

Stages of Change and Decisional Balance for 12 Problem Behaviors

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This integrative study investigated the generalization of the transtheoretical model across 12 problem behaviors. The cross-sectional comparisons involved relationships between two key constructs of the model, the stages of change and decisional balance. The behaviors studied were smoking cessation, quitting cocaine, weight control, high-fat diets, adolescent delinquent behaviors, safer sex, condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening, and physicians' preventive practices with smokers. Clear commonalities were observed across the 12 areas, including both the internal structure of the measures and the pattern of changes in decisional balance across stages.

Key words: stages of change, decisional balance, addictions, condom use, diets, exercise

The transtheoretical model has been presented as an integrative and comprehensive model of behavior change (Prochaska & DiClemente, 1983, 1984, 1985, 1986, 1992). Demanding criteria must be met to support the claims for such a model. To date, research has provided strong support for the reliability and validity of core constructs of the model such as the stages, processes, and levels of change (e.g., McConaughy, DiClemente, Prochaska, & Velicer, 1989; McConaughy, Prochaska, & Velicer, 1983; Norcross, Prochaska, & Hambrecht, 1985; Prochaska, Velicer, DiClemente, & Fava, 1988). Studies have also demonstrated the predictive validity of the model when dynamic variables like the stages and processes are compared with static variables like demographics and problem history (Lam, McMahon, Priddy, & Gehred-Schultz, 1988; Marcus, Rossi, Selby, Niaura, & Abrams, 1992; Medeiros & Prochaska, 1992; Prochaska, DiClemente, Velicer, Ginpil, & Norcross, 1985; Prochaska, Norcross, Fowler, Follick, & Abrams, 1992; Wilcox, Prochaska, Velicer, & DiClemente, 1985). Other research has supported the posited relationships between core constructs like the stages and processes of change (DiClemente et al., 1991; Gottlieb, Galavotti, McCuan, & McAlister, 1991; Prochaska & DiClemente, 1983). In this article we present data on the relationships between stages of change and decisional balance for 12 problem behaviors. Our objective in this investigation was to test two other major

criteria for an effective model: the generality of findings across problem behaviors and the ability to integrate core constructs from alternative models of behavior change.

Generalization Across Problem Behaviors

To develop a comprehensive model of behavior change, we need to develop a model that is generalizable across a broad range of problem behaviors and a wide variety of populations with such behaviors. In the present article we examine relationships between stages of change and two scales from a decisional balance measure across 12 behaviors: (1) smoking cessation, (2) quitting cocaine, (3) weight control, (4) high-fat diets, (5) adolescent delinquent behaviors, (6) safer sex, (7) condom use, (8) sunscreen use, (9) radon gas exposure, (10) exercise acquisition, (11) mammography screening, and (12) physicians' preventive practices with smokers. The first five behaviors involve cessation of negative behaviors like smoking and cocaine abuse. The last seven behaviors involve acquisition of positive behaviors like condom use, exercise, and mammography screening. These 12 problems include both addictive and nonaddictive behaviors. The behaviors also differ dramatically in terms of their frequency of occurrence, which ranges from many times a day for behaviors like smoking to yearly for a behavior like mammography screening. Finally, the behaviors involve legal and illegal actions, public and private actions, and socially acceptable and less socially acceptable actions.

Although there is considerable variety within this set of behaviors, there are also key commonalities among the problems. All of the behaviors have important health or mental health consequences. All of the behaviors require long-term attention rather than one-time performance. Finally, all of the behaviors are relevant to large numbers of people and together represent many of the major health behavior challenges of our times.

The samples in which these behaviors have been examined for this study represent a diversity of populations. The samples for safer sex range from college students to intravenous (IV)

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drug users, prostitutes, street youth, and the partners of each of these. The samples of smokers are mostly Caucasian, and the samples with delinquent behaviors are mainly from minority groups. Some of the samples, like the college students and the smokers, are mostly from middle-class groups. Several of the samples are from blue-collar groups, and still others, like the IV drug users, are from lower socioeconomic status (SES) groups. Some of the samples have a majority of men, such as the cocaine abusers, delinquents, and the physicians, but most have a majority of women, and the sample for mammography screening is obviously all female. By no means were all minority groups represented, nor were groups for all levels of SES, particularly the highest levels.

What these groups have in common is that they were all the first samples on which the relationships between stages of change and decisional balance were examined for their target behaviors. All of the groups were accidental samples or samples of convenience. Nine of the samples were recruited in Rhode Island or Massachusetts. The sample of smokers was from Rhode Island and Houston, Texas. The sample of adolescent delinquents was from Rhode Island and California. The sample involving high-risk sex was drawn from six major cities in the United States.

If hypothesized relationships between the stages of change and decisional balance can be found to generalize across the range of problem behaviors and the variety of samples, then strong evidence will be provided for the generality of the transtheoretical model. On the other hand, if different relationships are found for each of the 12 different problem behaviors, serious questions will be raised about the model's generalizability.

Stages of Change

In retrospective, cross-sectional, and longitudinal studies of how people quit smoking on their own, evidence was discovered that smokers move through a series of stages of change in their efforts to quit smoking (DiClemente & Prochaska, 1982; Prochaska & DiClemente, 1983; Prochaska et al., 1985). Similar concepts have been discussed by D. Horn (1976) and by Brownell, Marlatt, Lichtenstein, and Wilson (1986). These stages have been labeled precontemplation, contemplation, preparation, action, and maintenance. *Precontemplation* is a period in which smokers are not thinking about quitting smoking (at least not within the next 6 months). A 6-month time frame was used because it was assumed that this is about as far in the future as most people plan a specific behavior change. *Contemplation* is the period of time in which smokers are seriously thinking about quitting smoking in the next 6 months. *Preparation* has been defined as the time in which smokers who have tried to quit smoking in the past year seriously think about quitting smoking in the next month. *Action* is a period ranging from 0 to 6 months after smokers have made the overt change of stopping smoking. Originally this stage was separated into a 0-to-3-month early action period and a 3-to-6-month later action period. No differences were found between early and later action in terms of the frequency of use of change processes used to quit smoking. Therefore, the 0-to-6-month period has been used to define

the action stage, which is the busiest period of change (Prochaska & DiClemente, 1983). *Maintenance* is defined as the period beginning 6 months after action has started and continuing until smoking is terminated as a problem. Maintenance involves continued change. Particular processes of change are used significantly more during maintenance than during any pre-action stage (Prochaska & DiClemente, 1983). It should be noted that preparation has been included as a distinct stage only recently (DiClemente et al., 1991), so some of the studies reported here do not include it.

Previous studies have found the stages of change to be an effective dimension for integrating 10 processes of change that have their theoretical origins in diverse systems of psychotherapy (DiClemente et al., 1991; Gottlieb et al., 1991; Prochaska, 1984; Prochaska & DiClemente, 1983; Prochaska, Rossi, & Wilcox, 1991). Other studies have demonstrated integral relationships between the stages-of-change dimension and self-efficacy (DiClemente, 1986; DiClemente et al., 1991; Prochaska, Velicer, Guadagnoli, Rossi, & DiClemente, 1991; Velicer, DiClemente, Rossi, & Prochaska, 1990), which Bandura (1977, 1982) views as the most important construct in social learning theory.

Decisional Balance

In this study we also examine the ability of the transtheoretical model to integrate core constructs from an alternative model—namely, Janis and Mann's (1977) decision-making model. Decision making was conceptualized by Janis and Mann as a conflict model. A conflict approach assumes that sound decision making involves careful scanning of all relevant considerations that enter into a decisional "balance sheet" of comparative potential gains and losses (Mann, 1972). Janis and Mann (1977) suggested that the anticipated gains (or benefits) and the anticipated losses (or costs) can be categorized into four major types of consequences: (a) utilitarian gains or losses for self, (b) utilitarian gains or losses for significant others, (c) approval or disapproval from significant others, and (d) self-approval or self-disapproval. Thus, both individuals making decisions and their reference groups are taken into account with regard to instrumental objectives as well as value-based appraisals (Hoyt & Janis, 1975).

Velicer, DiClemente, Prochaska, and Brandenburg (1985) constructed a 24-item decisional balance measure to study the decision-making process across the stages of change for smoking cessation. Over 700 subjects completed the measure as part of a larger, longitudinal study. Principal-components analysis identified two orthogonal components that were labeled the Pros of Smoking and the Cons of Smoking. These scales were successful in differentiating among four groups representing the stages of change in the cessation process as well as a group that had relapsed after a period of successful smoking cessation. Both scales performed well in the analysis and supported the comparative approach to balancing decisions proposed by Janis and Mann (1977). Velicer et al. (1985) concluded that the decisional balance construct could be usefully allied with the stages-of-change model in studying the pattern of cognitive and motivational shifts across the stages in the resolution of other health-related and personal problems

as well. Prochaska et al. (1985) demonstrated the predictive utility of the decisional balance measure.

The two decisional balance measures have become critical constructs in the transtheoretical model. Rather than eight factors that need to be balanced when making decisions, as posited by Janis and Mann (1977), there are only two—namely, the pros and cons of the behavior in question. Next, the balance between the pros and cons varies depending on which of the following five stages people are in: precontemplation, contemplation, preparation, action, and maintenance. In the precontemplation stage, individuals will judge the pros of the problem behavior to outweigh the cons. In the action and maintenance stages, the opposite pattern will occur, with the cons judged as outweighing the pros. If these two postulates are correct, then the pros and cons of a problem behavior should cross over in either the contemplation or the preparation stages of change. If systematic relationships can be found between the stages of change and these decisional balance constructs across a variety of problem behaviors, strong evidence will exist for the ability of the transtheoretical model to integrate core constructs from an alternative model of behavior change.

Method

Subjects

For this study we drew on 12 separate samples with a total N of 3,858. Except for the cocaine users and adolescent delinquents, none of the groups were currently in treatment or intervention programs for their particular target behaviors. Each of the groups was a sample of convenience selected in part because it was expected to have subgroups representing all or most of the stages of change. Each of the samples was selected for this report because it was from the first or only study done on relating the stages of change to decisional balance within a specified problem behavior. Four of the 12 studies have been published.

In Table 1 the total N s and the n s for each stage for each of the 12 studies are presented. Only two of the studies (exercise acquisition and physicians' preventive practices with smokers) had subgroups representing the preparation stage. Most of the studies were completed before preparation was identified as a separate stage within the transtheoretical model.

cal model. Two of the studies (safer sex and radon gas exposure) combined subjects in the action and maintenance stages.

Smoking-cessation subjects. This group included 764 smokers and former smokers (Velicer et al., 1985). Smokers in the precontemplation stage had a mean age of 38 years, began smoking at age 16.3 years, and included 74 women and 34 men. Smokers in the contemplation stage had a mean age of 40 years, began smoking at age 17.4 years, and included 113 women and 74 men. Former smokers in the action stage had a mean age of 35 years, had begun smoking at a mean age of 16.6 years, had quit for a mean of 2.2 months, and included 80 women and 54 men. Former smokers in the maintenance stage for a mean of 5.9 years had a mean age of 44 years and began smoking at a mean age of 17.2 years. There were 133 women and 114 men in this stage.

Quitting-cocaine subjects. This group consisted of 156 current and former cocaine users recruited from a variety of settings, including inpatient ($n = 21$), outpatient drug-free ($n = 46$), methadone maintenance ($n = 35$), and residential ($n = 54$) treatment centers in Rhode Island and Massachusetts (Rosenbloom, 1991). The sample was 64% male and predominantly White (88%), was single (44%) or married (24%), and had an average age of 30.7 years ($SD = 7.0$), at least a high school education (66%), and a median annual income of approximately \$20,000.

Weight-control subjects. This group of 264 undergraduate and graduate students were recruited to develop the decisional balance instrument (O'Connell & Velicer, 1988). This sample included 186 women and 78 men. The instrument was validated on a subset ($n = 123$) of the sample who self-reported their current weight as at least 5 lb (2.3 kg) above the weight at which they would be satisfied. Subjects in the precontemplation stage had a self-reported excess weight of 5.8 lb (2.6 kg). Subjects in the contemplation stage had a mean excess weight of 11.8 lb (5.4 kg). Subjects in the action stage were 10.9 lb (4.9 kg) overweight and were currently on a weight loss program. Subjects in the maintenance stage were still 7.8 lb (3.5 kg) overweight but had lost more than 10 lb (4.5 kg) in the past, had not regained any of that loss, and had no goal of further weight loss. This entire sample was not self-defined as highly overweight, a situation consistent with a primarily late-adolescent sample. Concerns with weight loss involved primarily personal attractiveness and peer comparisons.

High-fat-diet subjects. This group of 180 university students, faculty, and staff volunteered to participate in a study of dietary habits (S. R. Rossi, 1993). The sample was 73% female, was predominantly White (95%) and married (65%), and had an average age of 42.4 years and a median annual household income of about \$45,000.

Table 1
Total Sample Size and Subsamples for Each Stage for Each of the 12 Problem Behaviors

Study	Sample	Total N	Precontem- plation	Contem- plation	Prepara- tion	Action	Maintenance
1.	Smoking cessation	764	108	187		134	247
2.	Quitting cocaine	156	8	15		71	62
3.	Weight control	123	18	65		22	18
4.	High fat diet	180	41	32		5	102
5.	Adolescent delinquency	159	29	46		43	41
6.	Safer sex	213	94	17		102	
7.	Condom use	345	131	58		20	114
8.	Sunscreen use	227	119	18		10	80
9.	Radon gas exposure	698	520	121		57	
10.	Exercise acquisition	717	53	242	182	101	139
11.	Mammography screening	141	31	24		26	60
12.	Physicians' practices	135	43	20	3	2	67

Note. Most of the studies were completed before preparation was identified as a separate stage within the transtheoretical model.

Adolescent delinquent subjects. This group of 159 adolescents exhibiting delinquent behaviors either were incarcerated at juvenile training schools because of delinquent behavior or were attendees at special schools for adolescents at risk for dropping out because of truancy and school failure (Fiore-Lerner, 1990). Approximately 41% of the sample was recruited from schools in Orange County, California, and the rest were from schools in Rhode Island. The sample was 82% male with a median age of 16 years (range = 12 to 18). The ethnic composition of the sample was 33% Caucasian, 29% Hispanic, 24% African American, 6% Asian American, and 8% other or mixed.

Safer sex subjects. This group of 213 sexually active college students were enrolled in undergraduate psychology or chemistry courses (Redding, Rossi, Velicer, & Prochaska, 1989). The sample was 79% female, was predominantly White (96%) and single (94%), had an average age of 20.2 years ($SD = 3.7$), and earned less than \$5,000 annually (77%).

Condom-use subjects. This group consisted of 345 individuals who had histories of high-risk sex (Prochaska, Harlow, et al., 1992). Subjects in the precontemplation stage had a mean age of 33.0 years, had an average of 8.6 dates per week, and included 56 women and 75 men. Subjects in the contemplation stage had a mean age of 32.0 years, had an average of 3.2 dates per week, and included 32 women and 26 men. Subjects in the action stage had a mean age of 29.4 years, had an average of 6.8 dates per week, had used condoms consistently for less than 6 months, and included 11 women and 9 men. Subjects in the maintenance stage had a mean age of 31.0 years and an average of 6.4 dates per week. There were 37 women and 79 men in this stage. The ethnic composition of the sample was 50% Caucasian, 36.5% African American, 12% Hispanic, 1% Native American, and 0.5% Asian American.

Sunscreen-use subjects. This group of 227 participants were from a self-help smoking cessation project. They agreed to answer questions about their sun exposure habits in addition to completing questionnaires about their smoking (J. S. Rossi & Blais, 1991). The sample was 62% female, was predominantly White (99%) and married (68%), and had an average age of 44.9 years ($SD = 11.7$), 14 years of education, and a median annual household income of approximately \$35,000. Current smokers comprised 61% of the sample.

Radon-gas-exposure subjects. This group of 698 employees agreed to participate in a worksite health promotion project emphasizing health risk appraisal and smoking cessation (J. S. Rossi, 1990). The sample was 56% male with an average age of 42.0 years ($SD = 10.5$) and a median annual household income of \$35,000.

Exercise-acquisition subjects. This group of 717 employees from four worksites (a retail outlet, an industrial manufacturer, a government agency, and a medical center) agreed to participate in a worksite health promotion project emphasizing health risk appraisal and smoking cessation (Marcus, Rakowski, & Rossi, 1992). The sample was 54% female, was predominantly White (95%) and married (70%), and had an average age of 41.5 years ($SD = 11.0$), 13.5 years of education ($SD = 2.0$), and a median annual household income of \$35,000.

Mammography-screening subjects. This group of 141 women were over age 40 (Rakowski et al., 1992). Women in the precontemplation stage had a mean age of 49.5 years. Women in the contemplation stage had a mean age of 52.9 years. Women in the action stage had a mean age of 51.5 years, had had a first mammogram in the past 12 months, and intended to have another. Women in the maintenance stage had a mean age of 54.3 years.

Physicians assisting smokers. This group consisted of 135 primary care physicians (Eaton et al., 1992). The precontemplators had a mean age of 44.0 years and included 14 women and 29 men. Physicians in the contemplation stage had a mean age of 41.2 years and included 8 women and 12 men. Physicians in the preparation stage had a mean age of 41.3 years and included 1 woman and 2 men. Physicians in the action stage had a mean age of 39.0 years and included 2 women and

no men. Physicians in the maintenance stage had a mean age of 42.0 years and included 20 women and 47 men.

Measures

Stages of change. Except for exercise acquisition, all of the studies used a 4- or 5-item algorithm for determining the stage in which subjects were. The first item asked if subjects currently had the problem or had engaged in the desired positive behavior. If subjects reported the undesired status and did not intend to change in the next 6 months, they were in the precontemplation stage. If they intended to change in the next 6 months, they were in the contemplation stage. For studies that included the preparation stage, subjects had to indicate that they were planning to change in the next month or had made some changes but were not at a particular criterion, such as exercising at least 20 min three times a week. Subjects in the action stage had reached a particular criterion, such as quitting smoking or cocaine, within the past 6 months. Subjects in the maintenance stage had reached criterion more than 6 months prior to the study. The time criteria were the same for all problem behaviors except mammography screening, where a 12-month criterion is appropriate for assessing action and intentions to take action. For exercise acquisition, a 10-step stage ladder was used for assessing subjects' current stage.

Decisional balance. Most of the studies included items to represent the eight categories of decision making in the Janis and Mann (1977) model: gains or losses for self, gains or losses for significant others, self-approval or self-disapproval, and approval or disapproval of others. The physician study and the mammography study did not include items for all eight categories but included only items that represented the more global pros and cons of a particular behavior. In all cases, the item content of the decisional balance questionnaire was specific to the problem being studied. Except for the mammography study, all items were answered in terms of importance for making a decision to change a specified problem behavior. A 5-point Likert scale was used that ranged from *not important* (1) to *extremely important* (5). The mammography instrument used an agree-disagree scale that ranged from *strongly disagree* (1) to *strongly agree* (5).

Procedure

A variety of procedures were used to recruit subjects. Smokers and high-fat-diet subjects were recruited through newspaper articles and ads. Cocaine users and adolescent delinquents were recruited from appropriate institutional settings. Weight-control and safer sex subjects were recruited from college classrooms. Condom-use subjects were recruited by street intercept interviews and newspaper ads. Radon-gas-exposure, exercise-acquisition, and mammography-screening subjects were recruited from worksites. Physicians were personally recruited by mail. Once recruited, subjects were administered or mailed a battery of questionnaires that included the stages-of-change and decisional balance items. Smokers and some of the condom users were paid \$5 and \$10, respectively, for completing the questionnaires.

Results

Because this is an integrative study, the observations are limited to consistencies across studies rather than significant differences within studies. Statistical analyses assess the probabilities that the observed consistencies were likely to have occurred by chance.

Principal-Components Analyses

Principal-components analysis with varimax rotation was performed on the decisional balance items for each of the 12

samples. Each analysis was based on the sample of subjects who completed the full questionnaires for a particular problem behavior. The MAP (Velicer, 1976; Zwick & Velicer, 1986), Scree (Cattell, 1966), and J. L. Horn (1965) methods were used to determine the number of components to retain. On the basis of all three rules, two components were retained in each analysis. The two components accounted for 40% to 80% of the total variance across samples. Rather than there being eight categories for decision making, the structure was comparable across all problems and all populations. There were simply two categories labeled *pros* and *cons*. For smoking, the pros and cons were written for the problem behavior itself (smoking); in all other cases, the pros and cons were written for the solution of the problem (e.g., controlling weight, using condoms, quitting cocaine, or exercise acquisition). In only one case, high-fat diets, was the interpretation of the principal-components analysis ambiguous. With high-fat diets, a case could be made for a four-component solution as well as a two-component solution, and a hierarchical model may be required. Internal consistency (alpha) coefficients ranged from .75 to .95 (see Table 2). The probability that 12 of the 12 studies would yield a two-component structure is .0002. The probability that at least 11 of the 12 studies would result in a two-component structure on the decisional balance is .003.

Cross-Sectional Comparisons

To facilitate interpretation and cross-problem comparisons, we converted raw scores for the pros and cons to standard (*T*) scores ($M = 50, SD = 10$). Subgroups for each of the 12 samples were ordered according to our stage model of behavior change (Prochaska & DiClemente, 1983, 1985, 1992). Figure 1 presents the standardized means for the pros and cons arranged in order of the stages for each of the 12 problem behaviors.

Figure 1 indicates that for all 12 problem behaviors the cons of changing the problem behaviors were higher than the pros for subjects who were in the precontemplation stage.¹ The probability that 12 of the 12 studies would result in the cons being higher than the pros for the precontemplation stage is .0002. The opposite was true for subjects in the action stage in 11 of the 12 studies, with quitting cocaine being the exception.

Table 2
Internal Consistency Coefficients for Decisional Balance Scales

Problem behavior	N	Coefficient alpha	
		Pros	Cons
Smoking behavior	764	.87	.90
Quitting cocaine	156	.86	.87
Weight control	123	.91	.84
Safer sex	213	.87	.85
Condom use	345	.92	.89
Adolescent delinquency	159	.83	.75
Sunscreen use	227	.91	.91
Randon gas exposure	698	.94	.87
High fat diet	180	.90	.81
Exercise acquisition	717	.95	.79
Mammography screening	141	.80	.82
Physicians' preventive practices	135	.83	.86

Note. Total N = 3,858.

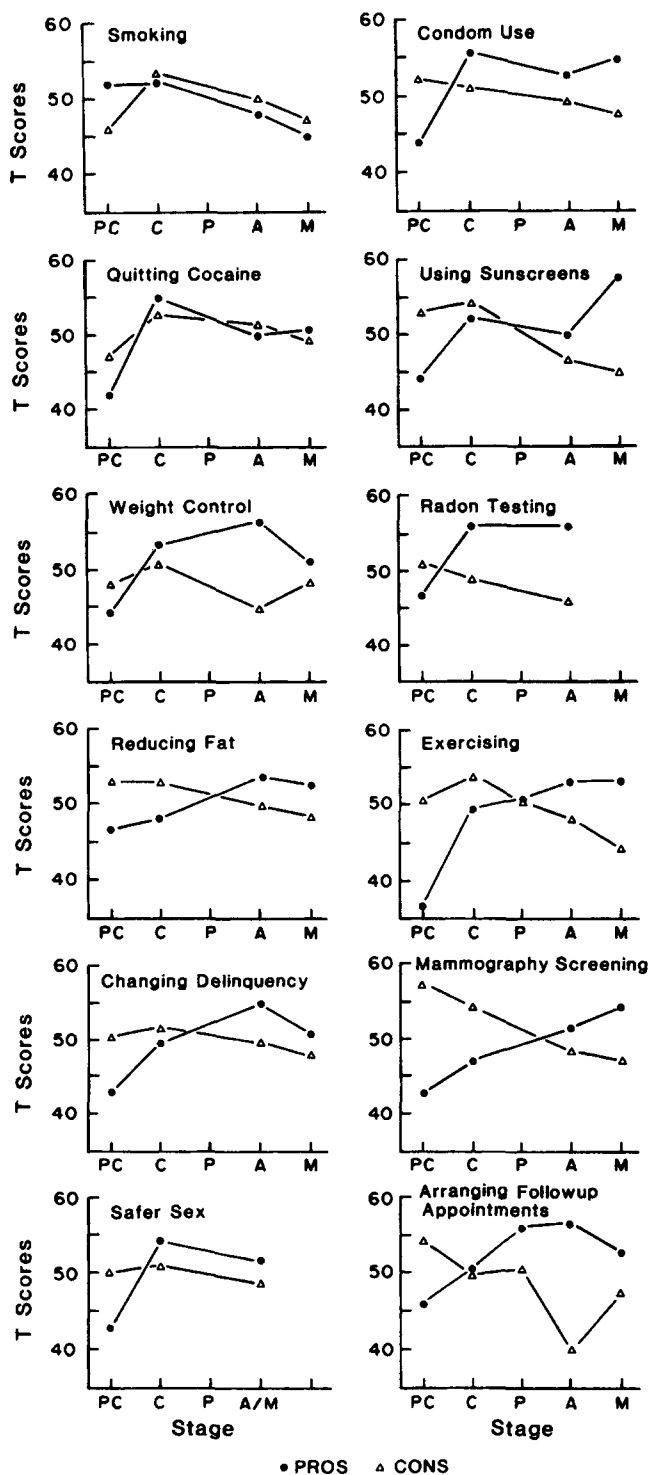


Figure 1. The pros and cons (in *T* scores) by stages of change for each of the 12 problem behaviors. (PC = precontemplation; C = contemplation; P = preparation; A = action; M = maintenance.)

¹ Note that the pros of smoking were higher than the cons, but that situation is comparable to the cons of quitting smoking being higher than the pros.

The probability that at least 11 of the 12 studies would result in the pros being higher than the cons in the action stage is .003.

Figure 1 also indicates that for all 12 problem behaviors, the pros of changing the problem behavior were higher for subjects in the contemplation stage than for those in the precontemplation stage ($p = .0002$). There was no consistent pattern of differences between the contemplation and precontemplation stages on the cons of changing.

There was, however, a consistent pattern of differences in the cons of changing between subjects in the contemplation stage and those in the action stage. For 12 of the 12 problem behaviors, the cons of changing were lower for subjects in the action stage than for those in contemplation ($p = .0002$). On the pros of changing there was no consistent pattern of differences between subjects in the contemplation stage and those in action. The pros were higher in the action stage for five of the behaviors, lower for five, and equal for two.

In 7 of the 12 samples the crossover between the pros and cons of changing occurred during the contemplation stage. In exercise acquisition the crossover was evidenced during the preparation stage. For delinquent behaviors, sunscreen use, high-fat diets, and mammography screening the crossover was evident during the action stage and, as in exercise acquisition, may have occurred during the preparation stage. For these behaviors, however, subgroups representing the preparation stage were not available. The probability of at least 8 of 12 studies resulting in the crossover's occurring before the action stage is only .194.

Discussion

Clear commonalities occurred across 12 problem behaviors studied in a variety of populations. First, the internal validity of the two-factor model of decisional balance was strongly supported across each of the studies in which it was tested. Instead of there being eight categories on which individuals made decisions to change their behaviors, the structure appeared to be much simpler. Two major categories, pros and cons, were found to clearly represent decisional categories for making behavior changes across the stages of change. In one sample (high-fat diets) there was the potential for a four-component solution, but even there a two-component solution was supported. These results strongly suggest that the structure for decision-making categories is much simpler than that posited by major theorists like Janis and Mann (1977).

Relating the pros and cons of decision making to the stages of change resulted in some highly predictable patterns. For all 12 samples, the cons of changing the problem behaviors outweighed the pros for subjects who were in the precontemplation stage. The opposite was true for subjects in the action stage in 11 of the 12 samples, with quitting cocaine being the exception. The cocaine action sample was relatively unique in that it contained a sizeable subgroup who were currently hospitalized or in residential programs. Because the action criterion involved not having used cocaine in the previous 6 months, these subjects may have met the criteria by reason of being inpatients rather than because of self-initiated attempts to quit cocaine.

In 7 of the 12 samples the crossover between the pros and

cons of the problem behavior occurred during the contemplation stage. With exercise acquisition, the crossover was evidenced during the preparation stage. For delinquent behaviors, sunscreen use, high-fat diets, and mammography screening the crossover was evident during the action stage and, as in exercise acquisition, may have occurred during the preparation stage. For these behaviors, however, subgroups representing the preparation stage were not available, so this interpretation requires additional data. Although more research is needed to determine the consistency of the crossover's occurring prior to the action stage, we predict from these results that for most problem behaviors people will decide that the pros of changing the behavior outweigh the cons before they take action to modify their behavior.

What accounts for the crossover between the pros and cons of changing in cross-sectional groups that represent progress from precontemplation to action? First, for all 12 problem behaviors the pros of changing are higher in the contemplation stage than in precontemplation. This suggests that progress from precontemplation to contemplation involves an increase in the evaluation of the pros of changing. For 12 of the 12 behaviors, the cons of changing are lower in the action stage than in contemplation. This suggests that progressing from contemplation to action involves a decrease in the cons of changing. The increase in the pros followed by a decrease in the cons should lead to a crossover in the decisional balance from the cons being greater in precontemplation to the pros being greater in action. In just which stage the crossover occurs is a function of how much and when the pros increase and how much and when the cons decrease. From the data that exist, we predict that the crossover will generally occur prior to the subject's taking action.

These results also suggest a systematic approach for changing the pros and cons so that progress from precontemplation to action is facilitated. First, intervention should target increasing the pros of changing, which should lead to progress from precontemplation to contemplation. Once such progress has occurred, intervention should then target decreasing the cons of changing, which should lead to further progress from contemplation to action.

In many ways, the figures presented in this study speak for themselves. They provide strong support for the generalizability of three basic constructs of the transtheoretical model: the stages of change, the pros and cons, and the integration between the stages and these decisional balance variables. These constructs and the relationships between them hold for behaviors differing on such dimensions as acquisition and cessation, addictive and nonaddictive, frequent and infrequent, legal and illegal, public and private, and socially acceptable and less socially acceptable.

These results also provide strong support for the generalizability of these transtheoretical constructs across a variety of populations. These constructs and the basic relationships between them hold for samples differing on such dimensions as gender, socioeconomic status, age, and minority status. This is not to say that these measures and model can be applied to a diversity of groups without sensitivity to the special needs and perspectives of each group. We draw a distinction, however, between the generalizability of a model and the implementa-

tion of a model as, for example, in the development and testing of interventions or treatment programs based on a model. Among other things, measures may need to be translated appropriately, reading levels of treatment materials may need to be adjusted, and individuals will need to be recruited and treated in culturally sensitive ways. But the underlying constructs that are important for understanding change may be quite similar across a broad diversity of groups with a broad diversity of problem behaviors.

These results are limited by the fact that they are based on cross-sectional analyses of groups representing different stages of change. These analyses assume that the groups are from the same population of people with a history of the same type of problem and that they vary only according to their current stage of change. It is possible that the groups could differ on variables other than stages, such as demographics or problem history, and that such differences could account for the systematic patterns in the decisional balance measures across groups. Although it is less likely that the same differences occurred across all samples with all problems, it is a possibility. Therefore, these results need to be tested in a series of longitudinal analyses that follow individuals through the stages so that the patterns of the pros and cons can be assessed as people progress through the stages over time. Longitudinal studies of smoking cessation have supported the cross-sectional results presented here (Prochaska, Velicer, Guadagnoli, Rossi, & DiClemente, 1991).

These results are also limited by the fact that the size and nature of the samples varied considerably. In a few of the samples, such as the cocaine abusers, high-fat dieters, and physicians, fewer than 10 subjects were available to represent a particular stage. In other samples, like the exercise-acquisition sample, the participants were recruited from worksite programs for a different target behavior such as smoking. In at least one of the samples (weight control) the behavior targeted was primarily related to appearance rather than health. Ideally we would have selected samples that were large enough and clinically relevant enough to avoid such limitations. But in this integrative study we did not intentionally exclude any study that existed, and we intentionally included the first or only study available on a problem behavior. In spite of or perhaps because of such limitations it may be even more impressive that such consistent results were found.

These results suggest that alternative models of behavior change, such as Janis and Mann's (1977) decision-making model and our stage model, can be mutually enhanced when studied together. Our systematic studies of Janis and Mann's (1977) decisional balance constructs indicate that their complex model of eight categories can be greatly simplified to one with the two basic categories of the pros and cons of a behavior. Similarly, studying decision-making models across stages can greatly enhance our understanding of how people weigh the pros and cons of problem behaviors at each stage of change.

In the past when two models of behavior change have been compared empirically, we have usually examined the ability of one model to outpredict or outperform a competing model. A new approach involves testing the ability of one model to integrate empirically the core constructs of an alternative

model. This approach enables us to break with the horse-race tradition of behavior change research that pits one therapy against another. After more than 400 such horse races, we have made few advances in our ability to help people better understand, predict, and control their behavior (Prochaska, 1984). We hope that an integrative approach can take us beyond the parochial pairing of partisan theories and therapies toward a more comprehensive approach to behavior change.

To date, we have found that processes of change that have their theoretical origins in such variable and supposedly incompatible approaches as behavioral, cognitive, experiential, humanistic, and psychoanalytic therapies can be integrated empirically within the stage dimension of change (Prochaska & DiClemente, 1983). We have also found evidence suggesting that self-efficacy theory can be integrated within the same stage dimension (Velicer et al., 1990). The present results add substantial evidence that core constructs from a decision-making model can also be integrated within the stage dimension. We hope that such results can advance us beyond the all-too-common form of either-or thinking (either this model is correct or the competing one is better), and we anticipate the possibility of integrating alternative perspectives into more comprehensive approaches to behavior change.

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