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# Client Commitment Language During Motivational Interviewing Predicts Drug Use Outcomes

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Client language from a motivational interview (MI) and drug use outcome were investigated. Interview videotapes of 84 drug abusers were coded for frequency and strength of utterances expressing commitment, desire, ability, need, readiness, and reasons to change or maintain their habit. Cluster analysis of proportion days abstinent (PDA) revealed 3 groups: high PDA at intake and follow-up (3, 6, 9, 12 months; maintainers); low intake PDA/high follow-up PDA (changers); and low intake PDA/low to moderate follow-up PDA (strugglers). Distinct group patterns emerged for commitment strength (CS) during MI. Clients dishonest in checklist self-report exhibited CS similar to strugglers. CS for client evaluation of a change plan predicted outcome PDA. CS was predicted by strength of desire, ability, need, and reasons, but more strongly predicted outcome PDA, suggesting CS is a pathway for their influence on behavior.

Encouraging client commitment to practice behavior leading to a favorable outcome is a goal of many therapeutic approaches (Mahrer, Gagnon, Fairweather, Boulet, & Herring, 1994). In their study, Mahrer et al. (1994) analyzed a large number of therapy session transcripts; commitments uttered by a client were identified and catalogued by clinical judges according to the mode of therapy used and purpose of their elicitation by the therapist. Over 16 different therapeutic approaches were found to evoke client commitments in a number of ways with the goal of either encouraging the client to change a target behavior or altering the client's general mode of perceiving daily living. One commonly observed method used to promote client verbal commitment to change involved therapist's exploration of the client's readiness and willingness to carry out certain postsession behaviors. This form of assessing and supporting client motivation for behavioral change is especially evident in client-centered approaches (Rogers, 1959), including motivational interviewing (MI; Miller & Rollnick, 1991), which has exhibited particular success in the treatment of alcohol use disorders (for a review, see Burke, Arkowitz, & Dunn, 2002).

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## MI

In MI, a client's degree of commitment to changing his or her substance use is viewed as a critical factor leading to behavioral change, and strengthening client commitment is therefore a critical task for the therapist. To accomplish this, the therapist typically explores the client's ambivalence regarding the pros and cons of change, focusing on motivational factors such as desire, self-efficacy, need, readiness, and reasons. The MI therapist then seeks to tip the perceived cost-benefit analysis by eliciting and differentially reinforcing client speech consistently with that person's motivation for and commitment to change. As motivation increases, the focus of MI shifts toward development and commitment to a change plan.

This progression from ambivalence to commitment to behavior change is mirrored in the stages of change described in the transtheoretical model of Prochaska and DiClemente (1982). In this model, the person enters the change process by moving from the precontemplation stage (not considering change) to the contemplation stage, weighing the costs and benefits of changing or maintaining their drug use. As ambivalence resolves into commitment, the person moves into the preparation stage. If strengthened and maintained, this commitment carries through to the action and maintenance stages, in which behavior change is initiated and stabilized. MI was originally conceptualized as guiding the client from precontemplation or contemplation into preparation and action by increasing motivation and commitment to change (Miller, 1983).

The practice of MI includes the therapist's use of various methods (e.g., open questions and reflective listening) to elicit increasing levels of client "change talk" and to minimize resistance (Miller & Rollnick, 2002). The strength of the client's perception of the importance of change and confidence in achieving it is presumed to underlie his or her commitment to change and to be evident in speech during an MI session.

## Client Commitment and Subsequent Behavior

Outside of the MI literature, an empirical connection between expressed client commitment and subsequent behavior has been reported for both medical problems (e.g., Finney, Friman, Rapoff, & Christopherson, 1985; Kulik & Carlino, 1987; Levy, Yamashita, & Pow, 1979; Putnam, Finney, Barkley, & Bonner, 1994; Wurtele, Galanos, & Roberts, 1980) and behavioral problems (e.g., Hall, Havassy, & Wasserman, 1990, 1991; Levy, 1977; Marlatt, Curry, & Gordon, 1988; McKay et al., 1999; Mussell et al., 2000). However, across these studies, there is a lack of consensus on an operational definition of *client commitment*. Some studies have defined it in terms of secondary effects, such as the client's prediction of treatment success, or of underlying dimensions, such as desire to quit and perceived difficulty to quit (e.g., Hall et al., 1990, 1991; Marlatt et al., 1988; Mussell et al., 2000). Others have defined it indirectly in terms of simple affirmative responses (vocal, written, or gestural) to a question (e.g., "Will you do this?"; Levy, 1977; "Will you promise. . .?"; Kulik & Carlino, 1987).

Marlatt et al. (1988) developed a measure of commitment to quit smoking that involved client selection of an abstinence goal from a set ranging ordinally in restrictiveness (e.g., *total abstinence*, *occasional use*, *controlled use*, *no goal*). This measure also assesses certain dimensions underlying commitment: desire to quit, perceived difficulty to quit, and expectancy to quit (the last two dimensions probe self-efficacy). This abstinence goal measure also reliably predicts length of remission in opiate and cocaine use (Hall et al., 1990, 1991) and in problematic eating behaviors (Mussell et al., 2000), but the underlying dimensions have met with mixed support among these studies. For example, Mussell et al. (2000) found reliable contributions for desire and expected success but not for predicted difficulty, whereas Hall et al. (1991) found a reliable contribution for expected success but not for desire or predicted difficulty. Finally, Marlatt et al. found that, immediately following initial assessment, smokers who ultimately quit exhibited greater desire and anticipated less difficulty in quitting than those persons who did not quit. After 2 years, only desire to quit remained greater for quitters than for nonquitters. Although implied by the nature of the measures used in these studies, what is not addressed directly is whether or how these underlying dimensions function in determining commitment strength.

## Analysis of Talk in Therapy

Although the studies discussed have relied on questionnaires to assess client commitment, a potentially richer source of information about the therapeutic process is the client talk arising in therapy. Language plays a central role in the delivery and potentially the success of "talk therapy" (Pea & Russell, 1987; Russell, 1987a, 1987b)—being the primary medium of informational exchange between therapist and client. Numerous taxonomies have been devised with which to assess the process of psychotherapeutic change from an initial problem state to one of improvement (see reviews by Gale, 1991; Russell, 1987a, 1987b; Siegfried, 1995). Most of these taxonomies have been either top-down—involving the reconstruction of the meaning of selected verbal exchanges often specific to a given therapeutic approach (e.g., for psychoanalysis, coding utterances as evidence for forms of anxiety: death, mutilation, shame, etc.; see Gottschalk, 1987; but cf. Stiles, 1987) or bottom-up—focusing on discursive properties of verbal and nonverbal events shaped by the conversational context of a therapy session without necessarily appealing to underlying client mental constructs (e.g., Mahl, 1987; Watson, 1995). Sample verbal events range from specific words, partial phrase repetitions, and conversational turns to extralinguistic aspects such as pauses and changes in intonation. Although both reconstructive and discursive analyses of therapeutic discourse have resulted in numerous detailed expositions, they have often failed to reliably predict (or even been used to predict) subsequent client behavior (Siegfried, 1995).

A major theme arising from criticisms of traditional reconstructionist analyses of therapist and client language is the importance of viewing client speech as a product of normal conversational principles rather than as a unique or pathological mechanism analyzable only through the lens of a clinical theory for the diagnosed disorder. By doing so, one can use the techniques of discourse analysis to reveal what the client is saying and how it informs therapeutic process (Mondada, 1998; Siegfried, 1995). The argument is also made explicitly in MI that verbal behaviors arising in therapy are ordinary behaviors and reflect normal phenomena such as ambivalence rather than unique pathological states such as denial (Miller & Rollnick, 1991).

One natural language structure that pervades discourse and, in particular, discourse between therapist and client, is the speech act. Speech acts, in general (see, e.g., Searle, 1977), are utterances that either describe a current state of affairs (statements) or change that state by inducing the therapist or client to alter immediate or latent behavior (e.g., verbal commitments, requests, threats, pronouncements). As such, speech acts offer critical cues to the therapeutic change process (Labov & Fanshel, 1977). Given the theoretical centrality of commitment as a determinant of behavioral change in MI, verbal commitments take on particular relevance. The assessment of verbal commitments provides an intermediate position on the reconstructionist–discursive dimension of therapeutic discourse analysis alluded to earlier: Whereas commitment and its underlying motivational and self-efficacy factors are the foci in promoting, assessing, and predicting the progress of a client in MI, utterances representing these language elements can be objectively observed in actual therapy talk.

## Nature of Verbal Commitments

Attempts to conceptualize client commitment in clinical studies share notions from speech act theory (Austin, 1962; Searle, 1969). Generally defined, a verbal commitment is some proposition or set of propositions that, when uttered, is understood by the speaker and listener(s) to obligate the speaker to perform some action in the future—for the hearer and/or for the speaker him- or herself (Austin, 1962; see also McCawley, 1977). In MI, for example, the client qua speaker may be jointly committing to the therapist and to him- or herself concerning changes in his or her drug use. This public nature of verbal commitments and the associated dissonance arising from noncompliance—perceived or previously experienced (Festinger, 1957)—has been offered as an explanation for improved behavioral compliance in several studies (see Kulik & Carlino, 1987; Rohen & Mayer, 1969).

Table 1
*Client Sample Demographic Information*

| Outcome group | Age, years *M* (*SD*) | Gender % | Designated drug % | Ethnicity % | Education, years *M* (*SD*) | Median annual income |
|---|---|---|---|---|---|---|
| Maintainers ($n = 30$) | 32.83 (6.54) | 33 male<br>67 female | 27 cocaine<br>34 crack<br>7 heroin<br>33 other[a] | 30 Anglo<br>60 Hispanic<br>3 African American<br>3 Native American<br>4 other[b] | 12.07 (2.33) | $7,500 |
| Changers ($n = 31$) | 33.77 (7.16) | 61 male<br>39 female | 23 cocaine<br>29 crack<br>39 heroin<br>9 other[a] | 29 Anglo<br>55 Hispanic<br>6 African American<br>10 other[b] | 11.71 (1.55) | $6,000 |
| Strugglers ($n = 14$) | 32.07 (5.59) | 57 male<br>43 female | 14 cocaine<br>29 crack<br>43 heroin<br>14 other[a] | 43 Anglo<br>43 Hispanic<br>14 African American | 12.29 (1.90) | $5,000 |
| Discrepants ($n = 9$) | 36.11 (10.59) | 78 male<br>22 female | 22 cocaine<br>33 crack<br>33 heroin<br>11 other[a] | 11 Anglo<br>56 Hispanic<br>11 Native American<br>11 Asian American<br>11 other[b] | 12.67 (1.50) | $5,640 |
| Overall ($N = 84$) | 33.40 (7.10) | 52 male<br>48 female | 23 cocaine<br>31 crack<br>27 heroin<br>19 other[a] | 30 Anglo<br>55 Hispanic<br>6 African American<br>2 Native American<br>1 Asian American<br>6 other[b] | 12.04 (1.91) | $6,330 |
| Group comparison | $F < 1$ | $\chi^2(3, N = 84) = 7.80, p > .05$ | $\chi^2(9, N = 84) = 13.06, p > .05$ | $\chi^2(15, N = 84) = 19.61, p > .05$ | $F < 1$ | $\chi^2(83, N = 84) = 14.27, p > .05$ |

[a] Other drugs were methamphetamines, speed, crank, marijuana, Percocet, Xanax, and codeine. [b] No ethnic group was listed.

Verbal commitments can vary in form, being direct (1) or indirect (2):

I'm determined to stop using. (1)

There's no question about quitting this time. (2)

Utterance 1 is direct because the committing nature of the utterance is conveyed by the explicit use of the predicate "am determined," one of a large number of predicates that appear in "performative" verbal commitments (e.g., Amrhein & Martinez, 1993; McCawley, 1977; Searle, 1989). Utterance 2 is indirect because the committing nature of the utterance must be inferred from its entire wording, involving determination of its conventionality in conveying a verbal commitment (Blum-Kulka, 1989). In addition, for a direct verbal commitment, what is said also conveys what is intended (speaker taking on obligation) and what should follow (speaker discharging obligation) in a straightforward manner, whereas in the case of an indirect verbal commitment, this conveyance relies much more on the conversational context in which it was encountered.

Verbal commitments can vary in strength (Amrhein, 1992; Furberg, 1971; Sbisa, 2001; Searle, 1977). For example, the verbal commitment expressed in Utterance 1 is stronger than that expressed in Utterance 3 and likely stronger than Utterance 2 (see Brown & Levinson, 1987).

I'll try to stop using. (3)

Differences in strength are important because they give rise to different levels of expectation that the mentioned act will indeed be carried out in the future. We would expect that after Utterance 1 the speaker would be more likely to stop using drugs than after Utterance 3 or 2.

What ultimately determines the strength of a verbal commitment, direct or indirect? Assuming a sincerely uttered commitment, its strength is influenced by a range of factors composing what Searle (1969, 1977, 1989; see also Audi, 1986) has termed "sincerity conditions"—speaker willingness and ability, and "preparatory conditions," including speaker perception of need—in

Table 2
*Sample Coded Utterances*

| Category | Strength value |
|---|---|
| Commitment | |
| "I won't be using." | 4 |
| "If it wasn't for the anxiety, I wouldn't fix at all." | 0 |
| "Why suffer, why should I get sick? I could get high." | −2 |
| Desire | |
| "Well, I want to quit doing drugs." | 5 |
| "I mean I want to but I don't want to [quit]." | 0 |
| "I really like the whole, the whole ritual of doing it, you know." | −4 |
| Ability | |
| "I can do it. . .this is doable." | 4 |
| "If I could get rid of these drugs. . . " | 0 |
| " . . .okay well, I can do some [drugs] myself." | −3 |
| Need | |
| "I need to stop." | 4 |
| "I don't need to turn to alcohol or anything." | 0 |
| "Cause I need it everyday." | −5 |
| Readiness | |
| "I'm ready to do this." | 5 |
| "I'm not too ready to ask for help." | 0 |
| " . . .thought, well, when I'm ready, I'll go up on my methadone and I'll quit [heroin]." | −2 |
| Reasons | |
| "I'm killing myself." | 5 |
| "It bothers me when I can't do things right." | 0 |
| "I get relaxed. My problems go away." | −4 |

this case the speaker's own—to carry out the specified action.[1] Indeed, variance in the strength of commitment conveyed by verbs in direct verbal commitments can be traced to some of these factors; specifically, the polarity of speaker desire and ability. Positive instances of each strengthen commitment strength; negative instances weaken it (Amrhein, 1992). Of course, not only can these speaker intentions be affirmative or negative, speaker intentions can vary in strength. For example, with regard to desire to change drug use, a client might utter "I might want to change" or, more strongly, "I really want to stop using." With regard to perceived ability, a client might utter "I can't do this on my own" or, more strongly, "I'm able to quit." Collectively, then, the valence and strength of speaker intentions should contribute to the ultimate strength of the verbal commitment.

## Purpose of the Present Study

To the best of our knowledge, no study to date has assessed client commitment language—its frequency of occurrence or strength—as it arises naturally in the course of a psychotherapy session or client commitment language's capacity to predict subsequent behavior change. Mahrer et al. (1994) assessed the prevalence of commitment language arising during a therapy session; however, their purpose was solely to categorize the occurrence of such language according to therapeutic approach and not to assess its role in the therapeutic process (across or within therapies) or as a prognostic factor. Merely counting the occurrences of verbal commitments in psychotherapy may not predict treatment outcome. Indeed, the occurrence frequency of various language structures has not generally accounted for much of behavioral outcome (Siegfried, 1995). Moreover, most instruments assessing extent of commitment have focused primarily on behavior change, without also considering commitment to maintain the status quo. A notable exception is found in decisional balances measures of the pros and cons of change (Janis & Mann, 1977). Measuring strength of commitment language is a particularly appropriate way to assess the dynamic events in MI, given that strengthening client commitment to change is the stated primary goal of this approach. Bivalent measurement of speech acts in therapy also allows for direct observation of ambivalence, a central construct in understanding MI and stages of change.

The basic aim of this collaboration of a psycholinguist (Amrhein) with clinical psychologists (Miller and Yahne) was to explore the connection between what a client says during MI and what a client does following MI. This was accomplished through a series of complementary statistical analyses. On the basis of videotaped MI sessions of drug-abusing clients, we coded transcriptions for the occurrence and strength of commitment language utterances as well as utterances pertaining to underlying factors concerning client desire, perceived ability, need, reasons, and readiness to change (or maintain) drug use. Preliminary analyses identified specific behavioral outcome groups. We then examined whether clients with these different behavioral outcomes following MI had exhibited systematic differences in patterns of commitment

[1] Although not addressed explicitly by Searle, reasons for a speaker to make a verbal commitment would also appear to be presuppositions for its utterance, whereas readiness to make it could be seen as a final, enabling aspect arising when the other factors are positive.

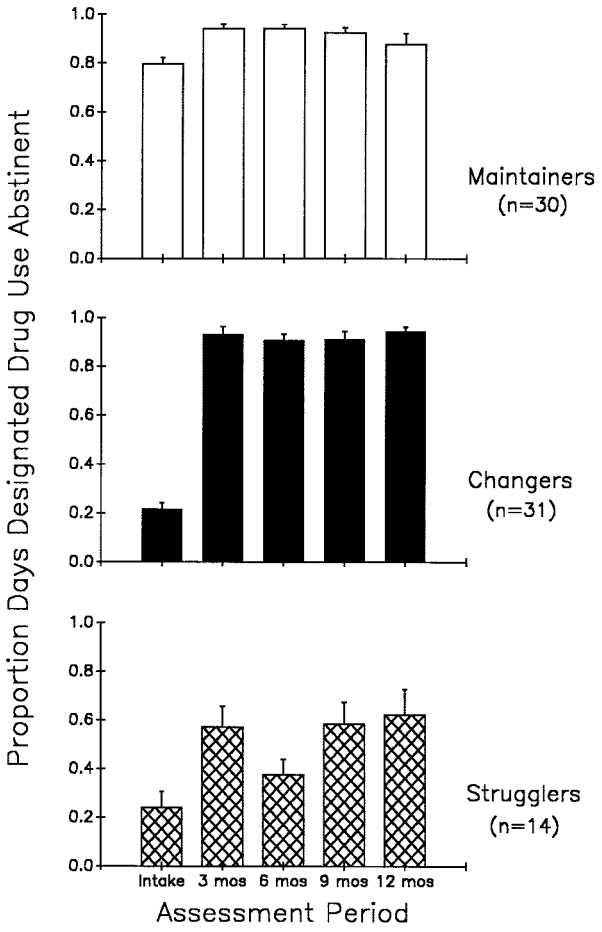


*Figure 1.* Mean days abstinent from designated drug use (with standard errors) plotted as a function of outcome group cluster and assessment period.

language frequency or strength during MI. Because different phases of the manual-guided MI session were associated with predictable therapeutic operations, we could also study whether clients' outcomes were more predictable from their responses (in commitment language) to particular portions of MI. Further analyses were conducted to ascertain whether specific cognitive (e.g., self-efficacy; Bandura, 1977, 1978, 1986, 1997) or emotive components of motivation (e.g., desire, need) were most predictive of behavior change (cf. Curry, Wagner, & Grothaus, 1990). Of particular interest was whether commitment strength is a stronger predictor of behavioral outcome than the individual strengths of its underlying dimensions (Marlatt et al., 1988), assessed here through their corresponding language realizations. Relatedly, we studied whether the utterance strength of these presumed-to-be-underlying factors does indeed influence commitment strength. In combination with the preceding analyses, this provided a test of our view of commitment strength as being a construct that not only establishes personal and public obligation to change one's drug using behavior but also facilitates that change.

## Method

### *Clients*

Client participants in this report were 84 persons presenting for treatment of a variety of illicit drug use disorders at a public inpatient or outpatient treatment program. They represented an analyzable subset of 103 clients who had been randomly assigned to receive MI with 1 of 12 therapists participating in the parent clinical trial (Miller, Yahne, & Tonigan, 2003). Of the 103 MI clients, data from 16 were excluded because of nonexistent, incomplete, or faulty interview videotapes. Three others excluded had failed to return for any postintake assessments, thus providing no outcome data. Demographic characteristics of the sample are summarized in Table 1.

### *Determination of Drug Use Outcomes*

Client drug use was assessed at pretreatment baseline and at 3, 6, 9, and 12 months from intake. Self-reported drug use was assessed with the structured Form 90D interview (Miller, 1996). Usually the interviews were done in person, but they were also conducted by telephone when a personal interview was not feasible at follow-up. Reliability of the Form 90 interview has been shown for both the alcohol (Form 90A; Miller, 1996; Tonigan, Miller, & Brown, 1997) and the drug version of this interview (Westerberg, Tonigan, & Miller, 1998). As a check on self-report, eight-panel urine drug screens were also obtained at each assessment point.

### *Videotape Transcription and Coding*

Under conditions of informed consent, approved by the University of New Mexico Health Sciences Center Human Research Review Committee, each client was videotaped during a single MI session. Across clients, these sessions lasted from 45 to 90 min.[2] The camcorder was positioned in the interview room so as to capture images of the therapist and client. Videotapes were labeled, without reference to client identity or residence, and were kept in locked storage at the Center on Alcoholism, Substance Abuse and Addictions. Each videotape was transcribed with the occurrence of each utterance marked according to a videocassette recorder counter. Two graduate students (Palmer and Fulcher)—unaware of the identity or intake and outcome measures of the clients—independently coded the transcripts according to the following procedure: Codable utterances were those in which the client provided a thoughtful reflection in response either to therapist inquiries or comments or in an unsolicited, spontaneous manner. Such utterances could consist of a few words or several phrases or sentences—whichever was used to convey a "thought unit" on a certain topic of discussion. However, simple or brief acquiescent replies by clients were excluded (e.g., the therapist says, "Sounds like you're ready for a change," to which client responds with the terminal comment, "Yeah"). Codable client utterances were categorized as examples of commitment, desire, perceived ability, need, readiness, or reasons statements (see Table 2; for committing utterances, cf. Mahrer et al., 1994). Once categorized, each utterance was assigned a strength value, which ranged from −5 to 5, in which a negative value reflected client bias toward continued drug use and a positive value reflected client bias toward a reduction in drug use. Independent of valence, the stronger the utterance, the larger the strength value assigned to it.

[2] This variability depended primarily on client verbosity, which we demonstrate does not impact behavioral outcome. All therapists carefully followed the manual-based protocol for the MI session, with critical topics (see Figure 2) consistently introduced in the same order to all clients (for more on treatment fidelity concerning this study, see Miller et al., 2003).

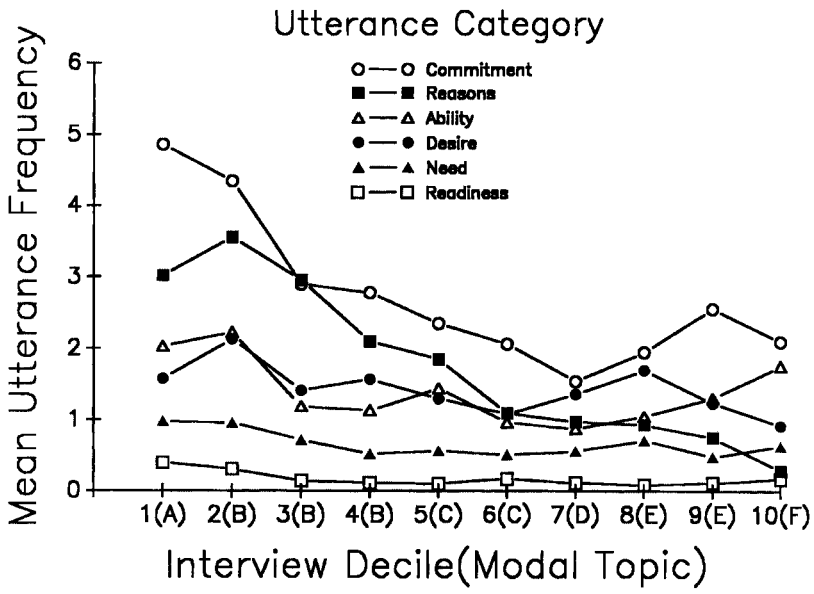


*Figure 2.* Mean utterance frequency plotted as a function of outcome group, language category and decile epoch. Note: Modal topics are as follow: A: What brought the client to motivational interviewing? B: What is good and/or bad about the client's drug use? C: What is the client's general population percentile rank for drug use? and/or What are the negative consequences of the client's drug use? D: Is the client ready for change? E: What would constitute a plan for client change? F: How would the client know whether the plan is working? and/or What might interfere with its implementation?

Transcript codes were then sorted by category and divided according to decile of occurrence for each client (using VCR counter values)—in this manner, videotapes of varying duration were standardized. For each client, codes from each rater were entered into a 6 (category) $\times$ 10 (decile) matrix. Two forms of interrater agreement were then computed from these matrices across the utterance codes: intercategory assignment and intracategory strength. Proportion of agreement between the coders with regard to category assignment of utterances within each decile across the 84 clients was .86 (Cohen's $\kappa = .80$). The overall interrater correlation for averaged strength (a continuous variable) within each category and decile for these clients was .83. Per client, the data to be analyzed consisted of two 6 (language category) $\times$ 10 (decile) matrices, one reflecting mean utterance frequencies and the other mean utterance strength values, averaged over coders. For each client's utterance strength matrix, estimated values were imputed for empty cells using an expectation-maximization algorithm (see Little & Rubin, 1987) that was applied blind to behavioral outcome and other client nonlanguage variables.

## Results

### *Treatment Outcome Clusters*

To test hypotheses concerning language category frequency and strength, and their relationship to behavioral outcome, we conducted a cluster analysis (BMDP KM) on the information provided by the Form 90D concerning the percentage of days abstinent a given client was for 90-day periods, commencing with intake and followed by the four consecutive assessment periods of 3, 6, 9, and 12 months. Three basic patterns of outcome were isolated: (a) high abstinence at intake followed by continued high abstinence through 3, 6, 9, and 12 month follow-up assessments (maintainers), (b) low abstinence at intake followed by high abstinence through follow-up assessments (changers), and (c) low abstinence at intake followed by low to moderate unstable abstinence through follow-up assessments (strugglers). The three outcome-group patterns are shown in Figure 1.

In quantitative terms, these outcome groups differed as follows: At intake, the changer and struggler groups had significantly lower proportion days abstinent (PDA) for their designated drug of choice (.22 and .24, respectively) than the maintainer group (.80), which showed relatively high rates of pretreatment PDA, $F(2, 72) = 109.08$, $p < .01$, $MSE = 0.03$. Over 3, 6, 9, and 12 months after MI, the struggler group attained only a modest level of PDA (.54) compared with the maintainer and changer groups (.92, for each group, $F(2, 72) = 68.87$, $p < .01$, $MSE = 0.05$. Within-group deviations for values of PDA did not vary reliably over follow-up periods, all $p$s $> .16$. These PDA values are displayed in Figure 1. As mentioned earlier, there were 9 clients who exhibited one or more discrepancies between their Form 90D self-report of complete abstinence and a drug-positive UA sample. On the basis of self-report information alone, 7 of these clients would have been assigned by the cluster analysis to the struggler group and the remaining two clients to the changer group. These clients were treated as a separate fourth group (discrepant). The four outcome groups did not differ reliably on any other examined variables including age, gender, designated drug, ethnicity, annual income (see Table 2), voluntary versus coerced referral status, amount of extra-study treatment received, therapist assignment, or inpatient versus outpatient treatment site (with chi-square tests, all $p$s $> .05$).

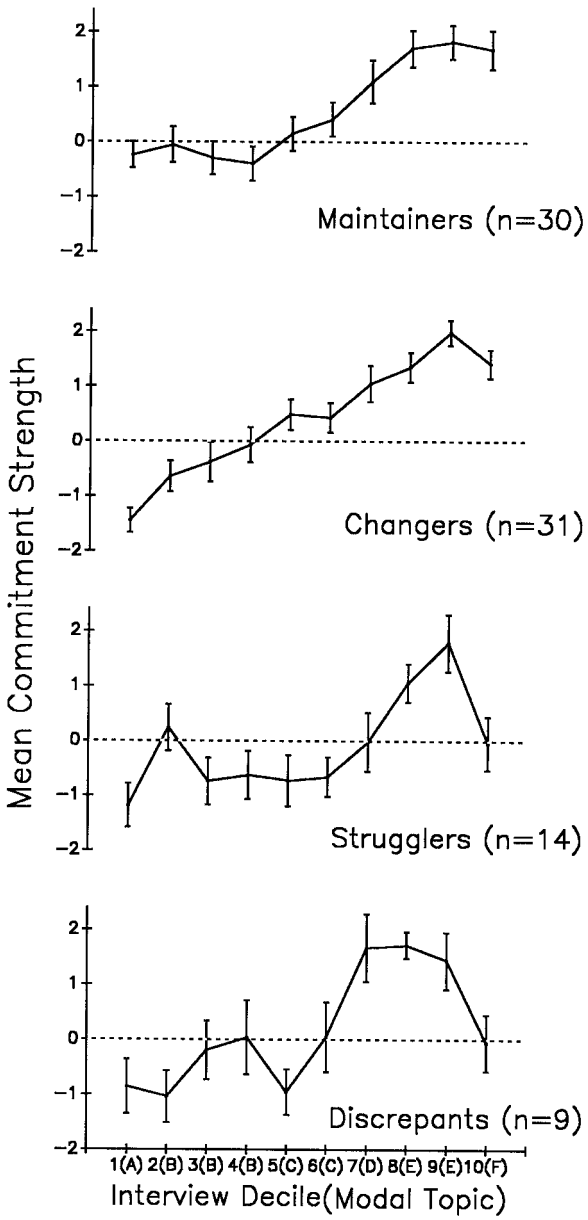


*Figure 3.* Mean commitment strength (with standard errors) is plotted as a function of outcome group and decile epoch. Note: Negative values indicate commitment to maintain the designated drug habit; positive values represent commitment to decrease or stop that habit. Modal topics are as follow: A: What brought the client to motivational interviewing? B: What is good and/or bad about the client's drug use? C: What is the client's general population percentile rank for drug use? and/or What are the negative consequences of the client's drug use? D: Is the client ready for change? E: What would constitute a plan for client change? F: How would the client know whether the plan is working? and/or What might interfere with its implementation?

### *Behavioral Outcome and Client Utterance Frequency*

Do these outcome groups differ in utterance frequency across language categories during MI? To provide an answer to this general question, we conducted a 4 (outcome group) × 6 (language category) × 10 (decile) mixed-participant, factorial analysis of variance (ANOVA). Frequencies are presented in Figure 2, plotted according to these factors averaged over clients within group. Outcome groups did not differ in their overall utterance frequency, with .41 utterances per language category and decile, $F < 1$. However, there were significant differences in frequencies among the language categories, $F(5, 400) = 138.86$, $p < .01$, $MSE = 4.08$, with commitment language uttered most often per decile (2.86), followed by reasons (1.85), ability (1.48), desire (1.46), need (0.68) and readiness (0.16). Also, client utterance frequency per decile generally decreased from the beginning (2.13) to the end (1.00) of the MI, $F(9, 720) = 26.78$, $p < .01$, $MSE = 3.68$. This finding is consistent with other clinical interviews (Soyland, 1995) and may reflect greater attentiveness by the client to the therapist. Finally, the Language Category × Decile interaction was significant, $F(45, 3600) = 10.44$, $p < .01$, $MSE = 1.84$. As can be seen in Figure 2, this interaction is due to a general convergence in the reduction in utterance frequencies of the language categories across deciles. Remaining interactions from this analysis were statistically nonsignificant (all $p$s $> .05$). Collectively, this analysis reveals that utterance frequency does not discriminate among different patterns of behavioral outcome exhibited by these clients. Because of the low number of readiness utterances per decile, this category was excluded from further analyses; possible reasons for their relatively low occurrence are discussed later in this report. Moreover, remaining analyses treat commitment language—the theoretical focus of this study and most frequently occurring type—as the primary language category for analysis; secondary analyses are then presented in which the other language categories are treated as representing its underlying dimensions.

### *Behavioral Outcome and Commitment Language Strength*

Commitment language strength was analyzed using a 4 (outcome group) × 10 (decile) mixed-participants, factorial ANOVA. Commitment language strength values are plotted in Figure 3, averaged over clients within outcome group. In the panels of this figure, commitment strength falling below the dotted zero line indicates commitment toward continued drug use, whereas commitment strength rising above this line indicates commitment toward change; means falling on or near the dotted line indicate a noncommittal stance. The four outcome groups differed in commitment strength, $F(3, 80) = 3.14$, $p < .05$, $MSE = 5.14$, with the maintainer group exhibiting the greatest strength in commitment to change followed by the changer, discrepant, and struggler groups. Overall, commitment strength generally increased across the session, $F(9, 720) = 20.95$, $p < .01$, $MSE = 2.47$; however, reliable group-specific patterns were observed, $F(27, 720) = 1.54$, $p < .05$, $MSE = 2.47$.

There were three particular deciles in which reliable group differences were observed: 1st, $F(3, 80) = 4.42$, $p < .01$, $MSE = 2.66$; 5th, $F(3, 80) = 3.06$, $p < .05$; $MSE = 2.57$, and 10th, $F(3, 80) = 5.01$, $p < .01$, $MSE = 2.90$. At the beginning of the session (1st decile), the changer, struggler, and discrepant

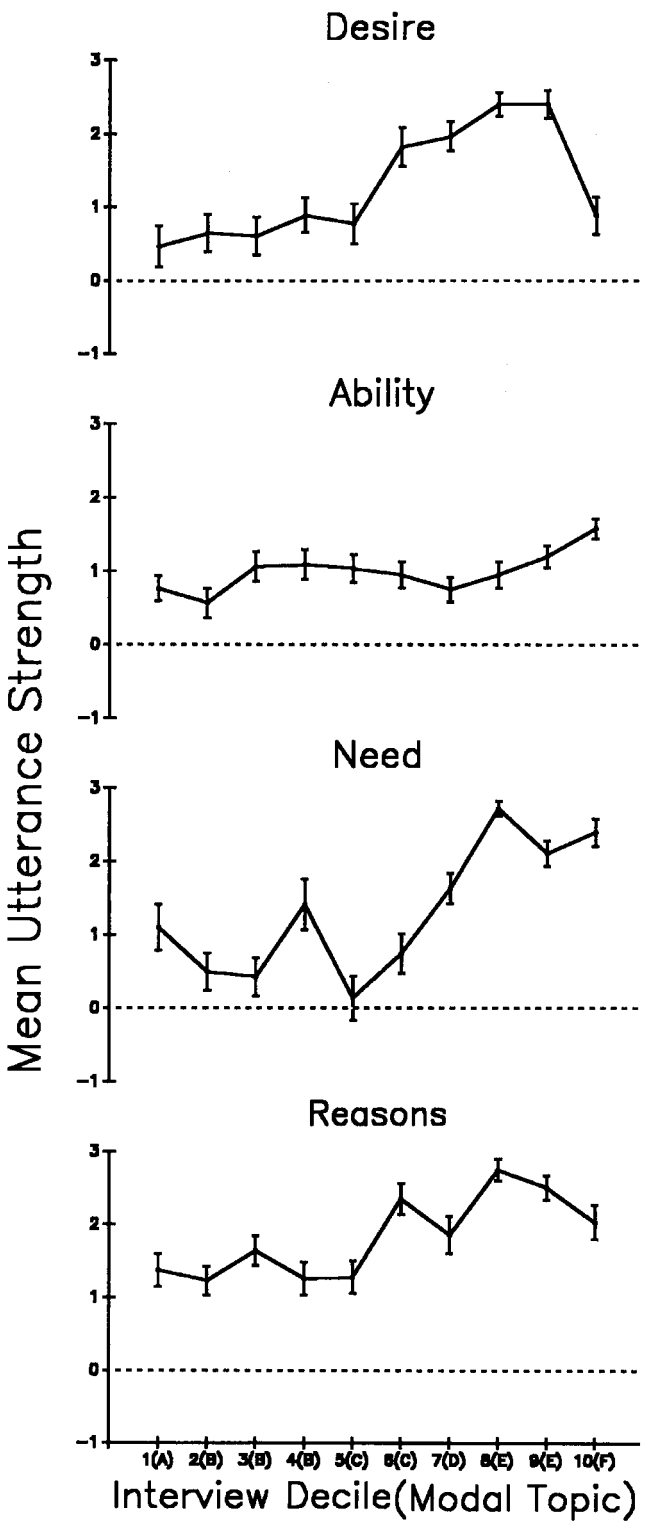


*Figure 4.* Mean utterance strength (with standard errors) is plotted as a function of language categories (representing dimensions underlying commitment) and decile epoch. Note: Negative values indicate strength in maintaining the designated drug habit; positive values indicate strength in decreasing or stopping that habit. Modal topics are as follow: A: What brought the client to motivational interviewing? B: What is good and/or bad about the client's drug use? C: What is the client's general population percentile rank for drug use? and/or What are the negative consequences of the client's drug use? D: Is the client ready for change? E: What would constitute a plan for client change? F: How would the client know whether the plan is working? and/or What might interfere with its implementation?

groups, which were equivalent ($F < 1$), differed significantly from the maintainer group, $F(1, 82) = 11.92$, $p = .009$, MSE = 1.75, by exhibiting greater strength in commitment toward their drug habit; by contrast, the maintainer group fell near the noncommittal line. By the middle of the session (5th decile), the maintainer and changer groups showed equivalent commitment strength ($F < 1$) that was significantly greater, $F(1, 82) = 9.94$, $p < .01$, MSE = 2.38, than that of the struggler and discrepant groups, which did not differ reliably, $F < 1$. That is, by midsession the maintainer and changer groups were evidencing commitment to change, whereas the groups with less favorable outcomes (strugglers and discrepants) exhibited continued commitment toward drug use. Finally, at the end of the interview (10th decile), the equivalent maintainer and changer groups ($F < 1$) again exhibited significantly greater commitment strength, $F(1, 82) = 14.95$, $p < .01$, MSE = 2.84, than the similarly ambivalent struggler and discrepant groups ($F < 1$). Group differences at the remaining deciles were statistically nonsignificant, all $p$s $> .15$.

Collectively, these group differences and similarities in commitment strength across the session indicate that MI elicits reliable differences in the language strength of clients, which in turn is predictive of subsequent behavioral outcomes. For example, maintainer clients initially exhibit a noncommital level of strength until the 5th decile, at which point commitment proceeds to increase nearly to the end of the session. In contrast, the struggler and discrepant groups clearly exhibit commitment to the drug habit both at the beginning and middle of the session. Although commitment strength does increase in the direction of change for these groups after the 6th decile, it plummets to a noncommittal level at the end of the session. The changer group functions as a transition group in comparison to the others: Initially, commitment strength is decidedly in favor of the drug habit and equivalent to that of the groups with poorer outcomes; however, by the middle of the session, it is clearly rising toward change and eventually becomes equivalent to that of the maintainer group by the end of the session.

What was happening during these deciles within the MI session? At the outset of the session (see Figure 3), the client was invited to discuss their reasons for seeking treatment—typically by describing how their life had been affected by their drug use. Here the maintainers, who were already manifesting a high level of abstinence (PDA), evidenced significantly less commitment to continued drug use relative to the other groups. At the midpoint of the session, clients had been receiving personal assessment feedback about their drug use level relative to the general population (all clients easily fell above the 95th percentile for the U.S. population) and its adverse conse-

quences, and they were responding to this feedback. At this point, a separation occurred among the groups: Those who have poorer behavioral outcomes (strugglers and discrepants) maintained or increased their commitment to the status quo, even in the face of such negative information, whereas the maintainers and changers exhibited increased commitment to changing their drug use. This pattern may be related to level of client equivocality or ambivalence, a topic discussed in the Discussion. Groups then closed ranks in the 8th and 9th deciles, a period during which the therapist encouraged the client to devise a plan with which to change his or her behavior; such "plan talk" substantially increased client commitment. This all changed, however, at the very end of the session, when the therapist queried the clients about how they would monitor the success of that change plan if it was implemented and what might interfere with that success. It is the strength of client commitment language during this phase of MI that most clearly discriminates the outcome groups. For the struggler and discrepant clients, discussion of the change plan led to neutralization of their prior movement toward commitment to change. For the ultimate changers and maintainers, in contrast, the increasing strength of commitment in earlier deciles is sustained through discussion of the change plan.

Unlike commitment language, the strength of other language categories, assessed separately in a series of 4 (outcome group) $\times$ 10 (decile) ANOVAs, did not exhibit reliable differences among the outcome groups. Specifically, strength-of-desire language generally increased, especially after the 5th decile until the 10th decile, at which point it exhibited a distinct drop, $F(9, 27) = 9.91$, $p < .01$, $MSE = 4.50$—perhaps reflecting the client's realization of the daunting change work ahead in implementing the change plan being discussed. Reliable between-group differences concerning this pattern were not observed (all $F$s $< 1$). "Strength of ability language" exhibited a modest increase across session decile, $F(9, 27) = 2.49$, $p < .01$, $MSE = 2.45$, again without reliable group differences during the MI overall, $F(3, 80) = 1.26$, $p$ .30, $MSE = 4.88$, or across session deciles ($F < 1$). Strength-of-need language likewise exhibited a general increase across the MI session, especially after the 5th decile, $F(9, 27) = 9.33$, $p < .01$, $MSE = 5.18$, without reliable overall or decile separation of outcome groups ($F < 1$). The same pattern was manifest in strength-of-reasons language that increased gradually, accelerating after the 5th decile, $F(9, 27) = 5.58$, $p < .01$, $MSE = 3.65$; again group differences were neither reliable nor significant in their interaction with decile (both $F$s $< 1$). Because none of these language categories differentiated outcome groups, Figure 4 shows their pattern of change across session deciles for the full sample. When contrasting language categories, overall strengths for each differ reliably, $F(3, 240) = 14.55$, $p < .01$, $MSE = 6.02$, with reasons to change strongest followed by need, desire, and ability. However, as can be seen in Figure 4, there are reliable differences in the pattern of strength increase across deciles among the language categories, $F(27, 2160) = 4.17$, $p < .01$, $MSE = 3.61$, indicating that each category provides distinct information. Although all language categories consistently exhibited strength toward change (i.e., above the zero line in Figure 4), affective motivational components (desire, need, and reasons) increased more during MI than did self-efficacy (ability). In sum, consistent with previous studies (cf. Hall et al., 1990, 1991; Marlatt et al., 1988; Mussell et al., 2000), language dimensions underlying commitment—here represented by four language categories—are not robustly related to behavioral outcome, but they still provide generally useful information.

### *Commitment Language Strength as a Predictor of Behavioral Outcome*

Although it is informative to demonstrate that when client outcome is known, language differences are observed, it is also useful to know how well commitment language strength can predict outcome. Accordingly, a stepwise logistic regression (BMDP LR) was performed with commitment language strength within each decile as the predictor and outcome group as the dependent measure. This analysis assessed commitment language strength as it corresponds to modal topics being addressed within deciles and tested whether clients' reactions to specific events in MI function as predictors of eventual behavioral outcome. Although a multinomial logistic regression could be performed using the four outcome groups just analyzed, a simpler analysis would involve determining the role of commitment language strength in predicting outcome regardless of self-reported drug use at intake. Therefore, to conduct this analysis, we simplified outcome group to two categories, good outcome and poor outcome. The good-outcome group was formed by collapsing the changer and maintainer groups ($n = 61$); the poor outcome group was formed by collapsing the struggler and discrepant groups ($n = 23$).

Analogous to the results of the ANOVA performed on the four outcome groups presented earlier, the 10th decile reliably improved prediction of outcome; however, in contrast, the 5th decile did not (although still exhibiting a trend, $p < .10$). Finally, the 7th decile also improved prediction ($p = .05$; see Table 3). These differences highlight the usefulness of analyzing the relation between commitment strength and behavioral outcome in different ways. Whereas the previously presented ANOVAs assessed the four outcome groups for differences from some average pattern in language strength, the stepwise logistic regression isolates variance sources among the decile predictors in accounting for a binary outcome in individual clients. For example, the stepwise logistic regression indicates that variance accounted for by the 10th decile subsumes much (but not all) of the variance accounted for by the 5th decile—even though these two deciles were only modestly correlated ($r = .32$).[3] In short, the clients contributing to group differences at the 5th decile in Figure 3 are also contributing to group

[3] Indeed, decile intercorrelations (all $r$s $< .41$) were clearly below the conventional value (.75) that suggests possible multicollinearity (see Tabachnick & Fidell, 2001).

differences at the 10th decile, in which poor outcome clients are exhibiting drops in commitment strength to change (even dropping toward maintaining the drug habit).[4] Said another way, clients whose commitment strength weakens at the end of the session (when discussing a change plan) were already showing a drop in their commitment to change (if not retrenchment toward drug-use maintenance) in midsession (5th decile).

In terms of classification, 84.5% of the clients were correctly assigned to their outcome group (see Table 4). Specificity for this test was 91.8% (56/61), whereas sensitivity was 65.2% (15/23). This high level of goodness of fit between actual outcome group and outcome group predicted by commitment strength across decile is supported by a Hosmer–Lemeshow's test, $C(8) = 9.03$, $p = .34$, indicating that deviation from prediction was statistically nonsignificant (see Hosmer & Lemeshow, 2000). Correct prediction from base rates alone (predict all good outcomes) would be 72.6%.

Strength of language categories representing underlying dimensions of commitment did not predict behavioral outcome as well. Overall, with all deciles retained, desire, ability, need, and reasons language exhibited lower levels of classification accuracy ($M = 76.8\%$, range = 72.6%–79.8%) relative to commitment language (84.5%). More specifically, although these language categories exhibited high levels of specificity ($M = 95.9\%$, range = 91.8%–100%), with each being quite good in predicting clients who would have good outcome, they showed strikingly poorer sensitivity in predicting poor outcomes ($M = 26.1\%$, range = 21.7%–34.7%) relative to commitment language (65.2%). Thus, in terms of these analyses, what distinguishes strength-of-commitment language from that of its underlying dimensions as the most potent predictor of behavioral outcome is its greater sensitivity to predict who will not succeed well after MI. Relatedly, there were generally fewer statistically significant decile predictors observed in these analyses. In terms of improvement in chi-square tests, only the 10th decile was reliable for ability, $\chi^2(1, N = 84) = 16.71$, $p < .01$, and need, $\chi^2(1, N = 84) = 18.29$, $p < .01$, language; whereas only the 8th decile was reliable for reasons language, $\chi^2(1, N = 84) = 17.18$, $p < .01$. Desire language strength did exhibit two reliable predictors, the 9th, $\chi^2(1, N = 84) = 17.01$, $p < .01$, and 10th, $\chi^2(1, N = 84) = 5.99$, $p < .02$, deciles; however, the collective contribution of these two deciles falls short of the improvement in chi-square observed for commitment language (in the 7th and 10th deciles, $\chi^2[1, N = 84] = 30.79$, $p < .01$).[5]

Table 3
*Stepwise Logistic Regression of Good and Poor Outcome Groups With Commitment Language Strength Within Decile as Predictor (N = 84)*

| Decile (modal topic) in order of regression solution | *B* | *SE B* | $\Delta\chi^2(1, N = 84)$ |
|---|---|---|---|
| 10(F) | .49 | .20 | 27.06** |
| 7(D) | .11 | .16 | 3.73* |
| 5(C) | .76 | .30 | 2.81† |
| 8(E) | .47 | .21 | 2.94† |
| 2(B) | −.30 | .22 | 1.59 |
| 3(B) | −.37 | .23 | 1.15 |
| 1(A) | .36 | .25 | 2.37 |
| 6(C) | .28 | .25 | 1.96 |
| 4(B) | −.12 | .19 | .36 |
| 9(E) | .01 | .19 | .01 |

*Note.* Modal topics are as follow: A = What brought the client to motivational interviewing? B = What is good and/or bad about the client's drug use? C = What is the client's general population percentile rank for drug use? and/or What are the negative consequences of the client's drug use? D = Is the client ready for change? E = What would constitute a plan for client change? F = How would the client know whether the plan is working? and/or What might interfere with its implementation? Overall $\chi^2(9, N = 84) = 43.97$, $p < .01$.
† $p < .10$. * $p \leq .05$. ** $p < .01$.

Table 4
*Behavioral Outcome Group Classification*

| | Obtained | |
|---|---|---|
| Predicted | Good | Poor |
| Good | 56 | 8 |
| Poor | 5 | 15 |

*Note.* Total cases correctly predicted: 71/84 = 84.5%; specificity: 56/61 = 91.8%; sensitivity: 15/23 = 65.2%.

The logistic regression analyses reported here were performed on two behavioral outcome groups, which necessitated collapsing across clients who varied in their self-reported drug use at intake (i.e., the maintainer and changer groups). A further question is whether commitment language strength provides predictive value above and beyond that of information concerning drug use at intake. Behavioral baseline information is itself a potent predictor of future drug use (e.g., McKay et al., 1999). Thus, it is possible that commitment strength is simply redundant to intake drug use information; in fact, one could argue that commitment strength expressed during MI merely reflects the client's views on their recent-past drug use.

To conduct this test, we carried out a stepwise multiple regression (BMDP 2R) treating behavioral outcome as a continuous dependent variable, without regard to outcome groups. For each client, a mean value was computed from his or her reported PDA for the four follow-up sessions at 3, 6, 9, and 12 months. Casting behavioral outcome in this manner required the exclusion of the data from the discrepant clients whose self-reports were known to be unreliable, reducing the sample size from 84 to 75 clients. Predictors entered into this analysis were drug use at intake (PDA for prior 90 days) and decile. For demonstrative purposes, all predictors, reliable or not, were retained. The results of this analysis are shown in Table 5, with predictors listed in decreasing order of influence. Although drug use at intake clearly accounted

[4] In fact, when the 10th decile was removed from analysis as a predictor, the 5th decile reliably improved chi-square; $\chi^2(1, N = 84) = 6.88$, $p < .01$.

[5] Even when all five reliable predictors from these underlying dimensions are entered collectively, the result, $\chi^2(4, N = 84) = 25.25$, $p < .01$, still falls short of the combined predictability of the 7th and 10th deciles for commitment language.

Table 5
*Stepwise Regression of Self-Reported Abstinence over 3-, 6-, 9- and 12-Month Follow-Up Assessments with Drug-Use at Intake and Commitment Language Strength Within Decile as Predictors (N = 75) (All Predictors Retained)*

| Predictor order in regression solution | *B* | *SE B* | $\beta$ | $\Delta R^2$ |
|---|---|---|---|---|
| Drug use at intake | .18 | .07 | .32 | .14** |
| Commitment language strength, decile (modal topic) | | | | |
| 10(F) | .02 | .01 | .23 | .05* |
| 7(D) | .02 | .01 | .22 | .05* |
| 2(B) | −.01 | .01 | −.12 | .02 |
| 5(C) | .02 | .02 | .15 | .01 |
| 6(C) | −.01 | .02 | −.07 | .01 |
| 8(E) | .01 | .02 | .11 | .00 |
| 3(B) | −.01 | .02 | −.08 | .01 |
| 9(E) | −.00 | .02 | −.03 | .00 |
| 1(A) | −.00 | .02 | −.03 | .00 |
| 4(B) | .00 | .01 | .01 | .00 |

*Note.* Modal topics are as follow: A = What brought the client to motivational interviewing? B = What is good and/or bad about the client's drug use? C = What is the client's general population percentile rank for drug use? and/or What are the negative consequences of the client's drug use? D = Is client ready for change? E = What would constitute a plan for client change? F = How would client know whether the plan is working? and/or What might interfere with its implementation? Overall $R^2 = .29$, $F(11, 63) = 2.27$, $p < .05$.
* $p < .05$ (based on $F[1, 63]$). ** $p < .01$.

for a sizeable amount of the variance in averaged behavioral outcome, so did commitment language strength at the 10th and 7th deciles. Constraining the stepwise regression to retain only reliable predictors (i.e., drug-use at intake and 10th and 7th deciles), overall $R^2$ remained at .24, $F(3, 71) = 7.43$, $p < .01$.[6]

Therefore, commitment language strength does indeed account for behavioral outcome beyond information concerning drug use at intake, corroborating the results of the corresponding stepwise logistic regression (and, in so doing, reinforcing the finding that the 7th decile—the interval in which the readiness topic is broached—significantly accounts for additional variance beyond that of the 10th decile in behavioral outcome assessed at the individual client level[7]).

### *Relation of Underlying Dimensional Language to Commitment Strength*

In the clinical literature, the construct of commitment (to be precise, commitment extent or strength) is typically treated as having variable aspects or underlying dimensions, such as absoluteness of behavioral goal, expectancy, perceived difficulty, or desire to change (e.g., Hall et al., 1990, 1991; Marlatt et al., 1988; McKay et al., 1999; Mussell et al., 2000). However, it remains unclear whether and how these dimensions influence commitment strength when each is independently assessed. The present study also provided an opportunity to examine these relationships. Expanding the psycholinguistic model of Amrhein (1992), we theorized that the valence and strength of related dimensions—specifically, client desire, ability, need, and reasons to change or maintain a drug habit, revealed through client session language—should influence strength of commitment during MI. This relationship was tested by means of a multiple regression, treating session deciles within language category for each client as a repeated factor (SUDAAN REGRESS). In this analysis, we assumed that language strength representing these dimensions is salient across deciles in predicting commitment strength. As can be seen in Table 6, language strength for these dimensions did indeed significantly account for variance in commitment strength, with each dimension making a unique and positive contribution.[8]

## Discussion

### *Commitment Language in Psychotherapy*

Our findings indicate that client commitment language is a dimension worth attending to in psychotherapy or at least in the specific case of MI for change in drug use. We propose that commitment is a useful "final common pathway" construct that may elucidate relationships between psychotherapy processes and outcomes. The underlying motivational dimensions of perceived desire, ability (or self-efficacy), need, and reasons for change did not individually (or collectively) improve prediction of behavioral outcome (cf. Siegfried, 1995), nor did they account for behavior outcome as well as did commitment language. Further, it was not the clients' general verbosity (frequency of utterances) regarding their commitment to change that predicted subsequent abstinence from drug use but rather the strength pattern of their commitment language. This explains, in part, our prior failure to find the predicted relationship between frequency of client "change talk" and behavioral outcomes (e.g., Miller, Benefield, & Tonigan, 1993). The regression analyses provide elaborative support for the predictive value of commitment language strength by demonstrating its relationship to behavioral outcomes, whether measured as a categorical (good vs. poor outcome over 12 months) or continuous variable (average PDA). It is also clear that strength of client commitment language, particularly toward the end of the MI session, provides unique prognostic information beyond the prediction of future behavior (outcome) from past behavior (baseline level of drug use).

[6] Stepwise regressions concerning the strength of each of the underlying language categories indicated fewer reliable contributions of language strength in terms of decile beyond information concerning drug use at intake. For desire and ability language strength, no reliable decile contributions emerged. For need language strength, only the 10th decile emerged as reliable, resulting in an overall $R^2 = .19$, $F(2, 72) = 7.02$, $p < .01$. For reasons language strength, only the 7th decile emerged as reliable, resulting in an overall $R^2 = .197$, $F(2, 72) = 8.85$, $p < .01$.

[7] In the commitment strength ANOVA, there was a statistically nonsignificant trend for the struggler and discrepant groups to collectively exhibit less commitment strength than the maintainer and changer groups at the 7th decile.

[8] Intercorrelations concerning desire, ability, need and reasons language strength were relatively small (all $r$s $< .20$; see Tabachnick & Fidell, 2001) allaying concerns of multicollinearity among the predictors.

Table 6
*Regression of Commitment Language Strength on Underlying Factor Language Strength (N = 84)*

| Underlying language factor | *B* | *SE B* | *t*(83) |
|---|---|---|---|
| Desire | .17 | .03 | 6.40** |
| Ability | .14 | .04 | 3.83** |
| Need | .10 | .03 | 3.84** |
| Reasons | .08 | .03 | 2.62*** |

*Note.* $R^2 = .11$, Wald $F(4, 83) = 26.36$, $p < .01$.
** $p < .01$. *** $p = .001$.

Commitment strength in turn is influenced by the strength of its underlying dimensions (cf. Hall et al., 1990, 1991; Marlatt et al., 1988; Mussell et al., 2000) recast as language categories in the present study. These factors include client desire, perceived ability or self-efficacy, need, readiness, and reasons. Desire and ability have been demonstrated as potent underlying factors determining the strength of a verbal commitment (Amrhein, 1992). The present findings provide ecological support for this laboratory finding. Implicitly, these findings also indicate that when clients are expressing commitment language, utterances pertaining to its underlying dimensions naturally co-occur, at least within MI. In the logistic regression analyses, each dimension (except readiness, not tested because of its low occurrence) was found to account for some of the variance in categorical behavioral outcome. However, commitment strength provided the best indicator, particularly for clients who exhibited a poor outcome. Separate measures of these underlying dimensions of commitment strength—be it self-efficacy (Bandura, 1977, 1997), readiness (Heather, Rollnick, & Bell, 1993), intrinsic motivation (e.g., Curry et al., 1990), or combinations (e.g., Miller & Tonigan, 1996)—may be indirect or incomplete predictors of behavioral outcome. Indeed, these separate dimensions are often less than robust predictors of substance use outcomes (cf. Hall et al., 1990, 1991; Marlatt et al., 1988; Miller, Westerberg, Harris, & Tonigan, 1996; Mussell et al., 2000).

Of further interest are findings with a small group of clients known to be untruthful about their recent drug use status: the discrepant group, for whom urine drug screens contradicted self-reported abstinence. Although these individuals were not honest in reporting their drug use, their pattern of commitment language during MI matched that of the struggling group, who did self-report continued drug use. Clients who are untruthful about their drug use might also provide less-than-valid responses to questionnaires regarding their motivation for and commitment to change. In the MI session, however, their pattern of commitment language identified them with the strugglers, predicting poor outcome. This underscores the potential value of analyzing the conversational language of clients in MI. More practically, the message for clinicians here is that a client's commitment language pattern appears to be relatively transparent to the truth and thus offers an in-session clue to predict behavioral outcome. We believe this is the first demonstration that MI-evoked client talk can provide veridical information even when client self-report does not. These commitment language patterns may be one basis for clinicians' intuitive judgments that certain clients are not being truthful in their self-reports of abstinence.

It should be noted that the demographics of our study indicate participation by a broad spectrum of ethnicities, not unlike the America Southwest or even some urban areas of the United States. As can be seen in Table 1, these clients were stressed economically. It is unclear how this might impact on their verbal behavior during MI or their later behavior. However, given that a large number of opiate abusers nationally are likewise economically depressed, these findings should at least generalize to such individuals. Moreover, all clients chose to communicate in English (even though several therapists were able to also converse in Spanish), indicating that the results of the language analyses should at least generalize to other English-speaking drug abusers receiving MI. However, we believe that parallel procedures for analysis of clients speaking other languages can be developed and that those results would be consistent with the present findings. Might middle to high income users respond differently to treatment—verbally as well as behaviorally—because they can more easily afford their drug-using habit for a longer period of time? This is an empirical question that should be addressed in future research.

### *Why Is Commitment Language Strength a Salient Predictor of Behavioral Outcome?*

Miller and Rollnick (1991, 2002) have emphasized the resolution of client ambivalence (equivocation) and the enhancement of client commitment as central to the efficacy of MI. This report provides the first clear empirical evidence consistent with this hypothesized mechanism of efficacy. The MI protocol used in this study provided a sequentially ordered set of interactions between therapist and client (see modal topics listed in Figure 1) specifically designed to enhance client commitment to change, and perhaps it allowed for a clearer test of the relationship between client commitment language and behavioral outcome than may occur with other forms of therapy (Mondada, 1998).

Yet why does committing language during an MI session predict subsequent behavior change? One possibility is that the public nature of making verbal commitments, the rewards of meeting the resultant obligation, and maybe more pointedly, the costs of failing to meet that obligation (cf. Festinger, 1957; Kulik & Carlino, 1987) cause the client to carefully calibrate the strength of their stated commitment during MI to match their anticipated state of affairs after MI. Therefore, in-session commitment language strength marks the client's expected and intended level of behavior change and does so more accurately than measures of component dimensions such as perceived ability, desire, or need.

Further, verbal commitments are typically made in response to an implicit or explicit request (Holtgraves, 2001; Wierzbicka, 1987). Of relevance, discourse analyses of therapeutic talk have been most revealing in exposing underlying client motivations, attitudes, and dispositions when client speech is viewed as constructed from dyadic interactions with the therapist (Siegfried, 1995). Therefore, commitment strength can be seen as arising in part from elicited responses to therapist requests concerning infor-

mation about the client's intentions (cf. Proia, 1998); that is, commitment to change is constructed within the conversational context provided in MI.

The particular manner in which commitment strength was defined and measured in this study may also have been important. We believe that commitment language may be an especially good predictor of behavioral outcome when commitment both to the status quo and to change are evaluated. Commitment strength may also derive its predictive characteristics, in part, from the collective, independent contributions of the strengths of underlying factors related to intrinsic motivation (revealed here by desire, need, or reasons language) and self-efficacy (revealed here by ability language). Individually, these factors do not predict behavioral outcome as well (or at all, given the results of the outcome group ANOVAs) as does a measure of the final common pathway of commitment.

### *Commitment, Behavior, and Social Psychology*

Findings from the present study are consistent with theoretical mechanisms offered by the social psychological literature. For example, the mediating role of commitment or intent in determining behavior that is influenced by other factors such as attitudes, beliefs, or perceived social norms has received much empirical support from studies assessing close relationships (Rusbult, Verette, Whitney, Slovick, & Lipkus, 1991; abortion decision making (Lydon, Dunkel-Schetter, Cohan, & Pierce, 1996), moral behavior (Vallerand, Deshaies, Cuerrier, Pelletier, & Mongeau, 1992), and even voting behavior (Ajzen and Fishbein, 1980). Our findings indicate that such support can be distilled from relatively unconstrained natural language situations as well as from overt word choice and judgment tasks typically used in that literature.

Another mechanism from social psychology may also inform more local phenomena observed in client language emerging from MI. Consider the striking difference between good- and poor-outcome groups in their commitment language at the 5th decile of the MI (see Figure 2). Modally during this portion of the interview, clients were receiving feedback on a number of personal dimensions. This feedback was rather uniformly negative for clients regardless of outcome group, but those who would eventually exhibit poor outcome retrenched to (or maintained) their commitment to drug use at this point in the MI, whereas clients who would eventually exhibit good outcome showed continued increase in commitment to change.

What may be occurring in the poor-outcome group is a phenomenon known as "escalation of commitment" toward an unfavorable behavioral option in the face of concurrent negative feedback (Hantula & DeNicolis Bragger, 1999). Clearly, clients enter the MI with varying degrees of ambivalence or equivocality toward changing their drug use, which might be exacerbated or attenuated through explicit therapist probing. Following Hantula and DeNicolis Bragger (1999), clients with higher equivocality should react to negative feedback by increasing (or at least maintaining) their commitment to drug use. In contrast, clients with lower equivocality should not exhibit such an increase in this situation. Hantula and DeNicolis Bragger argue that this seemingly paradoxical, error-full behavior may reflect client attempts at rational decision making when the outcome of maintaining (or changing) drug use is perceived as unclear. Under conditions of such uncertainty, familiarity with the status quo biases what the person decides to do.[9]

Independent support that good- and poor-outcome clients differed initially in their equivocality toward their drug use is given by judgment data from a decisional balance manipulandum used during pretreatment assessment. By rotating a bar on this device, clients indicated their degree of bias in considering their drug use in terms of whether it was a "good thing" (with this label anchored at 90° counterclockwise from upright) or a "bad thing" (with this label anchored at 90° clockwise from upright). A judgment placed upright (0°) and thus equidistant to these two anchors would indicate high equivocality. Overall, clients exhibited a bias toward their drug use being a bad thing (rotation $M = 32°$ clockwise from upright); however, the poor-outcome groups (strugglers and discrepants) were more equivocal (rotation $M = 26°$ clockwise from upright) than the good-outcome groups (changers and maintainers; rotation $M = 34°$). Although this difference only approached statistical significance, $F(1, 82) = 3.28$, $p = .07$, $MSE = 329.13$, with discrepants excluded, the contrast between strugglers (rotation $M = 22.4°$) and the good-outcome groups was statistically reliable, $F(1, 73) = 4.23$, $p < .05$, $MSE = 344.07$.

### *Whither Readiness?*

A surprising finding in this study was the relative paucity of instances of readiness language emerging from MI, given its importance as a construct in accounting for behavior change (see Miller & Rollnick, 1991). A number of reasons for this finding can be entertained. One possibility is that our coding of readiness language was too narrow or that by its nature this language category has fewer exemplars than the other categories. Another possible explanation is that a state of readiness to at least consider behavior change was implied by the mere presence of the client in MI and treatment. Yet another possibility is that the construct of readiness is reflected in the language of commitment. Clients may be signaling what is meant by "readiness" to change in their utterances indicating commitment making and in collective reporting on their desire, perceived ability, need and/or reasons to change or maintain their drug use. Some support for this argument is given by the finding that strength-of-commitment utterances arising in the 7th decile—a point in the MI during which the therapist typically broached the readiness to change issue with a

[9] Interestingly, this phenomenon can be experimentally reduced by providing a goal during the discussion of the positive and negative aspects of a certain behavior. Of relevance here, whereas all clients may have had a meaningful degree of equivocality toward changing their drug use, lacking a firm goal—suggested by some clients' weakened commitment when defending their change plan in the last decile—may explain why the poor-outcome groups exhibited an escalation in commitment to their drug use in the face of negative feedback in the 5th decile, whereas the good-outcome groups did not.

recapitulation of feedback and a key question—reliably contributed to the prediction of behavioral outcome.

### *Practical Implications for Motivational Interviewing*

It is noteworthy that these findings emerged from within-group analyses of clients receiving MI during a clinical trial in which MI itself was found to exert no main effect on drug use outcomes (Miller et al., 2003). That is, although these findings provide some support for the hypothesized mechanisms underlying MI efficacy, the addition of MI to treatment as usual did not significantly improve drug use outcomes. Thus, the parent clinical trial failed to replicate effects of MI on drug-treatment outcomes reported in several prior trials (Aubrey, 1998; Baker, Boggs, & Lewin, 2001; B. Saunders, Wilkinson, & Phillips, 1995; Stephens, Roffman, & Curtin, 2000; Stotts, Schmitz, Rhoades, & Grabowski, 2001).

With that caveat, what considerations for MI practitioners might be derived from these findings? First, attention to client commitment language as a reliable in-session indicator of the probability of target behavior change appears to be warranted. Acute midsession or late session drops in strength of commitment language may be particularly important, signaling a need for further intervention to avert poor outcomes. Optimal behavior change is related to steady increases in strength (not frequency) of committing language over the course of the MI session, with commitment strength at the end of the session being the most potent, unique predictor. The more positive the commitment strength observed at that point, the greater the level of drug use abstinence attained over the next year. Recall, however, that much of the predictive variance observed at the end of the session (10th decile) is shared with earlier commitment language (5th decile), so it is advisable to attend to fluctuations in commitment strength throughout a MI session.

Second is a possible caution with regard to the use of negative feedback (bad news) from client assessment. Although such feedback alone can decrease heavy drinking behavior (Agostinelli, Brown, & Miller, 1995), there may be clients for whom such feedback is ill-advised. Clients who were more equivocal (ambivalent) in their beliefs about the value of their drug use not only exhibited prognostic escalation in commitment to the status quo when confronted with negative information concerning the consequences of their drug use (i.e., the 5th decile) but also exhibited drastically weakened commitment to change at the end of the session (10th decile) when discussing, evaluating, and laying out a defense (cf. Kiesler, 1971) for a change plan. It is possible that the (premature) presentation of such negative feedback may backfire, escalating commitment to continued drug use among clients who are less certain of the adverse consequences of their drug use. Ironically, this is the group that could logically be judged as most in need of such feedback. It is also noteworthy that MI practitioners are sometimes advised to query the client's perceived positive aspects of current drug use to place a client at ease and convey empathy for the rational side of drug use (W. Saunders, Wilkinson, & Allsop, 1991) before proceeding to discuss the darker side. Doing so, however, could exacerbate equivocality and thereby promote at least a reduction in the strength, if not a change in direction, of the client's commitment.

Similarly, backpedaling in commitment can occur at the point of discussing a behavior change plan. The manual-guided format of MI used in this study prescribed discussion of a change plan toward the end of the session—especially concerning its evaluation and vulnerability. When this resulted in an acute drop in client commitment strength, little change in drug use followed. In contrast, clients who tolerated progression to a viable change plan with sustained strength of commitment showed high rates of abstinence. It appears unwise to progress inexorably to a change plan with all clients regardless of their response to doing so. Miller and Rollnick (1991, 2002), in fact, specifically recommend against doing so and advise instead that the therapist monitor readiness, test the waters, and proceed only when the client's response signals willingness to negotiate a change plan. This is one specific instance of a general MI precept that the therapist ought not get ahead of the client's level of readiness for change. Further support for this comes from our research on commitment, which points to dissatisfaction with communication when a requester's level of request is higher than a person's level of willingness to commit (Amrhein, 2002).

Overall, this suggests that somewhat modified MI strategies may be warranted for clients who are more committed to or ambivalent about drug use (precontemplators or early contemplators within the transtheoretical model of change). A prescribed and less flexible approach to MI (as can occur with manual-guided interventions) could paradoxically yield worse outcomes among initially less motivated clients—the very clients for whom MI was developed. This is, in fact, what was unexpectedly observed by the Project MATCH Research Group (1997), in which study early outcomes showed a pattern precisely opposite to the predicted matching effect. Clients who were less ready to change showed, at short-term follow-up, less favorable outcomes when assigned to the manual-guided motivational enhancement therapy (combining MI and assessment feedback).

More generally, our findings point to a need for flexibility in the application of MI, with continual sensitivity and responsiveness to fluctuations in client commitment language (Rollnick, 1998). Behavior change is associated with a relatively steady increase in the strength (not frequency) of commitment language during an MI session. Any acute drop (which might be perceived as renewed resistance) warrants attention and an adjustment of counseling strategies to restore a positive slope in commitment strength. For example, careful attention paid by the therapist to a client's ambivalence concerning the pros and cons of his or her drug use (which occurred in the 2nd to 4th deciles in this study), subsequently augmented by further therapist attempts to tip the balance toward change, may avert retrenchment in commitment to maintaining drug use (observed at the 5th decile) and the related drop in commitment observed when the client is asked to generate and evaluate a change plan (10th decile). Specific therapeutic strategies should be developed and evaluated for recovering from these prognostic drops in client commitment strength.

Finally, the component dimensions underlying strength of commitment warrant further attention. We propose, in fact, that they offer unique paths through which commitment strength can be augmented. Accordingly, attempts to strengthen a client's desire, self-efficacy (ability), need, and reasons to change should lead to gains in overall commitment strength and ultimately to behavior change. Rollnick (1998; Miller & Rollnick, 2002) has advocated such separate attention to the components of motivation for change (e.g., importance and confidence). Concepts such as readiness and the transtheoretical stages of change probably constitute summations of these various underlying component processes of commitment. All of this, of course, underscores the value of attending to clients' natural language (Grossen & Salazar Orvig, 1998; Siegfried, 1995) in providing a window into relevant motivational and intentional states that can be influenced by therapeutic processes and that ultimately lead to behavior change.

## References


Agostinelli, G., Brown, J. M., & Miller, W. R. (1995). Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education, 25*, 31–40.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Amrhein, P. C. (1992). The comprehension of quasi-performative verbs in verbal commitments: New evidence for componential theories of lexical meaning. *Journal of Memory and Language, 31*, 756–784.

Amrhein, P. C. (2002). *Speaker coordination from the words: The role of perspective taking in the comprehension of quasi-performative verbs in request-to-commit dialogs*. Unpublished manuscript, Department of Psychology, University of New Mexico.

Amrhein, P. C., & Martinez, B. (1993, November). *Verbal commitments and gestures: Exploring the connection*. Thirty-fourth Annual Meeting of the Psychonomic Society, Washington, DC.

Aubrey, L. (1998). *Motivational interviewing with adolescents presenting for outpatient substance abuse treatment*. Doctoral dissertation, University of New Mexico, Albuquerque.

Audi, R. (1986). Intending, intentional action, and desire. In J. Marks (Ed.), *The ways of desire* (pp. 17–38). Chicago: Precedent Publishing.

Austin, J. (1962). *How to do things with words*. Cambridge, MA: Harvard University Press.

Baker, A., Boggs, T. G., & Lewin, T. J. (2001). Randomized controlled trial of brief cognitive–behavioral interventions among regular users of amphetamine. *Addiction, 96*, 1279–1287.

Bandura, A. (1977). Self-efficacy: Towards a unifying theory of behavior change. *Psychological Review, 84*, 191–215.

Bandura, A. (1978). Reflections on self-efficacy. *Advances in Behavior Research and Therapy, 1*, 191–215.

Bandura, A. (1986). *Social foundations of thought and action*. New York: Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Blum-Kulka, S. (1989). Playing it safe: The role of conventionality in indirectness. In S. Blum-Kulka, J. House, & G. Kasper (Eds.), *Cross-cultural pragmatics: Requests and apologies* (pp. 37–70). Norwood, NJ: Ablex.

Brown, P., & Levinson, S. C. (1987). *Politeness: Some universals in language use*. Cambridge, England: Cambridge University Press.

Burke, B. L., Arkowitz, H., & Dunn, C. (2002). The efficacy of motivational interviewing and its adaptations: What we know so far. In W. R. Miller & S. Rollnick, *Motivational interviewing: Preparing people for change* (2nd ed., pp. 217–250). New York: Guilford Press.

Curry, S., Wagner, E. H., & Grothaus, L. C. (1990). Intrinsic and extrinsic motivation for smoking cessation. *Journal of Consulting and Clinical Psychology, 58*, 310–316.

DiClemente, C. C. (1991). Motivational interviewing and the stages of change. In W. R. Miller & S. Rollnick (Eds.), *Motivational interviewing* (pp. 191–202). New York: Guilford Press.

Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row, Peterson, and Company.

Finney, J. W., Friman, P. C., Rapoff, M. A., & Christopherson, E. R. (1985). Improving compliance with antibiotic regimens for otitus-media—randomized clinical trial in a pediatric-clinic. *American Journal of Diseases of Children, 39*, 89–95.

Furberg, M. (1971). *Saying and meaning*. Oxford, England: Blackwell.

Gale, J. E. (1991). *Conversation analysis of therapeutic discourse: The pursuit of a therapeutic agenda*. Norwood, NJ: Ablex Publishing.

Gottschalk, L. A. (1987). Content-category analysis: The measurement of the magnitude of psychological dimensions in psychotherapy. In R. L. Russell (Ed.), *Language in psychotherapy: Strategies of discovery* (pp. 1–70). New York: Plenum Press.

Grossen, M., & Salazar Orvig, A. (1998). Clinical interviews as verbal interactions: A multidisciplinary outlook. *Pragmatics, 8*, 149–154.

Hall, S. M., Havassy, B. E., & Wasserman, D. A. (1990). Commitment to abstinence and acute stress in relapse to alcohol, opiates, and nicotine. *Journal of Consulting and Clinical Psychology, 58*, 175–181.

Hall, S. M., Havassy, B. E., & Wasserman, D. A. (1991). Effects of commitment to abstinence, positive moods, stress, and coping on relapse to cocaine use. *Journal of Consulting and Clinical Psychology, 59*, 526–532.

Hantula, D. A., & DeNicolis Bragger, J. L. (1999). The effects of feedback equivocality on escalation of commitment: An empirical investigation of decision dilemma theory. *Journal of Applied Social Psychology, 29*, 424–444.

Heather, N., Rollnick, S., & Bell, A. (1993). Predictive validity of the Readiness to Change Questionnaire. *Addiction, 88*, 1667–1677.

Holtgraves, T. (2001). Preference organization and reply comprehension. *Discourse Processes, 30*, 87–106.

Hosmer, D. W., & Lemeshow, S. (2000). *Applied logistic regression*. New York: Wiley.

Janis, I. L., & Mann, L. (1977). *Decision-making: A psychological analysis of conflict, choice, and commitment*. New York: Free Press.

Kiesler, C. A. (1971). *The psychology of commitment*. New York: Academic Press.

Kulik, J. A., & Carlino, P. (1987). The effect of verbal commitment and treatment choice on medication compliance in a pediatric setting. *Journal of Behavioral Medicine, 10*, 367–376.

Labov, W., & Fanshel, D. (1977). *Therapeutic discourse: Psychotherapy as conversation*. New York: Academic Press.

Levy, R. A. (1977). Relationship of an overt commitment to task compliance in behavior therapy. *Journal of Behavioral Therapy and Experimental Psychiatry, 8*, 25–29.

Levy, R., Yamashita, D., & Pow, G. (1979). The relationship of an overt commitment to the frequency and speed of compliance with symptom reporting. *Medical Care, 17*, 281–284.

Little, R. J. A., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York: Wiley.

Lydon, J., Dunkel-Schetter, C., Cohan, C. L., & Pierce, T. (1996). Pregnancy decision making as a significant life event: A commitment approach. *Journal of Personality and Social Psychology, 71*, 141–151.

Mahl, G. F. (1987). Everyday disturbances of speech. In R. L. Russell (Ed.), *Language in psychotherapy: Strategies of discovery* (pp. 213–269). New York: Plenum Press.

Mahrer, A. R., Gagnon, R., Fairweather, D. R., Boulet, D. B., & Herring, C. B. (1994). Client commitment and resolve to carry out postsession behaviors. *Journal of Counseling Psychology, 41*, 407–414.

Marlatt, G. A., Curry, S., & Gordon, J. R. (1988). A longitudinal analysis of unaided smoking cessation. *Journal of Consulting and Clinical Psychology, 56*, 715–720.

McCawley, J. D. (1977). Remarks on the lexicography of performative verbs. In A. Rogers, B. Wall, & J. P. Murphy (Eds.), *Proceedings of the Texas Conference on performatives, presuppositions, and implicatures* (pp. 13–25). Arlington, VA: Center for Applied Linguistics.

McKay, J. R., Alterman, A. I., Cacciola, J. S., O'Brien, C. P., Koppenhaver, J. M., & Shepard, D. S. (1999). Continuing care for cocaine dependence: Comprehensive 2-year outcomes. *Journal of Consulting and Clinical Psychology, 67*, 420–427.

Miller, W. R. (1983). Motivational interviewing with problem drinkers. *Behavioural Psychotherapy, 11*, 147–172.

Miller, W. R. (1996). Manual for Form 90: A structured assessment interview for drinking and related behaviors. *Project MATCH Monograph Series, Volume 5*. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Miller, W. R., Benefield, R. G., & Tonigan, J. S. (1993). Enhancing motivation for change in problem drinking: A controlled comparison of two therapist styles. *Journal of Consulting and Clinical Psychology, 61*, 455–461.

Miller, W. R., & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior*. New York: Guilford Press.

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change* (2nd ed.). New York: Guilford Press.

Miller, W. R., & Tonigan, J. S. (1996). Assessing drinkers' motivation for change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). *Psychology of Addictive Behaviors 10*, 81–89.

Miller, W. R., Westerberg, V. S., Harris, R. J., & Tonigan, J. S. (1996). What predicts relapse? Prospective testing of antecedent models. *Addiction, 91*(Supple.), 155.

Miller, W. R., Yahne, C. E., & Tonigan, J. S. (2003). Motivational interviewing in drug abuse services: A randomized trial. *Journal of Consulting and Clinical Psychology, 71*, 754–763.

Mondada, L. (1998). Therapy interactions: Specific genre or "blown up" version of ordinary conversational practice? *Pragmatics, 8*, 155–166.

Mussell, M. P., Mitchell, J. E., Crosby, R. D., Fulkerson, J. A., Hoberman, H. M., & Romano, J. L. (2000). Commitment to treatment goals in prediction of group cognitive–behavioral therapy treatment outcome for women with bulimia nervosa. *Journal of Consulting and Clinical Psychology, 68*, 432–437.

Pea, R. D., & Russell, R. L. (1987). Ethnography and the vicissitudes of talk in psychotherapy. In R. L. Russell (Ed.), *Language in psychotherapy: Strategies of discovery* (pp. 303–338). New York: Plenum Press.

Prochaska, J. O., & DiClemente, C. C. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research, and Practice, 19*, 276–288.

Proia, N. (1998). Analysis of a first therapy session: Objectives and methods. *Pragmatics, 8*, 185–202.

Project MATCH Research Group. (1997). Matching alcoholism treatments to client heterogeneity: Project MATCH posttreatment drinking outcomes. *Journal of Studies on Alcohol, 58*, 7–29.

Putnam, D. E., Finney, J. W., Barkley, P. L., & Bonner, M. J. (1994). Enhancing commitment improves adherence to a medical regimen. *Journal of Consulting and Clinical Psychology, 62*, 191-194.

Rogers, C. R. (1959). A theory of therapy, personality, and interpersonal relationships as developed in the client-centered framework. In S. Koch (Ed.), *Psychology: The study of a science: Volume 3. Formulations of the person and the social context* (pp. 184–256). New York: McGraw-Hill.

Rohen, T. M., & Mayer, G. R. (1969). Dissonance and public commitment: Cognitive counseling. *Elementary School Guidance and Counseling, 4*, 20–27.

Rollnick, S. (1998). Readiness, importance, and confidence: Critical conditions of change in treatment. In W. R. Miller & N. Heather (Eds.), *Treating addictive behaviors* (2nd ed., pp. 49–60). New York: Plenum Press.

Rusbult, C. E., Verette, J., Whitney, G. A., Slovick, L. F., & Lipkus, I. (1991). Accommodation processes in close relationships: Theory and preliminary empirical evidence. *Journal of Personality and Social Psychology, 60*, 53–78.

Russell, R. L. (Ed.). (1987a). Introduction. In *Language in psychotherapy: Strategies of discovery* (pp. 1–9). New York: Plenum Press.

Russell, R. L. (Ed.). (1987b). Psychotherapeutic discourse: Future directions and the critical pluralist attitude. In *Language in psychotherapy: Strategies of discovery* (pp. 341–351). New York: Plenum Press.

Saunders, B., Wilkinson, C., & Phillips, M. (1995). The impact of a brief motivational intervention with opiate users attending a methadone programme. *Addiction, 90*, 415–424.

Saunders, W., Wilkinson, C., & Allsop, S. (1991). Methadone intervention with heroin users attending a methadone clinic. In W. R. Miller & S. Rollnick (Eds.), *Motivational interviewing* (pp. 279–292). New York: Guilford Press.

Sbisa, M. (2001). Illocutionary force and degrees of strength in language use. *Journal of Pragmatics, 33*, 1791–1814.

Searle, J. R. (1969). *Speech acts*. London: Cambridge University Press.

Searle, J. R. (1977). A classification of illocutionary acts. In A. Rogers, B. Wall, & J. Murphy (Eds.), *Proceedings of the Texas conference on performatives, presuppositions, and implicatures* (pp. 27–46). Arlington, VA: Center for Applied Linguistics.

Searle, J. R. (1989). How performatives work. *Linguistics and Philosophy, 12*, 535–558.

Siegfried, J. (Ed.). (1995). Introduction. In *Therapeutic and everyday discourse: Towards a micro-analysis in psychotherapy process research* (pp. 1–25). Norwood, NJ: Ablex Publishing.

Soyland, A. J. (1995). Analyzing therapeutic and professional discourse. In J. Siegfried (Ed.), *Therapeutic and everyday discourse: Towards a micro-analysis in psychotherapy process research* (pp. 277–300). Norwood, NJ: Ablex Publishing.

Stephens, R. S., Roffman, R. A., & Curtin, L. (2000). Comparison of extended versus brief treatments for marijuana use. *Journal of Consulting and Clinical Psychology, 68*, 898–908.

Stiles, W. B. (1987). Verbal response modes as intersubjective categories. In R. L. Russell (Ed.), *Language in psychotherapy: Strategies of discovery* (pp. 131–170). New York: Plenum Press.

Stotts, A. M., Schmitz, J. M., Rhoades, H. M., & Grabowski, J. (2001). Motivational interviewing with cocaine-dependent patients: A pilot study. *Journal of Consulting and Clinical Psychology, 69*, 858–862.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics*. Boston: Allyn & Bacon.

Tonigan, J. S., Miller, W. R., & Brown, J. M. (1997). The reliability of Form 90: An instrument for assessing alcohol treatment outcome. *Journal of Studies on Alcohol, 58*, 358–364.

Vallerand, R. J., Deshaies, P., Cuerrier, J. P., Pelletier, L. G., & Mongeau, C. (1992). Ajzen and Fishbein's theory as applied to moral behavior: A confirmatory analysis. *Journal of Personality and Social Psychology, 60*, 98–109.

Watson, D. R. (1995). Some potentialities and pitfalls in the analysis of process and personal change in counseling and therapeutic interaction. In J. Siegfried (Ed.), *Therapeutic and everyday discourse: Towards a micro-analysis in psychotherapy process research* (pp. 301–340). Norwood, NJ: Ablex Publishing.

Westerberg, V. S., Tonigan, J. S., & Miller, W. R. (1998). Reliability of Form 90D: An instrument for quantifying drug use. *Substance Abuse, 19*, 179–189.

Wierzbicka, A. (1987). *English speech act verbs: A semantic dictionary*. Sydney, Australia: Academic Press.

Wurtele, S. K., Galanos, A. N., & Roberts, M. C. (1980). Increasing return compliance in a tuberculosis detection drive. *Journal of Behavioral Medicine, 3*, 311–318.

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