettes. After 40 years of smoking being the number one public health priority, most smokers know that the benefits of quitting are supposed to outweigh the costs. So, it is easier to endorse the pros or benefits of quitting than to endorse the cons or costs.

We interpret this phenomenon as indicating that such behavioral change decision making is not as conscious or rational as traditional utility function theories would suggest. Smokers in the precontemplation stage, for example, are not aware that compared with their peers in other stages, they are underestimating the pros of quitting and overestimating the cons. Without expert help, patients can remain stuck in the precontemplation stage, if they are not particularly conscious that they are underestimating the pros of changing and overestimating the cons.

Another pattern that is apparent in Figure 1 is that from precontemplation to action, the pros of making a behavior change such as quitting smoking are higher at each subsequent stage. In contrast, the cons are lower at each subsequent stage from contemplation to maintenance. Furthermore, the magnitude of the differences in the pros from precontemplation to action was found to be exactly 1.00 standard deviations (SD), as predicted a decade earlier.[7] It is quite striking that the magnitude of the predicted difference was correct to the second decimal point. The magnitude of differences in the cons for contemplation to action was .53 SD, which is quite similar to the .5 SD predicted a decade earlier.[7] The significance of these values will be elaborated on shortly.

These patterns and magnitudes of relationships were found across more than 50 health behaviors, including compliance with a variety of medications, mammography screening, colorectal screening, smoking cessation, exercise, diet, stress management, depression management, partner violence, bullying prevention, and anorexia and bulimia. These patterns emerged from more than 140 studies from 10 countries involving 9 languages. One might think that so much variability in behaviors, populations, and studies would result in so much noise that no clear signal would be detected. Instead, it appears that the underlying relationships between stages of change and decision-making variables are common across a multitude of behaviors.

If there is a common structure to decision making across a broad range of health behaviors, as these results suggest, these patterns can have profound theoretical, empirical, and practical implications. Theoretically, these results support the TTM perspective that there is a common structure or pattern to behavior change across very diverse problems and populations. Empirically, hundreds of thousands of data points can be represented by this relatively clear and concise theoretical integration of stages and pros and cons of decision making. Practically, developers and practitioners of health behavior change programs can master a small number of behavior change constructs that can help produce progress with a large number of behaviors.

IMPLICATIONS OF THE RELATIONSHIPS OF DECISION-MAKING VARIABLES AND STAGES OF CHANGE

This clear and concise integration of results from 140 studies leads to immediate suggestions of how clinicians could help patients change, particularly those in the early stages. Historically, there were no evidence-based treatments for patients in the precontemplation and contemplation stages. In the second edition of the US Clinical Guidelines for the Treatment

of Tobacco,[8] there was a range of evidence-based treatments for motivated smokers, defined as those who were prepared to quit in the next 6 months. Despite the availability of 6000 studies on tobacco, there were no evidence-based treatments for smokers in the precontemplation and contemplation stages, even though they make up more than 80% of smokers in the United States. In Germany, China, and Japan, only about 5% of smokers are in the precontempation stage.[9] Applying principles from TTM, we now have a growing series of population cessation trials providing evidence of effective treatments for smokers at each stage of change.[10–14]

The first principle in these treatments is to help patients set realistic goals. It is not realistic for patients in precontemplation to progress immediately to action. Such a prescription would most likely produce noncompliance or failure. It is realistic to progress 1 stage in a relatively brief period.

To progress from precontemplation, the pros of changing must increase. If they do not, the behavioral medicine is not working. But to expect the pros to increase 1 SD is too large of an effect size for available treatments and would be a prescription for failure. Clinicians do not have to worry about the cons decreasing until contemplation. Furthermore, twice as much emphasis should be placed on helping patients appreciate the pros of changing than on decreasing the cons because the pros have to increase twice as much as the cons decrease.

Prior to taking action, such as starting lifetime medications like statins or antihypertensives, the pros of changing should be greater than the cons. For example, on brief but sensitive standardized assessments, patients should rate health and other benefits of statins as more important to them than the hassles and costs. If patients in the contemplation stage start a medication just because of pressure or persuasion from the physician, they will not be prepared to cope with the cons of compliance. One problem with pressure is that it is highly likely to decrease the further removed the patient is from the office visit. Given the delicate balance between the pros and cons, experience with side effects, costs, or hassles can throw contemplation into a negative balance with high risk for discontinuation.

Our group's TTM treatments that most often involve proactive mail, telephone, or online counseling outreach apply statistical decision-making procedures to help patients make more conscious, empirical, and effective decision making. Such procedures require reliable and valid measures of the pros and cons of changing for a particular behavior. They also require databases for comparing patients' pros and cons with norms of their peers who made the most progress through the stages. The databases also provide ipsative feedback about how patients are increasing their pros and/or decreasing the cons. Without such scientific assessments, patients and providers cannot accurately assess progress. It would be like asking patients to assess whether their cholesterol or hypertension is decreasing without adequate scientific assessments available. Normative and ipsative feedback can help both patients and providers to see the benefits of their behavioral medicine, just as laboratory feedback can help them to see the benefits of the biological medicine that is being applied.

DECISION MAKING IS NOT ENOUGH

Patients' progress from a negative balance to a positive decisional balance is necessary but not sufficient for long-term behavior change. Ten other processes of change are helpful when applied differentially at different stages of change.[15] As they take action, for example, it is helpful for patients to be prepared to reinforce themselves as they cope effectively with temptations to relapse or discontinue. They will do better if they have helping relationships available for support, particularly during times of stress and distress that can trigger relapses across many behaviors. They need to condition new, healthier behaviors to counter temptations to relapse, such as walking, talking, or relaxing when stressed rather than abusing alcohol or prescribed medications. The better the efforts patients make with such processes, the more likely they are to maintain long-term behavior change.[16]

Furthermore, patients will do better if they apply such processes at levels similar to peers who are most successful in changing. As with decision making, our TTM treatments use statistical decision making to assess patients on each principle and process of change relevant to their stage and provide expert feedback on which change variables they are underusing, which they are overusing, and which they are using appropriately as compared with their successful peers.

Details on these applications of the full TTM are available for a growing range of health behaviors such as medication compliance,[17,18] mammography screening,[19] smoking cessation,[10–13] stress management,[20] and multiple behavior changes.[13,14,17,21] The most important point in this article is that research on decision making driven by a theory of

behavior change, such as TTM, can advance science-based treatments for patient populations who were historically understudied and underserved because they were noncompliant, unmotivated, resistant, or not ready for our sciences and our services.

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