

# Motivational enhancement and other brief interventions for adolescent substance abuse: foundations, applications and evaluations

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## ABSTRACT

**Aims** To present a comprehensive review of the use of motivational enhancement and other brief interventions for substance use in adolescents.

**Methods** In this paper, we review the major theoretical foundations and influences of brief interventions (including motivational interviewing), consider developmental issues in its application for adolescents, discuss methodological issues in the design and implementation of brief interventions, including the assessment of treatment fidelity, evaluate and interpret the latest findings on brief interventions for adolescents and young people and discuss the issue of translating and exporting effective research into practice.

**Findings** Results from recent clinical trials using motivational interventions indicate that these approaches result in decreases in substance-related negative consequences and problems, decrements in substance use and increased treatment engagement, with results particularly strong for those with heavier substance use patterns and/or less motivation to change.

**Conclusion** While results are promising, more research is needed to examine the essential elements of motivational interventions, for whom they work best, and their impact on developmental transitions during adolescence.

**KEYWORDS** Adolescence, brief intervention, motivational enhancement.

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## INTRODUCTION

Grounded on psychological models of behavior change, clinical researchers have developed brief interventions, such as motivational enhancement, for substance use problems and other addictive behaviors. Shorter-term and less extensive than more traditional substance abuse treatments, brief interventions have the overarching goal of addressing and enhancing motivation to change. Given its relative status as 'newcomer' in the area of psychological research and treatment, it is remarkable how much of an impact motivational enhancement and similar brief interventions (i.e. interventions that focus on increasing readiness to change behavior; Rollnick & Miller 1995) have had on the field. For example, from

electronic literature searches using the terms 'motivational interviewing', 'motivational intervention', 'brief intervention' and 'motivational counseling', Dunn and colleagues (Dunn, Deroo & Rivara 2001) found 107 scientific papers published between 1983 and 1997. Many more clinical trials examining motivational enhancement interventions are currently under way both in the United States and internationally. While the term 'motivation' has been part and parcel of the social psychology lexicon for many decades, it is now becoming an essential part of the language of researchers and clinicians in the addictions field. Instead of the question, 'How much is this individual in denial?', we now hear: 'How motivated is this person to change their behavior?' This is no small leap in semantics, but rather the emergence of a true

paradigmatic shift in theory, method and approach toward intervening with substance abuse and other addictive behaviors.

There are probably many reasons why motivational enhancement and other brief interventions have struck such a chord in the field, the most important being that, at least among adults, they have the highest effect sizes among all treatments for alcohol abuse and dependence (Miller 2000; Miller *et al.* 1995). Moreover, they offer a cost-effective alternative to traditional, longer-term treatments and evidence similar efficacy rates (Project MATCH Research Group 1997). Motivational enhancement interventions are all-inclusive in that they tend to utilize a harm reduction approach for targeting excessive, hazardous drinking, versus an abstinence-based approach that may be indicated for those with alcohol dependence, but may not be relevant to those with less serious problems, less motivation to change or those with less extensive drinking histories, such as adolescents and young adults. In line with this advantage of inclusivity, motivational enhancement interventions are tailored typically to the needs and issues of the targeted individual, which in turn might increase the intervention's appeal. Several recent studies have utilized motivational enhancement interventions following alcohol-related negative events (Monti *et al.* 1999, 2001), and there is some evidence that delivering a motivational intervention following a negative event may increase the saliency of the event and the desire to avoid such events in the future (Barnett *et al.* 2002). Finally, the success of motivational enhancement interventions may also be due in part to their attractiveness to clinicians, counselors and treatment providers, who can learn how to apply the techniques of motivational enhancement proficiently within a relatively reasonable training period time (Miller & Mount 2001) and increase rapport and commitment to change from clients and patients that they may have once deemed to be 'in denial' or 'resistant' (e.g. Miller 1996).

As with most psychological interventions, there has been a downward extension of motivational enhancement interventions from adult populations to adolescents and college students who use and misuse alcohol and other substances. While preliminary results are encouraging, there are still many unanswered questions. What developmental considerations should be taken when designing and applying motivational interventions with adolescents and young adults? What methods are more or less effective for adolescents compared to adults? What are the mechanisms of action, the mediators and moderators of outcome, and how do they differ for adolescents? Given results from recent clinical trials of motivational interventions with adolescents, what is the best way to translate and export effective interventions to the

communities, settings and adolescents who need them the most?

## **THEORETICAL FOUNDATIONS OF MOTIVATIONAL ENHANCEMENT INTERVENTIONS**

Not to be confused with traditional treatment conducted in a faster, shorter or truncated period of time, brief intervention is understood to have the singular focus of targeting problematic behaviors in a certain systematic and specific manner. As defined by Miller & Sanchez (1994), the common elements of effective brief interventions are represented best by the acronym FRAMES: personalized Feedback or assessment results detailing the target behavior and associated effects and consequences on the individual; emphasizing the individual's personal Responsibility for change; giving Advice on how to change; providing a Menu of options for change; expressing Empathy through behaviors conveying caring, understanding and warmth; and emphasizing Self-efficacy for change and instilling hope that change is not only possible but also within reach.

Generally, brief interventions can comprise from one to five sessions (Bien, Miller & Tonigan 1993) and have been delivered by a variety of professionals, including nurses (Woollard *et al.* 1995), physicians (Kuchipudi *et al.* 1990; Richmond *et al.* 1995), college-educated treatment providers and counselors (Monti *et al.* 2001a, 1999), substance abuse counselors (Brown & Miller 1993; Project MATCH Research Group 1998), probation officers (Harper & Hardy 2000) and psychologists (Miller 1983). Because of their brevity and mobility, brief interventions can be delivered virtually anywhere—in a busy urban emergency department (e.g. Monti *et al.* 1999), in a physician's office (Stott *et al.* 1996), in jails or other correctional settings (Davis *et al.* 2003), as well as in a therapist's office. The opportunities for application are seemingly endless, which makes brief interventions particularly relevant for effecting change among individuals who would not ordinarily seek out assistance nor come to the attention of substance abuse services. The public health implications of brief interventions are obvious (WHO 1996; Abrams & Clayton 2001).

Of this framework of brief interventions, Miller & Rollnick (2002, 1991) developed motivational interviewing, arguably the most influential and widely used brief intervention. As Miller (1996) and Miller & Rollnick (2002, 1991) have said, the term 'motivational interviewing' pertains both to a style of relating to others and a set of techniques to facilitate that process. Its five main tenets include an empathic, non-judgemental stance, listening reflectively; developing discrepancy, rolling with

resistance and avoiding argument; and supporting self-efficacy for change. Originally developed for helping individuals change addictive behaviors (Miller 1983), motivational interviewing has progressed beyond alcohol addictions to target other health risk behaviors, including HIV and other sexually transmitted disease-related risk behavior (Kalichman *et al.* 1999; Carey *et al.* 2000), eating disorders (Feld *et al.* 2001), smoking (Colby *et al.* 1998), sexual offenses (Garland & Dougher 1991), gambling (Hodgins *et al.* 2001) and compliance to medication and other health-related regimens (Berg-Smith *et al.* 1999).

The theoretical basis of motivational enhancement and motivational interviewing is grounded in client-centered therapy, social learning theory and cognitive-behavioral therapy. First, studies demonstrated repeatedly, much as Rogers (1957) touted, that therapist behaviors, namely, genuineness, acceptance and warmth promoted change in the client, while other behaviors such as non-acceptance and negative confrontation were associated with no change or sometimes worse outcomes (e.g. Patterson & Forgatch 1985; Miller, Benefield & Tonigan 1993). Secondly, the emergence of social learning theories helped to propel the recognition that the external, social environment and the individual's interactions with it were salient factors in motivation for changing drinking behaviors (Bandura 1977; Abrams & Niaura 1987; Maisto, Carey & Bradizza 1999). This, in turn, resulted in the gradual shift from viewing motivation as a 'trait' to a 'state'. Thirdly, the popularity of the transtheoretical model of behavior change (e.g. Prochaska, DiClemente & Norcross 1992) increased awareness of change as occurring along a series of stages or steps, rather than as a static event that either does or does not happen. This development also facilitated the recognition that individuals could be in higher or lower stages of motivation to change, rather than the previously held dichotomy of 'motivated' versus 'unmotivated' individuals. Fourthly, cognitive-behavioral therapy, borrowing in part from social learning theories, emphasized the importance of building a repertoire of coping skills in order to master interpersonal and intrapersonal situations that are high risk for alcohol relapse (Monti *et al.* 1989, 2002). With more mastery over experiences in coping with these situations, individuals could increase their self-efficacy for change and effectively reduce their risk for relapse (Monti *et al.* 1993).

Because of its tenets of acceptance, understanding and increasing motivation to change, motivational enhancement interventions hold promise for adolescent alcohol misuse for several main reasons. The vast majority of adolescents never come to the attention of substance abuse treatment, despite the fact that many teens meet diagnostic criteria for alcohol abuse or dependence

(Chung *et al.* 2000). Indeed, the issue of 'ownership' of adolescent drinking problems does not have to be a barrier to help-seeking within a motivational enhancement approach, as it may well be with other more traditional approaches (e.g. Alcoholics Anonymous: AA). Although parents and other authority figures may refer adolescents to treatment because of their own concerns rather than any concerns expressed on the part of the adolescent, it is not necessary for adolescents to admit to or acknowledge having substance use problems in order to benefit from motivational enhancement approaches. Because motivational enhancement interventions do not rely on diagnostic labels and can be applied to individuals within a range of readiness to change, adolescents may be particularly receptive to motivational methods and could be approached in a wide range of settings (Barnett, Monti & Wood 2001). Another powerful reason for motivational enhancement intervention's potential with adolescents is its focus on avoiding argumentation and hostile confrontation. By accepting adolescents as individuals without lecturing them or telling them what to do, as they may be accustomed to from teachers, parents and other authority figures, treatment providers using motivational enhancement interventions may be able to connect more easily with a 'rebellious' or 'oppositional' teen and foster an atmosphere of self-directed change.

## METHODOLOGICAL ISSUES

In motivational interviewing and motivational enhancement interventions, the treatment provider uses specific techniques to facilitate identification and recognition of problematic behavior and to help the individual move toward change. Employing an empathic style is demonstrated by reflective listening techniques and a warm, non-judgemental stance. Developing discrepancy is achieved through asking the individual about their short- and long-term goals and how the behavior in question might be hindering or preventing goal achievement. This can be achieved, for example, by asking the individual to describe the pros and cons of their alcohol use, presenting normative feedback about how the individual's alcohol use compares to his/her peers and having the individual describe what life would be like with and without drinking. Rolling with resistance and avoiding argumentation are seen when the treatment provider accepts the individual and does not enter into debates about the individual's beliefs, perceptions or behaviors. In this way the treatment provider and individual are not approaching from opposing viewpoints, but rather are collaborators aligned on the side of the individual. Indeed, if the individual exhibits resistance through such behaviors as inattention, anger or interrupting the treatment provider, it is

viewed as an immediate signal that the treatment provider must change the approach and help to decrease defensiveness and hostility through reflective listening and similar techniques. Finally, supporting self-efficacy is manifest through statements of affirmation, e.g. 'I can appreciate how much effort you have put into trying to make things better in your life', statements of hope, e.g. 'There is a part of you that believes that change is possible, and your past successes really encourage you to know that you can change', and statements that reinforce the individual's own statements about behavior change, e.g. 'You mentioned that once you set your mind on something, you do it—you can change this if you want to.'

The obvious question arises as to whether younger adolescents are developmentally and cognitively capable of benefiting from the motivational techniques outlined above. For example, adolescents by nature of their age generally do not have the same drinking histories and profiles as adult problem drinkers, whereas motivational interviewing was developed originally in order to intervene with problem drinkers. Because of comparatively fewer alcohol-related negative consequences, it could be argued that adolescents may not respond to assessment feedback on their alcohol use and its effects. Moreover, it could be argued that they may have difficulty imagining future goals and how drinking would hinder achievement of those goals, making the technique of developing discrepancy a moot point. Indeed, adolescents tend to live in the 'here and now' and generally pay less attention to envisioning their future. Using a cost-benefit strategy, such as eliciting the perceived pros and cons of drinking, may not benefit younger adolescents lacking abstract reasoning and comprehension skills.

This might be exacerbated further if the adolescent does not think that their drinking is non-normative or if their drinking is supported or reinforced by their social and physical environment, e.g. college campus. There is considerable research showing that experimental alcohol use in adolescence is a normative phenomenon (Yamaguchi & Kandel 1984; Winters 2001) and may actually be associated with better psychological health than complete abstinence during adolescence (Shedler & Block 1990). There is also ample evidence that most adolescents 'mature out' of heavy episodic drinking as they transition into adulthood and begin to assume adult roles and responsibilities, such as marriage or partnership, children, and occupation (Fillmore 1988; Jessor, Donovan & Costa 1991; Baer *et al.* 2001; Schulenberg *et al.* 2001).

Additionally, there is the more pragmatic issue of abstinence-based versus harm reduction-based motivational enhancement interventions and the ethics of using one or the other for adolescents who have not reached

majority age. Most high schools, college campuses and substance abuse treatment facilities adopt a zero tolerance policy for underage drinking. This is in contrast to motivational enhancement interventions, which typically reinforce any movement toward change and view harm reduction as positive: although abstinence may be the ideal goal, success is defined as any change in behavior that decreases risk and associated harm (Marlatt 1996; Miller, Turner & Marlatt 2001). Motivational enhancement interventions view the individual as an autonomous agent, capable of making decisions and accepting responsibility for change; adolescents may not be in a position to select harm reduction goals freely when their authority figures demand complete abstinence.

Recent studies have begun to shed light on some of these issues, with interesting and fairly consistent findings as outlined in our recent work (Monti, Colby & O'Leary 2001b). Regarding developmental and cognitive abilities, it appears that both younger and older adolescents benefit from motivational enhancement interventions that include the basic elements of motivational interviewing, as seen in long-lasting reductions in alcohol-related risky behaviors and in alcohol consumption (Marlatt *et al.* 1998; Monti *et al.* 1999). Indeed, adolescents lower in initial motivation to change their drinking had more positive outcomes with motivational interviewing than those higher in motivation at baseline (Monti *et al.* 1999; 2001a), suggesting that the techniques designed to increase intrinsic motivation translate effectively into meaningful behavior change. One important element of delivering effective motivational enhancement interventions to adolescents is that the feedback must be sufficiently understandable to them. Our treatment providers read through the feedback with the adolescent and discuss and explain all concepts in simple and clear ways throughout the entire intervention, with heavy reliance on visual graphics of concepts and feedback, to ensure that the adolescent fully comprehends the material.

The question of whether to intervene with adolescents who may be experiencing a temporary, discrete period of excessive drinking that will probably resolve with time is easily answered: the benefits of intervention clearly outweigh concerns about the potential for overzealous application. Interventions that are successful in adolescence often have long-term effects into adulthood (Baer 1993; Schulenberg *et al.* 2001) and may in fact be life-saving. An adolescent who drinks excessively once a month may not come to the attention of parents, teachers or other authority figures unless that one episode leads to a motor vehicle accident, alcohol-related injury, or suicide attempt—all of which are associated significantly with prior alcohol consumption (Barnett *et al.* 2001). Considering the relatively low cost of brief interventions, such as motivational enhancement, coupled with its wide-scale



motility, the return on the investment is manifold (IOM 1990; Fleming *et al.* 2000).

The issue of abstinence-based versus harm reduction-based models and motivational enhancement is also surmountable. Although motivational enhancement interventions often adopt a harm reduction approach, in that reductions in the target behavior are encouraged and reinforced, one of the first studies using motivational interviewing found it to be effective for individuals entering a residential treatment program with an abstinence-based model (Brown & Miller 1993). Certainly among college students, promoting an abstinence model can fall on deaf ears and may not be realistic or accepted. The critical ingredient, regardless of the model, is that within the motivational enhancement intervention the behavior change plan should be discussed explicitly with the adolescent in the context of any requirements for abstinence or limitations on drinking imposed by one's parents, school, campus or general environment.

In a similar vein, adolescent minors who receive a motivational enhancement intervention must usually have parental informed consent prior to talking with a treatment provider. This begs the question of whether parental involvement and knowledge of the adolescent's drinking influences the veracity of adolescent self-report or responsivity to the intervention itself (cf. Brody & Waldron 2000). To date, there is no evidence suggesting that adolescents whose parents are knowledgeable about their drinking respond differentially to the intervention or have less valid assessment data (Monti *et al.* 1999; Winters 2001), and adolescent self-report has been shown to be generally valid (Oetting & Beauvais 1990). Moreover, some of the strongest and most impressive adolescent substance use interventions, in terms of behavioral outcomes, have incorporated family members explicitly into the intervention (e.g. Stanton & Shadish 1997; Waldron 1997; Waldron, Brody & Slesnick 2001). The integration of family intervention and motivational enhancement has a strong conceptual and clinical rationale (Waldron *et al.* 2001). It is something that we are pursuing in our work with younger adolescents, who may benefit differentially from a family-based motivational intervention following an alcohol-related negative event.

It should be noted that there are myriad psychiatric and familial problems that co-occur with adolescent substance use and abuse (Lewinsohn *et al.* 1995; Stanton & Shadish 1997). While there is empirical evidence in support of integrating motivational enhancement approaches and strategies with family therapy (e.g. Waldron *et al.* 2001), for adolescents with severe problems along the continuum of substance use motivational enhancement alone is likely insufficient. Some of the advantages of motivational enhancement interventions, such as brief administration and wide disseminability due

to ease of provider training, are clearly less important when there are significant psychiatric and familial issues present. Nonetheless, researchers have pointed to the benefits of using motivational enhancement interventions for adolescents with significant co-occurring psychiatric and family problems as a means of maximizing treatment engagement, setting goals for behavior change, and providing feedback to increase motivation to change (Myers *et al.* 2001). Indeed, research currently under way at our Center at Brown University is examining the potential benefits of integrated treatment for both substance abuse and psychiatric comorbidity among adolescents.

Another methodological issue that arises is that of treatment fidelity. As Miller (2001) has forcefully stated, one of the most important and potentially neglected areas of research on motivational enhancement interventions pertains to fidelity: to what degree do intervention providers adhere faithfully to the spirit of motivational interviewing, i.e. empathy, reflective listening and a non-judgemental, accepting therapeutic stance? To address this issue, we have developed extensive manual-guided methods to evaluate and monitor fidelity to the motivational enhancement interventions in our research studies, in addition to an extensive training period for our treatment providers and weekly clinical supervision meetings (see Barnett *et al.* 2001 for a review). Below we describe two methods used in our laboratory to measure treatment fidelity.

In the first method, adolescents and treatment providers complete evaluation forms assessing whether certain core components of the motivational enhancement intervention were delivered. These include items assessing perceived rapport, empathy and self-efficacy. Responses were rated on a scale from 1 to 4 (from strongly disagree to strongly agree). Specific aspects of the protocol are also assessed, as are their perceived utility (responses range from 0 = topic not discussed to 3 = the topic was very useful). An analysis of adolescent responses (Barnett *et al.* 2001) showed that adolescents gave very high ratings to treatment providers on rapport (mean = 3.9), empathy (mean = 3.7) and supporting self-efficacy (mean = 3.7), in support of the fidelity of the intervention to the three core elements of motivational enhancement. Across all specific aspects of the protocol, adolescents reported that they were presented to them 88% of the time, with average ratings of the specific elements of the protocol ranging from 2.3 to 2.8, reflecting responses of 'somewhat useful' to 'very useful'.

In the second method of assessing treatment fidelity, we have adapted methods used by Project Match (Carroll *et al.* 1998) to rate the delivery of motivational enhancement that allowed a way for trained raters to evaluate the implementation of the study protocol during an

intervention. Experts have proposed that the gold standard for measuring adherence to motivational interviewing should be direct observation with actual patients or study participants (e.g. Miller 2001). However, because the majority of the interventions in our program of clinical research are delivered bedside in a crowded, loud emergency department with frequent interruptions, videotaping or audiotaping interventions is neither feasible nor desirable. Instead, treatment providers conduct videotaped motivational enhancement interventions with role-playing confederates. Raters assess both the treatment providers' use and skill in applying the key ingredients of motivational enhancement (e.g. empathy) and their skill and adherence in applying protocol-specific intervention elements (e.g. assessment feedback). In a recent analysis, treatment providers were rated as consistently administering protocol elements, with ratings comparable to those reported for therapists in Project Match (Barnett *et al.* 2001). While the use of role-play confederates to assess treatment providers' behavior and adherence to intervention protocols and techniques is a pragmatic solution to assessing fidelity, its use should be tempered with the recognition that the conditions cited above that make videotaping impractical might also inadvertently influence providers' adherence to the interventions.

In addition to examination of treatment fidelity, it is important in the context of treatment efficacy evaluation to focus on assessing the discriminability of motivational interventions (e.g. Carroll *et al.* 1998). In other words, how well-defined and distinctive are these brief interventions from control or comparison conditions within studies as well as from more traditional treatments? Is it simply their brevity that sets them apart, or are their conceptual underpinnings key? While research on the discriminability of motivational interventions has been conducted in studies of adults in substance abuse treatment (Rollnick & Miller 1995; Carroll *et al.* 1998), tackling this issue in clinical studies with adolescents and young adults is imperative if motivational enhancement is to grow in its application with adolescents.

## EVALUATION AND INTERPRETATION OF RESULTS ON MOTIVATIONAL ENHANCEMENT INTERVENTIONS FOR ADOLESCENTS

In terms of adolescent-specific motivational enhancement interventions, several studies have recently been completed and highlight similar findings. In one of the first studies on motivational interviewing with adolescents (Monti *et al.* 1999), older (18–19-year-old) adolescents who presented to an emergency department (ED)

following an alcohol-related event were randomized to one session of motivational interviewing versus usual care. At 6-month follow-up, those who had received the motivational interview had a significantly lower incidence of drinking and driving, traffic violations and alcohol-related problems and injuries than those in standard care (Monti *et al.* 1999). A second study on younger (13–17-year-old) adolescents also recruited from the ED and randomized to the same two treatment conditions found that while those who were already motivated to change their drinking showed no differential benefit of motivational interviewing, teens with lower motivation to change at baseline prior to intervention showed significantly greater benefit in reductions in drinking and driving (Monti *et al.* 2001a). In both studies, results for reduced drinking rates were not significantly different between interventions and instead indicated a main effect for drinking reductions from baseline to follow-up.

Recent work has also examined the efficacy of motivational enhancement interventions for reducing adolescent smoking. In one of the first studies using motivational enhancement for adolescents (Colby *et al.* 1998), 40 adolescent smokers aged 14–17 were recruited and assigned randomly to receive either a one-session motivational interview or brief advice to quit smoking. In the 30-minute individual motivational interview, the treatment provider explored the adolescent's beliefs about the effects of smoking and showed the adolescent four videotaped vignettes that were used to stimulate discussion about the various consequences of smoking. Adolescents were assisted in setting personal goals for behavior change, with the treatment provider providing advice about strategies. Although these adolescents were not actively seeking out smoking treatment, only 11% of eligible individuals refused to participate, suggesting that teens may be receptive to a smoking intervention if asked and if they are provided with assistance and resources. At 3-month follow-up assessment, two-thirds of the sample had made a serious (>24 hours) quit attempt, with an average duration of about 3 weeks, and significant reductions were found in smoking rate and nicotine dependence. Twenty-two per cent of those who had received motivational interviewing were no longer smoking at follow-up, compared with 10% of those who received brief advice, which represented a small to medium effect size of the motivational interview.

Results of motivational enhancement interventions for college students also have implications for adolescent interventions, considering that the majority of studies examining college student drinking have focused on younger students, i.e. 18-year-old freshmen. Although not technically fitting the criteria of a brief intervention study, we review a study by Kivlahan and colleagues (Kivlahan *et al.* 1990) because of its influence on future

clinical trials using motivational enhancement interventions. Kivlahan *et al.* (1990) introduced one of the first harm reduction interventions to a college campus, albeit in a traditional skills training program. Forty-three students were randomized into one of three groups: an 8-week, moderation-oriented, cognitive-behavioral skills training class; an eight-session alcohol information class (limited primarily to lectures and films on the hazards of alcohol consumption); or assessment-only control. Although the entire sample demonstrated significant declines in drinking rates from baseline to a 12-month follow-up, there were trends for those in the moderation-oriented skills training group to show greater declines over time. By providing a viable alternative to abstinence-only models of treatment for adolescents and college students, this study not only paved the way for future clinical trials using harm reduction and motivational interventions for youth, but also helped to establish the legitimacy of using such approaches for young people.

In one of the first studies examining the relative efficacy of motivational interviewing for college students, Baer and colleagues (Baer *et al.* 1992) assigned students randomly to receive a 6-week class and discussion group, a six-unit self-help manual to read in a correspondence format or a 1-hour motivational enhancement intervention. The correspondence format resulted in significantly and dramatically higher attrition rates than the other two conditions and was therefore deemed invalid for analysis. Follow-up assessments at 3, 6, 12 and 24 months post-treatment revealed significant reductions in drinking rates that were maintained throughout the follow-up period for students who received either the one-session motivational interview or the more extensive 6-week class, thus revealing a clear cost-benefit advantage for the one-session motivational interview.

These results led into a second study (Marlatt *et al.* 1998) that compared the motivational enhancement intervention to no intervention. Graduating high school seniors who had been accepted and intended on enrolling in a large, 4-year university were screened, prior to arrival on campus, for alcohol use rates and alcohol-related problems. Those who screened positive for high risk for alcohol problems were randomized to either a brief motivational enhancement intervention during the winter of their first year at college or to a no-treatment control. A comparison group was also selected from the screening pool of students. This group, comprised of individuals with a range of risk status, was designed to provide a natural history comparison group. Students in the motivational enhancement condition were instructed to keep daily monitoring cards of their drinking for 2 weeks prior to the intervention. During the individual intervention session, the treatment provider reviewed the monitoring cards and gave the student personalized

assessment feedback, including normative data on drinking rates, perceived risks for current and future alcohol-related negative consequences, information about biphasic effects of alcohol and the notion of 'diminishing returns' with excessive consumption, and suggestions for reducing risk. At 6-month and 2-year follow-up, the high-risk students who had received the motivational enhancement intervention showed greater declines in drinking rates and alcohol-related problems than the no-treatment control group, although high-risk students continued to drink more than those in the normative comparison group.

To address the clinical significance of these reductions, a subsequent study examined the pattern of results across the entire sample from baseline to the 2-year follow-up (Roberts *et al.* 2000). Specifically, individuals were classified, using risk cut-points, by whether they had become a new case, had become reliably worse, had no change, had reliably improved or had resolved on alcohol-related problems and on drinking frequency and quantity measures. Among those in the high-risk intervention group, more individuals had improved outcomes and fewer had become worse from baseline to 2-year follow-up, compared with individuals in the high-risk no-treatment control group (Roberts *et al.* 2000). Echoing previous findings, these results were observed more strongly for alcohol problems than for drinking frequency and quantity indices. The authors concluded that the motivational enhancement intervention may have forestalled continued problems for some of the high-risk individuals and helped to foster trajectories of moderation drinking for others.

In a longitudinal follow-up to the Marlatt *et al.* (1998) study, Baer and colleagues (Baer *et al.* 2001) examined the natural history of drinking problems among this sample over a 4-year period. While all three groups showed declines in drinking quantity and negative consequences over time, students who had received the motivational enhancement intervention demonstrated significantly fewer negative consequences which stood the test of time: the beneficial effects of the intervention on reducing alcohol-related problems were sustained for 4 years. On the other hand, reductions in frequency and quantity of alcohol use from baseline to 1-year follow-up were washed out by the 4-year follow-up point.

Borsari & Carey (2000) randomized students who had reported binge drinking two or more times in the past 30 days to either a one-session motivational intervention ( $n = 29$ ), using the Brief Alcohol Screening and Intervention for College Students (BASICS; Dimeff *et al.* 1999) or to a no-treatment control group ( $n = 31$ ). At 6-week follow-up, students in the motivational intervention group showed significant reductions in frequency and quantity of alcohol use compared to the no-treatment

group. Because additional analyses revealed that student perception of typical student drinking mediated the relationship between drinking and intervention, the authors proposed that providing normative feedback on drinking during the motivational intervention may have been the catalyst for reduced alcohol use. In another study of the BASICS program, 99 college students were assigned randomly to BASICS, an educational intervention or an assessment-only control group, with a follow-up period of 9 months post-intervention (Murphy *et al.* 2001). While results indicated no significant between-group differences on alcohol consumption measures or alcohol-related problems at 3- or 9-month follow-up, heavier drinkers randomized to BASICS had better outcomes in terms of reduced alcohol use compared to heavier-drinking students who had been randomized to either the education intervention or assessment-only control (Murphy *et al.* 2001).

In other recent work using motivational interventions for college students, researchers have begun to take the powerful influences of the social environment on drinking into account in designing the intervention. For example, Larimer and colleagues (Larimer *et al.* 2001) evaluated the efficacy of a brief motivational enhancement intervention in reducing alcohol use and alcohol problems among first-year fraternity members from baseline to 1-year follow-up. Randomization was performed by fraternity house rather than by individual level. Six fraternity houses were assigned to motivational enhancement with individual and housewide feedback, and six houses received treatment as usual (consisting of a 1-hour didactic presentation with no feedback on their alcohol use). Moreover, the feedback was delivered by either professional research staff or by a peer interviewer. Results indicated significant reductions in total average alcohol consumption and peak blood alcohol levels among fraternity members who received the motivational intervention versus those who received treatment as usual. Interestingly, no group differences emerged on drinking-related negative consequences, and the efficacy of the motivational intervention was equivalent across professional and peer interviewers. However, compared to normative drinking rates, alcohol use levels were still elevated at follow-up among individuals who had received the motivational enhancement intervention, and the well-established link between higher drinking rates and increased risk of experiencing alcohol-related negative consequences may have accounted for a lack of findings on reduced alcohol problems.

O'Leary *et al.* (2002) conducted a pilot study with college students who were mandated to receive an alcohol education session for an alcohol-related infraction of university policy. The two interventions tested were individual motivational interviewing and peer-enhanced

motivational interviewing, wherein a supportive peer of the student attended the motivational intervention with the student. Students ( $n = 29$ ) and their gender-matched peers ( $n = 29$ ) were assessed independently at baseline. Students were then randomized to receive individual motivational interviewing (IMI) or peer-enhanced motivational interviewing (PMI), in which their gender-matched peer, who was nominated by the student as someone that they knew well and was supportive of them (mostly identified by the students as 'friends' or 'roommates') also participated in the MI session and received feedback about their own drinking. One-month follow-up results indicated that students in both interventions decreased overall number of drinking days as well as heavy drinking episodes. Further analyses revealed that heavier drinking levels among peers at baseline did not predict heavier drinking rates for students at follow-up, thus minimizing some concerns about potential iatrogenic effects of including heavy drinking peers in an intervention for a targeted high-risk sample (e.g. Dishion, McCord & Poulin 1999). While the lack of a true control condition and small sample size are limitations, the study demonstrated the feasibility of intervening with students and their peers, most of whom reported similar drinking patterns and who often drank together in social situations.

Evaluations of group-based motivational enhancement interventions for college students (i.e. with more than two people present) have had mixed results. In one published study, college students who were classified as moderate to heavy drinkers were assigned randomly to a group-based, 2-hour motivational enhancement session, a mailed feedback-only condition or to a no-treatment control group. Follow-up results at 6 weeks post-intervention indicated that individuals who had received mailed feedback decreased their drinking significantly, compared to no-treatment controls; the two active treatment groups had similar outcomes (Walters, Bennett & Miller 2000). Agostinelli, Brown & Miller (1995) had also found mailed feedback to be effective in producing reductions in alcohol consumption rates among heavy-drinking college students.

One possible explanation why mailed feedback might be better than group-based motivational enhancement approaches concerns the content of the feedback. A recent study compared self-focusing feedback (e.g. self-monitoring of alcohol use), normative feedback (e.g. providing information about the true rates of alcohol use in one's peer group in order to highlight discrepancies in perceived use) and the combination of the two versus a no-feedback control (Nye, Agostinelli & Smith 1999). Findings indicated that presenting either type of feedback *alone* produced the most negative evaluations of one's drinking, while presenting self-focusing and



normative feedback in combination decreased problem recognition. The authors speculate that the combination of the two feedback types may have created resistance and increased defensiveness. Extending this argument to group processes, it might be the case that presenting self-focusing and normative feedback together (not uncommon in motivational enhancement interventions) creates a situation wherein the group becomes defensive, questions the validity of the feedback and challenges the interventionist, who in turn must attempt to listen reflectively to several members of a group simultaneously and avoid confrontation. There is also the possible diffusion of responsibility and of diminished personal recognition of problems when feedback is delivered in a group: 'If everyone in this group is drinking about as much and as often as I am, then my drinking can't be all that bad, right?' It is easy to imagine the unique challenges that well-intentioned group motivational enhancement interventions have to overcome in order to be successful in producing change in its members.

Taken together, results over several clinical trials using motivational enhancement interventions with adolescents and college students have shown positive results stemming primarily from reductions in alcohol-related problems and, to a lesser extent, from reductions in drinking. They have also suggested that while most young people do mature out of hazardous drinking patterns, providing a motivational enhancement intervention to high-risk individuals may help accelerate that maturation process. Although results are less clear when using motivational enhancement interventions with groups, the importance of reaching and intervening with the broader social network of the adolescent and college student, given the strong social influences of drinking during adolescence and young adulthood, is still grist for the mill.

## **TRANSLATING AND EXPORTING EFFECTIVE RESEARCH INTO PRACTICE**

To date, the evidence in favor of motivational enhancement interventions for reducing alcohol use and alcohol-related problems among adolescents and young adults continues to mount. Now that the research field is replete with empirically validated manuals, protocols and procedures for implementing these interventions, the question remains: what is the best way to translate the relevant findings to clinicians, practitioners, administrators and public policy makers so that motivational enhancement interventions can be available and accessible to those adolescents and young adults who might benefit from them?

One promising method is through media that have wider reach, such as internet-based interventions. Skinner and colleagues (Skinner *et al.* 2001) provide a comprehensive review of internet websites on alcohol, smoking and drug use for both adolescents and practitioners, with the rationale that in one of their survey studies, 90% of adolescents endorsed willingness to use the internet to access drug information and 75% had current internet access through schools, home, friends, cafes and public libraries. In one recent internet-based study (Woodruff *et al.* 2001), 26 adolescents had seven 1-hour internet chat sessions with a trained smoking cessation interventionist and other adolescent smokers over the course of 2 months, with sessions geared around motivational enhancement methods (exploring ambivalence, eliciting goals for change, non-confrontational interactions, etc.). Adolescents showed decreased smoking rates and more intentions to quit smoking at 1-month follow-up, but the lack of a control condition limits the conclusions of the study. More research is needed to explore the incredible potential of using internet-based motivational enhancement interventions to reach large numbers of adolescents and young adults.

Computer-based and computer-assisted interventions also have the ability to maximize the practical application of motivational enhancement interventions for adolescents and college students. Several recent studies have used motivational enhancement interventions that rely on computer-generated, personalized feedback (e.g. Monti *et al.* 1999, 2001a; Dimeff & McNeely 2000) containing visually appealing graphics designed to increase interest in reading and discussing the feedback itself. In the Monti *et al.* (1999, 2001a) studies, the assessment was interviewer-administered into a laptop computer with results printed out on an attached printer in the clinical setting, while in Dimeff & McNeely (2000), the assessment was self-administered using desktop computers in a student health clinic, with individuals having the option to print out their personalized graphic feedback and practitioners providing an intervention after the individual had printed out their feedback. In both cases, the software designed for delivering the personalized assessment feedback could, in theory, be exported easily to other settings that had similar samples of adolescents and young adults or college students.

A vital factor underlying the success of translating and exporting effectiveness research on motivational enhancement interventions has to do with the level of comfort and connection that researchers have with clinicians, administrators and public policy makers. Undoubtedly, the extensive and intensive workshops and trainings that Bill Miller, Steve Rollnick and their colleagues have conducted throughout the world have much to do with the success and impact of motivational interviewing on

the field. Their collective efforts have helped to make motivational enhancement interventions available, accessible, attractive and esteemed in the clinical community. Not only does this require considerable time and effort on the part of the clinical researchers who develop and test these interventions, but it is also requires evidence that training clinicians and practitioners in the community in the methods of motivational enhancement results in improved outcomes and is also conducted in the spirit of motivational interviewing. For example, several researchers have begun to examine changes in therapist behaviors following motivational interviewing training (e.g. Miller & Mount 2001) and levels of skill in applying motivational interviewing (Tappin *et al.* 2000; Barsky & Coleman 2001). More studies on how best to train clinicians and practitioners and with what methods should help increase confidence that the proliferation of motivational enhancement interventions has not only benefited its recipients but also had advanced the clinical science of the field itself. This is particularly relevant in the case of motivational enhancement interventions for adolescents, about which less is known.

Finally, dissemination of effectiveness research to larger public health contexts depends greatly on whether the targets are whole populations or high-risk subpopulations (Abrams & Clayton 2001). This leads to the issue of whether motivational enhancement interventions can be adapted to be preventive in nature, in addition to serving as preventive interventions (i.e. delivered after a triggering event, such as intoxication, getting into trouble with parents or at school because of drinking, etc.). Abrams & Clayton (2001) propose that primary prevention methods directed at whole populations be combined with screening for high-risk subgroups. These high-risk subgroups would then receive motivational enhancement interventions, and for those who have continuing or more severe problems the motivational interventions would be stepped-up to more intensive clinical interventions. In light of this recommendation, there is some evidence that front-loading and/or integrating motivational interventions onto pre-existing treatment for substance abuse results in improved outcomes (e.g. Barrowclough *et al.* 2001). Indeed, in a recent study conducted at our Center at Brown University (Rohsenow *et al.* 2004), we found that when we front-loaded a motivational intervention onto a more extensive coping skills training treatment for adult substance abusers, patients randomized to the motivational intervention prior to the more extensive treatment remained in treatment significantly longer than those who were randomized to a control condition.

With newer outcome trials on motivational enhancement interventions for adolescents and young adults being reported and published each year, there is increasing evidence of the efficacy and effectiveness of using

motivational interventions with adolescents. Given the recent evidence that front-loading motivational interventions onto pre-existing treatments for adult substance abuse results in patients' remaining in treatment longer and/or improved outcomes, front-loading motivational interventions onto adolescent treatments might prove fruitful, especially as compliance is of paramount importance with adolescence. How many motivational intervention sessions, for which adolescents, and onto what other treatments are, of course, all reasonable questions. Clearly, work is needed to understand the mechanisms of change of these combined interventions, to understand the impact of motivational interventions on adolescent developmental transitions and to understand how to disseminate these interventions meaningfully and effectively to those adolescents who need them most.

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