Analysis of the Transtheoretical Model of Behavior Change

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Abstract

The focus of this paper is on the Transtheoretical Model of Behavior Change (TTM). A description of the model, the applications toward modifying health behavior, and the model's criticisms will all be examined. Through research of published literature, the paper concludes that the model does in fact seem to support health behavior change and shows potential for effective, appropriate intervention. More research is necessary in the area of measurement validity, criteria consistency, and application over unique populations to make the model more widely accepted.

Introduction

The purpose of this paper is to describe the Transtheoretical Model of Behavior Change, discuss the applications it has for modifying health behaviors, and discuss the criticisms of the model. There are many thoughts, ideas, and theories that try to explain how people modify their own behaviors but not one of them is universally agreed upon. The Transtheoretical Model of Behavior Change (TTM), created by Prochaska and DiClemente (1983), is one of the more popular theories used to describe this event.

The TTM is a model of intentional change that focuses on the decision-making abilities of the individual rather than the social and biological influences on behavior as other approaches tried (Velicer, Prochaska, Fava, Norman, & Redding, 1998; Scholl, 2002). This model grew from systematic integration of more than 300 theories of psychotherapy, along with analysis of the leading theories of behavior change (Prochaska & Velicer, 1997). The critical assumptions of the TTM and main constructs which include the stages of change, processes of

change, self-efficacy, and decisional balance will be examined in detail below (Patten, Vollman, & Thurston, 2000; Prochaska & Velicer, 1997; Velicer et al., 1998; Scholl, 2002).

Theory Constructs
Stages of Change

The aspect that makes the TTM unique is the idea that change occurs over time, an aspect generally ignored by other theories of change (Prochaska & Velicer, 1997; Velicer et al., 1998; Scholl, 2002). This temporal dimension of the theory proposes that a person may progress through five stages of change when trying to modify their behaviors (Prochaska & DiClemente, 1983; Prochaska et al., 1992; Prochaska & Velicer, 1997). In the TTM, behavior change is treated as dynamic, rather than an "all or nothing" phenomenon. This distinction is considered one of the theory's strengths (Marshall & Biddle, 2001).

The first stage of the TTM is the precontemplation stage, where people have no intentions of taking action in the foreseeable future, usually measured as the next six months (Prochaska et al., 1992; Prochaska & Velicer, 1997; Scholl, 2002). Individuals in this stage may be unaware or uninformed of the consequences of their behavior (Prochaska et al., 1992; Scholl, 2002) or may have had a number of failed attempts at change and are discouraged to try again (Prochaska & Velicer, 1997). Prochaska et al. (1992) suggest that the main trait of someone in the precontemplation stage is they show resistance to recognizing or modifying a problem behavior. For an individual to move out of this stage they must experience cognitive dissonance, a negative affective state, and acknowledge the problem (Scholl, 2002).

In the next stage, contemplation, individuals are intending on making a change within the next six months (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). People in this stage weigh the pros and cons of making the change which can cause them to remain here for long periods of time (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). A person in this stage is deciding if he or she needs to correct the problem and whether or not the pros and cons of making a change outweigh the pros and cons of maintaining his or her present behavior (Scholl, 2002). Being stuck in this stage is known as chronic contemplation or behavioral procrastination (Prochaska & Velicer, 1997). During this stage the person still participates in the risky behavior but is aware that this behavior causes a problem (Patten et al., 2000). The main trait of

someone in the contemplation stage is that the person is seriously considering resolving the problem (Prochaska et al., 1992). An individual will move on to the next stage if he or she perceives that the pros outweigh the cons and if the force of motivation is stronger for change than it is for remaining stable (Scholl, 2002).

The next stage, preparation, is when the person is planning on making a behavior change within the next month (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). A person in this stage has often unsuccessfully taken some sort of action to change the behavior within the last year, but still engages in the high-risk behavior (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). An individual in this stage may not know how to proceed to make a change and could be nervous about his or her ability to change (Scholl, 2002). A plan of action is made up for elimination or significant reduction of the problem behavior in which the person can choose between alternative potential solutions (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Individuals will move to the next stage when they select a plan of action that they feel will work and if they feel confident that they can follow through with the plan (Scholl, 2002).

In the action stage, individuals have made efforts to modify their behaviors, experiences, or environments within the last six months to overcome their problem (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). The action stage requires a significant commitment of time and energy and is the stage where the individual gets the most recognition from others because of their visible efforts (Patten et al., 2000; Prochaska et al., 1992). Research warns not to mistake this visible action of trying to change with change itself, because the individual's actual change only occurs when a certain criteria has been reached, a criteria which scientists and professionals agree is sufficient to reduce risks the problem behavior (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Prochaska, DiClemente, and Norcross (1992) suggest that the main ways of recognizing that someone is in the action stage is through their significant efforts made to change and through modifying the problem behavior to acceptable criterion levels. Movement into the final stage occurs when an individual sees evidence of performance improvement, has a positive affective state, and receives positive social and performance feedback (Scholl, 2002).

The final stage of the TTM is maintenance (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). In this stage people work to prevent relapse and secure their gains made during action (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Individuals in the maintenance stage are less tempted to relapse and more confident that they will be able to continue their changes (Prochaska & Velicer, 1997; Velicer et al., 1998). According to Prochaska and colleagues (1992) the ability to remain free from the problem behavior and the ability to participate in new incompatible behaviors for more than six months is the criteria used to categorize someone into the maintenance stage. Research also recognizes that maintenance is a continuation of change, not an absence of it (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

The stages of change are often measured using a four- or five-item algorithm in which the questions asked are responded to with "yes" and "no" answers (Prochaska et al., 1994). The responses to the questions reveal whether or not an individual meets the criteria to be in one of the stages of change (Prochaska et al., 1994). The questions asked cover current behavior, future intentions, and sometimes past attempts to change (Littell & Girvin, 2002; Prochaska et al., 1994). Prochaska and Velicer (1997) have found that there is a general rule of thumb when it comes to the distributions of people in each stage. In an assessment of 15 different health behaviors, it was generally found that 40% of the population will be in precontemplation, 40% in contemplation, and 20% in preparation (Prochaska & Velicer, 1997).

Process of Change

The stages of change describe the temporal aspect of when shifts in attitudes, intentions, and behaviors happen. The process of change, which is the second major aspect of the TTM, describes how these shifts occur (Patten et al., 2000; Prochaska et al., 1992; Rodgers, Courneya, & Bayduza, 2001). Ten processes have received the most theoretical and empirical support as the covert (cognitive) and overt (behavioral) activities used to progress through the stages (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Rodgers, Courneya, & Bayduza, 2001; Velicer et al., 1998). The first five processes are used in the early stages and classified as experiential, while the last five are classified as behavior processes and used in later stages, as shown in Table 1 (Patten et al., 2000; Velicer et al., 1998).

Table 1

The Stage of Change Where the Processes of Change Are Most Emphasized

	Stages of Change				
	Precontemplation	Contemplation	Preparation	Action	Maintenance
Processes	Consciousness raising				
of	Dramatic relief				
Change	Environmental reevaluation				
		Self-reevaluation			
			Self-liberation		
				Contingency management	
				Helping relationship	
				Counterconditioning	
				Stimulus control	

Consciousness Raising

Consciousness Raising is a process in which the individual needs to increase his or her awareness about the negative consequences, the causes, and the cures of the problem behavior (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Awareness can be increased through feedback, education, confrontation, interpretation, and media campaigns (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Dramatic Relief

Dramatic Relief is the process in which the individual needs to experience and express his or her feelings and emotions relating to the problem behavior (Patten et al., 2000; Prochaska et al., 1992). Patten and colleagues (2000) suggest that life events such as the death of a family member or close friend can move someone into precontemplation emotionally. This is especially common if the death was related to the problem behavior. Other techniques used to move someone emotionally include psychodrama, role-playing, grieving, personal testimonies, and media campaigns (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Self-Reevaluation

Self-Reevaluation is a cognitive and affective assessment of the individual's own self image with and without the problem behavior (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). This means that people assess the way they feel and think about the problem behavior and may become aware of their guilt towards the behavior (Patten et al., 2000). Patten et al. (2000) suggests that self-reevaluation is most important when the person is moving from the contemplation stage to the preparation stage. Value clarification, healthy role models, corrective emotional experience, and imagery are among the ways to increase chances of self-reevaluation (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Environmental Reevaluation

Environmental Reevaluation is the individual's assessment of how the presence or absence of their problem behavior affects his or her social environment (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Prochaska and Velicer (1997) suggest that environmental reevaluation can include awareness of how the individual functions as a positive or negative role model for others. Strategies to help environmental reevaluation to occur include empathy training, documentaries, and family interventions (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Self-liberation

Self-liberation is the belief within the individual that he or she can change and the commitment to take action towards that belief (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Strategies for self-liberation can include New Year's resolutions, public testimonies, decision-making therapy, logotherapy techniques, commitment enhancing techniques, and multiple rather than single choices (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Research on motivation has shown that people with two choices have greater commitment than those with one choice, and those with three choices have the greatest commitment to ceasing their problem behavior (Prochaska & Velicer, 1997; Velicer et al., 1998).

Social Liberation

Social Liberation is the need for an increase in opportunities or alternatives for non-problem behaviors in society, especially for those who are deprived or oppressed (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Prochaska and

colleagues (1992) report that advocating the rights of the repressed, empowerment, and policy interventions will increase social liberation.

Counterconditioning

Counterconditioning requires the individual to learn to substitute healthy behaviors for problem behaviors (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Relaxation, desensitization, assertion, and positive self-statements all enhance counterconditioning (Prochaska et al., 1992; Velicer et al., 1998).

Stimulus Control

Stimulus Control is the process in which the individual needs to remove any stimuli associated with the problem behavior and replace it with prompts to participate in healthy behaviors (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Restructuring one's own environment, self-help groups, and avoidance can all support appropriate change and reduce risk for relapse (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Contingency Management

Contingency management provides consequences to the individual for participating in problem behavior or for following through and avoiding the problem behavior (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). Punishment can be used with contingency management but using rewards as reinforcement is emphasized (Prochaska & Velicer, 1997; Velicer et al., 1998). Procedures for contingency management include contingency contracts, overt and covert reinforcement, self-reward, and group recognition (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Helping Relationships

Helping relationships involves helping the individual to be open and trusting with those who are actively involved in helping them change their problem behavior (Patten et al., 2000; Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998). This support can be found with self-help groups, therapeutic alliances, buddy systems, counselor calls, and social support (Prochaska et al., 1992; Prochaska & Velicer, 1997; Velicer et al., 1998).

Self-efficacy

The theory of self-efficacy is from the research done by Bandura (1977) which showed that the perception a person has about his or her own abilities to act out a specific behavior is important in determining behavior change. More of Bandura's (1982) research suggests that self-efficacy can help account for changes in coping, levels of physiological stress reactions, achievement strivings, growth of intrinsic interest, and career pursuits. The TTM construct of self-efficacy, integrated from Bandura, is described as the situation-specific confidence that an individual can cope with high-risk situations and not relapse back to the problem behavior (Fallon & Hausenblas, 2004; Patten et al., 2000; Prochaska & Velicer, 1997; Velicer et al., 1998). Self-efficacy is considered important for people to move through the upper stages of change. An example of this would be when an individual moves from the contemplation to preparation stage, and preparation to action stage (Kraft, Sutton, & Reynolds, 1999).

Another aspect of the TTM that is often brought up because of the relationship it has with self-efficacy is temptation (Fallon & Hausenblas, 2004; Patten et al., 2000; Prochaska & Velicer, 1997; Velicer et al., 1998). Temptation is described as the intensity of urges to engage in a specific habit while in a difficult situation (Prochaska & Velicer, 1997). Prochaska and Velicer (1997) go on to acknowledge that the most common types of temptation come from situations of negative affect or emotional distress, positive social situations, and cravings. Studies have shown that temptation and self-efficacy have an inverse relationship with one another across stages of change, which suggests that temptation is highest during the earlier stages of change and lowest during the later stages, while sharing equal levels in the action stage (Fallon & Hausenblas, 2004; Patten et al., 2000).

Decisional Balance

Decisional balance refers to the individual's weighing of the pros with the cons, the benefits of changing the behavior, and the costs of changing the behavior (Patten et al., 2000; Prochaska & Velicer, 1997). The core constructs of Janis and Mann's (1977) decision-making model were used to define decisional balance for the TTM (Prochaska & Velicer, 1997; Prochaska et al., 1994). In a study by Velicer, DiClemente, Prochaska, and Brandenburg (1985) to measure decisional balance for smoking cessation only two factors were used, pros and cons of smoking, rather than eight factors proposed by Janis and Mann (1977) (Prochaska

et al., 1994). The two scales, pros and cons, supported the comparative approach to balancing decisions studied by Janis and Mann (1997) (Prochaska et al., 1994).

The main utility of decisional balance is that it has been identified that individual's judgments of pros and cons vary through the stages of change (Prochaska et al., 1994). During the precontemplation stage, individuals will judge the pros of the problem behavior to outweigh the cons. While in the action and maintenance stages, the opposite will occur, with the cons outweighing the pros (Prochaska et al., 1994). Decisional balance has demonstrated to be a good predictor through the stages of change (Prochaska et al., 1985; 1994).

Critical Assumptions

Prochaska and Velicer (1997) outline the following list of seven assumptions that drive transtheoretical theory, research, and practice: 1) No one single theory can account for all of the complexities of behavior change. 2) Behavior change progresses over time through a sequence of stages. 3) Stages are open and stable to change just as chronic problem behavior factors are both stable and open to change. 4) Without planned interventions, people will remain caught in early stages because there is no inherent motivation to progress through stages of intentional change as there seems to be in stages of physical and psychological development. 5) The majority of at-risk populations are not ready for action and will not be served by traditional action-oriented prevention programs. 6) Specific process and principals of change need to be applied to specific stages for proper progress through the stages. 7) Chronic behavior patterns are often under some combination of biological, social, and self-control. Stage-matched interventions are primarily designed to increase self-controls.

Applications of TTM to Healthy Behaviors

According to Prochaska et al. (1994) the TTM is generalizable across a broad range of problem behaviors as well as a wide variety of populations with such behaviors. These behaviors include smoking cessation (Andersen & Keller, 2002; DiClemente & Prochaska, 1982; Pallonen, Fava, Salonen, & Prochaska, 1992; Prochaska & DiClemente, 1983), quitting cocaine, weight control (Cardinal, 1997; Fallon & Hausenblas, 2004; Marshall & Biddle, 2001; Rodgers et al., 2001), high-fat diets, adolescent delinquent behaviors, safer sex (Patten et al., 2000), condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening, and physicians' preventive practices with smokers (Marshall & Biddle, 2001; Patten et al., 2000; Prochaska

et al., 1994). Studies have also examined the TTM over a range of populations including different work-site groups such as medical, industrial, retail, and governmental, as well as age groups, places of residence such as rural and urban, medical conditions, and countries (Rodgers et al., 2001). Many studies have supported the TTM, some of which are examined below.

Patten et al. (2000) tested the TTM with intravenous drug users (IDU's) in hopes of reducing the risk for spreading HIV. The authors observed and interviewed health practitioners, needle exchange program nurses, and harm reduction coalitions who use the TTM framework, and found that it is useful for these providers who work with IDU's in HIV prevention. Patten and colleagues (2000) suggest that by staging each IDU they work with, nurses can gain an understanding of their motivations and use staging to asses which social or environmental processes could be affecting them at the time. An example of how the TTM can be applied in these settings is if an IDU is particularly resistant to drug treatment and has no intention of trying to quit using drugs (the precontemplation stage), nurses would not encourage drug treatment but focus on other behaviors such as HIV prevention (Patten et al., 2000). It is important to note that the TTM doesn't suggest interventions for individuals at each stage but suggests general strategies and approaches to use when counseling clients or patients (Patten et al., 2000).

A study by Rodgers et al. (2001) found support that the principles of the TTM apply to diverse populations. The study examined self-efficacy and processes of change of the TTM with exercise across three populations to determine its suitability for use in diverse groups. The three populations examined were high school students, university undergraduate students, and employed adults. Questionnaires were used to measure the stage of change, process of change, and self-efficacy. The results of the study suggest that the underlying principles of change in the TTM are similar across all populations.

Stages of change and decisional balance (the pros and cons) were examined across 12 problem behaviors in a study by Prochaska and colleagues (1994). Through this study, the researchers found that progress from the precontemplation to contemplation stage involves an increase in the evaluation of the pros of changing the problem behavior while progressing from the contemplation to action stage involves a decrease in the cons of changing the behavior. This finding is significant for programs that use the TTM as the framework for the intervention. The interventions should be advised to target people in the precontemplation stage with efforts towards increasing the pros of changing the problem behavior to create optimum progress. Once this progress occurs, the intervention should aim at decreasing the cons of changing the problem behavior in attempt for progress from the contemplation to action stage. These

results also provide strong support for the generalizability of transtheoretical constructs across a variety of problem behaviors.

Criticisms

Even with an intuitive and heuristic appeal, the TTM does not go without criticism (Marshall & Biddle, 2001). Some critics reject stage-based theories of human behavior on conceptual grounds (Bandura, 1997; Kraft et al., 1999), while others see methodological or analytic flaws and concerns over existing evidence (Macnee & McCabe, 2004; Sutton, 2001). Examples of both these concerns and criticisms are described below.

The TTM has been criticized for the fact that human functioning is too versatile and multidimensional to be categorized into discrete stages (Bandura, 1997). According to Bandura, a genuine stage theory has three defining properties: qualitative transformations across stages, invariant sequence of change, and no reversibility. The TTM violates all of these requirements. Bandura goes on to say that qualitative transformations across stages are violated because the first two stages (precontemplation and contemplation) are only different in their degrees of intention, while the other stages are graduations of regularity or duration of behavioral adoption rather than differences in kind. Invariant sequences of change and nonreversibility does not happen in the TTM because individuals do not all start at the same stage as well as the fact that individuals are able to skip stages within the model. Kraft and colleagues (1999) found no theoretical reasoning or empirical findings to indicate that the six month time frame is appropriate for defining stages. The argument for the six month time frame is that there is an assumption that people plan behavior change about that far into the future (as cited in Velicer et al., 1995). Kraft and colleagues also suggest that the TTM could be reduced to two stages only, precontemplation and one that includes the rest of the stages. This judgment was made due to the clear differences found between precontemplation and the rest of the stages on pros, cons, and confidence. In this instance, the staging algorithm could be reduced to one question: Are you thinking about quitting smoking in the next six months? This suggestion was made because the key difference in definition between precontemplation and the rest of the stages are that precontemplators are not thinking about quitting within the next six months, while contemplators and preparers are.

Macnee & McCabe (2004) do not have conceptual concerns regarding the TTM, but question the applicability of the model to specific populations. The population under investigation is that of Southern Appalachia where cultural characteristics and the history of economic dependence on tobacco raise questions about whether the TTM is appropriate for

smoking cessation. Following TTM framework, the authors found that the distribution of smokers in Appalachian Tennessee was 56% in precontemplation, 30% in contemplation, and only 14% in preparation. This population differs from the national sample in their cognitive and motivational decision making about smoking and smoking cessation. This study raises questions about the applicability of the TTM to unique populations as well as the possible modification of intervention strategies in such areas. Another concern examined by Sutton (2001), suggests that there are some serious problems with the existing methods used to measure the stages of change. Sutton goes on to state that staging algorithms are based on arbitrary time periods, some of which are logically flawed. For example, some questionnaires reveal a pattern of correlations among the subscales that do not measure discrete stages of change, which may contribute the low concordance found between different methods in studies. In the critique by Littell and Girvin (2002), similar evidence has been found. For example, algorithm questions and stage criteria are not consistent across studies that use the approach. Some studies do not include questions about past attempts to change, and various time frames are used as reference points which alter distribution of people across stages (as cited in Lerner, 1990; Nigg et al., 1999; Stevens & Estrada, 1996; Weinstein et al., 1998). Finally, Littell and Girvin (2002) suggest that a continuous model of readiness for change may be more integrated with related concepts from other theories. They also recognize that there is importance in distinguishing readiness for change from readiness to participate in particular treatments, and that change can come about quickly as a result of life events or external pressures.

Conclusion

The purpose of this paper, to describe the TTM, discuss the applications it has for modifying health behavior, and discussion of the criticisms of the model have seemingly led to a stalemate. At the present time there are stacks of evidence supporting the model, verifying the constructs, and showing support for application to modifying health behavior. Also, at this time there is an increase in the number of studies criticizing the model over conceptual, methodological, and analytic concerns. Possibly because the TTM is a fairly new construct it has not had the chance to be studied and criticized as older theories have. It will be interesting to see what future research will find when examining the Transtheoretical Model of Behavior Change.

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