

RELAPSE SITUATIONS AND SELF-EFFICACY: AN INTEGRATIVE MODEL

WAYNE F. VELICER

University of Rhode Island

CARLO C. DICLEMENTE

University of Houston

JOSEPH S. ROSSI and JAMES O. PROCHASKA

University of Rhode Island

Abstract — Researchers studying relapse for an addictive behavior have employed two different conceptual models. Researchers concerned with typologies of relapse situations have developed a variety of discrete classes of high risk situations. Researchers who have employed a Self-efficacy approach have typically assessed different situations but scored the measure as a single general construct. Using structural modeling, this paper evaluates five alternative measurement models, representing alternative conceptualizations. A hierarchical model which integrates the previously competing models provided the best fit to the data and serves to explain a large body of previous findings. The model includes three first order constructs (Positive/Social; Negative/Affective; and Habit/Addictive) and one general second-order factor. The results were replicated across two different response formats and two different subject samples.

The problem of relapse has received a great deal of recent attention by researchers involved with addictive behaviors (Brownell, Marlatt, Lichtenstein, & Wilson, 1986). Research has involved emerging models of relapse, investigating the causes of relapse, and interventions designed to prevent relapse. Two broad approaches have been applied to the area of relapse: typologies of relapse situations and assessment of efficacy expectations in relapse situations. These two approaches have produced different models of the relapse situation. Self-efficacy has been treated as a single construct while relapse situation research has generally found three (or more) distinct situations. The purpose of the present paper is to demonstrate that this difference results partially from an artifact. In addition, a general model which integrates the two approaches will be presented. Data from the area of smoking cessation will provide the basis for this study.

Self-efficacy (Bandura, 1977, 1982, 1986) conceptualizes a person's perceived ability (efficacy expectation) to perform on a task as a mediator of performance on future tasks. Increased self-efficacy will result in improved performance and vice versa. Therefore, a change in the level of self-efficacy can predict a lasting change in behavior if there are adequate incentives and skills. Self-efficacy measures vary for different problem areas, but are typically scored as a single summation score across situations. The predictive power of the self-efficacy construct for changes in smoking behavior has been demonstrated in several studies (Coelho, 1984; Condiotte & Lichtenstein, 1981; DiClemente, 1981, 1986; DiClemente, Prochaska, & Gibertini, 1985; McIntyre, Lichtenstein, & Mermelstein, 1983; Prochaska, DiClemente, Velicer, Ginpil, & Norcross, 1985; Supnick & Colletti, 1984).

This research was supported by Grant CA27821 from the National Cancer Institute. We thank Lisa Harlow for helpful comments. An earlier version of this paper was presented at the annual meeting of the Society of Multivariate Behavioral Research, Vancouver, British Columbia, October 1987.

Requests for reprints should be sent to Wayne F. Velicer, Psychology Department, University of Rhode Island, Kingston, RI 02881.

In contrast, studies which have focused on determining situations in which individuals relapse have generated a taxonomy of distinct situations (Cummings, Gordon, & Marlatt, 1981; Dubbert & Wilson, 1984; Marlatt & Gordon, 1980; Shiffman, 1982, 1986; Shiffman, Read, & Jaravik, 1985). The procedure employed has typically been a formal or informal cluster analysis. The number of categories has varied, but three characteristics distinguish the different clusters: (a) Affect, particularly negative affect; (b) Social Situations, i.e., whether alone or with others; and (c) Physical Craving, involving both withdrawal symptoms and physical response to cues. Brownell et al. (1986) refer to these as individual, situational, and physiological, respectively. The first two are the most consistently reported across studies (Baer & Lichtenstein, 1988).

Some of the confusion in the area is illustrated by previous attempts to perform an internal or factorial validity study for self-efficacy scales. DiClemente et al. (1985) performed a component analysis on a 31-item self-efficacy scale and found four distinct but highly overlapping components. They concluded that the components were not adequately distinct to be interpretable as separate scales and, following the lead of other researchers, scored self-efficacy as a single scale. Conditte and Lichtenstein (1981) performed a cluster analysis on a 48-item scale and reported seven distinct clusters of items. However, cluster analysis does not permit complex items and, in effect, forces separation and independence, so these results could be an artifact of the type of data analysis. Cluster analysis procedures are more appropriately applied to subjects rather than variables. Baer, Holt, and Lichtenstein (1986) reanalyzed the Conditte and Lichtenstein (1981) scale using principal components analysis, and determined that it was better scored as a unitary scale.

The purpose of this paper is to resolve the discrepancies resulting from these two alternative conceptual models. Both are employed extensively in the study of relapse, and the clarification of the conceptual model has implications for intervention as well as research. Data from the smoking cessation area will be employed. First, the presence of a type of response bias which distorts the results of the multivariate statistical analysis will be described. Appropriate modification of the data set will partially remove this problem. Second, a structural model analysis will be used to determine the best measurement model for the self-efficacy construct. One of the models that will be considered is an Hierarchical model which involves both first- and second-order factors. This type of model could easily resolve the confusion that has occurred in this area. Third, based on the formal measurement model, a short, highly reliable questionnaire will be described which can be adapted to specific research problems. Fourth, the results of the first study will be replicated on a sample of subjects recruited for a smoking cessation intervention study.

STUDY 1: METHOD

Subjects

The subjects were drawn from a sample of 960 adults from Rhode Island and Texas who volunteered in response to newspaper advertisements for a longitudinal study of cigarette smoking. Only data from the first assessment is described here. Women comprised 63% of the sample. At the time of initial assessment, respondents ranged in age from 15 to 80, with an average age of 38.9 ($SD = 12.3$). Slightly more than half (55%) of the participants were married, 22% single and the remainder divorced, separated, or widowed. Three-quarters of the sample had some college education and the median family income was between \$15,000 and \$20,000. Current smokers in the sample smoked an average of 25.9 cigarettes per day ($SD = 13.5$).

The subject pool was originally divided into five different groups based on current smoking behavior, previous smoking behavior, and reported intentions about cessation.

These groups represent five separate stages in the process of change (DiClemente & Prochaska, 1985; Prochaska & DiClemente, 1985). There were 122 subjects who represented the *Precontemplation Stage* in that they were currently smoking and were not considering quitting. The *Contemplation Stage* was represented by 206 subjects who were currently smoking but were seriously considering quitting in the next 6 months. Subjects ($N = 143$) who had quit smoking without a formalized treatment in the past six months represented the *Action Stage*. The *Maintenance Stage* consisted of 231 subjects who quit on their own at least six months prior to the study. The final 255 subjects were *Relapsers*, defined as individuals who initially quit on their own for at least 24 h but then relapsed in the 6 months prior to the study. More details of this subject pool, stage model, and other measures employed are described extensively in several other papers (DiClemente et al., 1985; Prochaska & DiClemente, 1983; Prochaska et al., 1985; Prochaska, Velicer, DiClemente, & Fava, 1988; Prochaska, Velicer, DiClemente, Guadagnoli, & Rossi, in press; Rossi, Prochaska, & DiClemente, 1988; Velicer, DiClemente, Prochaska, & Brandenburg, 1985).

Measures

The initial item pool was developed by the following procedure. First, items were generated which seemed to describe situations likely to elicit smoking behavior. Second, the items were sorted on two dimensions: The affective state represented (anxiety, anger, joy, etc.) and the specific context (at home, work, etc.). This was done to assure adequate content sampling. The items were also reviewed to determine adequate representation of different levels of intensity of affect. Third, 31 items were selected which were not redundant and represented a wide variety of affects and situations. Each of the items was rated by subjects on two different five-point Likert-type scales. For the Confidence Inventory, each subject was asked to rate how confident he/she was that he/she could avoid smoking in that situation. For the Temptation Inventory, each subject was asked to rate how tempted he/she would be to smoke in each situation. The Confidence Inventory most closely represents the self-efficacy construct, while the Temptation Inventory represents an alternative format which is more easily responded to by subjects in some of the stages. DiClemente (1981) provides a detailed description of development and refinement of this initial item pool.

Procedure

After volunteering for the study in response to newspaper articles and ads, subjects were informed of the nature of the research, signed an informed consent form, and were guaranteed anonymity of their responses. Subjects were then mailed a questionnaire, which included the Confidence and Temptation Inventories, the Processes of Change Questionnaire (Prochaska et al., 1988), the Decisional Balance Scale (Velicer et al., 1985), and both a smoking history and health history. Subjects were reimbursed \$4.00 for the completed questionnaire and \$4.00 for a personal interview. In addition subjects were eligible to win one of 10 bonus drawings worth \$25 to \$250.

R E S U L T S

The analysis involved three separate steps. The first step was an assessment of the distributional characteristics of the two inventories, Confidence and Temptation, for the full variable and subject data set. The second step involved the deletion of inappropriate subjects and items on the basis of a series of analyses. The third step involved formulating and testing a variety of alternative measurement models to determine the appropriate model.

Distribution of scores

Table 1 provides the distribution of mean scores on all 31 initial items for all subjects for

Table 1. Frequency distribution for total scores on Confidence Inventory

Interval	Frequency
1.00-1.19	76 ^a
1.20-1.39	60
1.40-1.59	40
1.60-1.79	51
1.80-1.99	43
2.00-2.19	72
2.20-2.39	71
2.40-2.59	50
2.60-2.79	32
2.80-2.99	26
3.00-3.19	26
3.20-3.39	17
3.40-3.59	20
3.60-3.79	26
3.80-3.99	21
4.00-4.19	36
4.20-4.39	26
4.40-4.59	11
4.60-4.79	21
4.80-5.00	119 ^b
Total	844

^aIncludes 48 cases = 1.00.

^bIncludes 101 cases = 5.00.

whom complete records existed ($N = 844$) on the Confidence Inventory. Listwise deletion was employed because of the availability of a large initial subject pool ($N = 960$). An examination of the frequency distribution illustrates the non-normal nature of the data. The kurtosis index (-1.143) reflects this extensive departure from normality. This type of distribution, sometimes labeled "platykurtic," is characterized by a very high frequency of scores in the tails of the distribution. Particularly notable is the number of subjects who selected the "1" response on all 31 items ($n = 48$) and the number of subjects who selected the "5" response on all 31 items ($n = 101$). Results for the Temptation Inventory, not presented here, parallel those for the Confidence Inventory.

This pattern of responding is sometimes described as an *extremity response style* (Velicer & Steiger, 1990). The effect is to create a high degree of interitem correlation and a corresponding artificial "general factor." If the effect is strong enough, the resulting lack of differentiation will disguise the presence of distinguishable separate factors. In this case, viewing the presence of these extreme responders may not represent a stylistic error or distortion but rather the appropriate responding of some subsets of the subjects. A Precontemplator who responds that he/she would be likely to smoke in any situation and a Maintainer who responds that he/she would be unlikely to smoke in any situation would seem to be engaged in accurate responding rather than a response distortion. The sample used in this study was intentionally heterogenous to span the continuum of subjects in the process of quitting. A sample of subjects recruited for smoking intervention programs would be unlikely to contain many members from the two extreme stages (i.e., Precontemplators and Maintainers).

Preliminary analysis

Subjects. Since the self-efficacy construct is designed to assess subjects actively in the process of changing, all subsequent analyses employed only subjects in the Action and

Relapse subgroups ($N = 398$). These groups are more representative of subjects who are likely to volunteer for a smoking cessation program. When the frequency distribution of responses for this group was plotted, the result more closely approximated a normal distribution. A slight positive skew occurred for the Confidence Inventory and a corresponding negative skew occurred for the Temptation Inventory. The size of this subsample is more than adequate for the analysis performed (see Guadagnoli & Velicer, 1988).

Variables. Means, standard deviations, and correlations with the total score were calculated for each item. In addition, a principal components analysis was performed. The MAP rule (Velicer, 1976; Zwick & Velicer, 1982, 1986) indicated that a three-component solution was the best for both inventories. Both a varimax and a promax rotation were performed. The item content was reviewed with respect to the quantitative information available. Thirteen of the 31 items were deleted because of poor differentiation, confused wording, or difficulty in interpretation. The remaining 18 items were employed in all subsequent analyses. The same 18 items were retained for both the Confidence Inventory and the Temptation Inventory.

Fitting the measurement model

Five alternative models were fit to the 18 manifest variables (items) for each of the two inventories employing a structural analysis procedure. The first model was the *Null model* which assumes all the manifest variables are unrelated. This is not proposed as a serious model. Rather, it provides a baseline which is employed by some of the comparison fit indices (see below). The second model was the *Single Factor Model*. This model tested if a single general factor will account for all the correlations between the variables. This is the model assumed by researchers who score Self-efficacy scales as a unitary construct. The third model was the *Three (Uncorrelated) Factors Model*. This model reflects the type of model assumed by the relapse situation researchers. The fourth model was a *Simple Hierarchical Model*. This model combined the previous two models in a hierarchical manner, with the three factors treated as primary factors and the single factor treated as a second order factor. The fifth model was a *Complex Hierarchical Model*. This represents a slight modification of the previous model in that correlated error terms are permitted between variables allocated to the same primary factor on the basis of various diagnostic indices available in the LISREL VI program (Joreskog & Sorbom, 1984).

Five different fit indices were calculated on each of the five alternative models to determine which provided the best fit to the data. Rejected from consideration was the popular but flawed asymptotic chi-square test (Marsh, Balla, & McDonald, 1988; Velicer & Jackson, 1990; Zwick & Velicer, 1986). The five indices considered were the Goodness of Fit Index (GFI) and Root Mean Square Residual (RMS) (Joreskog & Sorbom, 1984); the Normed (NFI) and Non-normed (NNFI) Fit Indices (Bentler & Bonnett, 1980); and the Parsimonious Fit Index (James, Mulaik, & Brett, 1982). All five fit indices provide a consistent pattern of results with respect to the choice between the five models, and only the GFI is reported here. As expected, the Null Model was inconsistent with the data (GFI = .114). The single factor model was substantially compatible with the data but not fully adequate (GFI = .703). The same description can be applied to the Three Uncorrelated Factors Model, which was only marginally better (GFI = .714). The Hierarchical model provided a "very good" fit to the data (GFI = .829). The fifth model provided a small improvement over the fourth model by adding one correlated error term (GFI = .855). Exactly identical models were fit for both the Confidence Inventory and Temptation Inventory, with the results for the Temptation Inventory replicating the results for the Confidence Inventory.

Figures 1 and 2 present the Complex Hierarchical Model for the Confidence and

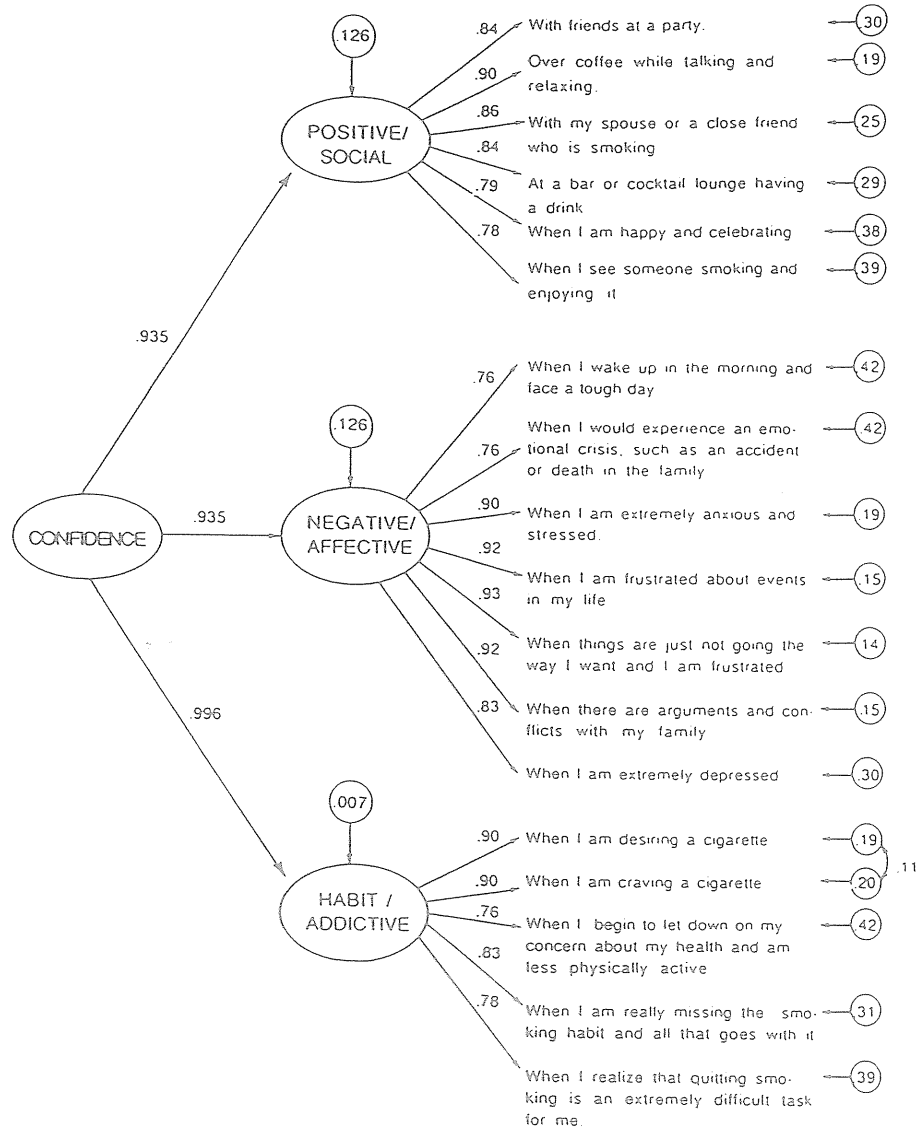


Fig. 1. Measurement model with standardized parameter estimates for Confidence Inventory.

Temptation Inventories, respectively. The first primary factor was labeled *Positive/Social* situations. All items involved both a positive affect (i.e., happy, relaxing), and also a social aspect (i.e., with friends, spouse), or an implied social situation (i.e., talking, at a bar). The six items which measure this construct include "over coffee while talking and relaxing" and "with my spouse or a close friend who is smoking." The second primary factor was labeled *Negative/Affective*. All items involved a negative affect or situation. They also typically seem to imply isolation. The seven items which measure this construct include "When I am frustrated about events in my life" and "When I am extremely anxious and stressed." The third primary factor was labeled *Habit/Addictive*. This factor seems to reflect the physical cravings associated with smoking cessation. The five items which measure this factor include

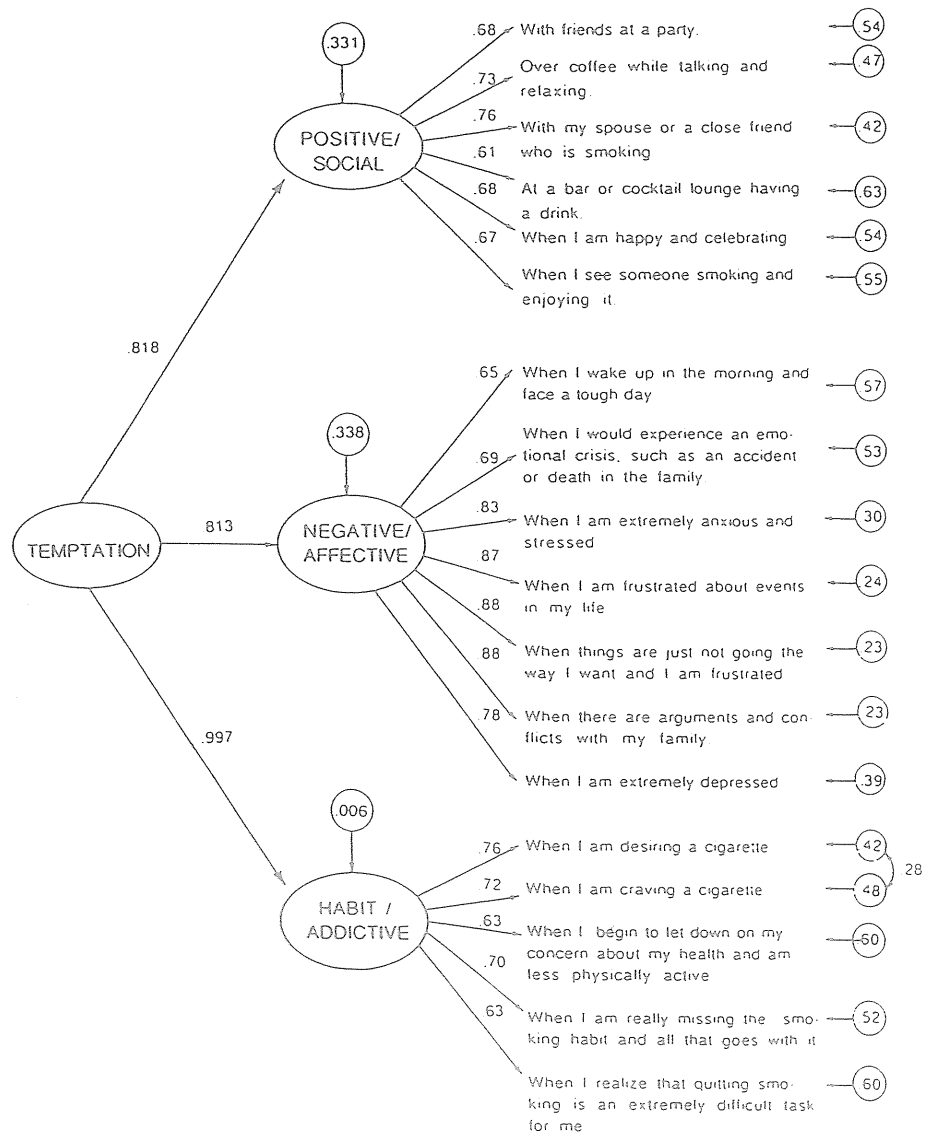


Fig. 2. Measurement model with standardized parameter estimates for Temptation Inventory

“When I am craving a cigarette” and “When I begin to let down on my concern about my health and am less physically active.”

All three primary factors loaded heavily on the single second-order factor. It was labeled *Confidence* for the Confidence Inventory and *Temptation* for the Temptation Inventory. Several alternative interpretations are available for the second order factor. First, a general level of confidence may exist which reflects a real individual difference. This general level of confidence may exist across different situations. Second, the general factor may reflect a social desirability response distortion. This interpretation could be tested. A Social Desirability Scale (Jackson, 1967) had been included for approximately a third of the subjects. Table 2 includes the correlations between Social Desirability and scales based on

Table 2. Summary statistics for three scales of Temptation and Confidence Inventories

Scale	Number of Items	Mean ^a	Standard Deviation	Coefficient Alpha	Social Desirability ^b	Skewness	Kurtosis
Part I. Confidence (<i>N</i> = 360)							
Positive/Social	6	2.75	1.19	.933	-.029	.477	-.830
Negative/Affective	7	2.56	1.20	.951	.074	.497	-.743
Habit/Addictive	5	2.73	1.18	.924	.013	.464	-.819
Part II. Temptation (<i>N</i> = 363)							
Positive/Social	6	3.70	0.87	.844	.071	-.746	.432
Negative/Affective	7	3.76	0.99	.918	-.026	-.742	.085
Habit/Addictive	5	3.60	0.90	.825	.037	-.621	.011

^aScale totals divided by number of items before calculating means and standard deviations.

^bCorrelation with Social Desirability based on a second sample: *N* = 100 for Confidence Inventory and *N* = 101 for Temptation.

the inventory. All correlations are near zero. Third, the general factor could represent a centrality response error. The scale anchor points are open to different interpretation by individuals. What one subject labels "very confident" another subject may label "somewhat confident." Such a difference in individual scale anchor points would create a lack of differentiation between the constructs. Fourth, some subset of the subjects may still be providing an extremity response pattern. This would also result in a lack of differentiation. The subject selection procedures were designed to delete only those subjects in categories where they could be expected a priori to give extremity responses. If an adequate number of subjects in the two remaining groups also provided an extremity response pattern, the general factor would result.

Scale scores corresponding to each of the three factors were obtained by calculating the unweighted sum of the items allocated to each scale. Table 2 presents the means, standard deviations, and skew and kurtosis indices for each of the three scales for both the Confidence Inventory and the Temptation Inventory. Since the theoretical scale mean would be 3.00, the scales demonstrate the slight skew in the direction of low confidence and high temptation. Alpha coefficients were calculated for each of the three scales and ranged from .825 to .951. The highest Alphas were found for the seven-item Negative/Affective scales and the lowest for the five-item Habit/Addictive scales. Test-retest reliabilities are not appropriate for dynamic constructs, and are not reported. The selection of the subject sample would result in either an overestimate of stability, that is, if all 844 subjects were used, or an underestimate of stability, that is, if only the 360 subjects who are in the process of changing were employed.

S T U D Y 2

The results of Study 1 suggested changes in both sample selection and scale items, and these changes were incorporated into a second study. Subjects in Study 1 were recruited for a naturalistic study of the course of self-change of smoking behavior, without intervention, over a two-year period. Such subjects were expected to exhibit, and in fact did exhibit, a highly stable pattern of smoking behavior over the duration of the study (Prochaska et al., in press; Prochaska, Velicer, DiClemente, Rossi, & Guadagnoli, 1989). As discussed previously, such patterns form the basis of the extremity response style.

Subjects in Study 2 were recruited to participate in a self-help manual-based smoking cessation program. Such subjects were expected to be more highly motivated to take action than a purely naturalistic sample of smokers. Dynamic rather than stable patterns of smoking

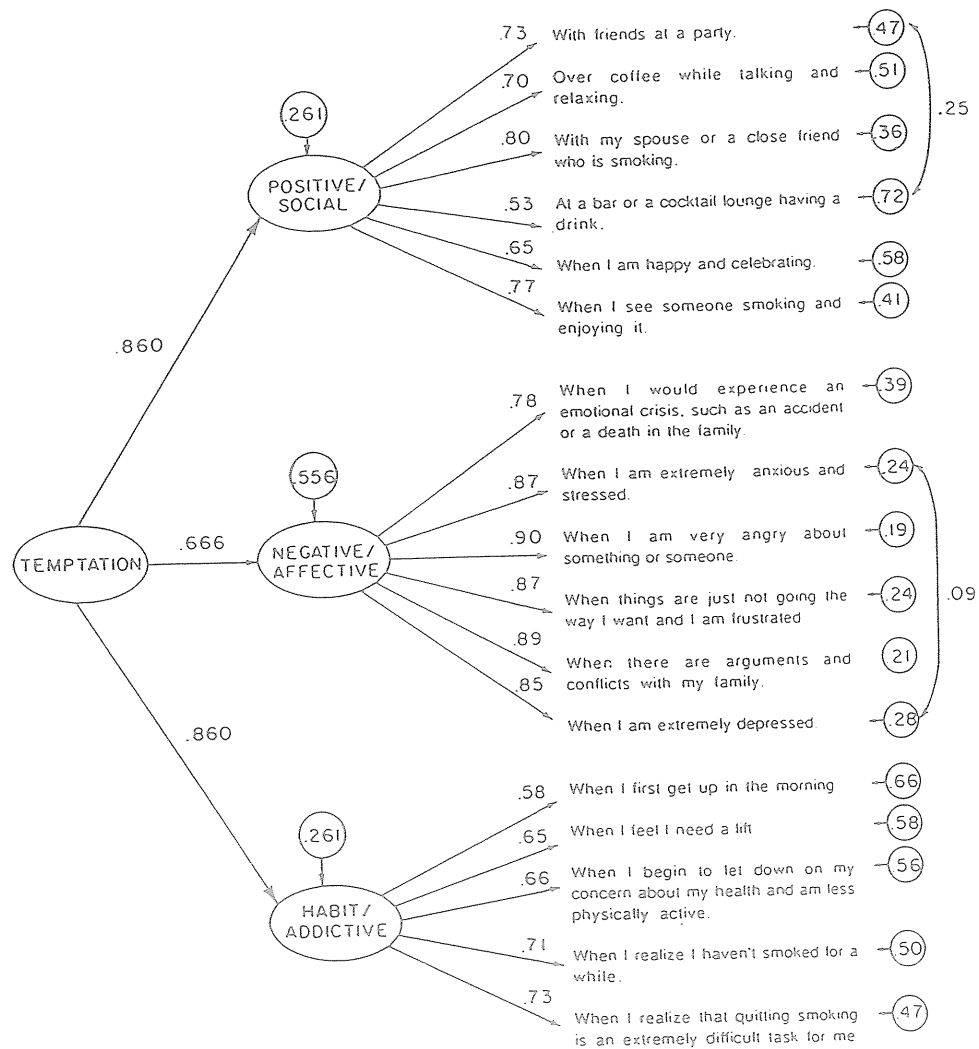


Fig. 3. Measurement model with standardized parameter estimates for revised Temptation Inventory.

were expected for these subjects, since all were participants in an intervention program. As a result, the three primary factors of the Self Efficacy Inventories were expected to be more clearly differentiated for this sample.

Some revision of items was also incorporated in Study 2, primarily affecting the Habit/Addictive factor. Several items were added to this factor in an attempt to more clearly define the content domain of this construct.

METHOD

Subjects

Study 2 was based on 421 subjects from Rhode Island who responded to newspaper advertisements for a self-help manual intervention program designed to aid smokers'

Table 3. Summary statistics for three scales of the Revised Temptation Inventory

Scale	Number of Items	Mean ^a	Standard Deviation	Coefficient Alpha	Skewness	Kurtosis	Test-Retest ^b
Temptation (<i>N</i> = 421)							
Positive/Social	6	3.62	0.85	.857	-.400	-.067	.565
Negative/Affective	6	3.89	1.00	.946	-.858	.068	.572
Habit/Addictive	5	3.27	0.89	.800	-.337	-.107	.581

^aScale totals divided by number of items before calculating means and standard deviations.

^bTest-Retest reliability based on 339 subjects completing the one-month follow-up questionnaires.

cessation attempts. Subjects ranged in age from 17 to 73 ($M = 42.5$, $SD = 11.8$), and approximately 66% were women. Current smokers in the sample ($N = 394$) smoked an average of 26.8 cigarettes per day ($SD = 14.7$). On most other demographic and smoking history variables this sample was similar to the sample used in Study 1. The data reported here were gathered prior to any interventions.

Measures

The 18-item inventories resulting from Study 1 were modified for Study 2. Two items were deleted, one each from the Negative/Affective and Habit/Addictive scales, since the content of these items overlapped with other items. Four items were added to the inventories, one for the Negative/Affective scale and three for the Habit/Addictive scale. These latter items were added to more clearly define the Habit/Addictive component of the model. The resulting inventories thus each consisted of 20 items.

Procedure

Procedure for Study 2 was largely similar to that used in Study 1 except that subjects received \$5.00 for returning completed questionnaires and that no personal interview was conducted. In addition, upon completion of a pretest battery which included these measures, all subjects received self-help manuals designed to aid their self-quit cessation attempts.

RESULTS

Measurement models similar to those described in Study 1 were conducted on the revised Self-efficacy measures using the LISREL computer program. Since the results for both the Temptation and Confidence Inventories were essentially the same, only the results for the Temptation scale will be presented.

Initial analyses suggested the deletion of 3 items, one from the Negative/Affective component and two from the Habit/Addictive component. As in Study 1, five alternative measurement models were fit to the interitem correlation matrix. The two hierarchical models again clearly provided the best fit and the Complex Hierarchical Model was selected as the best representation of the data ($GFI = .906$). Standardized parameter values for the complex hierarchical model are shown in Figure 3.

Scale score summary statistics for the three Temptation components are displayed in Table 3. Internal consistency coefficients, also shown in Table 3, were high for all three components.

DISCUSSION

The primary purpose of this study was to assess alternative conceptual models that have produced different approaches to the problem of relapse. The results of this study provide a

conceptual model for Self-efficacy that is consistent with previous results. The resulting model is stable across alternative formats for item presentation and different samples of subjects. The problem with extremity response bias needs to be recognized generally for the measurement of variables associated with a dynamic process. The presence of this problem can result in a failure to distinguish between different constructs and the adoption of overly simplistic models. The problem was exaggerated in this case by the presence of a hierarchical model, which will also cause problems in detecting distinct constructs.

The focus of this paper was internal validity. Both of the approaches discussed were already well established with respect to external validity. Several alternative versions of a Self-efficacy scale have been demonstrated to possess good predictive ability (Coelho, 1984; Conditte & Lichtenstein, 1981; DiClemente, 1981, 1986; DiClemente et al., 1985; McIntyre et al., 1983; Prochaska et al., 1985; Supnick & Colletti, 1984). Likewise, a similar typology of relapse situations has resulted from a variety of studies, despite the use of a wide variety of different methods of clustering, ranging from informal subjective observational procedures to quantitative objective analytic procedures (Baer & Lichtenstein, 1988; Brownell et al., 1986; Cummings et al., 1981; Dobbert & Wilson, 1984; Marlatt & Gordon, 1980; Shiffman, 1982, 1986; Shiffman et al., 1985). The consistency of results across different Self-efficacy measures and the similarity of typologies across different procedures provide evidence of the strength and generalizability of the constructs involved. However, the parallel development of the two distinct approaches is a result of the rush to demonstrate external validity while ignoring internal validity and a proper exploration of the basic conceptual model.

The three constructs described here are consistent with the typology described in a recent review paper by Brownell et al. (1986). The construct that we have labeled Negative/Affective corresponds to their Individual/Intrapersonal factor which involves negative emotional states and inadequate motivation. The construct that we have labeled Positive/Social corresponds to their Environmental/Social factor which includes environmental stimuli and external contingencies, including social factors. The construct that we have labeled Habit/Addictive corresponds to the subjective impressions generated by their Physiological factors, including cravings, urges, and withdrawal.

The dynamic nature of the construct resulted in a number of unique problems. The clearest problem was the inclusion of stable subjects in the subject pool which distorted the structure of the measure. In a more subtle way the dynamic nature of the process may be responsible for the hierarchical model. The hierarchical model may be conceptualized as the structure that results from a model changing over time. Initially, the single unitary model (general factor) applies to Contemplators. Then, for a period of several weeks after cessation, the Habit/Addictive aspect becomes highly differentiated from general Self-efficacy. After that, the Positive/Social aspects may be differentiated from general Self-efficacy. During this second phase, the Habit/Addictive aspect is no longer distinct, as many of the internal physiologically based cues are no longer dominant. Rather, the external environmental cues have the most valence. During the third phase, the Negative/Affective aspect would be differentiated, operating mainly as an "excuse" to relapse. Finally, the single unitary model with the associated lack of differentiation will also apply to Maintainers. If the structure does change over time and subjects are combined from different points in the cessation process, the result would be the type of hierarchical model described here.

One result of this study is a short (17-item) measure of Self-efficacy and/or Temptation that has a well established structure.¹ The replication of the structure across two different

¹The revised version of the Self-efficacy measures described here are available in optical scanner format upon request.

formats and two different subject samples indicates a high degree of stability. Researchers may score this instrument in two different ways, depending on the purpose of the study. If employed as a general screening device to determine "readiness" to change, a single global score would be appropriate. If employed during the course of treatment, three separate scores should be used to determine where relapse prevention programs should be targeted for maximum effectiveness. This scale is also specific to the smoking cessation area. However, the existence of a conceptual model will provide guidance for developing versions for other addictive behaviors using the same sequential test development strategy employed here (see Jackson, 1970, 1971). A study comparing this scale with other instruments, such as the 14-item Baer and Lichtenstein (in press) Self-efficacy scale, would serve to test the generality of the model under variable sampling. These studies will serve to increase our understanding of the Self-efficacy construct and the role it plays in addictive behaviors.

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