

CHAPTER 1

Relapse Prevention for Alcohol and Drug Problems

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The major goal of relapse prevention (RP) is to address the problem of relapse and to generate techniques for preventing or managing its occurrence. Based on a cognitive-behavioral framework, RP seeks to identify high-risk situations in which an individual is vulnerable to relapse and to use both cognitive and behavioral coping strategies to prevent future relapses in similar situations. RP can be described as a tertiary prevention strategy with two specific aims: (1) preventing an initial lapse and maintaining abstinence or harm reduction treatment goals, and (2) providing lapse management if a lapse occurs, to prevent further relapse. The ultimate goal is to provide the skills to prevent a complete relapse, regardless of the situation or impending risk factors. In this chapter we summarize the major tenets of RP and the cognitive-behavioral model of relapse, including hypothesized precipitants and determinants of relapse. These latter topics are covered in greater detail in the second edition of *Assessment of Addictive Behaviors* (Donovan & Marlatt, 2005). We also provide a brief discussion of meta-analyses and reviews of the treatment outcome literature and controlled clinical trials incorporating RP techniques. Finally, we describe a re-conceptualization of the relapse process and propose future directions for clinical applications and research initiatives.

MODELS OF RELAPSE

In 1986, Brownell and colleagues (Brownell, Marlatt, Lichtenstein, & Wilson, 1986) published an extensive, seminal review on the problem of relapse in addictive behaviors. At that time, addictive behaviors researchers were moving away from the disease model of addiction, and toward more cognitive and behavioral definitions of addictive disorders. Relapse has been described as both an outcome—the dichotomous view that the person is either ill or well, and a process—encompassing any transgression in the process of behavior change (Brownell, Marlatt, Lichtenstein, & Wilson, 1986; Wilson, 1992). The origins of the term “relapse” derive from a medical model, indicating a return to a disease state after a period of remission, but this definition has been diluted and applied to a variety of behaviors, from alcohol abuse to schizophrenia. Essentially, when individuals attempt to change a problematic behavior, a lapse (or instance of a previously ceased behavior) is highly probable. One possible outcome, following the initial setback, is a return to the previous problematic behavior pattern (relapse). Another possible outcome is the individual getting “back on track” in the direction of positive change (prolapse). Regardless of how relapse is defined, a general reading of the psychotherapy outcome literature from a variety of the behavior disorders reveals that “relapse” may be the common denominator in the treatment of psychological problems. That is, most individuals who make an attempt to change their behavior in a certain direction (e.g., lose weight, reduce hypertension, stop smoking, etc.), will experience lapses that often lead to relapse (Polivy & Herman, 2002).

The Cognitive-Behavioral Model of Relapse

Twenty-seven years ago, Marlatt (1978) obtained detailed, qualitative information from 70 chronic male alcoholics regarding the primary situations that led them to initiate drinking alcohol during the first 90 days following their release from an abstinence-based inpatient treatment facility. Based on the information obtained from this clinical data, Marlatt (1978) subsequently developed a detailed taxonomy of high-risk situations based on eight subcategories of relapse determinants. Drawing from this taxonomy of high-risk situations, Marlatt proposed the first cognitive-behavioral model of the relapse process (Cummings, Gordon, & Marlatt, 1980; Marlatt, 1996b; Marlatt & George, 1984; Marlatt & Gordon, 1985). Shown in Figure 1.1, the cognitive-behavioral model centers on an individual’s response in a high-risk situation. The components include the interaction between the person (affect, coping, self-efficacy, outcome expectancies) and environmental risk factors (social influences, access to substance, cue exposure). If the individual lacks an effective coping response

and/or confidence to deal with the situation (low self-efficacy; Bandura, 1977), the tendency is to “give in to temptation.” The “decision” to use or not use is then mediated by the individual’s outcome expectancies for the initial effects of using the substance (Jones, Corbin, & Fromme, 2001).

Individuals who choose to indulge may be vulnerable to the “abstinence violation effect” (AVE), which is the self-blame, guilt, and loss of perceived control that individuals often experience after the violation of self-imposed rules (Curry, Marlatt, & Gordon, 1987). The AVE contains both an affective and a cognitive component. The affective component is related to feelings of guilt, shame, and hopelessness (Marlatt, 1985), often triggered by the discrepancy between one’s prior identity as an abstainer and one’s present lapse behavior. The cognitive component, based on attributional theory (Weiner, 1974), assumes that if the individual attributes a lapse to factors that are internal, global and uncontrollable, then relapse risk is heightened. If, however, the individual views the lapse as external, unstable, and controllable, then the likelihood of a relapse is decreased (Marlatt & Gordon, 1985). For example, if an individual views a lapse as an irreparable failure or due to chronic disease determinants, then the lapse is more likely to progress to a relapse (Miller, Westerberg, Harris, & Tonigan, 1996); however, if the same individual views the lapse as a transitional learning experience, then the progression to relapse is less probable (Laws, 1995; Marlatt & Gordon, 1985; Walton, Castro, & Barrington, 1994). The individual who views a lapse as a learning experience is more likely to experiment with alternative coping strategies in the future, which may lead to more effective responses in high-risk situations. Several studies have demonstrated the role of the AVE in predicting relapse in alcoholics (Collins & Lapp, 1991), smokers (Curry, Marlatt, & Gordon, 1987), dieters (Mooney, Burling, Hartman, & Brenner-Liss, 1992), and marijuana users (Stephens, Curtin, & Roffman, 1994).

RELAPSE PREVENTION

The phrase “relapse prevention” may usefully stimulate thought, break old molds, get the adrenalin flowing, give the title to a book, but at the end of the day it can be an invitation to artificial segmentation of the interaction, total and fluctuating process of change. (Edwards, 1987, p. 319)

In his criticism of the first edition of *Relapse Prevention* (Marlatt & Gordon, 1985), Edwards (1987) suggested that RP would not provide an adequate account of the idiosyncrasies of change, and in doing so he highlighted the importance of the relapse process as an interactive, fluctuating process that may never be interrupted in certain individuals. Yet, as we will

show, RP has been an adjunct to the treatment of several behavior disorders and a useful tool for navigating the rough waters of maintaining behavior change.

The cognitive-behavioral model and the taxonomy of relapse precipitants were originally developed as the basis for an intervention designed to prevent and manage relapse in individuals who received treatment for alcohol use disorders (Chaney, O'Leary, & Marlatt, 1978). The RP model has since provided an important heuristic and treatment framework for clinicians working with several types of addictive behavior (Carroll, 1996). Treatment approaches based on the model rely on the initial assessment of potentially high-risk situations for relapse (e.g., environmental stressors, personality characteristics). Once situations are identified, the therapist works with the client to monitor the individual's coping skills, self-efficacy, and lifestyle factors (e.g., lifestyle imbalance), which may increase the probability of the individual being in a high-risk situation (Daley, Marlatt, & Spotts, 2003; Larimer, Palmer, & Marlatt, 1999).

RP combines behavioral skills training with cognitive interventions designed to prevent or limit the occurrence of relapse episodes. RP treatment begins with the assessment of the potential interpersonal, intrapersonal, environmental, and physiological risks for relapse and the factors or situations that may precipitate a relapse (Marlatt, 1996a). Specific assessment strategies based on a biopsychosocial model are discussed in the second edition of *Assessment of Addictive Behaviors* (Donovan & Marlatt, 2005). Once potential relapse triggers and high-risk situations are identified, cognitive and behavioral approaches are implemented that incorporate both specific interventions and global self-management strategies. Specific interventions include teaching effective coping strategies, enhancing self-efficacy, and encouraging mastery over successful outcomes.

As in most cognitive-behavioral treatments, RP incorporates a large educational component, including cognitive restructuring of misperceptions and maladaptive thoughts. Challenging myths related to positive outcome expectancies and discussing the psychological components of substance use (e.g., placebo effects) provide the client with opportunities to make more informed choices in high-risk situations. Likewise, discussing the AVE and preparing clients for lapses may also serve to prevent a major relapse episode. Lapse management is presented as an emergency procedure to be implemented in the event a lapse occurs. It is critical that clients are taught to restructure their negative thoughts about lapses, not to view them as a "failure" or an indication of a lack of willpower. Education about the relapse *process* and the likelihood of a lapse occurring may better equip clients to navigate the rough terrain and slippery slope of cessation attempts.

After providing education and intervention strategies specific to the immediate high-risk situation, RP focuses on the implementation of global

lifestyle self-management strategies. Lifestyle balance is a critical factor in the maintenance of goals following treatment, and RP incorporates the assessment of lifestyle factors that may relate to an increased probability of relapse. Oftentimes clients are experiencing several daily stressors, and the therapist should work with a client to either reduce stressors or increase pleasurable activities, such that a balance between daily negatives and positives may be achieved. In addition, specific cognitive-behavioral approaches, such as relaxation training, stress management, or a time management exercise, can be implemented. Recently, mindfulness techniques and meditation exercises have been incorporated into the treatment of several behavior disorders (e.g., borderline personality disorder, depression, anxiety), and preliminary results demonstrate that mindfulness meditation may be a viable, effective adjunct to the treatment of alcohol and drug abuse (Marlatt, 1998; Marlatt & Kristeller, 1999; Witkiewitz, Marlatt, & Walker, in press).

Bringing it all together, the therapist and the client can work together in the development of “relapse road maps,” analyses of possible outcomes that may be associated with different choices in high-risk situations. Mapping out possible scenarios can help prepare clients for navigating situations and utilizing the appropriate coping responses. The exercise of identifying and rehearsing possible high-risk situations and effective coping strategies is designed to enhance client self-efficacy and prevent the incidence of a lapse.

Effectiveness and Efficacy of Relapse Prevention

Chaney and colleagues (1978) provided the first randomized trial of RP techniques in an inpatient population of problem drinkers. Forty individuals receiving inpatient alcohol treatment at a Veterans Administration hospital were randomly assigned to either group-based skills training, an insight-oriented discussion group, or treatment as usual. The skills training RP-type intervention incorporated modeling, behavioral rehearsal, coaching, and identifying and coping with high-risk situations. The results demonstrated that the skills training group had significantly fewer days drunk, less alcohol consumption, and shorter drinking periods than the two comparison groups. The authors concluded “that problem drinkers’ responses to situations that present a high risk of relapse can be improved through training” (Chaney et al., 1978, p. 1101).

Since 1978, several studies have evaluated the effectiveness and efficacy of RP approaches for substance use disorders (Carroll, 1996; Irvin, Bowers, Dunn, & Wang, 1999), and there is evidence supporting RP for depression (Katon et al., 2001), sexual offending (Laws, Hudson, & Ward, 2000), obesity (Brownell & Wadden, 1992; Perry et al., 2001), obsessive-compulsive disorder (Hiss, Foa, & Kozak, 1994), schizophrenia (Herz et

al., 2000), bipolar disorder (Lam et al., 2003), and panic disorder (Bruce, Spiegel, & Hegel, 1999). Carroll (1996) conducted a narrative review of 24 randomized, controlled trials utilizing RP or coping skills training techniques directly invoking the procedures recommended by Marlatt and Gordon (1985). Incorporating studies of RP for smoking, alcohol, marijuana, and cocaine addiction, Carroll concluded that RP was more effective than no-treatment control groups and equally effective as other active treatments (e.g., supportive therapy, social support group, interpersonal psychotherapy) in improving substance use outcomes. Several of the reviewed studies demonstrated that RP techniques reduced the intensity of relapse episodes, when compared to no-treatment or active treatment (Davis & Glaros, 1986; O'Malley et al., 1996; Supnick & Colletti, 1984). In addition, several studies identified sustained main effects for RP, suggesting that RP may provide continued improvement over a longer period of time (indicating a "delayed emergence effect"), whereas other treatments may only be effective over a shorter duration (Carroll, Rounsaville, & Gawin, 1991; Carroll, Rounsaville, Nich, & Gordon, 1994; Goldstein, Niaura, Follick, & Abrahms, 1989; Hawkins, Catalano, Gillmore, & Wells, 1989; Rawson et al., 2002). These findings suggest a lapse/relapse learning curve, in which incremental changes in coping skills lead to a decreased probability of relapse. Anyone who has attempted to water ski, snowboard, or ride a bicycle understands that most people rarely can avoid falling on their first attempt; for most it takes repeated trials of falling, adjusting, and trying again before a person masters these activities.

Irvin and colleagues (1999) conducted a meta-analysis of RP techniques in the treatment of alcohol, tobacco, cocaine, and polysubstance use. Twenty-six studies representing a sample of 9,504 participants were included in the review. The results demonstrated that RP was a successful intervention for reducing substance use and improving psychosocial adjustment. In particular, RP was more effective in treating alcohol and polysubstance use than it was in the treatment of cocaine use and smoking, although these findings need to be interpreted with caution due to the small number of studies ($n = 3$) evaluating cocaine use. RP was equally effective across different treatment modalities, including individual, group, and marital treatment delivery, although all of these methods were most effective in treating alcohol use. Considering RP was originally developed as an adjunct to treatment for alcohol use, it is not surprising that this meta-analysis found it was most effective for individuals with alcohol problems. This finding suggests that certain characteristics of alcohol use are particularly amenable to the current RP model and that scientist-practitioners should continue to modify/enhance RP procedures to incorporate the idiosyncrasies of other substance use (e.g., cocaine, smoking, heroin) and nonsubstance (e.g., depression, anxiety) relapse. For example, Roffman has developed a marijuana-specific RP intervention, which has produced

greater reductions in marijuana use than a comparison social support treatment (Roffman & Stephens, Chapter 7, this volume; Roffman, Stephens, Simpson, & Whitaker, 1990).

Relapse Replication and Extension Project

The National Institute on Alcohol Abuse and Alcoholism (NIAAA) provided funding for a group of researchers to conduct a modern replication of Marlatt's original taxonomy for classifying relapse episodes. The Relapse Replication and Extension Project (RREP), initiated by the Treatment Research Branch of the NIAAA, was specifically designed to investigate the cognitive-behavioral model of relapse developed by Marlatt and colleagues (Lowman, Allen, Stout, & the Relapse Research Group, 1996). Three research centers—Brown University, Research Institute on Addiction, and University of New Mexico—recruited 563 individuals who were seeking treatment for alcohol abuse and dependence. These participants were recruited from several treatment programs, including both inpatient and outpatient programs, which represented a variety of approaches to alcohol treatment (although all treatment programs required an abstinence goal). All three research sites utilized several measurement instruments and received similar training, from Marlatt and his colleagues, on the scoring instructions for the relapse taxonomy. In addition to the initial assessment of relapse episodes and participant experiences, each site conducted follow-up assessments in bimonthly intervals for 12 months. The results from the RREP and commentaries are provided in a special issue of *Addiction* (1996, Volume 91, issue 12s).

The RREP focused on the replication and extension of the high-risk situation in relation to relapse, and the reliability and validity of the taxonomic system for classifying relapse episodes. The results from the RREP, provided in the 1996 supplement to the journal *Addiction*, are summarized here. Information on drinking behavior during the 12-month period following treatment supported previous findings on relapse rates (Hunt, Barnett, & Branch, 1971) with 82% and 73% of participants, outpatients and inpatients, respectively, having at least one drink. As in Marlatt's original studies of relapse episodes in alcoholics, the RREP found that negative emotional states and exposure to social pressure to drink were most commonly identified as high-risk situations for relapse (Lowman et al., 1996).

In general, the data and research questions used in the RREP raised significant methodological issues concerning the predictive validity of Marlatt's relapse taxonomy and coding system. Based on the findings in this set of studies, a major reconceptualization of the relapse taxonomy was recommended (Donovan, 1996; Kadden, 1996). Longabaugh and colleagues (Longabaugh, Rubin, Stout, Zywiak, & Lowman, 1996) suggested a revision of the taxonomy categories (to include more distinction between

the inter- and intrapersonal determinants, more emphasis on craving, and less focus on hierarchical classification). In suggesting a modification of the relapse precipitant theory, the authors recommend identifying other factors that may be used in the prediction of relapse, including more emphasis on the “relapse occasion” (p. 87), wherein some individuals are more likely to relapse regardless of the specific situational context. Donovan (1996) concluded that the RREP did not adequately test the assumptions of the broader cognitive-behavioral model of relapse, on which several RP intervention strategies are based. Many of the RREP findings, including the influence of negative affect, the AVE, and the importance of coping in predicting relapse are in fact quite supportive of the original RP model (Marlatt, 1996b). More generally, all of the researchers for the RREP relied solely on statistical analyses that are grounded in the general linear model. Yet the major theories of the relapse process, as well as clinical case studies, suggest that relapse is “random,” “complex,” and “dynamic” (Brownell et al., 1986; Donovan, 1996; Litman, 1984; Marlatt, 1996a; Shiffman, 1989).

Working from the criticisms provided by the researchers in the RREP (Donovan, 1996; Kadden, 1996; Longabaugh et al., 1996), as well as other critiques of RP and the cognitive-behavioral model of relapse (Allsop & Saunders, 1989; Heather & Stallard, 1989; Sutton, 1979), the remainder of this chapter is devoted to a review of relapse risk factors and a proposal for a reconceptualization of the relapse taxonomy and relapse process. Although no single model of relapse could ever encompass all individuals attempting all types of behavior change, a more thorough understanding of the critical determinants of relapse and the underlying processes may provide added insight into the treatment and prevention of relapsing disorders.

DETERMINANTS OF LAPSE AND RELAPSE

Intrapersonal Determinants

Self-Efficacy

Self-efficacy is defined as the degree to which an individual feels confident and capable of performing a certain behavior in a specific situational context (Bandura, 1977). As described in the cognitive-behavioral model of relapse (Marlatt, Baer, & Quigley, 1995), higher levels of self-efficacy are predictive of improved alcoholism treatment outcomes (Annis & Davis, 1988; Burling, Reilly, Moltzen, & Ziff, 1989; Connors, Maisto, & Zywiak, 1996; Greenfield et al., 2000; Project MATCH Research Group, 1997; Rychtarik, Prue, Rapp, & King, 1992; Solomon & Annis, 1990). Connors and colleagues (1996) studied self-efficacy and treatment out-

comes one year after inpatient and outpatient treatment. The authors found that self-efficacy was positively related to the percentage of days abstinent, and negatively related to the number of drinks per drinking day. Greenfield and colleagues (2000) considered the relationship between self-efficacy and relapse survival in a group of male and female alcoholic patients receiving inpatient treatment. The results from this prospective study supported the finding that self-efficacy is predictive of survival functions of abstinence. This finding suggests that a person's self-efficacy score was predictive of both the amount of time to first drink and time to relapse within the first 12 months following treatment. Self-efficacy, as measured by the Alcohol Abstinence Self-Efficacy Scale (AASE; DiClemente, Carbonari, Montgomery, & Hughes, 1994), was also shown to predict 3-year alcohol treatment outcomes (Project MATCH Research Group, 1998).

The measurement of self-efficacy continues to be a challenge, especially considering the context-specific nature of the construct. Annis and colleagues have created two self-report questionnaires that aim to measure self-efficacy. The Inventory of Drinking Situations (IDS; Annis, 1982a) and the Situational Confidence Questionnaire (SCQ; Annis, 1982b) measure past and current self-efficacy, respectively, in 100 situations. As described earlier, DiClemente and colleagues (1994) developed the AASE to evaluate an individual's confidence in abstaining and perceived temptation to drink in 20 situations. For all of these self-report measures, when removed from the contexts provided by these questionnaires an individual may report being very confident (high self-efficacy) in abstaining, but the true assessment of self-efficacy occurs in the real-time environment during an actual high-risk situation. For example, Curry, Marlatt, and Gordon (1987) found that prospectively predicted attributions of smoking lapses in hypothetical situations were not significantly associated with the attributions for lapses during actual smoking episodes. Annis and Davis (1988) maintain that the purpose of self-report measures in the treatment of alcohol dependence is to identify high-risk situations and to increase awareness of *where* and *when* the strongest coping skills might be needed. In addition, further consideration should be given to the measurement of self-efficacy in real situations (Shiffman et al., Chapter 4, this volume), such as through self-monitoring techniques (e.g., the ecological momentary assessment [EMA] technique developed by Stone and Shiffman, 1994).

A study by Shiffman and colleagues (2000) using EMA demonstrated that baseline differences in self-efficacy were as predictive of the first lapse as were daily measurements of self-efficacy, demonstrating the stability of self-efficacy during abstinence. However, daily variation in self-efficacy was a significant predictor of smoking relapse progression following a first lapse, above and beyond baseline self-efficacy and pretreatment smoking behavior. Using the same methodology, Gwaltney and colleagues (2002) showed that both individuals who experience a smoking lapse and those

who abstain from smoking following treatment are capable of discriminating nonrisk from high-risk situations, with situations that are rated as high risk (e.g., negative affect contexts) receiving the lowest self-efficacy ratings.

Outcome Expectancies

Alcohol outcome expectancies are the anticipated effects that an individual expects will occur as a result of alcohol or drug consumption (Jones et al., 2001; Leigh & Stacy, 1991; Stacy, Widaman, & Marlatt, 1990). An individual's expectancies may be related to the physical, psychological, or behavioral effects of alcohol; the expected drug effects do not necessarily correspond with the actual effects experienced after consumption. For example, an individual may *expect* to feel more relaxed (physical), happier (psychological), and outgoing (behavioral) after drinking alcohol, but the individual's *actual* experience may include increased tension (physical), sadness (psychological), and withdrawal (behavioral). Treatment outcome studies have demonstrated that positive outcome expectancies (e.g., "A cigarette would be relaxing") are associated with poorer treatment outcomes (Connors, Tarbox, & Faillace, 1993) and negative outcome expectancies (e.g., "I will have a hangover") are related to improved treatment outcomes (Jones & McMahon, 1996).

Expectancies are typically measured using self-report questionnaires that have an underlying factor structure representing different expectancy types (e.g., the Alcohol Expectancy Questionnaire by Brown, Goldman, & Christiansen, 1985). The major criticism of this approach has been the reliance on measures of "expectancies," which may actually be assessing general attitudes toward drinking or drugging (Leigh & Stacy, 1991; Stacy et al., 1990). In response to these criticisms, network models of expectancy have been developed that incorporate the importance of long-term memory and cognitive processes in the prediction of current and future consumption (Goldman, Brown, Christiansen, & Smith, 1991).

Based on a network model of expectancies, Jones and colleagues (2001) concluded that although expectancies are strongly related to outcomes of treatment and prevention programs, there is very little evidence that targeting expectancies in treatment leads to changes in posttreatment alcohol consumption. Reductions in positive outcome expectancies do not always lead to reductions in alcohol consumption (Connors et al., 1993), and the role of expectancies in predicting treatment outcome may depend on the targeted population and motivational frameworks. From a simplistic view, positive expectations may provide the individual with motivation to drink, while negative expectations may provide motivation to restrain from drinking (Cox & Klinger, 1988).

Based on operant conditioning, the motivation to use in a particular situation is based on the expected positive or negative reinforcement value

of a specific outcome in that situation (Bolles, 1972). For example, if an individual is in a highly stressful situation and holds the positive outcome expectancy that smoking a cigarette will reduce his or her level of stress, then the incentive of smoking a single cigarette has high reinforcement value. Baker and colleagues (Baker, Piper, McCarthy, Majeskie, & Fiore, 2004) have demonstrated that perceived or expected reductions in negative affect and withdrawal severity (Piasecki et al., 2000) provide negative reinforcement, which may enhance positive outcome expectancies.

Recently, more complex accounts of expectancies, based on implicit cognitive and affective processing models, have been proposed (Baker et al., in press; Ostafin, Palfai, & Wechsler, 2003). Experimental investigations have demonstrated that responses to explicit measures of expectancies may vary greatly from implicit measures, which could indicate automatic responding to alcohol-related stimuli and consequences (Kelly & Witkiewitz, 2003; Palfai & Ostafin, 2003). Kelly & Witkiewitz (2003) studied reaction time to attitudes about alcohol-expectancy domains (e.g., tension reduction) in heavy- and light-drinking college students. The results demonstrated slower responding in the heavy drinkers, which was interpreted to mean that heavy drinkers have more complex associations with alcohol-expectancy information. Palfai and Ostafin (2003) demonstrated that implicit attitudes toward the anticipation of drinking (i.e., alcohol-approach tendencies) were significantly correlated with global positive expectancies and reliably predicted stronger urges and more heightened arousal in the anticipation of drinking. These findings highlight the automatic processes underlying alcohol expectancies (Stacy, Ames, & Leigh, 2004). From a behavioral economics perspective it is postulated that, for heavy drinkers, the explicit weighing of negative expectancies for substance use consequences in high-risk situations is highly unlikely; rather, the consideration of current versus delayed reinforcers may lead to automatic pilot reactions (Vuchinich & Tucker, 1996).

Motivation

Cox and Klinger (1988, p. 168) proposed that the “common, final pathway to alcohol use is motivational.” This idea was inherently tied to the idea of positive expectations for the effects of alcohol, as described by expectancy theory, but it also stimulated the notion that motivation for drinking was a key component in predicting behavior change. Motivation may relate to the relapse process in two distinct ways, the motivation for positive behavior change and the motivation to engage in the problematic behavior. The *Oxford English Dictionary* (2002) defines motivation as “the conscious or unconscious stimulus for action towards a desired goal provided by psychological or social factors; that which gives purpose or direction to behavior.” Using the example of alcohol use we could define the

first type of motivation (*motivation to change*) as the stimulus for action toward abstinence or reduced use of alcohol, and the second type of motivation (*motivation to use*) as the stimulus for engaging in drinking behavior.

The ambivalence toward change is often highly related to both self-efficacy (e.g., “I really want to quit shooting up, but I do not think that I’ll be able to say no”) and outcome expectancies (e.g., “I would quit drinking, but then I would have a really hard time meeting people”). Prochaska and DiClemente (1984) have proposed a transtheoretical model of motivation, incorporating five stages of readiness to change: precontemplation, contemplation, preparation, action, and maintenance. Each stage characterizes a different level of motivational readiness, with precontemplation representing the lowest level of readiness (DiClemente & Hughes, 1990). During preparation there is very little motivation to change, but as the individual moves toward contemplation there is an increase in ambivalence and “change talk.”

Interventions that focus on resolving ambivalence (e.g., evaluating the pros and cons of change vs. no change) may increase intrinsic motivation by allowing clients to explore their own values and how they may differ from actual behavioral choices (e.g., “I want to be an effective employee, but I often spend my daytime hours hung-over and my evening hours getting drunk.”). Motivational interviewing (MI), developed by Miller and Rollnick (1991, 2002), is a client-centered interviewing style with the goal of resolving conflicts regarding the pros and cons of change, enhancing motivation and encouraging positive behavior change. Originally developed to work with patients presenting for alcohol disorders, MI has demonstrated efficacy for reducing alcohol consumption and frequency of drinking in this population (Bien, Miller, & Boroughs, 1993; Miller, Benefield, & Tonigan, 1993). A recent meta-analysis of 30 different clinical trials of MI demonstrated that it is more effective than no treatment or placebo controls, and as effective as other active treatments for alcohol and drug problems, diet, and exercise (Burke, Arkowitz, & Menchola, 2003). With regard to MI for alcohol problems, the review demonstrated that the pooled effect of MI across studies indicated a 56% reduction in drinking. MI has also been successfully adapted and applied to work with a variety of other health behaviors, including use of illicit substances (Budney, Higgins, Radonovich, & Novy, 2000; Stephens, Roffman, & Curtin, 2000), smoking (Butler et al., 1999), and HIV risk reduction (Carey et al., 2000).

Coping

Based on the cognitive-behavioral model of relapse, the most critical predictor of relapse is the individual’s ability to utilize effective coping strategies in dealing with high-risk situations. Coping includes both cognitive

and behavioral strategies designed to reduce danger or achieve gratification in a given situation (Lazarus, 1966). Litman, Stapleton, Oppenheim, Peleg, and Jackson (1983) first emphasized the importance of coping strategies in preventing alcohol relapse in dangerous situations. Litman proposed a model of relapse that incorporated an interaction between the situation, the availability and effectiveness of coping behaviors, and the individual's self-efficacy in dealing with the situation.

Several types of coping have been proposed, which differ by function and topography. Shiffman (1984) described the distinctions between *stress coping*, which functions to diminish the impact of stressors, and *temptation coping*, which is intended to resist the temptation to use drugs, independent from stress. The relationship between stress or temptation coping and the individual's response has been described as transactional, whereby individuals make a cognitive appraisal of their ability to cope with the stressor or temptation, and that appraisal determines the response (Lazarus & Folkman, 1984). Either stress or temptation coping can take the form of *cognitive coping*, using mental processes and "willpower" to control behavior, and *behavioral coping*, which involves some form of action. An example of cognitive temptation coping is thinking about the negative consequences of using, whereas behavioral temptation coping may be the active avoidance of drug cues to prevent use. Cognitive stress coping might include mindfulness meditation as a stress management technique, and behavioral stress coping might include going for a walk to get out of a stressful situation, such as a family quarrel.

Moos (1993) highlighted the distinction between approach and avoidance coping. Approach coping may involve attempts to accept, confront, or reframe as a means of coping, whereas avoidance coping may include distraction from cues or engaging in other activities. Chung and colleagues (Chung, Langenbucher, Labouvie, Pandina, & Moos, 2001) predicted 12-month treatment outcomes in alcoholic patients by focusing on the distinctions between the behavioral and cognitive components of approach and avoidance coping. Utilizing the Coping Responses Inventory (CRI; Moos, 1993), they defined cognitive approach coping as attempts to gain insight on a stressor or positively reframe the stressor, cognitive avoidance coping as avoiding thinking about the stressor or acceptance of the stressor; behavioral approach coping as support seeking and problem solving, and behavioral avoidance coping as incorporating emotional discharge and alternative pleasurable activities. Results suggested that avoidance coping, particularly cognitive avoidance coping, was predictive of fewer alcohol (including alcohol problem severity and alcohol-dependence symptoms), interpersonal, and psychological problems at the 12-month follow-up. Behavioral approach coping also predicted decreased alcohol problem severity at 12 months. In general, the alcohol patients reduced their use of avoidance coping and increased their use of approach coping.

Although these studies have demonstrated that coping is a critical factor in predicting and preventing relapse, issues of definition and measurement remain: What is coping? And, how do we measure it? Coping is commonly operationally defined as scores on a self-report questionnaire, such as the Coping Behavior Inventory (CBI; Litman, Stapleton, Oppenheim, & Peleg, 1983), or as responses to specific situations (Chaney et al., 1978; Monti et al., 1993). The Situational Competency Test, originally developed by Chaney and colleagues (1978), demonstrated that latency in responding to a high-risk situation was predictive of relapse. Monti and colleagues (1993) developed the Alcohol-Specific Role Play Test, which incorporates observer ratings of demonstrated coping skills in general and in alcohol-specific situations. While this procedure may provide more objective information than a self-report questionnaire, the generalizability of a role play to a real-world high-risk situation is questionable. More importantly, the use of coping skills while “in role” as part of a treatment program or research study may actually be a measure of either demand characteristics (e.g., wanting to please treatment staff or the experimenter), self-efficacy (e.g., the client is confident in his or her ability to abstain), or readiness to change (e.g., the client is highly motivated to practice and utilize coping strategies).

The role of coping skills, self-efficacy, and motivation in the prediction of alcohol treatment outcome was investigated by Litt and colleagues (2003). The results demonstrated that self-efficacy and coping independently predicted successful treatment outcomes. Motivation was related to treatment outcome via its relationship with coping skills, such that higher levels of readiness enhance the use of coping skills, resulting in more successful outcomes. Litt and colleagues (2003) examined the effectiveness of cognitive-behavioral therapy (CBT), which included coping skills training, versus a treatment based on interactional/interpersonal therapy (IPT) that did not include coping skills training. Both treatments yielded good outcomes, based on percentage of days abstinent and proportion of heavy drinking days, and improvements in coping skills. Availability of coping skills following treatment was a significant predictor of outcome, yet neither CBT nor IPT led to substantially greater increases in coping skills. These results are consistent with a recent review conducted by Morgans and Longabaugh (2000), which found that improvements in coping skills was not a mediating mechanism of improved outcomes following cognitive-behavioral interventions. The finding that coping skills do not mediate the effectiveness of CBT has led these authors to conclude that research has not yet determined the active mechanisms of CBT.

One explanation for these findings is the dynamic interaction between coping, self-efficacy, and motivation (Litt et al., 2002; Shiffman et al., 2000). A second explanation is the operationalization of coping in previous studies: Are we accurately measuring how “coping” is experienced by the individual? The definitions of coping described earlier involve an *ac-*

tive, conscious response (Monti et al., 1993; Moos, 1993; Shiffman, 1984). Paradoxically, the act of engaging in substance use, in the presence of stress, negative affect, or substance cues, could be described as an ineffective and over-learned *active* coping strategy.

Coping may also be experienced as *inaction*. Inaction has typically been interpreted as the acceptance of substance cues (e.g., Litman, 1984; Marlatt, 2002), which can be described as “letting go” and not acting on an urge. This view of inactive coping is consistent with the Buddhist notion of skillful means (Marlatt, 2002)—the acceptance of the present moment and observation of logical, sensory, physical, and intuitive experiences, without analyzing, judging, or emotional responding. The focus is not about “doing what’s right” or making good decisions, but rather the goal is to “just do.” An example of a coping strategy that is consistent with skillful means is the use of “urge surfing” (Marlatt & Kristeller, 1999). Using a wave metaphor, urge surfing is an imagery technique to help clients gain control over impulses to use drugs or alcohol. In this technique, the client is first taught to label internal sensations and cognitive preoccupations as an urge, and to foster an attitude of detachment from that urge. The focus is on identifying and accepting the urge, not acting on the urge or attempting to fight it.

In a recent study on the effectiveness of a mindfulness meditation technique (of the Vipassana tradition) in reducing substance abuse in an incarcerated population, participants reported that “staying in the moment” and being mindful of urges were helpful coping strategies (Marlatt et al., 2004). Mindfulness meditation is also a major component of dialectical behavior therapy for the treatment of borderline personality disorder (Linehan, 1993) and mindfulness-based cognitive therapy for depression (Segal, Williams, & Teasdale, 2002). Borderline personality disorder (BPD), depression, and substance abuse are similar in that individuals with these disorders utilize ineffective and maladaptive learned coping strategies in stressful life situations. It has been proposed that meditation may provide an alternative coping strategy in response to stress, negative affect, and anxiety (Marlatt, Pagano, Rose, & Marques, 1984). In describing the use of meditation as a coping strategy for addictive behavior, Groves and Farmer (1994) state: “In the context of addictions mindfulness might mean becoming aware of triggers for craving . . . and choosing to do something else which might ameliorate or prevent craving, so weakening this habitual response” (p. 189). Focusing on the present moment and silently observing and accepting the distress associated with craving, stress, or negative affect, may provide addicts with an effective and adaptive coping strategy.

Emotional States

In the original qualitative investigation of relapse episodes (Marlatt & Gordon, 1980), negative emotional state was the strongest predictor of re-

lapse in a sample of male alcoholics (37% of the sample reported that negative affect was the primary relapse trigger). Several other studies have reported a strong link between negative affect and relapse to substance use (e.g., Brandon, Tiffany, Obremski, & Baker, 1990; Cooney, Litt, Morse, Bauer, & Guapp, 1997; Hodgins, el Guebaly, & Armstrong, 1995; Litman, 1984; Litt, Cooney, Kadden, & Gaupp, 1990; McKay, Rutherford, Alterman, Cacciola, & Kaplan, 1995; Shiffman, Paty, Gnys, Kassel, & Hickcox, 1996). Baker and colleagues (2003) have recently identified negative affect as the primary motive for drug use. According to this affective model of drug motivation, excessive substance use is motivated by affective regulation, both positive and negative. Substance use is often reinforcing for clients, leading the individual to engage in future substance use. Oftentimes substance use provides negative reinforcement via the amelioration of an unpleasant affective state, such as physical withdrawal symptoms (Baker et al., 2004). For example, McKay and colleagues (1995) found that cocaine addicts experienced loneliness (62.1%), depression (55.8%), tension (55.8%), and anger (40%) on the day of a relapse; a smaller percentage of the sample experienced feeling extremely good (37.9%) and extremely excited (33.7%).

In response to the high comorbidity of substance use and mood disorders, it has been proposed that substance dependence may be a form of self-medication (Khantzian, 1974). According to this theory, individuals who are experiencing severe affective disturbance may be utilizing addictive drugs as a coping mechanism, albeit a strategy that is only effective in the short-term, but can oftentimes be maladaptive in the long run. In other words, individuals are using substances to relieve symptoms of preexisting mood disorders. Alternatively, it has been proposed that drug taking as self-medication is an attempt to relieve substance-induced affective disturbances (Raimo & Schuckit, 1998), which further substantiates the finding that lapses are often predicted by self-reported negative affect (Hodgins et al., 1995). A recent study using ecological momentary assessment (EMA) provided support for this model, with alcohol consumption being prospectively predicted from nervous mood states and cross-sectionally associated with reduced levels of nervousness (Swendsen et al., 2000).

The distinctions between positive and negative affect in the prediction of treatment outcomes have been demonstrated in several studies. Hodgins and colleagues (1995) showed that both positive and negative affect were associated with alcohol relapse; however, negative affect was associated with heavy drinking and positive affect was related to lighter drinking episodes. The authors concluded that negative affect may be more predictive of major relapses, while positive affect is more often predictive of lapses. Similarly, Borland (1990) found that lapses occurring in conjunction with a positive mood were more likely to lead to successful (abstinent) recovery. In experimental manipulations, positive and negative mood inductions are

both related to increases in smoking urges (Taylor, Harris, Singleton, Moolchan, & Heishman, 2000) and alcohol cue reactivity (Cooney et al., 1997). Positive affect has also been associated with more positive treatment outcomes and lower relapse rates (McKay, Merikle, Mulvaney, Weiss, & Koppenhaver, 2001).

In opposition to the prominent view of negative affect as a strong predictor of substance use, Shiffman and colleagues (2002) have recently shown that daily changes in affect, as measured using EMA (Stone & Shiffman, 1994), were not significantly associated with *ad lib.* smoking in heavy smokers prior to a designated quit date. The only psychological states that were predictive of smoking behavior were urges to smoke and restlessness. Arousal, negative affect, and attention disturbance were unrelated to smoking. In a related study using EMA, Shiffman and Waters (2004) again demonstrated that negative affect in the days prior to a smoking lapse was not predictive of the lapse event, but negative affect steadily rises in the 6 hours prior to a smoking lapse. They also found that smoking lapses were often preceded by the combination of negative affect, stress, and arguing with another individual. In the author's discussion of their findings, they state: "An argument can easily spring up in minutes and lead quickly to a lapse, without any advance build-up or predictability" (p. 198).

A behavior analysis of drug addiction demonstrates that many drugs provide both negative reinforcement (e.g., the reduction of negative affect, referred to as "self-medication") and positive reinforcement (e.g., positive outcome expectancies, or the "problem of immediate gratification"). The self-medication hypothesis applies when the individual is using a substance as a means of coping with negative emotions, conflict, or stress. The problem of immediate gratification (PIG) applies when the person is focusing on the positive aspects and euphoria of using a substance, while ignoring the negative consequences (Marlatt, 1988). The biphasic sequence of immediate reductions in dysphoria and increases in euphoria provides the temporal contingencies required for maintaining drug use behavior. In addition, the negative consequences that may accompany drug use (e.g., hangovers, loss of employment, financial strain) are often delayed. As described earlier, from a behavioral economics perspective, the value of consequences decreases as the time between the behavior and the contingency increases (Bickel & Vuchinich, 2000). Unfortunately, some of the most negative consequences resulting from addictive behavior (e.g., HIV or hepatitis C infection, liver disease, lung cancer) often occur years after the instatement of the behavior. Therefore the probability of relapse is increased when negative consequences are delayed and/or alternative reinforcers are not available (Bickel, Madden, & Petry, 1998). Bickel has provided the example that an effective treatment may provide an immediate alternative reinforcer, but only when the treatment is desired by the individual client (Marlatt & Kilmer, 1998).

Craving

Craving is possibly the most widely studied and the most poorly understood concept in the study of drug addiction (Lowman, Hunt, Litten, & Drummond, 2000). Patients, clinicians, and researchers often describe craving as a formidable adversary in the recovery and persistence of addictive disorders. The history of alcohol-craving research dates back to Isbell (1955), who described both physical (indicated by withdrawal symptoms) and psychological (related to outcome expectancies and urge) types of craving. Later, Jellinek (1960) associated craving with both a *loss of control* and the inability to abstain from alcohol, emphasizing both acute physical withdrawal and an impulsive compulsion to drink. Edwards and Gross (1976) described an “alcohol dependence syndrome” characterized by a narrow drinking repertoire, the importance of drinking, tolerance, withdrawal, and “subjective awareness of the compulsion to drink.” This last characteristic was associated with both craving, defined as an irrational desire to drink, and loss of control.

Empirical investigations, incorporating a placebo design, have provided evidence that disconfirms the *loss of control* hypothesis. In one study (Marlatt, Demming, & Reid, 1973), alcohol-dependent participants who consumed alcohol, even though they were told they would not be drinking alcohol, did not consume more alcohol in an *ad lib.* consumption period than social drinkers after both groups were given an initial (priming) dose of alcohol. When the participants thought they were drinking alcohol, although they were actually drinking a nonalcoholic placebo, they continued to “lose control” and drink more of the placebo than the social drinkers following a priming dose of alcohol. Bickel and colleagues (1998) proposed that the *loss of control* phenomenon can be explained within a behavioral economics framework, based on the discounting of delayed reinforcers. Essentially, substance abusers impulsively select smaller, more immediate reinforcers in place of larger, delayed reinforcers.

Siegel, Krank, and Hinson (1988) propose that both craving and symptoms of withdrawal may be acting as conditioned drug-compensatory responses, which are often in the opposite direction from the actual unconditioned drug effect. These responses are conditioned by several exposures to drug-related stimuli paired with physiological effects of the drug. Often referred to as tolerance, this process is explained by environmental drug cues eliciting a preparatory physiological response to prepare the individual for the drug effects (e.g., the elevation of blood glucose caused by nicotine over several occasions of smoking is preceded by an anticipatory hypoglycemic response in the presence of future nicotine cues). The preparatory response allows the individual to consume more of a desired substance while reducing the effects of the drug. Symptoms of withdrawal and craving may also be limited to situations in which prior learning of prepa-

ratory responses to drug effects has occurred, such as in reactions to the exposure to drug cues (Siegel, Baptista, Kim, McDonald, & Weise, 2000).

More recently, craving has been broadly defined by conditioned reinforcement models (Li, 2000), incentive-sensitization models (Robinson & Berridge, 2000), dopamine system regulation (Grace, 1995), social learning theory (Marlatt, 1985), and cognitive processing models (Tiffany, 1990). These recent models of craving have been thoroughly discussed in a 2000 supplement of the journal, *Addiction* (Volume 95, Supplement 2), devoted to current research perspectives on alcohol craving. In addition to the problem of defining "craving" (Lowman et al., 2000), several researchers discussed the larger problem of measuring this phenomenon (Sayette et al., 2000; Tiffany, Carter, & Singleton, 2000). Sayette and colleagues (2000) encourage a multidimensional and theory-driven approach to the definition and measurement of craving, while Tiffany and colleagues (2000) highlight the need for more sensitive measures of craving and the revisiting of basic measurement issues, such as the reliability and validity of craving measures.

One common finding of recent addiction research is the lack of a strong association between subjective reports of craving and relapse (e.g., Kassel & Shiffman, 1992; Tiffany, 1990). Drummond and colleagues (Drummond, Litten, Lowman, & Hunt, 2000) identified four possible explanations for this finding: (1) craving and relapse are unique and independent phenomena, (2) craving is predictive of relapse, but current measures of craving are not sensitive enough to detect this relationship, (3) craving is only predictive of relapse in select conditions, and (4) "the subjective experience of craving is not predictive of relapse," but the correlates and underlying mechanisms of craving do predict relapse. Therefore, subjective reports of craving do not predict relapse (as they are currently measured), but other factors that cause craving (such as the opponent process of drug preparatory responses or incentive-sensitization models described earlier) may also be predictive of relapse (Sayette et al., 2000).

The fourth explanation of craving described by Drummond is most consistent with a cognitive social learning model of craving as it applies to relapse and RP. According to this model, cognitive expectations impact how an individual responds to conditioned substance-related stimuli and his or her ability to utilize effective coping mechanisms. Based on this model, Marlatt and colleagues (Larimer, Palmer, & Marlatt, 1999) distinguish craving, or the subjective desire to experience an addictive substance, from an urge, the behavioral intention or impulse to consume alcohol or drugs. Using this conceptualization, cravings may be reduced or eliminated by focusing on client's subjective biases and outcome expectancies for a desired substance. The current state of knowledge regarding craving and relapse leads us to focus on the integration of physiological, learning, and cognitive theories of drug addiction. A transactional model, whereby phys-

iological responses, tolerance, outcome expectancies, and/or self-efficacy moderate the relationship between subjective reports of “craving” and relapse to drug addiction should be tested in future research (Niaura, 2000).

Interpersonal Determinants: Social Support

In addition to the intrapersonal influences described earlier, social support plays a critical role as an interpersonal determinant of relapse. Positive social support is highly predictive of long-term abstinence rates across several addictive behaviors (Barber & Crisp, 1995; Beattie & Longabaugh, 1997, 1999; Dobkin, Civita, Paraherakis, & Gill, 2002; Gordon & Zrull, 1991; Havassy, Hall, & Wasserman, 1991; Humphreys, Moos, & Finney, 1996; McMahan, 2001; Noone, Dua, & Markham, 1999; Rosenberg, 1983). Similarly, negative social support in the form of interpersonal conflict (Cummings, Gordon, & Marlatt, 1980) and social pressure to use substances (Annis & Davis, 1988; Brown, Vik, & Craemer, 1989) has been related to an increased risk for relapse. Social pressure may be experienced directly, such as peers trying to convince a person to use, or indirectly through modeling (e.g., a friend ordering a drink at dinner) and/or cue exposure (e.g., friends with drug paraphernalia in the house). Social network size and the perceived quality of social support have also been shown to predict relapse (McMahan, 2001). Likewise, antisocial personality traits, which tend to preclude positive social relationships, are often associated with heightened relapse risk (Alterman & Cacciola, 1991; Fals-Stewart, 1992; Longabaugh, Rubin, Malloy, Beattie, Clifford, & Noel, 1994).

Beattie and Longabaugh (1997) demonstrated that functional social support is more predictive of drinking outcomes and psychological well-being than either quality or structural support. In a later study, the same authors found that alcohol-specific support (e.g., partner supporting the patient in abstinence goals) predicted more of the variance in short- (3 months) and long-term (15 months) posttreatment abstinence rates than general support (e.g., support from friends and extended family, which may include “drinking buddies”). Furthermore, alcohol-specific support mediated the relationship between general support and abstinence, suggesting that patients should be encouraged to seek out individuals who support them in their decisions to reduce drinking or remain abstinent following treatment (Beattie & Longabaugh, 1999). In support of these findings, behavioral marital therapy (Winters, Fals-Stewart, O’Farrell, Birchler, & Kelley, 2002), which incorporates partner support in treatment goals, has been described as one of the top three empirically supported treatment methods for alcohol problems (Finney & Monahan, 1996). (The community reinforcement approach, a skills training-based treatment that focuses on building a supportive social network, and RP were regarded as the other two supported methods for alcohol treatment.)

FUTURE DIRECTIONS IN THE DEFINITION, MEASUREMENT, AND TREATMENT OF RELAPSE

Two decades have elapsed since Marlatt and Gordon published the first edition of *Relapse Prevention*. During that time the term “relapse prevention” has been widely disseminated and tested, but it has also been misused, distorted, and embellished. Several authors have criticized RP, suggesting that it be modified to incorporate more complexity (Edwards, 1987), additional relapse determinants (e.g., craving; Longabaugh, et al., 1996), more information on the likelihood or timing of a relapse event (Stout, Longabaugh, & Rubin, 1996), and increased construct validity (Maisto, Connors, & Zwiak, 1996). In addition to these critiques, there has been an accumulation of findings regarding the importance of self-efficacy (Greenfield et al., 2000), positive and negative affect (Hodgins et al., 1995), outcome expectancies (Jones et al., 2001), craving (Lowman et al., 2000), withdrawal symptomatology (Baker et al., 2004), coping (Morganstern & Longabaugh, 2000), motivation (Project MATCH Research Group, 1997), and social support (Beattie & Longabaugh, 1999) in the relapse process.

Reconceptualizing the Relapse Process

Synthesizing this accumulation of empirical findings into a unified theory requires a degree of complexity that has traditionally not been afforded to addictive behavior researchers. Unlike the simple path diagram of the cognitive-behavioral model presented in Figure 1.1, which centers on an individual’s response in a high-risk situation, we propose that the determinants described herein are multidimensional and dynamic. The use of an effective coping response may not guarantee an increase in self-efficacy and continued abstinence, although in conjunction with functional social support, generalized positive affect, and negative outcome expectancies it may greatly improve the likelihood of maintenance.

Seemingly insignificant changes in one risk factor (e.g., an undetected reduction in self-efficacy) may kindle a downward spiral of increased craving, positive outcome expectancies, and intensified negative affect. These small changes may result in a major relapse, often initiated by a minor cue. The sheer disaster of a relapse crisis after an individual has been maintaining abstinence has bewildered patients, researchers, and clinicians for years. The symbolism of “falling from the wagon” provides an illustration of the sudden, devastating experience of the chronic return to previous levels of abuse. This experience is often followed by the harsh realization that getting back on the wagon will not be as effortless as the fall from it.

The picture of relapse painted here would most likely be described as unpredictable or chaotic. In fact, many researchers and clinicians have de-

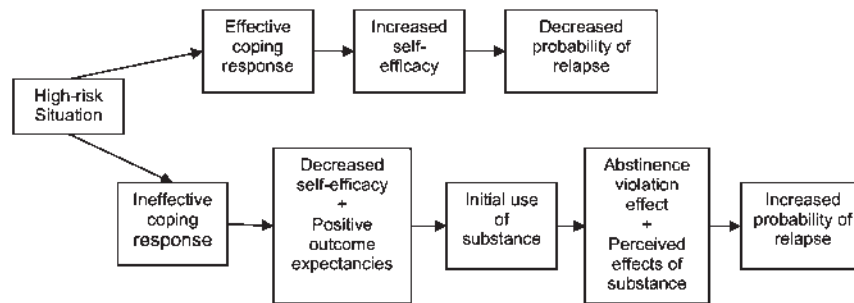


FIGURE 1.1. Cognitive-behavioral model of relapse (Marlatt & Gordon, 1985).

scribed relapse using these descriptors (Brownell et al., 1986; Donovan, 1996; Shiffman, 1989). The current reconceptualization of relapse acknowledges the complexity and dynamic nature of this process. Consider a simple example, an individual with a family history of alcoholism and low baseline self-efficacy who is likely to make more negative appraisals of perceived coping (e.g., “I can’t do this. . . Mom was always an alcoholic and I will be too”). This lowered coping-efficacy makes the person more susceptible to an ineffective coping response in a high-risk situation, and increased probability of a lapse. The lapse is followed by further reductions in self-efficacy, which combined with a higher likelihood for physical dependence (given the family history), leads to a full-blown relapse.

Focusing on the situation, we propose a dynamic interaction between several factors leading up to, and during, a high-risk situation. In every situation, an individual is faced with the challenge of balancing multiple cues and possible consequences. The individual’s response can be described as a self-organizing system, incorporating distal risk factors (e.g., years of dependence, family history, social support, and comorbid psychopathology), cognitive processes (e.g., self-efficacy, outcome expectancies, craving, the AVE, motivation), and cognitive and behavioral coping skills. As shown in Figure 1.2, this dynamic model of relapse allows for several configurations of distal and proximal relapse risks (Witkiewitz & Marlatt, 2004). Dotted lines represent the proximal influences and solid lines represent distal influences. Connected boxes are hypothesized to be nonrecursive, that is, there is a reciprocal causation between them (e.g., coping skills influence drinking behavior and, in return, drinking influences coping). These *feedback loops* allow for the interaction between coping skills, cognitions, affect, and substance use behavior. As depicted by the large striped circle in Figure 1.2, situational cues (e.g., walking by the liquor store) play a prominent role in the relationship between risk factors and substance use behavior.

In order to test this new theory, future research will need to incorpo-

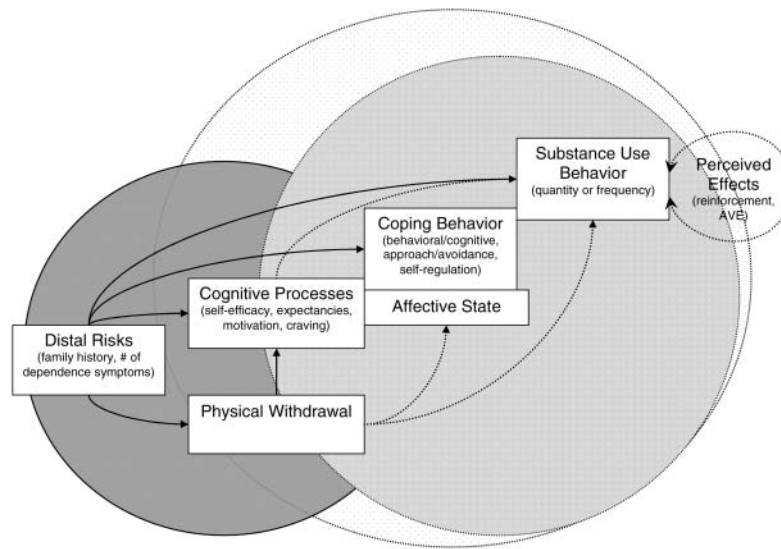


FIGURE 1.2. Dynamic model of relapse (Witkiewitz & Marlatt, 2004).

rate innovative data analytic strategies that will allow for complex and discontinuous relationships between variables. For example, Piasecki and colleagues (2000) have provided interesting findings on the withdrawal dynamics of smoking cessation, demonstrating that relapse vulnerability is indexed by the combination of severity, trajectory, and variability of withdrawal symptoms. Boker and Graham (1998) investigated dynamic instability and self-regulation in the development of adolescent substance abuse; they found that relatively small changes feedback into the system can lead to large changes over a relatively short period of time. Warren and colleagues (2003) successfully modeled an individual's daily alcohol intake using nonlinear time series analysis, which provided a data fit superior to that of a comparable linear model, and more accurately described the idiosyncrasies of drinking dynamics. Hawkins and Hawkins (1998) also present a case study of an individual's alcohol intake over a 6-year period of treatment. Based on more than 2,000 data points, analyses revealed a periodic cycle defined by bifurcations, in which lapses predicted discontinuous changes in the trajectory of the system.

The utility of nonlinear dynamical systems, such as models based on chaos and/or catastrophe theory, in the prediction and explanation of substance abuse has been described by several authors (Ehlers, 1992; Hawkins & Hawkins, 1998; Skinner, 1989; Warren et al., 2003). For example, catastrophe theory has been used to predict alcohol relapse (Hufford, Witkiewitz, Shields, Kodya, & Caruso, 2003; Witkiewitz, Hufford, Caruso, & Shields, 2002). Catastrophe models allow for the prediction of sud-

den discontinuous change in a measured behavior resulting from slight continuous changes in environmental and situational variables (Thom, 1975). Hufford and colleagues (Hufford, Witkiewitz, Shields, Kodya, & Caruso, 2003) evaluated a catastrophe model incorporating alcohol dependence, self-efficacy, depression, alcohol-use severity, family history, family conflict, and stress as predictors of 6-month alcohol consumption in small samples of individuals treated in both inpatient (more severe addiction) and outpatient (less severe addiction) treatment facilities. The catastrophe model provided a significantly better fit to the data in both samples, predicting 58% (inpatient) and 83% (outpatient) of the variance in posttreatment drinking, than the best-fitting linear models, which only predicted 19% (inpatient) and 14% (outpatient). Witkiewitz and colleagues (2002) replicated these initial findings using data from Project MATCH (Project MATCH Research Group, 1997), which showed alcohol risk, addiction severity, self-efficacy, depression, social support, and motivation for change predicted 77% of the variance in 12-month percentage of days abstinent (PDA) using a catastrophe model, and only 2% of the variance using a linear model. The striking amount of variance explained by the catastrophe models in these studies is posited to be a function of the underlying assumptions of catastrophe theory. Catastrophe modeling techniques allow for discontinuous functions and attempt to capture more of the data surrounding statistical modes. Oftentimes data (and behavior) is multimodal, yet linear functions will estimate a best fit line between two statistical modes. Catastrophe models seek to maximize the function near statistical modes, allowing for more data to be classified as unique variance, rather than error.

Assessing Relapse

Progress in the area of quantitative modeling procedures will only inform our understanding of the relapse process to the extent that we improve upon our operational definitions of relapse. Advancements in the assessment of lapses and relapse may provide the impetus for providing a more comprehensive definition of relapse and exhaustive understanding of this complex process (Haynes, 1995). A few of the recent developments that may increase our ability to accurately measure addictive behavior include EMA (Stone & Shiffman, 1994), interactive voice response technology (IVR; Mundt, Bohn, Drebus, & Hartley, 2001), physiological measures (Niaura, Shadel, Britt, & Abrams, 2002), and brain imaging techniques (Bauer, 2001). Many of these approaches are discussed at greater length in *Assessment of Addictive Behaviors* (Donovan & Marlatt, 2005).

EMA utilizes handheld computers to collect momentary, daily, and weekly assessments of self-reported behavior. Individuals carrying the palmtops are queried randomly, daily, and weekly. The individuals are also

instructed to complete reports after an episode of use or strong temptation to use. The strength of EMA is its ability to collect data anonymously and in the moment, without the problems of retrospective recall (Shiffman et al., 1997). Using EMA, Shiffman and colleagues have been able to tease apart the differences between baseline differences and daily variation in relapse risk factors. For example, Shiffman and colleagues (2002) have recently demonstrated that daily reports of affect are not highly predictive of smoking behavior in heavy smoking adults, which is not consistent with the well-established association between affect and substance use described earlier. The weakness of EMA, like many other assessments of alcohol and drug use, is the reliance on self-reported information and the possibility of reactivity to the assessment device (e.g., participant noncompliance). IVR is very similar to EMA; however, the participants are instructed to make a telephone call to an automated telephone service, which feeds data directly from the participant's voice into a computer database. IVR is effective in that it also allows for immediate, anonymous reporting. The downfall of IVR is that it also relies on participant self-report and may result in reactivity and noncompliance (Mundt et al., 2001). Both EMA and IVR are time-consuming and more invasive than simple paper-and-pencil questionnaires, which may lead to higher rates of participant attrition and nonresponding.

Physiological measurements and brain-imaging techniques are unique to the study of relapse because they do not rely on self-report data. For example, Niaura and colleagues (2002) measured heart rate changes during a laboratory investigation of the effects of social anxiety on the prediction of relapse. The results demonstrated that an increase in social skills and a decrease in heart rate during the anxiety induction procedure predicted 3-month smoking abstinence rates. Imaging studies have also provided successful results. Using electroencephalography techniques, Bauer (2001) demonstrated that participants who relapsed during the first 6 months following treatment had enhanced high-frequency beta activity in regions of the frontal cortex, when compared to abstinent and non-drug-dependent participants. These results support the findings from previous imaging studies that showed functional deficits in the orbitofrontal cortex of relapse-prone patients, an area of the brain that has been shown to inhibit highly emotional responding (Bauer, 1994, 1997). Taken together these studies demonstrate that relapse may be assessed and predicted on an objective, physiological level.

White Bears and Mice

Gaining a better understanding of the relapse process will largely benefit from the incorporation of research on nonaddictive behavior and nonhuman animals. In this section we review social psychological models of self-control and thought suppression, and recent animal models of relapse.

With regard to addictive behaviors, the issue of self-regulation and “will-power” is commonly referenced as an explanation for success (Norcross & Vangarelli, 1989). Mischel and colleagues (Mischel, Shoda, & Mendoza-Denton, 1988) have identified self-regulation as a central feature of personality, which requires strength to maintain. For example, Wegner and Wheatley (1999) have demonstrated that self-control may be inhibited by the exercise of thought suppression. For example, when participants are told to not think about a white bear, they engage in more of the prohibited behavior than individuals who are instructed to think about white bears. These findings are highly relevant to the study of craving and the AVE. If an individual is told, either by treatment staff or family and friends, not to think about using cocaine and to avoid all cues associated with cocaine, they may be more likely to have intrusive thoughts about using cocaine and increased craving.

Recent work by Baumeister, Heatherton, and Tice (1994) has described self-control and self-regulation as a type of psychological muscle, which may be strengthened and may also become fatigued. The “fatigue” of self-regulation, which has also been called “ego-depletion,” provides an explanation for why individuals are more likely to succumb to temptation (i.e., self-regulatory failure) when they are experiencing stress and/or negative affect. Coping with stressful life events and emotional distress are related to the deterioration of self-control (Muraven, Baumeister, & Tice, 1999). Fortunately, muscles that are deteriorating may be strengthened, and recent research from Baumeister’s lab has demonstrated that the exertion of self-regulatory control can be strengthened over time. Therefore, exerting self-control leads to ego depletion over the short-term, but over time self-control becomes stronger with exercise. These findings have strong implications for the treatment of addiction. Individuals who are encouraged to exert willpower in the face of cravings, negative affect, and stressful events can be validated for how difficult it is to maintain treatment gains and reinforced for their efforts by describing the evidence of willpower as a muscle that needs to be continually strengthened and stretched.

Unlike models of self-control, certain hypothesized precipitants of relapse cannot be ethically demonstrated in an experimental setting. For example, researchers are unable to empirically show that environmental stress and low self-efficacy cause relapse in participants who are attempting to maintain abstinence. Alternatively, research may be conducted with animal models of human behavior; some aspects of stress, cue reactivity, and craving have been shown to predict “relapse” in animals (Littleton, 2000; Marlatt, 2002). Shaham, Erb, and Stewart (2000) have demonstrated that footshock stress causes reinstatement of heroin and cocaine seeking in rats. Roberts, Cole, and Koob (1996) verified that rats engage in significantly more ethanol seeking and consumption during withdrawal,

and several researchers have demonstrated environment-dependent tolerance and “place-preferences” for cages previously associated with alcohol administration (e.g., Cole, Littleton, & Little, 1999; Kalant, 1998; Siegel et al., 1988).

Unfortunately, animals do not truly experience “relapse,” “craving,” or “alcoholism,” and models tested within the confines of a rat’s cage do not easily generalize to the high-risk situations and subsequent responses experienced by humans (Littleton, 2000). Nevertheless, recent advances using drug reinstatement, priming, and extinction models have demonstrated the effects of addictive substances on anticipation, postwithdrawal consumption, and incentive motivation, and future work with animal models may continue to provide more insight into human relapse (Li, 2000). Recently, Leri and Stewart (2002) trained rats to self-administer heroin in the presence of a light stimulus. After extinction the rats experienced one of six different types of lapses (no heroin and no-light stimulus, no heroin with light stimulus, self-administered heroin and no-light stimulus, self-administered heroin with light stimulus, investigator-administered heroin yoked with self-administering rats with light stimulus). This design is both innovative and informative because it is the first study of its kind to measure the lapse–relapse process in animals (Baker & Curtin, 2002). Further, Leri and Stewart (2002) provide data that asks whether a self-administered lapse is associated with different relapse rates than an investigator-administered lapse (called “priming”). The results from this study demonstrated that self-initiated heroin use and heroin administration paired with a heroin-related stimuli lead to heroin seeking during the relapse test. Mere exposure to heroin or heroin-related stimuli had little or no effect on subsequent heroin-seeking behavior during the relapse test. The robustness of their results is notable; however, animal models of relapse will never provide an analogue for the cognitive (e.g., abstinence violation effect) and environmental (e.g., peer pressure) precipitants of relapse in humans (Baker & Curtin, 2002; Marlatt, 2002). Furthermore, rats cannot make a voluntary commitment to either abstinence or moderation goals during the extinction phase, which has been shown to be a powerful predictor of relapse in human substance users (Sobell, Sobell, Bogardis, Leo, & Skinner, 1992).

Relapse Prevention Treatment in the 21st Century

Two recent, methodologically rigorous meta-analyses of treatment outcome studies for alcohol use disorders provided invaluable data on the present state and proposed future direction of alcohol treatment. Moyer and colleagues (Moyer, Finney, & Searingen, 2002) demonstrated that for less severe cases, brief interventions are more effective than extensive interventions; for severe cases, brief interventions were found to be as effective

as extended interventions. This finding coincides with the results from Project MATCH (Project MATCH Research Group, 1997), in which the four-session motivational enhancement treatment was as successful as 12 sessions of either cognitive behavioral or 12-step facilitation therapies. Likewise, Miller and Wilbourne (2002) found brief interventions to be one of the most efficacious treatments. Other treatments with the strongest evidence of efficacy were social skills training (broadly defined as RP by McCrady, 2000), the community reinforcement approach, behavior contracting, behavioral marital therapy, and case management. Given the restrictive climate of health care and the time limitations imposed by managed care and health maintenance organizations, it is very encouraging that briefer interventions are at least as effective as more intensive, extended treatments. Furthermore, advertising a less intensive and more supportive intervention, rather than a traditional 28-day inpatient treatment program, may reduce the fears and stigma associated with seeking treatment for alcohol and drug problems (Marlatt & Witkiewitz, 2002).

We view RP as playing a role in the continuous development of brief interventions for alcohol and drug problems. Motivational interviewing (Miller & Rollnick, 2002), brief physician advice (Fleming, Barry, Manwell, Johnson, & London, 1997), and two-session assessment and feedback (Dimeff, Baer, Kivlahan, & Marlatt, 1999) are three examples of brief interventions that have demonstrated success in reducing alcohol and drug use in a variety of populations. Other studies have found that many participants are maintaining abstinence at 6 and 12 months following treatment. Incorporating the cognitive-behavioral model of relapse and RP techniques, either within the brief intervention or as a booster session of the initial intervention, will provide additional help for individuals who are attempting to abstain following treatment. In addition, RP techniques may be supplemented by other treatments for addictive behaviors, such as pharmacotherapy (Schmitz, Stotts, Rhoades, & Grabowski, 2001) or mindfulness meditation (Marlatt, 2002). Currently, a treatment is being developed that will integrate RP techniques with mindfulness training into a cohesive treatment package for addictive behaviors (see Witkiewitz, Marlatt, & Walker, in press, for an extensive introduction).

Adjunct Treatment Approaches: Medication and Meditation

Medication

Pharmacotherapy has often been the first line of defense in the fight against substance use disorders. With regard to alcohol use disorders, disulfiram (Antabuse) has been widely used as behavioral control agent designed to prevent an individual from drinking by bringing about an aversive response (sickness) to drinking alcohol. Compliance with disulfiram treat-

ment is extremely low, and it has not been shown to be superior to placebo in double-blind studies (Schuckit, 1996). More recently, naltrexone (an opiate antagonist) and acamprosate (calcium acetyle homotaurine) have both been shown to be better than placebo at reducing cravings and increasing the percentage of days abstinent following treatment (Sass, Soyka, Mann, & Zieglgansberger, 1996; Volpicelli, Alterman, Hayashida, & O'Brien, 1992).

Smoking cessation has been successfully treated using nicotine replacement therapy (NRT; Hughes, 1993). Although the effectiveness of NRT varies widely (18–77%), more successful outcomes have been found when NRT is combined with a behavioral treatment (Fiore, Smith, Jorenby, & Baker, 1994). It appears that continuous exposure to low doses of nicotine, which decreases acute physical withdrawal symptoms, in combination with providing individuals with the skills to quit smoking (e.g., teaching effective coping strategies), is related to increased abstinence success, coping skills, and self-efficacy (Cinciriprini, Cinciriprini, Wallfisch, Haque, & Van Vunakis, 1996).

Opiate addiction has been primarily treated with a variety of opioid replacement agents, such as methadone, LAAM (levo-alpha-acetylmethadol), buprenorphine, and naltrexone (Hart, McCance-Katz, & Kosten, 2001). The efficacy of methadone in reducing relapse has been well demonstrated (Ling, Rawson, & Compton, 1994), although the higher doses required for better outcomes can be highly addictive (Caplehorn, Bell, Kleinbaum, & Gebski, 1993). LAAM is an opioid agonist with a longer duration of action than methadone, although higher doses of LAAM may have undesirable and/or unsafe side effects (Jones et al., 1998). Ling and colleagues (1994) demonstrated that buprenorphine may result in less physical dependence than methadone, although more large-scale research needs to be conducted on the efficacy and side-effects of buprenorphine (Hart et al., 2001). One new approach to opiate dependence that may be more desirable for clients and cost-effective for society is the implementation of methadone maintenance by primary care providers. A randomized controlled trial comparing a traditional narcotic treatment program with methadone delivered in the primary care office demonstrated that office-based methadone maintenance was as feasible and effective, and was significantly more satisfactory than the narcotic treatment program (Fiellin et al., 2001).

Cocaine has been treated within an RP framework using both acute treatment (drugs that work to suppress acute withdrawal from cocaine) and maintenance treatments (drugs that help patients maintain abstinence, albeit with limited success). Placebo-controlled trials with two acute treatments, bromocriptine and amantidine, have demonstrated mixed findings (Kosten, 1989; Kosten et al., 1992). Among the maintenance treatments, desipramine has been shown to reduce cocaine use (Feingold, Oliveto, Schottenfeld, & Kosten, 2002). Naltrexone (50 mg) has also been shown to be effective in the reduction of cocaine use following treatment, but only

if it is combined with RP therapy (Schmitz et al., 2001). This dosage of naltrexone may be ineffective for individuals with co-occurring cocaine and alcohol dependence (Hersh, Van Kirk, & Kranzler, 1998). Other studies have demonstrated that disulfiram is effective in the treatment of this polysubstance combination (Carroll et al., 1993; Higgins, Bunday, Bickel, Hughes, & Foerg, 1993), and is regularly prescribed within community reinforcement approaches (Budney & Higgins, 1998). Although multiple pharmacotherapies have been evaluated as treatments, or adjuncts to therapy for cocaine addiction, no medication has consistently demonstrated efficacy in comparison to placebo.

Meditation

Recently our laboratory, the Addictive Behaviors Research Center at the University of Washington, completed a pilot study on the use of meditation as a “treatment” for alcohol and drug problems. Inmates, many of whom were heavy substance abusers prior to incarceration, were recruited from a minimal security rehabilitation facility (North Rehabilitation Facility, Seattle) to participate in a 10-day Vipassana meditation course. Inmates who did not want to participate in the course were recruited to serve as case-matched, treatment as usual, control participants. Three months following their release from prison, Vipassana participants demonstrated significant decreases in alcohol and drug consumption, increased self-regulation, higher levels of optimism, and less recidivism, when compared to a case-matched control group (Marlatt, Witkiewitz, Dillworth, et al., 2004). Currently we are extending this study to include nonincarcerated individuals taking Vipassana courses in Washington, California, Massachusetts, and Illinois. Similarly, meditation-type interventions have been shown to be effective in the treatment of alcohol relapse (Taub, Steiner, Weingarten, & Walton, 1994), depression (Teasdale et al., 2002), personality disorders (Linehan, 1993), stress reduction (Bishop, 2002), and irritable bowel syndrome (Keefer & Blanchard, 2001).

CONCLUSIONS

Relapse is a formidable challenge in the treatment of all behavior disorders. Individuals working on behavior change are confronted with urges, cues, and automatic thoughts regarding the maladaptive behaviors they are attempting to change. Several authors have described relapse as complex, dynamic, and unpredictable (Buhringer, 2000; Donovan, 1996; Marlatt, 1996a; Shiffman, 1989), but previous conceptualizations have proposed static models of relapse risk factors (e.g., Marlatt & Gordon, 1985; Stout et al., 1996). The reconceptualization of relapse proposed in this chapter

acknowledges the complexity and unpredictable nature of substance use behavior following the commitment to abstinence or a moderation goal. Future research should continue to focus on refining measurement devices and developing better data analytic strategies for assessing behavior change. Empirical testing of the postcessation response system and further refinements of this new model will add to our understanding of relapse and how to prevent it.

The chapters that follow in this volume focus on intervention strategies designed to both prevent and manage relapse in the treatment of addictive behaviors. Each chapter provides an overview of the treatment approach for specific problem areas, including both substance use and other addictive behaviors. This book is designed to be used with *Assessment of Addictive Behaviors* (Donovan & Marlatt, 2005). Taken together, these two books provide the foundation for an evidence-based assessment and a cognitive-behavioral intervention approach to relapse prevention.

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