Process of Motivational Enhancement Therapy: Relationships between Therapist and Client Behaviours, and Alcohol Use Outcome

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List of Acronyms

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ADP	Advise with Permission (MICO)	146
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AF	Affirm (MICO)	146
AMI	"Adaptations" of Motivational Interviewing	20
BTP	Brief Treatment Programme	33
CO	Confront (MIIN)	146
DI	Direct (MIIN)	146
EC	Emphasise Control (MICO)	146
FA	Facilitate (Neutral Type Therapist Behaviour)	146
FI	Filler (Neutral Type Therapist Behaviour)	147
GAS	Global Assessment Scale	36
GI	Giving Information (Neutral Type Therapist Behaviour)	147
ICC	Intraclass Correlation Coefficient	49
MET	Motivational Enhancement Therapy	19, 35
M	Mean	
MI	Motivational Interviewing	14
MICO	MI-Consistent Therapist Behaviours	25
MIIN	MI-Inconsistent Therapist Behaviours	25
MISC 1.0	Motivational Interviewing Skill Code Version 1.0	24-25
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QUC	Closed Question (Neutral Type Therapist Behaviour)	147
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RCP	Raise Concern with Permission (Neutral Type Therapist Behaviour)	147
RCW	Raise Concern without Permission (MIIN)	147
REC	Complex Reflection (MICO)	147
RES	Simple Reflection (MICO)	147
RF	Reframe (MICO)	147

SD	Standard Deviation
SE	Standard Error
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TBC	Target Behaviour Change 40
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I would like to acknowledge the contribution of supervisors, Dr Simon Adamson and Dr Janet Carter. I have particularly appreciated their encouragement and their open sharing of knowledge. Furthermore, this thesis could not have been accomplished without the hard work of Duncan Edwards, notably his coding of half of the audiotaped sessions.

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ABSTRACT

Motivational Interviewing (MI) is an evidence-based, directive, client-centered therapy designed to develop discrepancy and resolve ambivalence by eliciting and reinforcing client Change Talk. However, the exact link between the process engaged in during MI and outcome is only starting to be uncovered.

The present thesis has replicated and expanded on the current knowledge of the relationship between Therapist and Client Behaviours during a MI-based intervention (Motivational Enhancement Therapy; MET) and outcome, and has provided support for the emergent theory of the inner workings of MI. This was achieved by coding 106 audiotaped MET sessions primarily by the methods outlined in the Motivational Interviewing Skill Code Version 2.0. Data was drawn from 28 participants who received 3-4 sessions of MET within the context of a randomised controlled trial for mild-moderate alcohol dependence at the Community Alcohol and Drug Service of Christchurch. Therapist and Client Behaviours were analysed within sessions (categorised into Early, Mid, or End Intervals) and across sessions, and compared with whether the client had drank within national drinking guidelines during the 6-months after MET (Controlled Drinkers).

In terms of Client Behaviours during MET it was found that Uncontrolled Drinkers (compared with Controlled Drinkers) uttered a significantly higher frequency of Sustain Talk, lower Ability Language strength (over all MET and during End Intervals), and lower Commitment Language strength (during Session 2 and 4, and change over MET). Giving Information was the only Therapist Behaviour where significant

differences were observed over all MET, with a higher frequency given to the Uncontrolled Drinkers. However, during End Intervals within MET Sessions, Controlled Drinkers received a significantly higher frequency of Advise without Permission and a lower frequency of Emphasise Control statements. In most instances MI-Consistent Therapist Behaviours were associated with higher strength of Ability and Commitment Language, and a lower frequency of Sustain Talk. MI-Inconsistent Therapist Behaviour, Direct, was associated with lower Client Language strength. Limitations to these results include small sample, limited ability to make inferences about causality, coder biases, and uneven reliability. However, this exploratory study was unique in investigating the relationship between Therapist Behaviours and the strength of Client Language, and in examining these factors within and across multiple sessions, and has produced a number of potentially valuable findings that warrant further investigation.

1. INTRODUCTION

1.1. What is Motivational Interviewing (MI)?

MI is defined as a "client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence" (Miller & Rollnick, 2002, p. 25). This evolution of Rogers' client-centered therapy (1951) draws upon Bem's self-perception theory (1972) and focuses on exploring clients own arguments for change (Hettema, Steele, & Miller, 2006). MI is an approach which grew out of Bill Miller's work with problem drinkers. It was first introduced in 1983 as a style of therapy that assumed that an individual's motivation was not a personality trait but a state that can fluctuate as a result of interpersonal interactions (Miller, 1983).

1.1.2. Spirit and Guiding Principles of MI

The spirit in which MI is conducted has remained a critical element of this approach (Miller & Rollnick, 2002). In true MI spirit, the interview is a collaborative process between the client and therapist, where the resources and motivation to change are assumed to lie within each individual and need to be evoked rather than imposed. The autonomy of the client is preserved; that is, the right and responsibility to make choices and to change behaviour remains the client's. MI is regarded as a way of *being* with people rather than *doing* a set of specified techniques.

To enhance the specificity of practice of MI, four guiding principles have been outlined by Miller and Rollnick (2002): expressing empathy, developing discrepancy, rolling with resistance, and supporting self efficacy. Expressing empathy is based on the

reflective listening (accurate empathy) techniques described by Rogers (1951) in his client-centered therapy. Whereby, it is through skilful reflective listening that the therapist understands the client without judging, criticising, or blaming. Reflective listening here refers to the therapist thinking reflectively about the meaning of the client's statement and reflecting this back to the client, which involves the therapist making a verbal statement about the meaning of the client's statement. Reflective listening statements can vary in complexity from simply repeating elements of what the client has said, to guessing about the unspoken meaning. In this way the therapist checks rather than assumes what is meant by the client's statement and encourages continuation of personal exploration (Miller & Rollnick). An attitude of acceptance underlies this principle of empathy, where ambivalence and reluctance are viewed as being a normal part of human experience.

It is in the second principle (developing discrepancy) that MI deviates from client-centered therapy. MI aims to increase the client's motivation for change by developing and amplifying the client's perceived discrepancies between their personal goals and values, and their present actions. This allows the client to come up with their own arguments for change. Resistance tends to occur and increase when the therapist presents the arguments for change rather than the client; thus the therapist should not oppose resistance and should avoid arguing for change. This leads on to the third principle: rolling with resistance. Resistance is considered an interpersonal phenomenon which is influenced by the therapist. The therapist is to accept the resistance and treat it as a signal to change tack perhaps by inviting (but not imposing) new perspective/s. Finally, motivation for change is hypothesised to come from two main factors: (1) the perception

that change is important/necessary (developed in the first three principles) and (2) the perception of having the ability to achieve tasks they set out to do. This second factor is known as self-efficacy and is in itself a powerful motivator and a good predictor of outcome (Bandura, 1997). Thus, the fourth principle is to develop and support self-efficacy. It is important that the client understands that it is their responsibility to choose and carry out change, not the therapist's. However, the therapist's own beliefs in the client's capacity to change can influence the outcome, acting as a self-fulfilling prophecy.

1.1.3. Stages of Change, Phases and Specific Strategies of MI

MI is a unique approach that matches itself to the client's stage of change (DiClemente & Velasquez, 2002). Motivational processes and change can be understood as occurring within the larger framework of the Transtheoretical model of change (Prochaska & DiClemente, 1982, 2002; Prochaska, 1994). This model highlights five stages that people typically go through to modify problem behaviour. At the *precontemplation* stage the client may be unaware that they have a problem but people around them have recognised a serious problem. Having not admitted the problem yet, they are not thinking of changing their behaviour. In the *contemplation* phase the person has recognised that they have a problem, however, they are still weighing up the pros and cons of the target behaviour, and thus are not yet committed to change. In the *preparation* stage, the balance of pros and cons has shifted in favour of change and the person intends to change their behaviour but has not begun yet. When the person begins to modify their behaviour they have reached the *action* stage. If behaviour change is successful the person then works at sustaining this change over the long-term (*maintenance* stage). It is

important to note these stages of change are conceptualised as a spiral, where people may violate self imposed rules and have to go through previous stages again and again before successfully attaining maintenance (some people never manage to get to or stay at this latter stage).

MI is typically conceptualised as occurring in two phases (Miller and Rollnick, 2002). Phase 1 is particularly aimed at moving people through the early stages of change, as it focuses on building intrinsic motivation for change. The client determines how long Phase 1 takes according to their readiness to change. When the client signals that they are willing (importance of change) and able (confident in their ability) to change, then this is the optimal time for transition into Phase 2. Phase 2 involves strengthening the client's commitment to change and developing a change plan.

During each of the phases specific strategies can be employed at the therapist's discretion depending on the client's situation and stage of change. Opening methods and early traps to avoid have been described by Miller and Rollnick (2002) in order to help operationalise the guiding principles of MI. The following five early methods (sometimes referred to as microskills) are prescribed to be used right from the beginning and throughout therapy in order to minimise resistance and enhance intrinsic motivation for change. The first four are summarised as OARS: Open Questions; Affirming, Reflecting; and Summarising. These methods are consistent with client-centered counselling but their purpose of encouraging the client to explore and resolve ambivalence is specific to MI.

The guiding strategy for resolving ambivalence is Eliciting Change Talk[1] (the fifth method), whereby OARS are applied with the goal of encouraging and reinforcing the client's own arguments for change, and their ability and intention to change. This point is central to MI and has roots in self-perception theory (Bem, 1972), which infers that an individual learns about what they believe by observing their own behaviour and hearing themselves speak. For example, a therapist might take the "problem-change" side of the conflict, by telling the client about the seriousness of the problem, and the appropriate course of action. A client who is ambivalent (about making a behaviour change) is likely to (naturally) react by defending the other side of their inner conflict, the "no-problem" standpoint. The more the client verbally defends a position the more committed they tend to become to that position, which may result in the client convincing themselves to not change. This interaction between a therapist and a client is referred to as the Taking Sides Trap and is considered by Miller and Rollnick to be the most common and important trap to avoid. The goal of eliciting and reinforcing Change Talk is to strengthen commitment or intention to change (i.e. Phase 2), thus increasing the likelihood that the individual will engage in change.

Other traps to avoid include: a pattern of the therapist asking successive questions followed by brief replies from the client; conveying the impression that the therapist is the expert who will "fix" the client's situation; labelling or blaming the client; and

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[1] The term "Change Talk" was originally referred to as "self-motivational statements" (e.g., Miller 1983), and was used to describe client speech that favoured change. Four subcategories of Change Talk were outlined in *Motivational Interviewing* (Miller & Rollnick, 2002, p. 24): (1) *Disadvantages of status quo*, such as reason for concern or discomfort; (2) *Advantages of change*, such as good things gained through change; (3) *Optimism for change*, such as confidence and hope about one's ability to change; (4) *Intention to change*, such as intention, desire, willingness, or commitment to change.

prematurely focusing on issues that the therapist sees as “the problem” when the client wishes to discuss other concerns at that point in time. Awareness and avoidance of these traps is hypothesised to reduce within session resistance, which has been associated with poor outcome (e.g. Miller, Benefield, and Tongian, 1993).

1.2. Efficacy of MI

Over the past two decades a substantial amount of thought, practice, and research has been dedicated to MI, and the results have been promising (Burke, Arkowitz, & Dunn, 2002; Burke, Arkowitz, & Menchola, 2003). In particular, an exemplar study entitled Matching Alcoholism Treatments to Client Heterogeneity (Project MATCH) highlights the efficacy of MI. Project MATCH is the largest scale randomised trial of psychological treatment for alcohol dependence to date, with an enrolled treatment sample of over 1700. From the literature, MI and Cognitive Behavioural Therapy (CBT) were identified as being empirically the most effective treatments, and the Twelve-Step Facilitation Therapy (TSF) as the most popular (Project MATCH Research Group, 1997a, 1997b). Motivational Enhancement Therapy (MET), a manual-guided intervention based on the principles of MI (described above) was developed by Miller, Zweben, DiClemente, and Rychtarik (1992) and first employed by Project MATCH. It consisted of 4 sessions over 12 weeks and was compared with manual-guided CBT and TSF which both consisted of 12 sessions over 12 weeks. At one year follow up all groups showed significant reductions in drinking (both frequency and severity) from pre-treatment but no one treatment was more effective overall (Project MATCH Research Group, 1997a). This result was particularly surprising, considering that MET was just as effective as the

comparison treatments in 4 sessions rather than 12. Furthermore, the results from the Project MATCH Research Group (1997b) indicated that clients high in anger had better post-treatment outcomes when treated with MET rather than CBT.

The efficacy of treatments based on the principles of MI (referred to as "adaptations" of motivational interviewing; AMIs; Burke et al., 2002) have been further supported by numerous reviews and meta-analyses of controlled trials (Burke et al., 2003; Burke, Atkins, & Phelps, 2004; Chanut, Brown, & Dongier, 2005; Hettema et al., 2005.; Miller, Zweben, & Jones, 2005; Rubak, Sandbaek, Lauritzen, & Christensen, 2005; Vasilaki, Hoisier, & Cox, 2006). There is a strong evidence-base for AMIs for addictions and health related behaviour (Hettema, et al.). For alcohol and drug problems, AMIs are among those treatments with the greatest evidence base (Miller et al.), equivalent to other active treatments, even though they were on average 120 minutes shorter (Burke et al., 2004), and outperformed traditional giving advice in 80% of the studies (Rubak et al.). For problems involving alcohol, drugs, diet and exercise, AMIs have yielded moderate effects compared with no treatment or placebo, and in addition to the target behaviour change they have impacted on broader problem areas related to substance abuse including legal, social, and occupational areas. However, many AMIs have failed to produce significant effects for smoking or HIV-risk behaviours (Burke et al., 2003, 2004). Not unlike other treatments, the effects of AMIs appear to fade across time (Vasilaki et al., 2006; Burke et al., 2004). For example, the most recent and largest (included 72 outcome studies) meta-analysis that looked at the efficacy of AMIs across problem areas (Hettema et al.), found an average short-term between group effect-size of .77 that had decreased to .3 within a year. Interestingly, Hettema and colleagues found that AMIs were particularly

efficacious (i.e. large effect sizes) in relation to treatment engagement, adherence, and retentions, and found that the effects of AMIs persisted or increased over time when added to other treatments. Other meta-analyses have also shown that AMIs are more effective as a prelude to other treatment services (Burke et al., 2004; Vasilaki et al.). Hettema and colleagues also found that AMIs were found to have the strongest effect when conducted without a manual and when treating ethnic minority populations, and Vasilaki and colleagues found that AMIs were effective for both treatment-seeking and non-treatment-seeking samples (for excessive drinking problems).

Even though it has been demonstrated that AMIs can be effective in 15 minutes (Rubak et al., 2005), some meta-analyses have indicated that more sessions were associated with better outcomes (Burke et al., 2003; Rubak et al.,). Burke and colleagues suggested that this potential moderating effect of dosage of MI (number of sessions) may indicate that later sessions could have the effect of helping clients initiate and/or maintain change.

1.3. Process of MI

The wide variability in the effectiveness observed across AMI providers, populations, target problems, and settings indicates a need to understand *how* and *why* AMIs effect behaviour change (Hettema et al., 2005). That is, links between the process that was engaged in during MI and outcome are yet to be fully understood (Burke et al., 2004). Burke and colleagues' investigation into MI process variables indicated that some promising beginnings have been made. There is some evidence that AMIs may exert their effects by enhancing motivation for change or readiness to change (with small but

significant effects) but this mechanism does not appear to be specific to AMIs. Research also indicates that AMIs may exert their effects by enhancing future treatment participation; or by amplifying the impact of personalised feedback. However, disentangling the effect of MI from feedback is critical in understanding what it is that makes MI effective (Burke et al., 2004).

The most widely used approach incorporating the principles of MI in research literature is one where clients were given feedback concerning their level of severity of the target symptoms compared with standardised norms (as was the case in the MET employed by Project MATCH). While this feedback is given in a MI style, it is not a pure measurement of MI, consequently the efficacy of "pure" MI is difficult to determine (Burke et al., 2003). However, a study by Sellman, Sullivan, Dore, Adamson, and MacEwan (2001) found that clients who received an additional four sessions of MET engaged in less unequivocal heavy drinking than those who only received feedback, and those who instead received an additional four sessions of non-directive reflective listening (NDRL; based on Rogers' client-centered therapy). No difference in outcome found between the latter two. This supports the additional benefit of employing MI guided treatment on top of feedback, and in comparison to a "control psychotherapy" designed to control for therapeutic contact per se. Also, the relative effectiveness of MET to NDRL may indicate the added benefit of the strategic, problem-focused elements of MET on top of the relational components of client-centered therapy (employed in both MET and NDRL).

1.3.1. Confrontational Therapist Behaviour and Client Resistance

Confrontational therapist behaviour (proscribed in MI) during feedback and treatment has been shown to have a deleterious effect, highlighting a benefit of the MI style (Burke et al., 2004). Studies by Patterson and Forgatch (1985), and Miller and colleagues (1993) are particularly good examples of the impact of therapist behaviour on the clients behaviour. Firstly, Patterson and Forgatch employed two coding schemes; the Client Noncompliance code (developed by Kavanagh, Gabrielson, and Chamberlain, 1982, and referred to as the Client Resistance code in Chamberlain, Patterson, Reid, Kavanagh, & Forgatch, 1984); and the Therapist Behaviour Code (developed Forgatch and Chamberlain, 1982) to code sessions of videotaped treatment for families with child management problems. The Client Noncompliance code was designed to measure client Noncompliance/Resistance behaviour (which included Interrupt, Negative Attitude, Confront, Own Agenda, and Not Tracking) and Cooperative Behaviour. The Therapist Behaviour Code included seven categories that described therapists' verbal behaviour (which included Support, Teach, Question, Confront, Reframe, Talk and Facilitate) during a session. Patterson and Forgatch's conditional probability analyses revealed that Therapists' Behaviours of Teach and Confront were associated with increased Noncompliance. Whereas, "Facilitate" and "Support" were accompanied by a decreased likelihood of Noncompliance. In their second study Patterson and Forgatch manipulated Therapist Behaviours in a series of single subject ABAB reversal designs. Clients displayed significantly more Noncompliant Behaviour during the Teach and Confront phases, which strengthened the likelihood that the relationship between Therapist

Behaviours Teach and Confront and client Noncompliance/ Resistance are causally related.

The study by Miller and colleagues (1993) also supports the notion that Noncompliance/ Resistance is influenced by the way therapist's interact with the client, and extends the findings to include therapeutic outcome. Miller and colleagues modified the coding schemes used by Pattern and Forgatch (1985) for the use of coding alcohol use problems in their study, which compared the way in which a 2-session motivational check-up was given. Specific Therapist Behaviour, Confront, was associated with significantly more client Resistance within sessions, which was in turn related to worse drinking outcomes at 1 year follow-up. No other specific Therapist Behaviours (Direct, Listen, Query, Restructure, Support, Teach, Understand) were associated with drinking outcome at 1 year but Therapist Behaviours, Listening and Restructuring, were related to positive client responses (i.e. Change Talk); however, this was unrelated to drinking outcome. These three studies, in combination with more recent studies looking at therapist's behaviours (e.g., Moyers & Martin, 2003) and looking at client's language during an MI session (e.g., Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003) has helped shed some light on the therapeutic process involved in MI.

1.3.2. Motivational Interviewing Skill Code Version 1 (MISC 1.0)

A coding scheme known as the MISC 1.0 (Miller, 2000) has been developed and can be used to investigate the relationship between therapist and client behaviours and possible causal mechanisms. The MISC 1.0 was developed as part of a study that evaluated training in MI (Miller and Mount, 2001) and was based on the coding system

used in Miller and colleagues' study (1993). The MISC 1.0 consists of three "passes" (i.e. three separate coding exercises over consecutive replaying of a recorded session) which include Global Ratings of Therapist and Client Behaviours, specific Therapist and Client Behaviour Counts, and timing of Therapist and Client Talk Time. Therapist Behaviours can be collapsed into a number of summary scores that indicate the quality of the MI, these include responses that are directly prescribed in MI (MI-Consistent Responses or MICO), and those directly proscribed (MI-Inconsistent or MIIN)[2]. More details regarding the MISC 1.0 are contained in the section 2.5. of this thesis.

The MISC 1.0 has been used in a number of studies and a brief summary of the results of each study in which the MISC 1.0 has had a central role can be found here in Appendix A. In addition to investigating process issues within MI, the MISC 1.0 has been used to assess treatment integrity (e.g., Mullins, Suarez, Ondersma, & Page, 2004; Tappin et al., 2000), and measure changes in therapists' skills after training in MI (e.g, Baer et al., 2004; Miller & Mount, 2001; Miller, Yahne, Moyers, Martinez, & Pirritano, 2004; Shafer, Rhode, & Chong, 2004). Treatment integrity and fidelity are both areas which are critical for improving methodology in AMI research, with measurement issues having been identified as a critical area which has limited conclusions regarding the precise mechanisms of change in AMIs (Burke et al., 2004). The psychometric properties of the MISC 1.0 have been detailed in a number of studies (see Madson & Campbell, 2006, for a review; also Appendix A contains details of the interrater reliability estimates of studies

[2] MICO responses include: Advise with permission, Affirm, Emphasise Control, Open Question, Reflect, Reframe, and Support. MIIN responses include: Advise without permission, Confront, Direct, Raise Concern without Permission, and Warn.

involving the MISC 1.0). However, due to the time consuming nature of the MISC 1.0 some researchers (e.g. de Jonge, Schippers, & Schaap, 2005) claim the MISC 1.0 is better suited to assessing process than treatment adherence or training. When considering studies (that have employed the MISC 1.0) that have investigated process issues or possible mechanisms of change, the relationship between therapist and client behaviours within a MI session (e.g., Boardman, Catley, Grobe, Little, & Ahluwalia, 2006; Catley et al., 2006; Miller et al., 1993; Moyers & Martin, 2003, 2006; Moyers, Miller, & Hendrickson, 2005) have been published far more frequently than the relationship between therapist behaviours within MI session and therapeutic outcome (e.g., Thrasher et al., 2006; Miller et al., 1993), and client behaviours within MI session and therapeutic outcome (e.g. Miller et al., 1993). Two possible explanations for this lack of published research are that studies involving the relationship between within session behaviours and outcome have not been as frequently studied or null findings have limited the publication of results (i.e. publication bias).

1.3.3. Theory of the Inner Workings of MI

The above limitations of research to date notwithstanding, based on over two decades of research and practice, an emergent theory of the inner workings of MI has been specified (Miller 2005, Hettema et al., 2005), which in its simplest form consists of the following hypotheses:

1. Therapists who practice MI will elicit increased levels of Change Talk and decreased levels of resistance from clients, relative to more overtly directive or confrontational therapeutic styles.

2. The extent to which clients verbalise arguments against change (Resistance) during MI will be inversely related to the degree of subsequent behaviour change.
3. The extent to which clients verbalise Change Talk (arguments for change) during MI will be directly related to the degree of subsequent behaviour change.

There is support for the first two hypotheses, where studies have generally found that therapist behaviours that are consistent with MI spirit (i.e. high Global Therapist Ratings) and practices (i.e. MICO Therapist Behaviours) increase Change Talk and those that are proscribed in MI increase Resistance (e.g., Catley et al., 2006; Miller et al., 1993; Moyers & Martin, 2003, 2006; Patterson & Forgatch, 1985). While Resistance has been shown to predict negative outcomes (e.g. Miller et al.), studies have not found evidence that supported the predicted relationship between frequency of Change Talk within an MI session, and behavioural outcome (e.g. Miller et al.).

1.3.4. Reconceptualisation of Change Talk

An alternative coding system developed by Amrhein (1992) and applied to MI (Amrhein et al., 2003) suggested a different structure for coding client speech that was predictive of behavioural outcome. Amrhein and colleagues claimed to be the first to investigate the strength and frequency of client Commitment Language as it occurred naturally during a MI session (or any psychotherapy for that matter) and its ability to predict treatment outcome. Specifically, Amrhein and colleagues coded client utterances of Commitment, Desire, Ability, Need, and Reasons to change or maintain their drug

abuse habits throughout a video taped MI treatment session for 84 drug abusers. They also assigned a strength rating to client utterances that were relevant to the target behaviour change. Strength was a rating of the level of motivation reflected in the client's utterance, for example; "I am determined to" is an expression of a greater degree of motivation than "I might". They found that the overall frequency[3] of client utterances was not related to outcome but the strength of client language during the MI session was. The strength of client Commitment Language was a better predictor of outcome than the strength of the other language categories[4] but Commitment strength itself was influenced by the language strength of Desire, Ability, Need, and Reason (i.e. underlying dimensions of Commitment strength). Furthermore, throughout the session evidence of increasing client Commitment was most indicative of a positive outcome, with strength of Commitment at the end of the session being the most significant predictor of outcome. Amrhein et al proposed "that commitment is a useful 'final common pathway' construct that may elucidate relationships between psychotherapy processes and outcomes" (p. 872).

The psycholinguistics of MI that were uncovered by Amrhein and colleagues (2003) led to important changes in the understanding of the underlying processes of MI efficacy (Miller, Moyers, Ernst, & Amrhein, 2003) and supported the third hypothesis

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[3] Frequencies in Amrhein et al (2003) were computed independent of whether the statement was towards or away from change and did not take the strength rating into account. The frequencies were employed to assess how talkative the clients were (P. C. Amrhein, personal communication, November 11, 2006).

[4] In fact, Amrhein and colleagues (2003) found that Commitment strength was the only category for which significant Outcome Group differences occurred. They also found reliable group differences in Commitment strength during the first, middle, and last sections within a single session of MET (decile 1, 5, and 10, respectively). The latter portion/decile represented evaluation of the Change Plan.

stated in the emergent theory of MI (Hettema et al., 2005), the link between in-session client speech favouring change and outcome. It was realised that the way that Change Talk had been measured (i.e. based on the MISC 1.0) was not able to detect the factors relevant to outcome. It was the pattern of the client's language strength across the MI session (especially the end) rather than the frequency at the beginning of sessions (typically the first 20 minutes were measured) that was indicative of efficacy. Furthermore, Commitment Language specifically needs to be attended to rather than generic Change Talk. Amrhein and colleagues findings led to a reconceptualisation of Change Talk and a revision to the way which Change Talk is measured in the latest version of the MISC, the Motivational Interviewing Skill Code Version 2.0 (MISC 2.0; Miller et al.). This tool is still in the development stages and there is currently no published research indicating the reliability, efficiency, and relevance of the MISC 2.0 to clinical practice (Madson & Campbell, 2006; Miller et al.).

Miller, Moyers, Amrhein, & Rollnick (2006) recently made a consensus statement on the definition of Change Talk which was primarily influenced by Armhein and colleagues' (2003) research. They made a number of specific recommendations which include: the term "Change Talk" being used as a generic term that includes all recognised types of self-motivational statements (Desire, Need, Commitment, and Taking Steps[5]); the use of the term "Preparatory Speech" to describe expressions of Desire, Ability,

[5] Subsequent experience with coding Change Talk based on the categories specified by Amrhein et al (2003) and research revealed an additional category, "Taking Steps", which incorporates speech regarding having engaged in a specific behaviour in the direction of the target behaviour change (e.g. I have made sure that I do not have any alcohol in my house) that needs to be considered separate from Preparatory Language.

Reason, and Need (DARN) with inclinations toward change. They also recommended the use of "Sustain Talk" to describe status quo/ inclination away from change statements (of Desire, Inability, Reasons, Need, and Commitment), and for this to be differentiated from resistance. Resistance was recommended to be used specifically to describe other behaviours that signal dissonance in the therapeutic relationship which include interrupting, disagreeing with, and discounting the therapist, and changing the subject away from change.

1.4. Purpose of the Present Study

The present study intends to replicate and expand on the current understanding of the link between the process engaged in during MI and outcome. Based on the hypotheses proposed in the emergent theory of the inner workings of MI (Hettema et al., 2005; Miller, 2005) and the research of Amrhein and colleagues (2003), the present study aims to investigate the following questions and related hypotheses:

1. What is the relationship between the Client Behaviours within MET and therapeutic outcome? It is hypothesised that:
    a. Clients who uttered higher levels of Change Talk will have better therapeutic outcomes than those with lower levels of Change Talk.
    b. Clients who uttered higher levels of Resist/Sustain Talk will have worse therapeutic outcomes than those with lower levels of Resist/Sustain Talk.
    c. Strength of Change Talk will be more important in terms of therapeutic outcome than frequency of Change Talk.

   d. Commitment Language will be more important in terms of therapeutic outcome than other Language categories.

2. How do Therapist Behaviours within MET relate to outcome? It is hypothesised that:
   a. MI-Consistent Therapist Behaviours (MICO) will be associated with better therapeutic outcomes and MI-Inconsistent Therapist Behaviours (MIIN) will be related to worse therapeutic outcomes.
3. How do Therapist Behaviours relate to Client Language within MET? It is hypothesised that:
   a. MICO will have a positive relationship with Change Talk (those types found to be relevant to outcome) and a negative relationship with Resist/Sustain Talk.
   b. MIIN will have a positive relationship with Resist/Sustain Talk and negative relationship with Change Talk.
4. How do Global Ratings of within MET session behaviours relate to Client within session Language and outcome? It is hypothesised that:
   a. Global Ratings will have a positive relationship with Change Talk and therapeutic outcome, and a negative relationship with Resist/Sustain Talk.

These questions and related hypotheses will be investigated by coding audiotaped MET sessions (from a randomised controlled trial of MET for clients with mild to moderate alcohol dependence, Sellman et al., 2001), primarily based on procedures outlined in the MISC 2.0 (Miller et al., 2003). Coding data regarding Therapist and Client Behaviours

will then be compared with outcome data from the clinical trial. An important difference between the present study and that of published articles (e.g. Amrhein et al., 2003) is that unlike other studies which have only investigated a single session (or portion of), the present study involves four sessions of treatment per client. This will allow for analyses of processes involved within each session and across all four sessions. This is of importance considering there is evidence to suggest higher doses of MI relate to better outcome (Burke et al., 2003; Polcin, Galloway, Palmer, & Mains, 2004). Also, to my knowledge, there are no published studies which look at the relationship between Therapist Behaviour and the strength of Change Talk or Commitment Language. Previous studies had only investigated the relationship between Therapist Behaviours and frequency of Change Talk rather than the strength of Commitment Language which was shown by Amrhein and colleagues to predict drug use outcomes.

2. METHODS

2.1. Participants

Data used in these analyses were drawn from the audiotapes of 28 participants who were recruited, assessed, and treated at the Community Alcohol and Drug Service of Christchurch, New Zealand. These participants represent a subset of the 42 participants who had been randomly assigned to receive MET within the context of a randomised controlled Brief Treatment Programme (BTP) for mild to moderate alcohol dependence (Sellman et al., 2001). All participants included in the study were between 18 and 60 years of age, had drank over the New Zealand national drinking guidelines[6] at least once in the past four weeks, met between 3 and 6 of the seven DSM-IV criteria for alcohol dependence (evidence of current or past alcohol withdrawal symptoms lasting longer than 24 hours excluded them from the study)[7] , and alcohol dependence was their principal current disorder. Under informed consent, approved by Canterbury Regional Ethics Committee, each MET session was audiotaped. The audiotape recorder was placed on a coffee table between the client and therapist. The tapes were labelled with a client number and kept in a locked filing cabinet. Audiotapes of only 31 of the 42 clients undertaking MET were made, and a further two were not successfully recorded. The data

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[6] Upper limits for safe/responsible drinking are 21 standard drinks a week for men and 14 standard drinks a week for women. On any one occasion, men should not exceed 6 standard drinks, and women should not exceed 4 standard drinks (MacEwan, 1995). One standard drink is defined as containing 10 grams, or 12.7ml of pure alcohol.

[7] Other Exclusionary criteria were: a history of daily (or almost daily) intravenous drug use for more than 2 weeks; current suicidal, homicidal or psychiatric symptoms requiring psychiatric treatment; evidence of significant cerebral, renal, thyroid or cardiac disease; psychoactive medication; history of cirrhosis, raised serum levels of AST, ALT or bilirubin; or GGT levels greater than three times normal.

from the 28 clients (of the 29) who completed at least 3 sessions of MET were used in this thesis (22 of which had four audiotaped sessions[8]), equating to 106 audiotaped sessions of client-therapist pairs. Each session was planned to be 50 minutes in duration, with the session recorded on one side of a 90 minute audiotape (i.e. 45 minutes recorded per client).

Four therapists were trained in MET, which consisted of an initial 15-hour group training followed by a varying number of individual sessions until therapists reached the standard required on a pilot MET case. Audiotaped sessions were used as part of ongoing fortnightly supervision throughout the trial. One of the main facets of supervision was ensuring that the MET delivered was strategic and focused on drinking. A further measurement of treatment integrity consisted of an external random audit of eight therapy sessions (five MET and three of the comparison psychotherapy, Non Directive Reflective Listening) by two independent auditors. Sellman and colleagues reported that there was 100% agreement about which type of therapy was conducted on each tape and on a measure of the overall quality of the therapy session (a 6-point scale, 6= excellent) the mean rating for the MET sessions was 4.9 (4=satisfactory and 5= very good).

2.2. Treatment

All participants received a two-part comprehensive assessment and a 20 minute feedback/education session. This was followed by four sessions of MET over a six-week

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[8] Three participants had missing recordings of their first session; one had a missing recording of their third session and another was missing their fourth session. Only one participant had attended only one session of MET.

period, a review session at the end of the six weeks, and a follow-up session six months after the review. MET was a manual-guided MI treatment based on that used in Project MATCH (Miller et al., 1992). Four primary modifications were made to the Project MATCH manual (Sellman, Sullivan, & Dore, 1996). (1) Controlled drinking was promoted as a valid treatment choice in addition to abstinence; with clients being encouraged to reduce their drinking to within the national drinking guidelines. (2) The four sessions of MET took place over 6 weeks rather than 12. (3) The feedback/education session was done prior to the first MET session. (4) Involvement of a significant other was encouraged at the feedback/education session only, rather than during the first two therapy sessions (as occurred in Project MATCH). Six additional strategies were utilised at the discretion of the therapist depending on the individual client's situation and stage of change. They included "Problems and concerns," "Good things-less good things" and "Personal dissonance" in Phase 1; and "Life satisfaction," "Costs and benefits" and "Construction of decisional balances" in Phase two. See Sellman and colleagues (1996; 2001) for more information about the assessment, feedback, or treatment.

2.3. Treatment Outcome Measures

The current analyses primarily involved two outcome measures: general adaptive functioning and drinking within the national guidelines, both of these were among those chosen *a priori* in the randomised controlled trial of MET (Sellman et al., 2001). A senior researcher who was blind to the treatment conditions took the participants through a series of questions on a continuum from "no drinking" to "unequivocal heavy drinking". Participants' drinking status on this continuum was determined by utilising the Timeline

Follow Back procedure (Sobell and Sobell, 1992) to characterise drinking pattern over the past six months. For the purpose of this thesis analyses the participants were categorised into two groups based on the amount and frequency of drinking over the six-month follow-up period. The two groups were as follows:

Controlled Drinkers: participants who did not exceed the national guidelines and those who abstained from drinking.

Uncontrolled Drinkers: participants that exceeded the national guidelines during the six-month follow-up period.

Each participant's general functioning, as measured by the Global Assessment Scale (GAS; Endicott, Spitzer, Fleiss, & Cohen, 1976), was estimated at the six-month follow-up in the trial of MET (Sellman et al., 2001). This was based upon descriptive data of the participants' general functioning over the previous month which included work performance, relationship functioning, and review of any coexisting disorders noted at baseline. This estimate of GAS was determined in an ongoing series of research-team consensus conferences and scored on a scale between 0 and 100 in intervals of 5.

2.4. Training for Coding

Two postgraduate psychology students[9] (one being the thesis author) were involved in supervised training for coding of the audiotaped sessions. Training consisted of three primary phases:

[9] Coder DE was male, aged 33, and Coder SC was female, aged 24. Both students used the data obtained from the coding and the BTP data for their own theses; however, each student had separate hypotheses and conducted independent data analyses.

(1) *Familiarisation* with the clinical methods of MI and coding manuals. This was achieved by attending an Introductory Workshop in MI (15 hours) with Dr Joel Porter, readings (including Miller & Rollnick, 2002), video tapes (Miller, Rollnick & Moyers, 1998), and studying the MISC 1.0 (Miller, 2000) and MISC 2.0 (Miller at al., 2003) manuals.

(2) *Two days (15 hours) supervised MISC training* with Dr Simon Adamson, Dr Janet Carter, and Dr Mark Wallace-Bell. This consisted of a seminar given by Dr Wallace-Bell (Senior Lecturer in Addictions) on the spirit of MI, principles, and some specific strategies; group review of MISC 1.0 and MISC 2.0 (with more attention being paid to the latter); a series of graded coding tasks (e.g., coding Open Questions and Closed Questions prior to other Therapist Behaviours and Client Behaviours) and discussion of assignment of codes, and comparison against pre-coded transcripts (available at www.casaa.unm.edu). Finally the group coded an audiotaped MET session from the BTP (the only client that was not included in the analyses due to only having two sessions) to ensure that the coding system was appropriate for the BTP. Correspondence was made with one of the MISC 2.0 authors, Dr Teresa Moyers, to clarify issues that arose during the training.

(3) *Continued practice using a modified version of the MISC 2.0*. This involved the coders initially coding and discussing an audiotaped session together, then coding five audiotaped sessions (two passes for each) independently, assignment of codes were compared and discrepancies reconciled by discussion, reviewing the coding manual, and/ or replaying the audiotaped session as necessary. Supervision was employed as needed to resolve any issues.

The training period was concluded after preliminary reliability analyses (of 12 audiotaped sessions; see section 2.8.2. below). This training approach was adapted from that prescribed by Miller and colleagues (2003).

2.5. Coding Manuals

The manual used for coding the audiotaped sessions of MET is referred to here as the Modified MISC 2.0 and was primarily based on the MISC 2.0 but important elements of the MISC 1.0 were also incorporated, and some additional adaptations were made, which are listed below. The process of coding in the Modified MISC 2.0 was based on that described in the MISC 2.0. Consistent with the procedures described in the MISC 2.0 coding involved listening to the entire duration of each audiotaped session twice (i.e. two passes). The first pass was without stopping and the appropriate Global Ratings were made at the end of each tape. During the second pass, every utterance (defined in the MISC 2.0 as a complete thought which ends either when a new thought begins or when it is interrupted) was coded, and the coder stopped the tape as many times as needed in order to assign the specific Therapist and Client Behaviour Counts (a brief definition of each of these can be found in Appendix B of this thesis). The Behaviour Count codes were recorded sequentially (in order to preserve the temporal nature in which the Therapist and Client Behaviour occurred) rather than being tallied (as prescribed in MISC 1.0[10]). Appendix C contains the Global Rating Scales Form and Behaviour Counts Coding Form which were created based on the relevant information in the MISC 1.0 and

[10] The MISC 1.0 also included an additional pass computing talk time for the therapist and client, which was not included in MISC 2.0 due to its lack of cost-effectiveness (Miller et al., 2003).

MISC 2.0 and adapted for the purposes of this study. A summary sheet, The Behaviour Count Rules: Trumps, Precedence, & Defaults, can also be found in Appendix C, which was compiled based on the information contained within the text of the MISC 1.0 and MISC 2.0, to provide a summary and quick reference of the Behaviour Count rules, and to consolidate concepts and increase reliability of coding.

The Modified MISC 2.0 included all of the Global Ratings from the MISC 2.0 (Therapist Global Rating Scales: Acceptance, Empathy, Spirit; and Client Global Rating Scale: Self-Exploration) and the Global Interaction Scales (Collaboration and Benefit) from the MISC 1.0 which had not been included in the MISC 2.0. The Global Ratings were rated on a 7-point Likert scale and aimed to capture an uninterrupted overall impression of the specific characteristic. See Appendix C for Global Rating Scales Form which contains a brief description of each Global Rating Scale.

The second pass Therapist Behaviour Counts were solely based on the MISC 2.0[11] which included the following Behaviour Count categories: Advise (subclassified as being with or without permission), Affirm, Confront, Direct, Emphasise Control, Facilitate, Filler, Giving Information, Questions (subclassified as either closed or open), Raise Concern (subclassified as being with or without permission), Reflect (subclassified as either simple or complex), Reframe, Structure, Support, and Warn. The second pass of MISC 1.0 and MISC 2.0 both involved coding client speech that is relevant and irrelevant

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[11] The MISC 2.0 represents a simpler classification system compared with the MISC 1.0 with regard to the classification of Information (formerly subclassified as Personal Feedback, Self Disclosure, and General Information) and Reflections (formerly subclassified as either Repeat, Rephrase, Paragraph, or Summarise, and whether client affect was or was not present). This simpler classification was derived from factor analyses of the MISC 1.0 (Moyers, Martin, Manuel, Hendrickson, & Miller, 2005) and acceptable reliability has been demonstrated (Moyers et al., 2005) whereas the previous classification yielded unacceptably low reliability (e.g. Moyers et al., 2003).

to the target behaviour change (TBC)[12]. Categories for coding client speech that are irrelevant to the TBC are similar between the two versions, with the exception of questions asked by the client being separated out in the MISC 1.0. In the Modified MISC 2.0 Follow/Neutral and Ask were coded separately due to the ease with which they could be collapsed to form one category if desired.

The most significant difference between the MISC 1.0 and MISC 2.0 is with regard to client utterances that are relevant to the TBC (see Figure 1). As can be seen in Figure 1, the MISC 1.0 TBC relevant speech is coded as being either moving away from change (Resist Change) or moving towards change (Change Talk). Whereas, in the MISC 2.0, the *types* (Ability, Desire, Need, Commitment, Reasons, and Taking Steps) of TBC relevant speech are coded separately, and are recorded with a positive or negative *valence*. A positive valence utterance is an inclination towards the TBC, whereas a negative valence utterance is an inclination either away from the TBC or to sustain the status quo. Some of the client behaviours captured in the MISC 1.0 were not captured in the MISC 2.0. For example, the MISC 1.0's definition of Resist Change includes both Sustain Talk and resistance (as defined by Miller et al., 2006), whereas, the MISC 2.0 only specifies codes for Sustain Talk (i.e. A-, C-, R-, D-, N-, and T-). The aim of the Modified MISC 2.0 was to capture both the definition of the MISC 1.0 and MISC 2.0 for relevant TBC speech. That is, if the TBC relevant utterance fell into any of the types of Client Language categories described in the MISC 2.0 then the appropriate code was assigned but if the TBC relevant utterance did not fall into those categories and fitted the

[12] In this study TBC was defined as any reduction in alcohol consumption.

Change Talk or Resist MISC 1.0 definitions then Change or Resist codes would be assigned as appropriate. Another modification to the MISC 2.0 was classifying Desire, Need, or Reason all under the same code (reason for or against change).

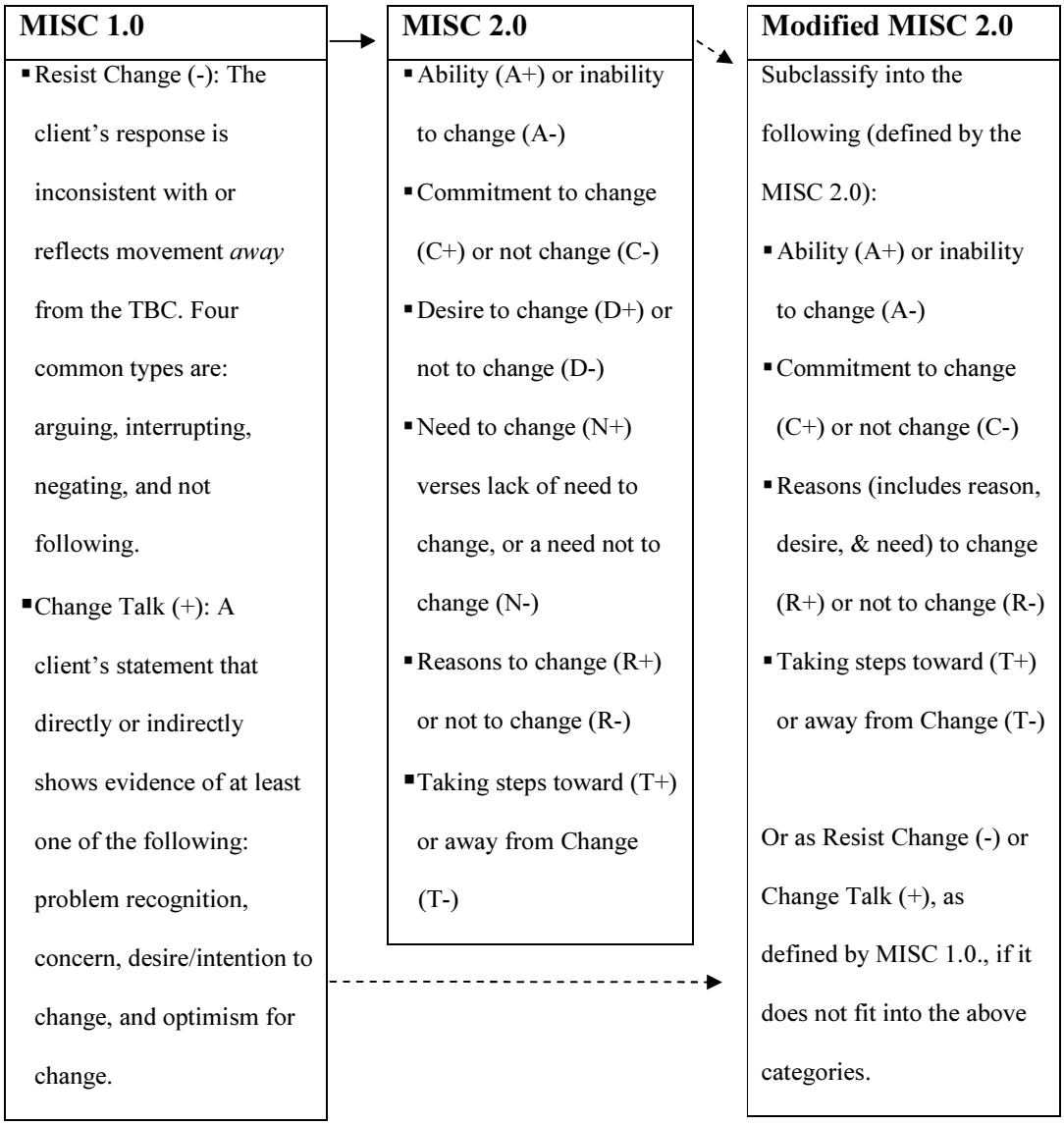

Figure 1. Evolution of TBC Relevant Client Behaviour Count categories (and codes) from the MISC 1.0 to the MISC 2.0, and categories employed from the MISC 1.0 and MISC 2.0 in the Modified MISC 2.0.

In addition in the MISC 2.0, each type of client TBC relevant speech is also given a strength score from +/-1 to +/- 5 (ranging between weak and strong inclinations toward/away TBC). The range does not include zero, as this is reserved for TBC irrelevant statements. The strength allocation system was simplified in the Modified MISC 2.0 into a 3 point scale rather than a 5 point scale (see Table 1 for a summary of this modification, and the Appendix B for brief definition of each of the three levels).

Table 1

Strength Rating of Client TBC Relevant Utterances

MISC 2.0 rating	**Equivalent Modified MISC 2.0 rating**
+/-1 & +/-2	+/-1
+/-3	+/-2
+/- 4 & +/-5	+/-3

The rationale for collapsing of Reason, Need, and Desire into one category, and the simplification of the strength ratings, was based on recent research (e.g., Moyers 2006) and personal communication with T. Moyers (December 20, 2005) which indicated that differentiating among the Change Talk categories and assigning strength ratings was a cognitively taxing task, for which it was proving difficult to achieve acceptable reliability (the latter was reiterated in personal communication with W. R. Miller, November 27, 2006). Furthermore, factor analytic research (Moyers, 2006) had indicated that Desire, Reason, and Need may represent a single factor which is separate from Commitment Language in accounting for variance in client speech. In the current study,

Ability was chosen to remain separate from the other preparatory language categories due to its close relationship with self-efficacy, which is of theoretical importance to MI (i.e. enhancing self-efficacy is specified as a guiding principle of MI).

Essentially the Modified MISC 2.0 was a merged document that contained the relevant descriptions from the MISC 1.0, MISC 2.0, and detailed any other modifications that had been made (discussed above), and additional material (contained in Appendix C).

2.6. Coding

In total 106 audiotaped sessions (6 participants with 3 sessions and 22 participants with 4 sessions) were coded in random order, with participants divided equally between the two coders. The coders were unaware of the identity, intake, or outcome information of the participant at the time of coding. Each audiotaped session was coded following the procedures described in the Modified MISC 2.0. It involved two passes; the first pass was recorded on the Global Rating Scales form, along with the session length (as measured by a tape counter). Each session was then broken up into 9 equal intervals in order to examine Client and Therapist Behaviour Counts at different points within each session and between each session, and standardise the duration of each session. The appropriate interval length and tape count at which each interval started was recorded on the Behaviour Counts Form, which was then used to sequentially record the Behaviour Count codes as they occurred within each interval during the second pass. The time taken to

code the second pass[13] ranged between 1 hour to 2 hours and 15 minutes depending on the length of the session (could be no longer than 45 minutes), pace of the session, verbosity of the client, and the experience of the coder.

2.7. Data Entry and Preparation for Analyses

Each of the coders entered their coding data into Excel, crossing off assigned codes as they were entered. At the end of each interval the coder counted the number of written codes and compared this against the sum of codes that had been entered into the spreadsheet, any discrepancies were immediately rectified. Once the data was entered, the intervals within each session were collapsed into *early* (first three intervals), *mid* (middle three intervals), and *end* (last three intervals). Thus, there were 12 collapsed intervals in total over four sessions of MET.

The frequency of each category of Therapist Behaviour Counts were summed for each interval (and each client separately), and the four summary measures (MI-Consistent [MICO], MI-Inconsistent [MIIN], Neutral Type and All Therapist Behaviours) were calculated by summing all the relevant behaviour counts. Those behaviour counts included in the MICO and MIIN calculations are those outlined in the MISC 1.0, where MICO consisted of: Advise with Permission, Affirm, Emphasise Control, Open Question, Simple and Complex Reflections, Reframe, and Support; and MIIN consisted of: Advise without Permission, Confront, Direct, Raise Concern without Permission, and Warn. Neutral Type Therapist Behaviours include those not included in MIIN or MICO definitions (Facilitate, Filler, Giving Information, Closed Questions, Raise Concern with

[13] These estimates were based on audiotaped sessions coded by the author of this thesis.

Permission, and Structure). The All Therapist Behaviour Counts summary measure included all of the Therapist Behaviour Counts regardless of type (i.e. the frequency of the total number of utterances made by the therapist per Interval of MET). In addition to separate data points for each Interval of MET, Average Therapist Behaviour frequencies were calculated for each specific Therapist Behaviour Count category and summary measure; this represented the mean frequencies per interval of MET for each client.

The Client Behaviour counts were used to generate both summary frequency counts and strength ratings per Interval of MET for each client (see Table 2 for an example of these calculations). Frequency measures included Change Talk frequency and Resist/ Sustain Talk frequency, and the frequency of All Client Behaviour Counts. Change Talk frequencies were calculated by summing all client utterances that represented an inclination toward target behaviour change (TBC), regardless of strength or Client Language category. Similarly, Resist/ Sustain Talk frequencies were calculated by summing all client utterances that represented an inclination away from TBC or maintaining status quo, regardless of strength or Client Language category. All Client Behaviour Counts were calculated by summing all of the client utterances whether they were relevant to the TBC or not (i.e. included Follow, Question, and Change and Resist/Sustain Talk categories). Strength measures represent a mean value that takes both valence and strength of TBC relevant utterances into account and vary from -3.0 to + 3.0 (from strong inclination away from TBC to a strong inclination toward). A strength value was calculated for each Client Language category relevant to TBC (i.e. Ability, Commitment, Reason, and Taking Steps). In addition, a strength value was also

calculated that included all TBC relevant categories and was labelled All Change & Sustain Talk strength[14].

To conduct analyses of change in Client Language strength within an audiotaped MET session, the strength of the *early* interval was subtracted from the strength *end* interval for each session and client. To conduct analyses of change in Client Language strength over MET for every participant, the *earliest* interval for each participant was subtracted from the *end* interval of their last audiotaped MET session[15].

Table 2

Example of Client Utterance Summary Measure Calculations

Client Behaviour Count Category	R-3	R-2	R-1	R+1	R+2	R+3
Frequency	1	15	9	4	8	2

Calculation of:

$$\text{R (Reason) Strength} = \frac{(1\text{x}\text{-}3)+(15\text{x}\text{-}2)+(9\text{x}\text{-}1)+(4\text{x}1)(8\text{x}2)(2\text{x}3)}{(1+15+9+4+8+2)}$$

$$= -.79$$

Contribution to Change Talk Frequency = 4+8+2 = 14

Contribution to Sustain Talk Frequency = 1+15+9 = 25

Note: Change and Resist/ Sustain Talk frequencies also include all other Client Language Categories; R = Reason.

[14] This is different from an average across the different language categories because utterances in each Client Language category occurred at different frequencies

[15] Change in strength difference between earliest and last interval of MET for each client was chosen as the change score over MET instead of other possible change scores (such as change in strength from the first to the last session of MET) for two primary reasons: (1) due to the typical structure of therapy and MET more specifically e.g., in the BTP MET Therapist Manual (Sellman et al., 1996), at the end of the brief standard introduction the therapists were instructed to say "Perhaps we could start by you updating me about how you see your situation now in terms of your drinking" (p. 20) and the end of the last session of MET consisted of "a final recapitulation of the patients situation and progress through the 4 MET sessions" (p. 25); (2) less overlap with other factors e.g. differences between sessions were already being investigated in the Repeated Measures ANOVA.

At each of the stages (i.e. collapsing, creating summary measures, and frequency and mean strength ratings) the first line and then at least 2 data points were checked against the original spreadsheet, raw coding sheets, and/or by manual calculation as appropriate to make sure that each stage/formula was accurate and any discrepancies were immediately corrected. The data was also transposed ready to be imported into SPSS 13.0 for data analyses.

2.8. Data Analyses

An exploratory data analyses approach was employed, where at each stage the data was examined in detail before being analysed further. However, the differences between Client and Therapist Behaviours within MET, and outcome measures; and the relationship between Client and Therapist Behaviours within MET were of primary interest. A significance level of $p<.05$ was employed, and no corrections for multiple comparisons were made due to the exploratory nature of this research and the small sample size. Any significant differences indicate areas for future research and require replication. See section 4.5.1 for further discussion of the interpretation and implications of the current exploratory data analyses.

Data was analysed using SPSS 13.0. BTP baseline and outcome data had already been transferred into SPSS for the purposes of previous analyses (e.g. Sellman et al., 2001). All of the participants in the current analyses had been followed-up at six months apart from one. For the participant with missing outcome data, Outcome Group was determined based on information obtained at the six-week review, and the Global Assessment Scale score (GAS) was imputed as being the same as at baseline.

2.8.1. Characteristics of the Sample

Descriptive statistics determining the characteristics of the sample were computed for baseline variables including demographics, current disorders, drinking measures, and GAS. Chi-square for contingency tables (independence) and independent samples *t*-test were used to check baseline variables against Outcome Groups for discrete and continuous data[16], respectively.

2.8.2. Reliability of Coding

Two measures of reliability were employed: interrater and test-retest reliability. The first 12 audiotapes were independently coded by both of the coders (Time 1) and preliminary reliability statistics were generated to determine whether reliability was at an acceptable level to proceed. Interrater reliability was considered acceptable when there was at least 95% agreement (± one point) on the seven point Global Rating Scales; and if the Behavioural Counts reliability statistics were comparable with published research e.g. only obtaining poor reliability on items that had yielded poor interrater reliability in other studies (e.g., Moyers et al., 2003; & de Jonge, 2005). In order to determine test-retest reliability coders recoded the original 12 sessions (from Time 1) more than four months later (Time 2), having each coded 47 tapes in between. Detailed interrater reliability analyses were generated with the data at time two. During both the interrater reliability phase and the test-retest phase each coder was blind to the other coders ratings and their coding at time one (respectively). Codings of audiotaped sessions at time two, and those

[16] Levene's test was employed to test for homogeneity of variance in comparisons involving continuous data.

done by the coder who had been randomly assigned to code that particular client's audiotaped sessions, were used in data analyses.

Intraclass (single measures) correlation coefficients (ICC) were chosen to assess reliability. This statistic is more conservative than the more familiar Pearson's correlation coefficient, as it corrects for chance agreement and systematic bias. Furthermore, Cicchetti (1994) argued that the ICC was the reliability statistic of choice. Guidelines for interpreting the level of clinical significance of the reliability coefficient (Cicchetti, 1994) are outlined in Table 3. Reliability coefficients (ICC) that fell in the poor range of clinical significance on either the interrater or test-retest reliability were considered unacceptably low and were not used for further analyses on their own[17]. In addition to ICCs, percentage of absolute agreement was also calculated for the Global Rating Scales.

Table 3

Guidelines for Interpreting the Level Clinical Significance of Reliability Coefficients

Reliability coefficient	Level of Clinical Significance
< .40	poor
.40 – .59	fair
.60 – .74	good
.75 – 1.00	excellent

[17] However; they may have been incorporated into summary measures along with other variables, if the summary measure itself demonstrated acceptable reliability.

2.8.3. Behaviour within MET and differences between Outcome Groups

Analyses involving Client and Therapist Behaviours (apart from change in Client Language strength over MET) and differences between Outcome Groups were first analysed using a separate General Linear Model Repeated measures ANOVA[18] for each Client and Therapist Behaviour category. Session and Interval[19] were treated as within factors and Outcome Group as the between factor. A Greenhouse and Geisser correction for degrees of freedom was used if the sphericity assumption was violated (Howell, 2002). Main effects, interactions, visuals plots, and marginal means were computed[20]. Due to the focus of this study, only simple effects involving Outcome Groups (i.e. differences between the two Outcome Groups on a Client or Therapist Behaviour category at one particular session or interval) were investigated further using independent *t*-tests[21]. Note that these simple effects between groups were only investigated if relevant interaction was significant.

Since change in strength scores over MET only represented one data point per participant for each language category, a MANOVA was conducted[22] to determine

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[18] These included analyses over all sessions of MET, thus only those participants (n=22) with four sessions were included.

[19] Session was the only within factor for change in Client Language strength within MET Sessions.

[20] If the main effect or interaction was significant then either the means or a plot (of the means) were reported/included, depending on ease of interpretation (i.e. generally plots were included if the interaction was significant).

[21] *t*-tests were chosen to investigate simple effects over General Linear Model analyses (i.e. MANOVA), so that larger sample sizes (i.e. data from up to 6 additional participants could be used in some analyses) could be employed to investigate a simple effect (because only those clients who had a full set of data over all four sessions of MET could be included in MANOVA). Another advantage of the SPSS *t*-test analyses is that it offers adjusted degrees of freedom if homogeneity of variance is violated.

[22] This was based on a method for conducting MANOVA with difference scores described by Howell (2002). MANOVA was chosen due to its ability to investigate simple effects and difference scores.

whether there was a significant increase in strength over MET for participants in general, and whether the Outcome Groups differed in terms of change in strength over MET.

2.8.4. Behaviour within MET as Predictors of Outcome Group

In addition to investigating whether client behavioural outcome differed with regard to Client and Therapist Behaviours during MET, it is also useful to know how well these within MET behaviours predict Outcome Group[23]. Accordingly, a series of Logistic Regressions were performed with Outcome Group as the criterion variable. Prediction models were created for Client and Therapist Behaviours separately. This consisted of a separate Logistic Regression for each of the following Client Language categories: Average frequency of TBC category measures (averaged across intervals of MET); Average strength category measures (averaged across intervals of MET); Intervals and Sessions of specific categories that yielded significant differences between Outcome Groups during Repeated Measures ANOVA; and MET Interval Change scores. A Correlation Matrix was then computed involving all of the client variables that were revealed as significant predictors of Outcome Group. Then all of the significant predictors were put into a single model which also included a baseline drinking measure (proportion of days in which the participant drank over the drinking guidelines during the 6 months prior to MET) to determine which combination of predictors were able to make the best prediction and whether client within session behaviour/language was able to account for behavioural outcome beyond level of drinking prior to treatment.

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[23] In SPSS 13.0 Controlled Drinkers were entered in the data sheet as "1" and Uncontrolled Drinkers as "2".

Parallel analyses were conducted involving Therapist Behaviours, including a correlation Matrix and two separate Logistic Regressions: the first with each Average Therapist Behaviour category (averaged across intervals of MET) as predictors of Outcome Groups, and the second with those Intervals and Sessions of Specific categories that yielded significant differences between Outcome Groups during Repeated Measures ANOVA. A final single Regression Model was conducted involving all of the Therapist Behaviours that had been revealed as significant predictors of Outcome Group and proportion of days over the drinking guidelines at Baseline[24].

2.8.5. Global Assessment Scale (GAS) as a Measure of Outcome

Parallel analyses to that described for Outcome Groups were conducted with GAS at six-months and change in GAS from baseline[25] as Outcome Measures. Since GAS is a continuous variable, correlations and Multiple Regressions were conducted with Client and Therapist Behaviours within MET instead of ANOVAs and Logistic Regressions.

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[24] The original intention was to conduct a final Regression analysis with Outcome Group as the dependent variable. This would have included all Therapist or Client Behaviours that had been revealed as significant predictors of outcome, along with baseline drinking and other variables that had a significant relationship with outcome. Due to the large number of variables (relative to the small sample size) that would have been included in the model, separate models for the Client and Therapist Behaviours were conducted instead.

[25] The change in GAS score was employed in order to control for any differences in baseline scores.

2.8.6. Therapist Behaviour and Client Language within MET

Correlation Matrices and Stepwise Multiple Regressions were utilised to investigate the relationships between Therapist Behaviours and Client Language[26]. Therapist variables (predictors) included Average Therapist Behaviour Categories, and Interval and Sessions of specific Therapist Behaviour categories that yielded significant differences between Outcome Groups during Repeated Measures ANOVA. Client variables (criterion variables) were those that had yielded significant differences between Outcome Groups during Repeated Measures ANOVA[27]. A separate model was conducted for each criterion variable.

2.8.7. Global Rating Scales

The intention was to investigate whether the Outcome Groups differed in terms of Global Ratings within MET; and the relationship between Global Rating Scales and within session Therapist and Client Behaviours, and GAS at 6 months. However; due to the low reliability of these scales these analyses were not conducted.

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[26] Note that due to the nature of this research (i.e. not a "true experiment") it cannot be said with certainty that Client Language/Behaviours depend on Therapist Behaviours and that Therapist Behaviours do not depend on Client Behaviours. Therefore variables in these analyses have been termed predictor and criterion variables, rather than independent and dependent variables. Even though it cannot be said with certainty what is cause and effect, it is still possible to use knowledge about one variable to predict scores of another (Aron and Aron, 1999). Previous research (e.g. Patterson and Forgatch, 1985) has demonstrated that Client Behaviour is clearly influenced by Therapist Behaviour and the majority of research in this area labels the Therapist Behaviour as the predictor variable (e.g. Catley et al., 2006; Moyer & Martin, 2003). Consistent with these studies, Therapist Behaviours were chosen as predictor variables and the Client Behaviours as the criterion variable in the current analyses. This issue is discussed in further detail in section 4.4. of this thesis.

[27] Only Client Language variables that were either an Average over MET, Change over MET, or End Session or Interval of MET were included. For example, significant early sessions were not included due to the increased difficulty interpreting the direction of the relationship between the variables.

3. RESULTS

3.1. Characteristics of the Sample

Information regarding client sample demographics and baseline information are summarised in Table 4 and are displayed in relation to the drinking Outcome Groups. Table 4 also shows that there were no significant differences between Outcome Groups in terms of baseline data. The percentage of Maori is the factor for which the largest difference between groups occurred, however, the difference is still not statistically significant (p=.11).

All apart from one (96%) of the clients *(N* = 28*)* had exceeded the national drinking guidelines six or more times during the six months prior to MET. In addition to alcohol dependency, at the time of the initial assessment (prior to MET) 10 individuals (36%) in the sample met the criteria for at least one additional current DSM-IV disorder. These were made up of the following disorders in order of prevalence: major depression (18%), cannabis dependency (11%), social phobia (7%), and dysthymia, post traumatic stress disorder, and panic disorder (each with 4% prevalence). The mean GAS score at baseline fell within the range described in the GAS (61-70) as: “some mild symptoms (e.g., depressive mood and mild insomnia) OR some difficulty in several areas of functioning, but generally functioning pretty well, has some meaningful interpersonal relationships and most untrained people would not consider him ‘sick’” (Endicott et al.,1976, *p* 768).

Table 4

Baseline Data in relation to Controlled and Uncontrolled Drinking during the 6-month period after MET

Baseline Data	Controlled Drinkers (*n*=12; 42.9%)	Uncontrolled Drinkers (*n*=16; 57.1%)	Over all Clients (*N*=28)	Outcome Group Comparison χ^2 / *t, p*
Women %	50%	38%	43%	.44, *p*=.51
Age, mean years (SD)	38.3 (9.4)	41.1 (12.3)	39.9	-.66, *p*=.52
Maori (%)	0.%	19%	11%	2.52, *p*=.11
Married or cohabiting (%)	50%	56%	54%	.11, *p*=.74
Education, mean years (SD)	12.0 (3.4)	13.2 (3.7)	12.7 (3.6)	-.87, *p*=.39
Current co-occurring disorder (%)	33%	38%	36%	.05, *p*=.82
Percentage of days over drinking guideline	50%	58%	54%	-.67, =*p*=.51
10+ std drinks 6+ times (%)	75%	88%	82%	.73, *p*=.39
GAS score at baseline, mean (SD)	64.2 (5.6)	64.1 (7.8)	64.1 (6.8)	1.23, *p*=.28

3.2. Reliability

3.2.1. Reliability of Global Rating Scales

As can be seen in Table 5**,** there was a ceiling effect with regard to the assignment of ratings on the Global Rating Scales. The majority of the mean ratings per session were close to the ceiling (on a scale 1-7) and there was very little variation (e.g. on the Global Therapist Rating Scales Coder DE assigned the entire reliability sample ratings of 7 at Time 2).

Table 5

Mean (SD) Rating of the Global Rating Scales per Session for the Reliability Sample, n = 12

		Coder DE		**Coder SC**	
Scale	**Subscale**	**Time 1**	**Time 2**	**Time 1**	**Time 2**
Therapist	Acceptance	6.75 (.62)	7.00 (.00)	6.83 (.58)	6.92 (.29)
	Empathy	6.75 (.45)	7.00 (.00)	6.75 (.62)	6.75 (.62)
	Spirit	6.92 (.29)	7.00 (.00)	6.58 (.67)	6.50 (.80)
Client	Self-Exploration	5.67 (.65)	5.25 (.45)	5.83 (.58)	5.83 (.58)
Interaction	Collaboration	6.92 (.29)	6.83 (.39)	6.58 (.90)	6.58 (.90)
	Benefit	5.92 (.79)	5.67 (.65)	5.33 (.89)	5.75 (.87)

As can be seen in Table 6, many of the Global Ratings Scales achieved an adequate level of agreement on most reliability conditions. However, the lack of variation of assignment contributed to the majority of the Intraclass correlations coefficients (ICCs) on Global Rating Scales being unacceptably low. ICCs were in the Poor range on at least one of the reliability conditions for all of the Global Rating Scales apart from

Collaboration. Given that this scale only achieved an interrater reliability ICC .41, it was decided not to analyse any of the Global Rating Scales any further. Nevertheless, such high scores on the reliability sample Global Rating Scales do suggest that the therapists delivering MET in the BTP generally displayed a high degree of Acceptance, Empathy, and Spirit (ratings ranging from 5-7 on each of these Global Therapist Rating Scales), with the majority of sessions attaining Global Therapist Ratings above the threshold for proficiency (> 5.0; Miller, 2000) as indicated by the coders' ratings of the reliability sample. Furthermore during sessions of MET, clients displayed moderate to high levels of Self-Exploration (ratings ranging from 4-7), and the interaction between the therapist and the client was rated as a moderate to high level of Collaboration and Benefit (ratings ranging from 4-7 on both Global Interaction Scales) across the reliability sample.

Table 6

Percentage of Agreement on the Global Rating Scales per Session for the Reliability Sample, n=12

Scale	**Subscale**	**Test-retest Reliability**		**Interrater Reliability**
		Coder DE	**Coder SC**	**(at Time 2)**
Therapist	Acceptance	83%	92%	92%
	Empathy	75%	100%	83%
	Spirit	92%	92%	67%
Client	Self-Exploration	42%	100%	42%
Interaction	Collaboration	92%	100%	67%
	Benefit	42%	58%	33%

3.2.2. Reliability of Therapist and Client Behaviour Counts

Due to the large number of Therapist and Client Behaviour Counts, additional reliability sample tables of specific Behaviour Counts are found in Appendix D. The mean (standard deviation) frequency of Therapist Behaviour Counts summary measures are presented in Table 7 (below). Neutral Therapist Behaviours occurred most frequently, followed by MI-Consistent (MICO), and MI-Inconsistent (MIIN; which rarely occurred). The specific Therapist Behaviour Confront (CO) was not assigned at all (i.e. behaviour not exhibited) during any of the reliability conditions; and Raise Concern with and without Permission (RCP, RCW, respectively), and Warn (WA) were not assigned during some of the reliability conditions (see Table 21 in Appendix D).

Table 7

Mean (SD) Frequency of the Therapist Behaviour Count Summary Measures per Interval for the Reliability Sample, n =36 (Intervals)

Summary	**Coder DE**		**Coder SC**	
Measures	**Time 1**	**Time 2**	**Time 1**	**Time 2**
All Counts	57.56 (16.83)	64.36 (19.96)	70.64 (25.65)	70.39 (22.32)
MICO	26.33 (10.90)	26.36 (10.56)	29.22 (10.60)	30.08 (11.15)
MIIN	1.08 (1.34)	.72 (1.09)	.36 (.76)	.42 (.91)
Neutral	30.14 (12.58)	37.28 (16.04)	41.06 (21.49)	39.89 (18.08)

Note: MI-Consistent (MICO) and MI-Inconsistent (MIIN)

As can be seen in Table 8, the reliability of all of the Therapist Behaviour Count Summary measures were in the good to excellent range, and these were generally better than the reliability found for the specific Therapist Behaviour Counts (see Table 22 in

Appendix D). Nevertheless, all of the specific Therapist Behaviour Counts that were coded in all of the reliability conditions gained acceptable reliability apart from Advise with Permission (ADP), Reframe (RF), and Support (SU). Thus ADP, CO, RCP, RCW, RF, SU, and WA were excluded from any further analyses involving specific Therapist Behaviours due to the reliability estimates being unacceptably low or the reliability not being able to be estimated because of the non occurrence of an item.

Table 8

Intraclass Correlation Coefficients of the Therapist Behaviour Count Summary Measures per Interval for the Reliability Sample, n = 36 (Intervals)

	Test-retest Reliability		**Interrater Reliability**
Measure	**Coder DE**	**Coder SC**	**(at Time 2)**
All Counts	.89	.92	.86
MICO	.91	.95	.90
MIIN	.65	.64	.75
Neutral	.86	.89	.87

Note: level of clinical Significance: <.40=poor; .40-.59=fair; .60-.74=good; ≥.75=excellent; MI-Consistent (MICO) and MI-Inconsistent (MIIN);

The mean (standard deviation) frequency of Client Behaviour Count summary measures are presented in Table 9. As can be seen in Table 9, Change Talk was assigned more frequently than Resist/Sustain Talk. In regards to strength measures, Ability was the only category that obtained a negative mean (suggesting a stronger degree of inability rather than ability to reduce their drinking), whereas all of the other categories had positive means (indicating a degree of commitment, reasons, and desire to reduce their

drinking). A number of specific Client Behaviour Count categories were not assigned at all during any of the reliability conditions (i.e. -3, -2, -1, +1, +2, +3; refer to Table 23 in Appendix D), all of which were the subcategories that should have been assigned if the client utterance did not fit into any of the Change talk Categories as defined by the MISC 2.0 (e.g. Ability, Commitment, Reason, or Taking Steps) but did fit the criteria for Change talk or Resist as defined by the MISC 1.0. This indicates that Sustain Talk was coded but Resist Change (i.e. interrupting, disagreeing, discounting) was not[28], thus Resist/Sustain Talk is referred to as Sustain Talk from this point on.

Table 9

Mean (SD) Frequency of the Client Behaviour Count Summary Measures per Interval for the Reliability Sample, n= 36 (Intervals)

Type of		**Coder DE**		**Coder SC**	
measure	**Category**	**Time 1**	**Time 2**	**Time 1**	**Time 2**
Frequency	All Counts	67.50 (16.30)	74.19 (21.20)	73.89(26.90)	71.03 (23.40)
	Resist/Sustain	13.14 (8.45)	16.28 (11.34)	10.00 (9.36)	8.36 (7.26)
	Change	30.14 (12.63)	35.78 (14.91)	27.14(14.77)	23.28 (12.01)
Strength	All Change & Sustain	.79 (.72)	.95 (.79)	.70 (.66)	.92 (.72)
	Ability	-.38 (1.27)	-.27 (1.54)	-.01 (.93)	-.24 (1.39)
	Commitment	.99 (1.06)	1.32 (.67)	.94 (.97)	1.10 (.79)
	Reason	.98 (.85)	.99 (.91)	.70 (.85)	.91 (.85)
	Taking Steps	.81 (1.17)	1.13 (1.18)	.81 (.96)	1.25 (.88)

[28] See Miller et al. (2006) or Reconceptualisation of Change Talk in the Introduction (Section 1.3.4) for the difference between Sustain and Resist Talk. Only Sustain Talk was coded in the full set of data as well.

As can be seen in Table 10, the reliability of the Client Behaviour Count summary measures were in the good to excellent range, which was generally more reliable than when the assignment of strength and category was considered. The reliability of the strength summary measures were in the fair to excellent range. While all of the summary measures achieved acceptable reliability, the reliability of specific Client Behaviour Counts were generally in the poor range (refer to Table 24 in Appendix D).

Table 10

Intraclass Correlation Coefficients of the Client Behaviour Count Summary Measures per Interval for the Reliability Sample, n= 36 (Intervals)

Type of measure	**Category**	**Test-retest Reliability**		**Interrater Reliability (at Time 2)**
		Coder DE	**Coder SC**	
Frequency	All Counts	.84	.92	.82
	Sustain	.72	.88	.75
	Change	.82	.77	.80
Strength	All Change & Sustain	.88	.92	.84
	Ability	.52	.80	.50
	Commitment	.69	.52	.63
	Reason	.77	.85	.78
	Taking Steps	.52	.72	.60

Note: level of clinical significance: <.40=poor; .40-.59=fair; .60-.74=good; ≥.75=excellent

3.3. Client Language within MET and Differences between Outcome Groups

3.3.1. Frequency of All Client Behaviour Counts and Outcome Group

A Repeated Measures ANOVA revealed that there were no significant differences between Controlled Drinkers and Uncontrolled Drinkers (i.e. no main effect of Outcome Group or interactions involving Outcome Group) in terms of the frequency of All Client Behaviour Counts per Interval (sum of the frequency within all of Client Behaviour Count Categories). However, there were significant differences between Sessions of MET, Intervals within MET Sessions, and a significant interaction between these two factors: F (3, 60) = 2.829, p = .046; F (1.496, 29.922) = 80.555, p = .000; and F (6, 120) = 2.569, p = .022 (respectively). These differences are depicted in *Figure 2*, where it can be seen that Session 1 had a higher frequency of All Client Behaviour Counts (compared with the other Sessions), and within each Session the frequency increased across Intervals. However, differences in frequency of All Client Behaviour Counts between Intervals and Sessions also depended on the level of the other factor, where it can be seen that there were less differences between Sessions during the Early Interval compared with the later Intervals.

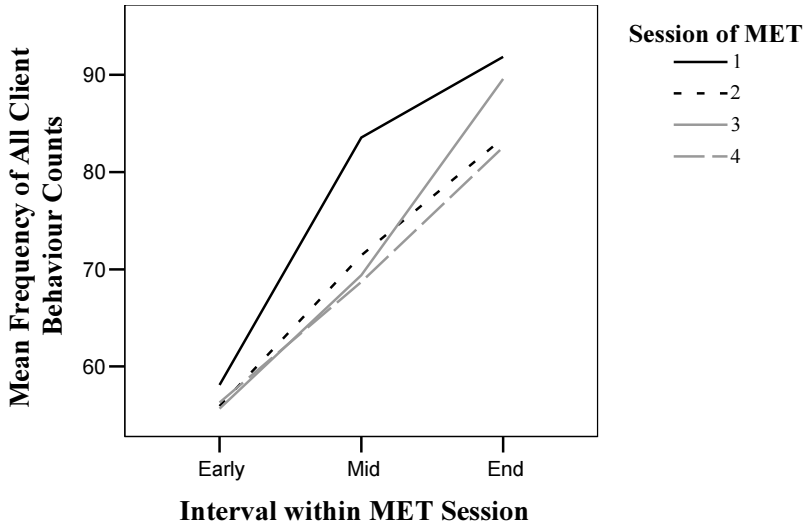

Figure 2: Frequency of All Client Behaviour Counts within Intervals and across Sessions of MET

3.3.2. Frequency of Change Talk and Outcome Group

A Repeated Measures ANOVA with frequency of Change Talk per Interval as the dependant variable revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers, or Sessions (i.e. no main effect of Outcome Group or Session). However, there were significant differences between Intervals within MET Sessions, F (2, 40) = 26.542, p = .000. As can be seen in Figure 3, there was a general increase in the frequency of Change Talk across Intervals within MET Sessions, and a trend towards differences between Outcome Groups depending on the Interval within MET Sessions (i.e. the interaction between Outcome Group and Interval was approaching significance), F (2, 40) = 3.021, p =.060. At a descriptive level little differences occurred between

Outcome Groups during the Early Intervals within MET Sessions; Uncontrolled Drinkers had a higher frequency of Change Talk during the Mid Interval; and Controlled Drinkers had a higher frequency of Change Talk during the End Interval[29]. No other interactions were found to be significant or approaching significance (p <.10).

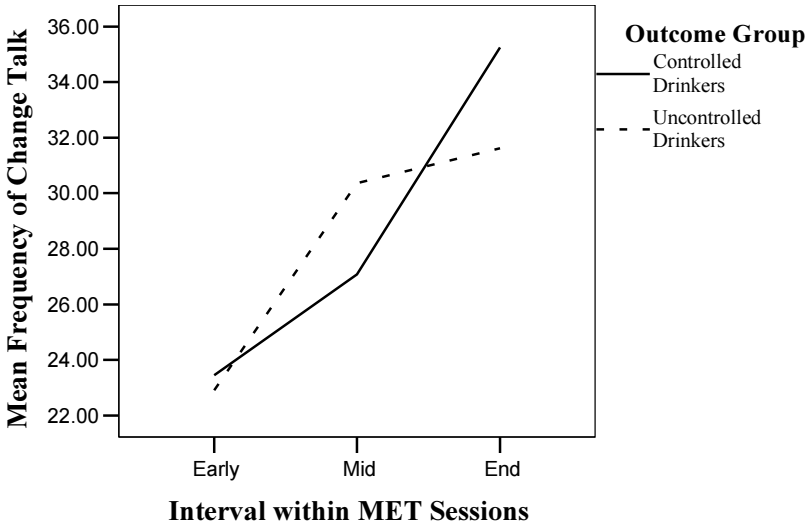

Figure 3: Frequency of Change Talk during Intervals within MET Sessions and Outcome Group

3.3.3. Frequency of Sustain Talk and Outcome Group

A Repeated Measures ANOVA with frequency of Sustain Talk per Interval as the dependent variable revealed significant main effects for all of the factors (Session,

[29] The statistical significance of these differences was not investigated but it is unlikely that the differences were significant given that the relevant interaction was not quite significant.

Interval, and Outcome group) but none of the interactions between these factors were significant. Controlled drinkers had engaged in a significantly lower frequency of Sustain Talk per Interval of MET (M = 7.861 and SE = 1.321) compared with the Uncontrolled Drinkers (M = 11.795 and SE =1.099), F (1, 20) = 5.240, p = .033. There were significant differences in the frequency of Sustain Talk between the Sessions, F (3, 60) = 6.970, p = .000. The mean during Session 1 (M = 13.127 and SE = 1.068) was higher than the other three Sessions (Session 2 M = 8.714 and SE = 1.146; Session 3 M = 9.248 and SE = 1.169; Session 4 M = 8.224 and SE = 1.136). Intervals within MET Sessions also yielded differences in frequency of Sustain Talk, F (2, 40) = 4.425, p = .018. Early Intervals (M = 8.376 and SE = .791) generally had a lower frequency of Sustain Talk than Mid Intervals (M = 10.846 and SE = 1.113) and the End Intervals (M = 10.262 and SE = 1.050).

3.3.4. All Change & Sustain Talk Strength and Outcome Group

A Repeated Measures ANOVA with All Change & Sustain Talk strength[30] per Interval of MET as the dependent variable, revealed a significant main effect of Session, F (2, 20) = 4.220, p=.009. This indicated that there were significant differences between Sessions in terms of mean strength of all target behaviour change relevant utterances. In Session 1 the mean (and SE) of All Change & Sustain Talk strength per Interval was .717 (.101) which increased to .979 (145) and .973 (.145) in Session 2 and 3 (respectively), and increased again in Session 4 to 1.058 (.133). No other main effects or interaction effects were found to be significant. However, the main effect of Outcome Group was

[30] A strength measure represents a mean value that takes both valence and strength of TBC relevant utterances into account, and can vary from -3.0 to + 3.0 (from strong inclination away from TBC to a strong inclination toward).

approaching significance, F (1, 20) = 3.701, p=.069, with Controlled Drinkers having a higher mean All Change & Sustain Talk strength (M = 1.137 and SE= .164) than the Uncontrolled Drinkers (M = .726 and SE= .137).

3.3.5. Ability Strength and Outcome Group

A Repeated Measures ANOVA with Ability strength per Interval of MET as the dependent variable revealed a significant main effect of Session and Outcome Groups, but not for Interval. That indicates that there were significant differences in Ability strength between the Sessions of MET, F (2.253, 45.057) = 6.156, p=.0031. Session 1 had lower Ability strength (M = -.297 and SE = .177) than Session 2 (M =.490 and SE .186), Session 3 (M = .555 and SE .219), and Session 4 (M = .524 and SE= .156). Furthermore, those who engaged in Controlled drinking during the 6 months after MET uttered a higher mean Ability strength (M = .615 and SE= .182) than the Uncontrolled Drinkers (M =.021 and SE= .151) , F (1, 20) = 6.313, p=.021. The interaction between Interval and Outcome Groups was the only interaction between factors that was significant, F (2, 40) = 3.463, p=.041. As can be seen in Figure 4, Outcomes Groups' strength of Ability Language differ depending on which Interval it was within MET Sessions, where the largest and only significant difference between Controlled and Uncontrolled Drinkers occurred in the End Interval within MET Sessions, t (26) = 3.237 = p = .003.

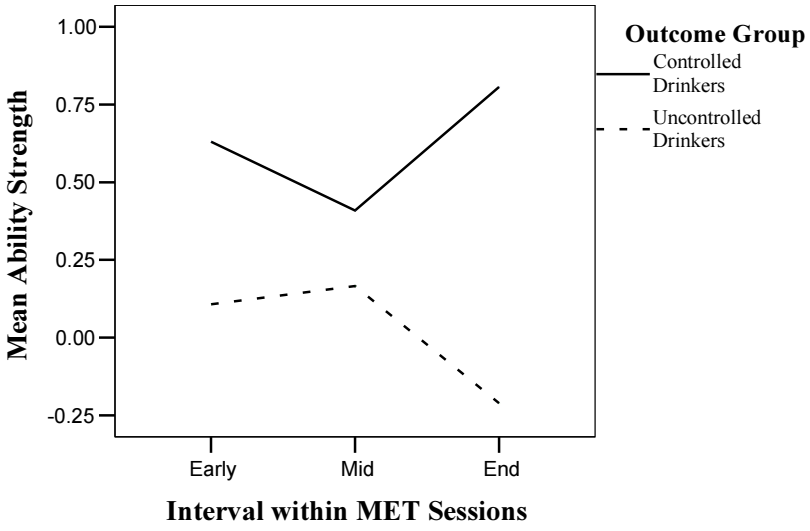

Figure 4: Strength of Ability during Intervals within MET Sessions and Outcome group.

3.3.6. Commitment Strength and Outcome Group

A Repeated Measures ANOVA with Commitment strength per Interval of MET as the dependent variable, revealed no significant differences between Interval within MET Sessions or Outcome Group, but there was a significant main effect of Session, F (3, 60) = 7.609, p=.000. The interaction between Session and Outcome Group was the only interaction between factors that was significant, F (3, 60) = 2.983, p=.038. The means (and SE) of Commitment strength for the Controlled and Uncontrolled Drinkers, for each MET Session are presented in Table 11. As can be seen in Table 11, Commitment strength averaged over all clients was lowest in Session 1 and highest in Session 4. Furthermore, differences in Commitment strength between the Outcome

Groups differed depending on the Session of MET, where Controlled Drinkers had significantly higher Commitment strength than Uncontrolled Drinkers during Session 2 and Session 4, t (26) = 2.573, p = .016 and t (24) = 3.913, p = .008 (respectively).

Table 11

Mean (SE) Commitment Strength across Sessions of MET

	Controlled Drinkers	Uncontrolled Drinkers	All clients
Session 1	.710 (.168)	.827 (.140)	.768 (.109)
Session 2	1.449 (.169)	.898 (.140)*	1.174 (.110)
Session 3	1.235 (.216)	1.055 (.180)	1.145 (.140)
Session 4	1.653 (.168)	1.113 (.140)*	1.383 (.109)

* Significant difference between Controlled and Uncontrolled Drinkers (p <.05)

3.3.7. Reason Strength and Outcome Group

A Repeated Measures ANOVA indicated that there were no significant main effects or interactions involving Outcome Groups, Sessions of MET, or Interval within MET Sessions. However, effects involving Outcome Group were approaching significance. Controlled Drinkers had a higher Reason strength (M = 1.164 and SE = .185) than the Uncontrolled Drinkers (M = .730 and SE = .154), F (1, 20) = 3.264, p=.086. Furthermore, differences between Outcome Groups showed a trend towards significance depending on which Session, and Interval within the Session it was (i.e. the Outcome Group, Session, and Interval interaction), F (6, 120) = 1.919, p=.083 (see Figure 5).

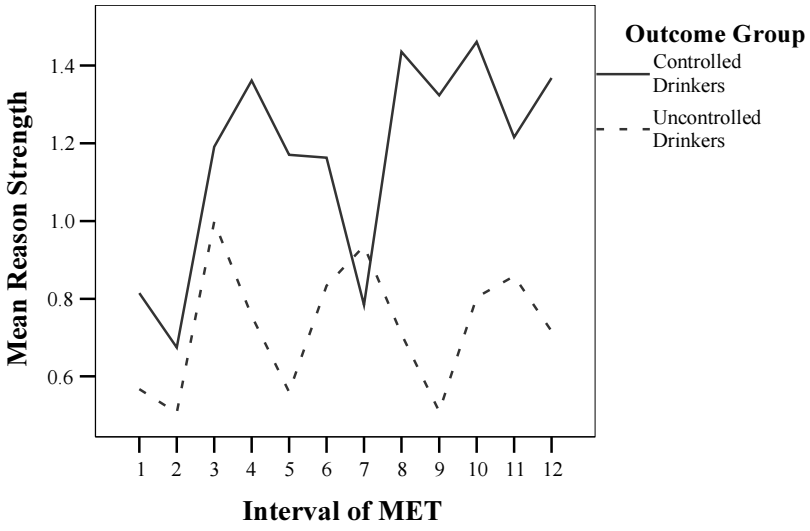

Figure 5: Strength of Reason during Intervals of MET[31]

3.3.8. Taking Steps Strength and Outcome Group

A Repeated Measures ANOVA indicated that there were no significant differences between Outcome Groups, Sessions of MET, or Intervals within Sessions in terms of Taking Steps strength (i.e. no main effects), and no significant interactions among any of these factors. The mean (SE) Taking Steps strength per Interval (averaged over all clients) was .974 (.116).

[31] Interval 1 = Early Session 1, Interval 2= Mid Session 1, Interval 3=End of Session 1, Interval 4= Early Session 2, Interval 5= Mid Session 2, Interval 6=End of Session 2, Interval 7= Early Session 3, Interval 8= Mid Session 3, Interval 9=End of Session 3, Interval 10= Early Session 4, Interval 11= Mid Session 4, Interval 12=End of Session 4.

3.3.9. Change in Client Language Strength within MET Sessions and Outcome Group

Repeated Measures ANOVAs indicated that there were no significant differences in terms of change in strength within MET Sessions between Sessions of MET or between Outcome Groups (or interaction between these factors) for any of the Client Language strength categories (i.e. All Change & Sustain Talk, Ability, Commitment, Reason, or Taking Steps)[32]. Furthermore, there was not a significant increase in strength within MET Sessions for any of the Client Language strength categories.

3.3.10. Change in Client Language Strength over MET and Outcome Group

A MANOVA revealed that there were significant increases in the strength of Ability, Commitment, and All Change/Sustain Talk strength from the first Interval to the last Interval of MET: F (1, 26) = 8.479, p= .007, F (1, 26) = 13.455, p =.001; and F (1, 26)= 8.945, p= 006 (respectively). However, Commitment strength was the only category in which the strength increased significantly more over the course of MET for the Controlled drinkers compared with the Uncontrolled drinkers, F (1, 26) = 5.222, p =.031). Means (and SE) change scores are displayed in Table 12.

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32 The interaction between Session of MET and Outcome Group with Change in Reason strength within MET Sessions as the dependent variable was the only interaction that was significant or approaching significance, F (3, 60) = 2.328, p=.084.

Table 12

Mean (SE) Change in strength over MET (from the first Interval of MET to the last Interval of MET)

Language Category	Controlled Drinkers	Uncontrolled Drinkers	All clients
Reason	.464 (.257)	.083 (.223)	.274 (.170)
Ability	.903 (.431)	.759 (.374)	.831 (.285) [I]
Commitment	1.146 (.291)	.266 (.252)*	.706 (.193) [I]
Taking Steps	-.087 (.461)	.163 (.399)	.038 (.305)
All TBC categories	.455 (.196)	.318 (.169)	.387 (.129) [I]

* Significant difference between Controlled and Uncontrolled drinkers ($p<.05$)

[I] Significant increase in strength over MET ($p<.05$);

3.3.11. Summary of Findings: Client Language within MET and Differences between Outcome Groups

In terms of differences between Outcome Groups the frequency of Sustain and Ability strength were the only Client Language categories where significant differences were observed over all MET (i.e. main effect of Outcome Group). Ability strength during the End Interval within MET Sessions, and Commitment strength during Session 2 and Session 4 were the only specific Intervals and Sessions of MET where Outcome Group differences were observed. Change in Commitment strength over MET was the only change score (including within MET Sessions and over MET) where group differences were found. Where significant differences between means were revealed, Controlled Drinkers had higher strength measures (Ability and Commitment), and Uncontrolled Drinkers had higher Sustain frequency.

3.4. Therapist Behaviour within MET and differences between Outcome Groups

3.4.1. All Therapist Behaviours and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Sessions of MET or between the Controlled Drinkers and Uncontrolled Drinkers (nor were any interactions involving Outcome Group significant) in terms of the frequency of All Therapist Behaviour Counts (sum of the frequency within all of the Therapist utterances). However, there were significant differences between Intervals within MET Sessions, and the interaction between Session and Interval was approaching significance: F (1.500, 20.002) = 126.597, p = .000; and F (6, 120) = 2.1153, p = .052 (respectively). The differences in frequency of All Therapist Behaviour Counts are depicted in Figure 6, where it can be seen that the frequency of All Therapist Behaviour Counts increased across Intervals within Sessions. Furthermore, while there were no significant differences between Sessions (averaged over Intervals), during the Mid Interval within Sessions, Session 1 appears to have a higher frequency than the other Sessions (i.e. interaction approaching significance).

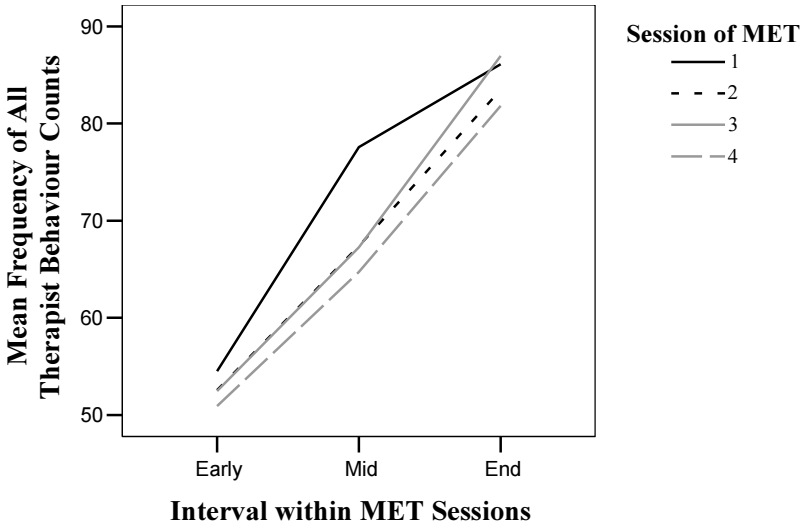

Figure 6: Frequency of All Therapist Behaviour Counts within Intervals and across Sessions of MET

3.4.2. MI-Consistent Therapist Behaviours (MICO) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between the Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of MICO (i.e. no main effect of Outcome Groups, or interactions involving Outcome Group). However, there were significant main effects for both Sessions of MET and Intervals within Sessions of MET and a significant interaction between these two factors: F (3, 60) = 6.856, p = .000; F (2, 40) = 68.340, p = .000; and F (6, 120) = 4.044, p = .001 (respectively). These differences in frequency of MICO are depicted in Figure 7, where it can be seen that MICO generally dropped in frequency over the Sessions of MET (averaged over Intervals within Session) and increased in frequency across Intervals

within MET Sessions (averaged over Sessions of MET). However, differences between these two factors depended on the level of the other factor, where greater difference between Sessions occurred during Mid and End Intervals compared with the Early Intervals.

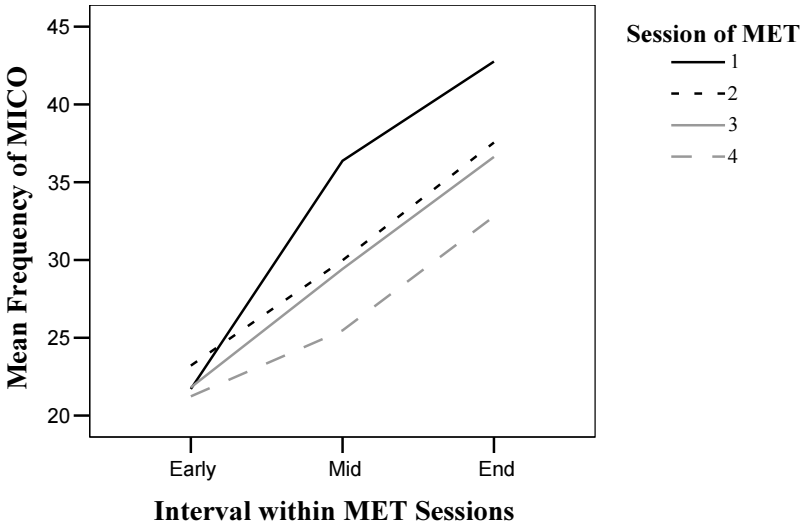

Figure 7: Frequency of MICO within Intervals and across Sessions of MET

3.4.3. MI-Inconsistent Therapist Behaviours (MIIN) and Outcome Group

A Repeated Measures ANOVA revealed significant differences between Sessions of MET, Intervals within MET Sessions, and a significant interaction between these two factors in terms of the frequency of MIIN: F (1.849, 36.984) = 5.109, p = .013; F (1.457, 29.144) = 30.758, p = .013; and F (3.683, 73.656) = 3.081, p = .008 (respectively) . These

differences are depicted in the upper plot in Figure 8, where it can be seen that a lower frequency of MIIN generally occurred during Session 1 (compared with the other Sessions), and the frequency generally increased across Intervals within MET Sessions. Furthermore, differences between Sessions increased across the Intervals within Sessions, with the largest difference in frequency of MIIN between Sessions occurring during the End Interval.

While there was no main effect of Outcome Group, there was a significant interaction between Outcome Group and Interval within MET Sessions, F (1.457, 29.144) = 3.758, p = .048. As can be seen in the lower plot in Figure 8, the largest difference between groups occurred during the End Interval within MET Sessions, where Controlled Drinkers received a greater frequency of MIIN than Uncontrolled Drinkers; however, this difference was not quite significant, t (26) = 1.944, p = .063[33]. In addition, it is important to note the relative lower frequency of MIIN compared with MICO (compare Figure 7 and Figure 8).

[33]Because this result was not significant, a t –test was also computed based on only the 22 clients involved in the Repeated Measures ANOVA to make sure that the insignificant result was not simply due to the inclusion of the other six clients. However, the difference at the End Interval based on 22 clients was less significant, t (20) = 1.668, p = .112.

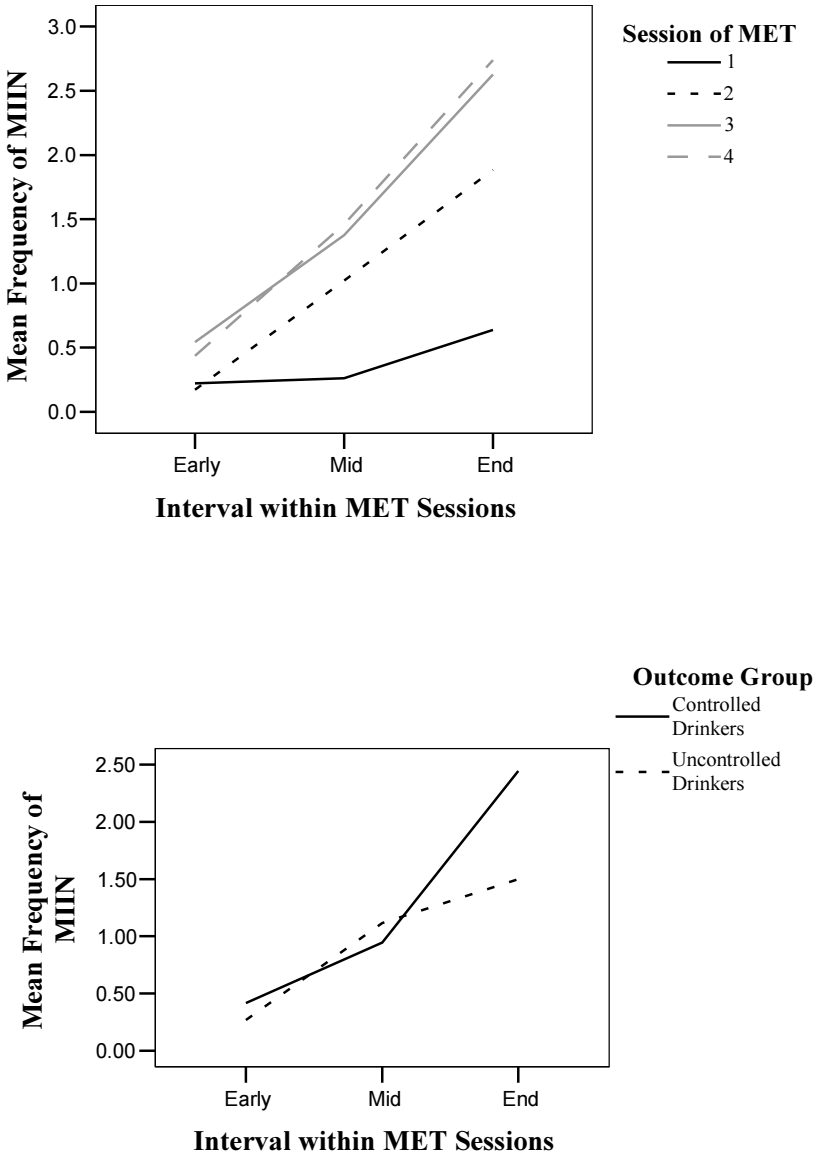

Figure 8: Two Plots of the Frequency of MIIN during Intervals within MET Sessions (the upper plot is by Session of MET and the lower by Outcome Group).

3.4.4. Neutral Type Therapist Behaviours and Outcome Group

A Repeated Measures ANOVA indicated there were significant differences between Intervals within MET Sessions in terms of the frequency of Neutral Type Therapist Behaviours, F (2, 40) = 59.117, p = .000. The means (SE) of each Interval were as follow: Early Intervals = 30.291 (2.350), Mid Intervals = 37.904, End Intervals = 45.188 (3.1279), which indicated that the frequency of Neutral Type Therapist Behaviours increased over the Intervals within MET Sessions. No differences were found between the Outcome Groups or Sessions of MET and none of the interactions between any of the factors were significant.

3.4.5. Advise without Permission (ADW) and Outcome Group

A Repeated Measures ANOVA with frequency of ADW as the dependent variable revealed a significant main effect of Session and Interval, and a significant interaction between these two factors: F (1.780, 35.598) = 5.782, p=.002; F (1.556, 31.128) = 22.399, p=.000; and F (2.822, 56.450) = 3.101, p=.007 (respectively). While there were no significant differences between the Controlled Drinkers and the Uncontrolled Drinkers in terms of the frequency of ADW over all MET, the interaction between Interval and Outcome Group was significant, F (1.556, 31.128) = 4.098, p=.000. Differences in the frequency of ADW can be seen in Figure 9, this figure shows that the frequency of ADW increased within the Sessions of MET and across the Sessions of MET. Furthermore, the frequency of ADW within Intervals of MET Sessions increased to a larger extent during the later Sessions compared with earlier Sessions. During the End Interval of MET Sessions therapists uttered a greater frequency of ADW to those clients who engaged in

Controlled Drinking during the 6-months follow-up period compared with those who engaged in Uncontrolled Drinking, t (26) = 2.064, p = .049[34].

ADW is a behaviour that is proscribed in MI, and not surprisingly Figure 8 (lower plot) and Figure 9 (lower plot) look almost identical, which indicates that significant interaction between Interval within MET Sessions and Outcome Group found for MIIN is primarily attributable to the ADW, as ADW is clearly the Behaviour Count category that made the largest contribution[35]. Furthermore, it is important to note the low occurrence of ADW. ADW occurred less than two and a half times per Interval within MET Sessions which is a small proportion of All Therapist Behaviour Counts (these occurred between 50 and 90 times per Interval of MET).

[34] The Outcome Groups were not significantly different at the other Intervals.

[35] Other MIIN categories were coded even more rarely. For example, Confront (CO) was only coded three times and each time to an individual who engaged in Uncontrolled Drinking (which is in the opposite direction to the interaction effect).

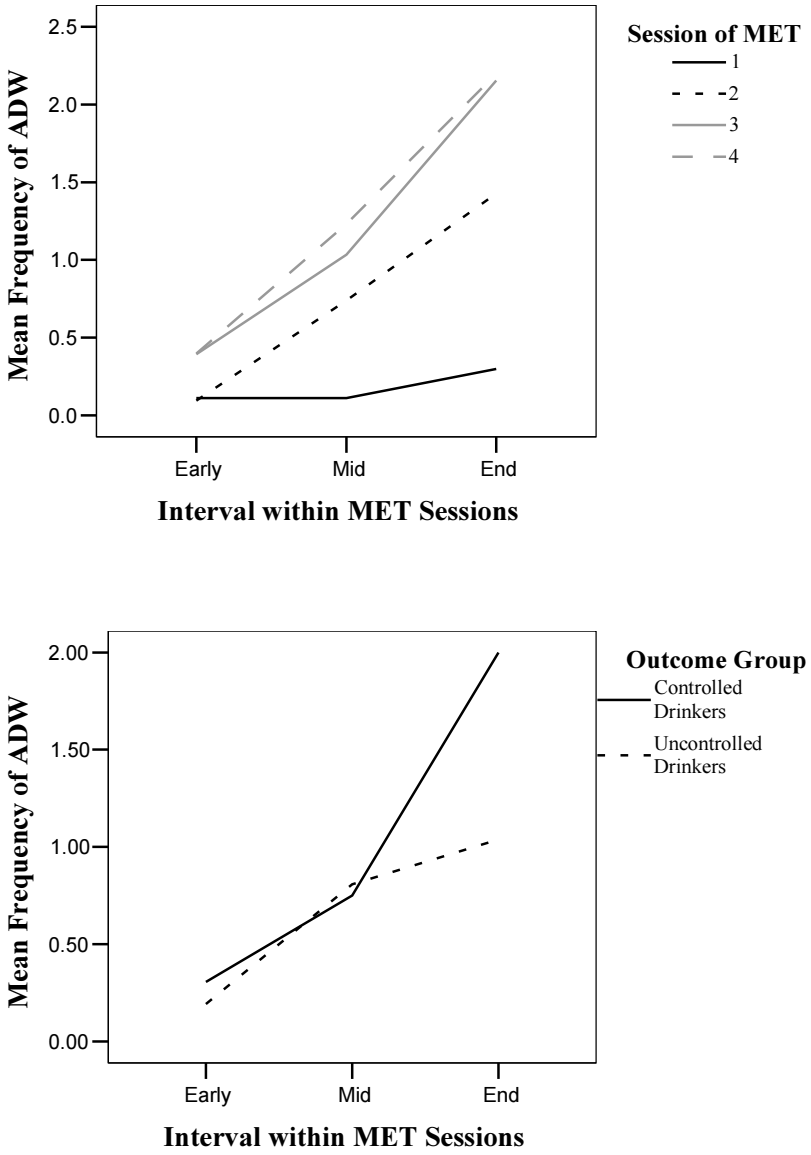

Figure 9: Two plots of the Frequency of ADW during Intervals within MET Sessions (the upper plot is by Session and the lower by Outcome Group)

3.4.6. Affirm (AF) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of AF (i.e. no main effect or interaction effects involving Outcome Group were significant). However, there were significant differences between Sessions, and Intervals within MET Sessions (i.e. main effect of Session and Interval), F (2.219, 44.390) = 10.315, p=.000, and F (1.454, 29.078) = 29.539, p=.000 (respectively). The means (SE) indicate that a higher frequency of AF occurred during End Intervals within MET Sessions (M= 2.776 and SE = .223) than for the earlier Intervals (Early Interval M = 1.149 and SE = .223; Mid Interval M = 1.435 and SE = .285). Furthermore, in regards to the Session of MET, the lowest frequency of AF occurred during Session 1 (M = .618 and SE = .125) and the greatest during Session 4 (M = 2.741 and SE = .540)[36].

3.4.7. Direct (DI) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of DI engaged in by the therapist within MET (i.e. no main effect or interaction effects involving Outcome Group were significant). However, there were significant differences between Intervals within MET Sessions (i.e. main effect of Interval), F (1.151, 23.023) = 4.390, p=.043). DI did not occur at all during the Early Intervals within MET Sessions, and even though it was still very rare it did increase in frequency throughout the Session, with a

[36] The M (SE) of Session 2 and Session 3 were 2.047 (.406) and 1.739 (.346), respectively.

mean (and SE) of .033 (.019) and .143 (.062) during the Mid and End Intervals within MET Session.

3.4.8. Emphasise Control (EC) and Outcome Group

A Repeated Measures ANOVA with the frequency of Emphasise Control (EC) as the dependent variable, revealed a significant main effect of Session, Interval, and a significant interaction between Interval and Session: F (3, 60) = 2.958, p=.039; F (2, 40) = 3.264, p=.049; and F (3.348, 66.952) = 12.507, p=.000 (respectively). Differences in frequency of EC between Sessions and Intervals within Sessions, and differences between Intervals within Sessions depending on the Session can be determined by examining Table 13. As can be seen in Table 13, the highest frequency EC occurred in Session 1 (compared with other Sessions) and in Early Intervals within MET Session (compared with other Intervals). Furthermore, the Early Interval of Session 1 was the only Interval in which EC occurred more than once (on average) or even close to once.

Table 13

Mean (SE) Frequency of EC within Intervals and Sessions of MET

Interval	Session 1	Session 2	Session 3	Session 4	Over all Sessions
Early	1.077 (.116)	.111 (.060)	.000 (.000)	.000 (.000)	.297 (.033)
Mid	.056 (.046)	.077 (.093)	.286 (.195)	.150 (.076)	.142 (.053)
End	.038 (.047)	.303 (.142)	.325 (.138)	.346 (.126)	.253 (.058)
Over all Intervals	.390 (.043)	.164 (.071)	.204 (.078)	.165 (.056)	.231 (.033)

Interestingly, an EC statement ("… what you do with that is completely up to you", Sellman et al., 1996, *p.* 20) was included in the standard introduction that therapists used at the beginning of the first session. This infers that apart from in the standard instruction EC rarely occurred (when considering all of the clients together).

The main effect of Outcome Group was approaching significance, where the Uncontrolled Drinkers (M =.295 and SE = .042) generally received a higher frequency of EC than the Controlled Drinkers (M = .167 and SE = .051), F (1, 20) = 3.745, p=.067. Furthermore, the interaction between Interval and Outcome Group was significant, F (2, 40) = 4.495, p=.017. As can be seen in Figure 10, differences between Outcome Groups depend on the Interval within MET Sessions. The End Interval was the only Interval within MET Sessions where the frequency of EC was significantly different, t (24.122) = -2.949, p = .007.

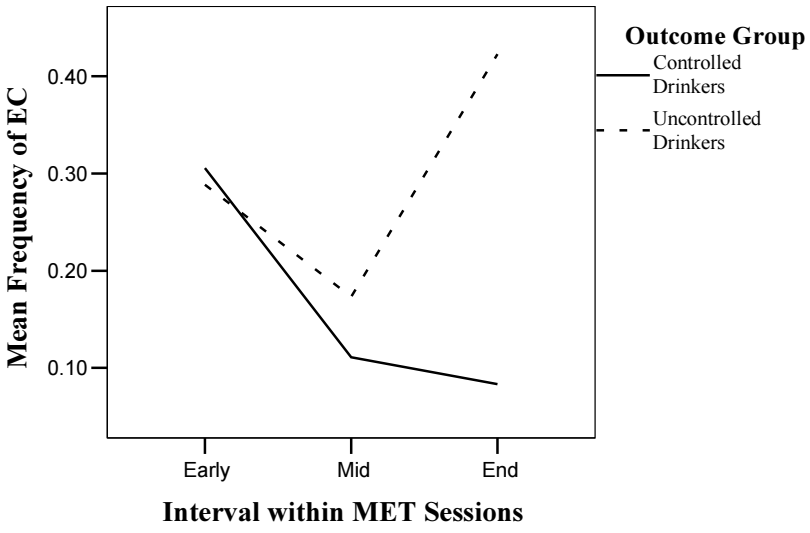

Figure 10: Frequency of EC during Intervals within MET Sessions and Outcome Group

3.4.9. Facilitate (FA) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of FA engaged in by the Therapist within MET (i.e. no main effect or interactions involving Outcome Group were significant). However, there were significant differences between Intervals within MET Sessions (i.e. main effect of Interval), F (1.433, 28.600) = 20.206, p=.000). The frequency of FA increased across Intervals within MET Sessions. The means (SE) were 21.990 (2.416), 27.226 (2.925), and 30.283 (3.349) for the Early, Mid, and End Intervals within MET Sessions, respectively. Note: that this category occurred at a higher frequency than the other specific Therapist Behaviour Count categories.

3.4.10. Filler (FI) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of FI engaged in by the therapists within MET (i.e. no main effect or interactions involving Outcome Group were significant). However, there were significant differences between Intervals within MET Sessions (i.e. main effect of Interval), F (2, 40) = 10.871, p=.000). The frequency of FI is lower during the Mid Interval of MET Sessions compared with the other Intervals. The means (and SE) were .746 (.091), .240 (.076), and .677 (.116) for the Early, Mid, and End Interval within MET Sessions, respectively.

3.4.11. Giving Information (GI) and Outcome Group

A Repeated Measures ANOVA revealed that therapists gave significantly more information to clients who engaged in Uncontrolled drinking (M = 4.167 and SE = .536) compared with Controlled drinking (M = 2.019 and SE = .644) during the six month follow-up period (i.e. main effect of Outcome Group), F (1, 20) = 6.568, p =.019. There were also significant differences between Intervals within MET Sessions (i.e. main effect of Interval), F (2, 40) =15.309, p =.000. The frequency of GI increased over the Intervals within Sessions of MET (Early Interval M = 1.329 and SE = .259; Mid Interval M = 3.272 and SE .586; End Interval M = 4.676 and SE = .697).

3.4.12. Closed Question (QUC) and Outcome Group

A Repeated Measures ANOVA with frequency of QUC as the dependent variable revealed a significant main effect of Interval and interaction between Session and Outcome Group: F (2, 40) = 16.637, p = .000; and F (3, 60) = 3.939, p = .012; respectively. The frequency of QUC generally increased over the Intervals within Sessions of MET. The means (and SE) were 5.011 (.802), 6.759 (.746), and 7.928 (.785) for the Early, Mid, and End Interval within MET Sessions, respectively.

As can be seen in Figure 11, therapists generally uttered more QUC during MET to those who engaged in Uncontrolled drinking during the six months after MET; however, significant differences between Outcome Groups (in terms of frequency of QUC) depended on the Session of MET, where the only significant difference between Outcome Groups occurred during Session 2, t (26) = 2.143, p = .042.

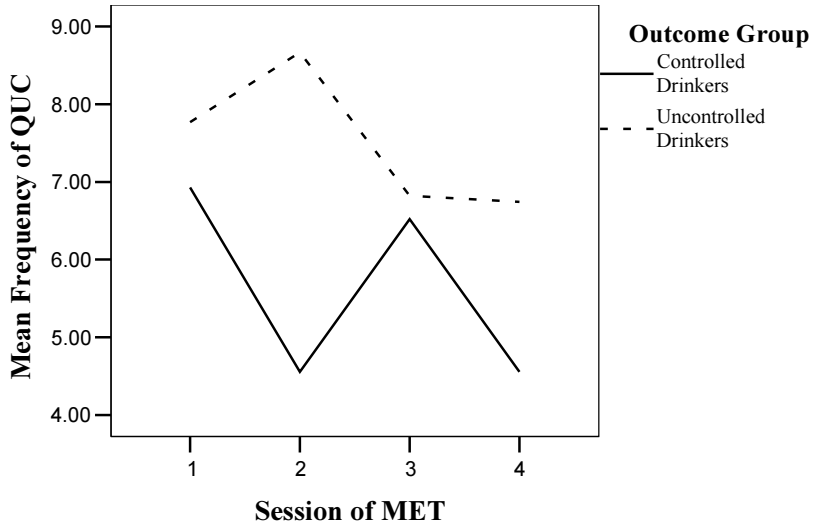

Figure 11: Frequency of QUC across Sessions of MET and Outcome

3.4.13. Open Question (QUO) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of QUO engaged in by the therapists (i.e. no main effect or interactions involving Outcome Group were significant). However, there were significant differences between Sessions and Intervals within MET Sessions (i.e. main effect of Session and Interval), and a significant interaction between these two factors: F (3, 60) = 5.304, p=.003; F (2, 40) = 6.465, p=.004; and F (6, 120) = 3.346, p=.004. As can be seen Figure 12, the highest frequency of QUO occurred during Session 1 (compared with the other Sessions) and the lowest frequency of QUO generally occurred during the Early Interval within MET Sessions (compared with other Intervals). However, differences between Sessions and Intervals

also depended on the level of the other factor, where larger differences between Sessions occurred during the Mid and End Intervals compared with the Early Intervals within MET Sessions.

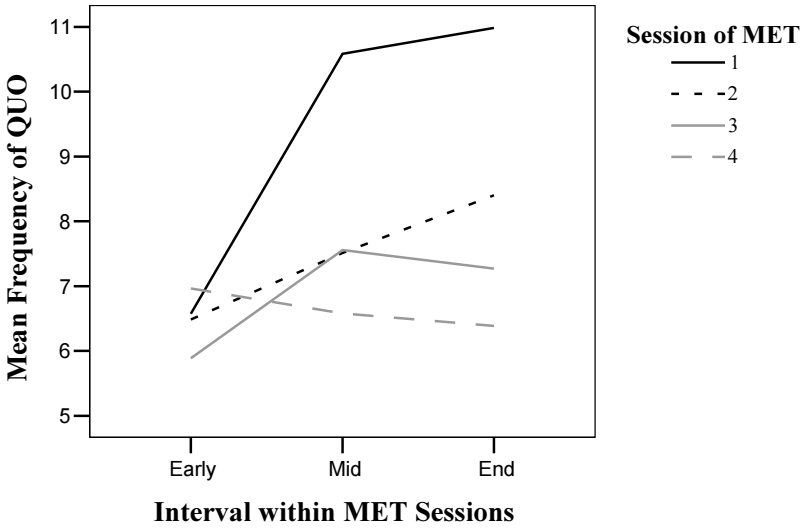

Figure 12: Frequency of QUO within Intervals and across Sessions of MET.

3.4.14. Simple Reflection (RES) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of RES engaged in by the therapists within MET (i.e. no main effect or interaction effects involving Outcome Group were significant). However, there were significant differences between Sessions and Intervals within MET Sessions (i.e. main effect of Session and Interval), and a significant interaction between these two factors: F (3, 60) = 7.187,

p=.000; F (2, 40) = 4.367, p=.019; and F (6, 120) = 3.420, p=.004 (respectively). As can be seen in Figure 13, the highest frequency of RES occurred during Session 1 (compared with the other Sessions) and the lowest frequency of RES occurred during Early Intervals within MET Sessions (compared with other Intervals). However, differences between Sessions and Intervals also depended on the level of the other factor, where the largest differences between Sessions of MET occurred during the Mid Interval within MET Sessions.

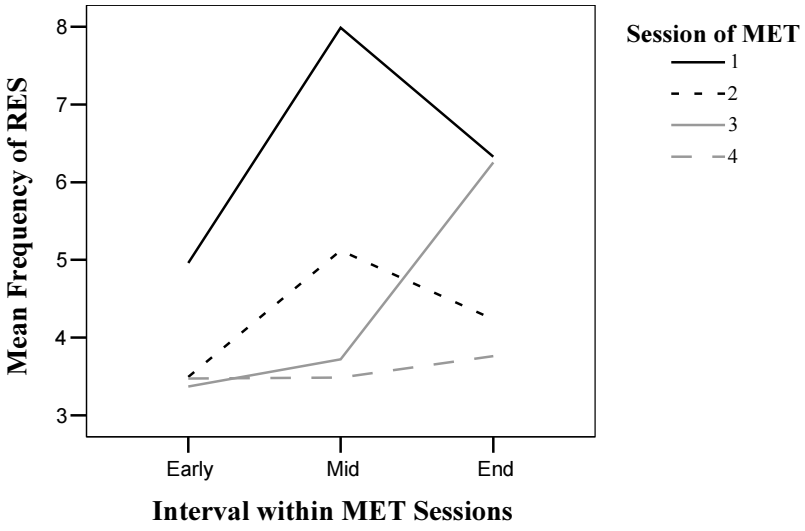

Figure 13: Frequency of RES within Intervals and across Sessions of MET

3.4.15. Complex Reflection (REC) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of REC

engaged in by the therapists within MET (i.e. no main effect or interaction effects involving Outcome Group were significant). However, there were significant differences between Sessions and Intervals within MET Sessions (i.e. main effect of Session and Interval), and a significant interaction between these two factors: F (3, 60) = 3.282, p=.027; F (2, 40) = 53.173, p=.000, and F (6, 120) = 3.597, p=.003. As can be seen in Figure 14, the lowest frequency of REC occurred during Session 4 (compared with the other Sessions) and there was an increase in frequency across Interval within MET Sessions. However, differences between Sessions and Intervals also depended on the level of the other factor, where the larger differences between Sessions occurred during the Mid and End Interval within Sessions compared with Early Interval within MET Sessions.

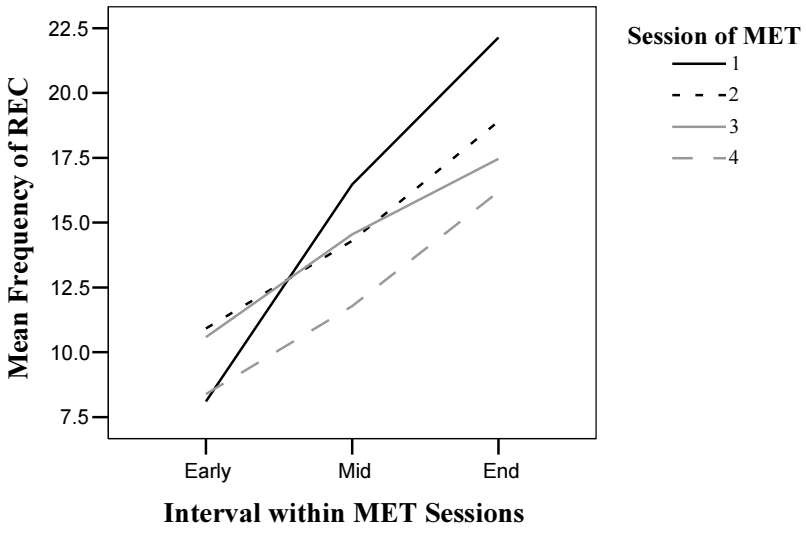

Figure 14: Frequency of REC within Intervals and across Sessions of MET

3.4.16. Structure (ST) and Outcome Group

A Repeated Measures ANOVA revealed no significant differences between Controlled Drinkers and Uncontrolled Drinkers in terms of the frequency of ST engaged in by the therapists within MET (i.e. no main effect or interactions involving Outcome Group were significant). However, there were significant differences between Sessions and Intervals within MET Sessions: F (3, 60) = 5.930, p=.001; and F (2, 40) = 40.812, p=.000 (main effect of Session and Interval, respectively). In regards to Intervals within MET the frequency of Structure was lower for Mid Intervals (M= .376, SE= .068) than the Early (M= 1.215, SE= .012) and End Intervals (M= 1.536, SE=.147, with the latter being the highest. In regards to Sessions of MET, the frequency of ST was higher during Session 1 than the other Sessions (2, 3, and 4), where the means (and SE) were 1.484 (.127), .929 (.171), .903 (.123), and .853 (.099), respectively. Note the relatively low occurrence of this specific Therapist Behaviour (i.e. roughly occurring once per Session).

3.4.17. Summary of Findings: Therapist Behaviour within MET and Differences between Outcome Groups

In terms of differences between Outcome Groups the frequency of Giving Information (GI) was the only Therapist Behaviour category where significant differences were observed over all MET (i.e. main effect of Outcome Group). Advise without Permission (ADW) and Emphasise Control (EC) during End Intervals within MET Sessions, and Closed Questions (QUC) during Session 2 were the only specific Intervals and Sessions of MET where Outcome Group differences were observed. Where

significant differences were revealed, Controlled Drinkers had higher levels of the ADW, and Uncontrolled Drinkers had higher levels of GI, EC, and QUC.

3.5. Prediction of Outcome Group

3.5.1. Client Language Categories within MET as Predictors of Outcome Group

Table 14 summarises the separate (Forward) Logistic Regressions performed for each group of Client Language categories. As can be seen in Table 14, each model only contained one predictor, indicating that the addition of other predictor variables were not able to make significant contributions to the model. The models indicated that the frequency of Sustain Talk (averaged over all intervals of MET [Average]), strength of Ability (Average and during the End Interval of MET Sessions), and change in strength of Commitment over MET were the most significant predictors of Outcome Group. In the case of Average strength Scores, the inclusion of only Ability contributed to the most statistically significant model; however; at a practical level a model[37] that included Average strength scores for Ability, Taking Steps, Reason, and All Change & Sustain was better able to predict outcome (89.3% accuracy; correctly identifying 91.7% of the Controlled Drinkers, and 87.5% of the Uncontrolled Drinkers).

[37] This model was able to predict Outcome Group at better than chance levels χ^2 (4) =10.623, p=.031, and was an adequate fit of the data (Hosmer and Lemeshow Test), χ^2 (7) =8.880, p=.261.

Table 14

Summary of separate Logistic Regressions with each Group of Client Language Measures as Predictors of Outcome Group, N=28

Measure Group	**Variables involved in the model**	**Goodness of Fit of model[38]**	**Percent Correctly Identified**	
			Un/Controlled drinkers	Over all
Average Frequency	Sustain	$\chi^2(1)=5.071$, $p=.024$	68.8/66.7	67.9
Average Strength	Ability	$\chi^2(1)=6.982$, $p=.008$	81.3/50.0	67.9
Interval/Session Strength[39]	Ability End Interval	$\chi^2(1)=8.367$, $p=.004$	86.7/72.7	80.8
Change over MET Scores	Commitment	$\chi^2(1)=5.124$, $p=.024$	75.0/66.7	71.4

A Forward and Backward Logistic Regression was performed which included all of the Client Language categories within MET (that had been revealed as being significantly different between Outcome Groups in the Repeated Measures ANOVAs)

[38] Hosmer and Lemeshow Test values for each model (respectively) were as follows: $\chi^2(7)=10.827$, $p=.147$; $\chi^2(7)=8.634$, $p=.280$; $\chi^2(7)=8.510$, $p=.290$; $\chi^2(7)=6.56$, $p=.656$; and $\chi^2(7)=6.647$, $p=.467$. This indicated that each model adequately fitted the data.

[39] This only included Intervals and Sessions within Categories for which Outcome Groups had differed significantly during Repeated Measures ANOVA and only included $n= 26$. Note that even though Commitment during Session 2 and 4 were Client Behaviour which the Outcome Groups differed significantly, they were not able to make significant contributions to the model once Ability End Interval was included (included first because it was the most significant predictor). This indicated that a lot of the variance in Outcome Group that might have been explained by Commitment Session 2 and 4 was already explained by Ability End Interval. Commitment Session 2 and 4 both had significant correlations with Ability End Interval ($r = .393$, $p = .039$; and $r = .432$, $p = .027$). See Appendix E (Table 25) for more correlations between Client Behaviours.

and a baseline drinking measure as predictors of Outcome Group. Appendix E (Table 25) contains a Correlation Matrix of these Client Language categories. The Forward Regression indicated that Ability strength during the End Interval of Sessions within MET was the most significant single predictor, with no other variables being able to make a significant contribution once it (Ability End Interval) was already included (see Table 14 for prediction details). When performing a Backward Regression, proportion of days exceeding the drinking guidelines at baseline was revealed as the least significant predictor of Outcome Group and was the first variable to be removed (Step $\chi 2$ (1) =-.300, p=.583). Table 15 summarises the Regression model after the proportion of days exceeding the drinking guidelines had already been removed. Table 16 contains a classification table based on predictions made from the Regression model (in Table 15) at each Step. As can be seen in Table 15 and Table 16, the model at Step 1 correctly identifies the highest proportion of clients. Prediction ability was reduced (but not to a significant degree) by the removal of Average Ability strength (Step 2), which was followed by the removal of Commitment strength during Session 4 (Step 3). Interestingly, Ability End Interval (which is the single best predictor) was removed in Step 4, due to its limited ability to explain unique variation in Outcome in the presence of the other variables. The final model contained: the frequency of Average Sustain Talk, Commitment strength during Session 2, and change in Commitment strength over MET, and was able to correctly identify 84.6% of clients' Outcome Group, which is similar to the 80.8% that Ability End Interval was able to predict on its own.

Table 15

Backward Logistic Regression with Client Language categories within MET as Predictors of Outcome Group, n= 26

Step	Variable in Equation	B (SE)	Wald (1, *n*=26)	Exp(B)
1	Average Sustain	.435 (.259)	2.819, p =.093	1.545
	Average Ability	2.859 (3.109)	.846, p =.358	17.449
	Ability End Interval	-2.661 (1.991)	1.786, p =.181	.070
	Commitment Session 2	-2.115 (1.695)	1.557, p =.212	.121
	Commitment Session 4	-2.322 (2.031)	1.307, p =.253	.098
	Commitment Change over MET	-1.295 (.888)	2.128, p =.145	.274
	Model= $\chi^2(6)$=19.746, p =.003			
2	Average Sustain	.337 (.216)	2.436, p =.119	1.400
	Ability End Interval	-1.259 (1.128)	1.246, p =.264	.284
	Commitment Session 2	-2.199 (1.626)	1.830, p =.176	.111
	Commitment Session 4	-1.470 (1.696)	.752, p =.386	.230
	Commitment Change over MET	-1.376 (.880)	2.442, p =.118	.253
	Step 2= $\chi^2(1)$=-.905, p=.341; Model= $\chi^2(5)$=18.841, p=.002			
3	Average Sustain	.342 (.216)	2.503, p =.114	1.407
	Ability End Interval	-1.541 (1.096)	1.977, p =.160	.214
	Commitment Session 2	-2.693 (1.505)	3.201, p =.074	.068
	Commitment Change over MET	-1.534 (.820)	3.503, p =.061	.216
	Step 3= $\chi^2(1)$=-.907, p=.341; Model= $\chi^2(4)$=17.934, p=.001			
4	Average Sustain	.378 (.192)	3.870, p =.049	1.459
	Commitment Session 2	-2.415 (1.288)	3.518, p =.061	.089
	Commitment Change over MET	-1.553 (.739)	4.419, p =.036	.212
	Step 4= $\chi^2(1)$= -2.290, p=.130; Model= $\chi^2(3)$=15.644, p=.001			

Note: This model was an adequate fit of the data at each step (Hosmer & Lemeshow Test, $p > .05$). Only includes Client Language categories for which Outcome Groups had significantly different means. All of the variables are strength measures apart from Sustain (frequency).

Table 16

Behavioural Outcome Group Classification for Model presented above (in Table 15)

		Predicted		
Step	**Observed**	Controlled Drinkers	Uncontrolled Drinkers	**Percent Correct**
1	Controlled Drinkers	11	0	100.0
	Uncontrolled Drinkers	3	14	93.3
				Overall: 96.2
2	Controlled Drinkers	10	1	90.9
	Uncontrolled Drinkers	2	13	86.7
				Overall: 88.5
3	Controlled Drinkers	10	1	90.9
	Uncontrolled Drinkers	1	14	93.3
				Overall: 92.3
4	Controlled Drinkers	9	2	81.8
	Uncontrolled Drinkers	2	13	86.7
				Overall: 84.6

3.5.2. Therapist Behaviours within MET as a Predictor of Outcome Group.

Table 17 summarises the separate Logistic Regressions performed for each group of Therapist Behaviour measures. The Logistic Regression with each Therapist Behaviour category (average frequency per Interval across MET) revealed that Giving Information (GI) was the most significant predictor of Outcome Group and once GI was included Direct (DI) was the only additional variable able to make a significant contribution (Step χ^2 (1) =4.684, p=.030). The Logistic Regression that included specific Intervals and Sessions within categories (for which Outcome Groups had significantly

different means), found that Emphasise Control (EC) during the End Intervals of MET Sessions was the most significant predictor of Outcome Group and the inclusion of Advise without Permission (ADW) during the End Interval within MET Sessions also made a significant contribution (Step χ^2 (1) =4.184, p=.041).

Table 17

Summary of separate Logistic Regressions with each Group of Therapist Behaviour Measures as Predictors of Outcome Group, N= 28

Measure Group	**Variables involved in the model**	**Goodness of Fit of model[40]**	**Percent Correctly Identified**	
			Un/Controlled Drinkers	Over all
Average Frequency	GI DI	χ^2(2)=10.983, p=.004	75.0/66.7	71.4
Interval/Session Frequency[41]	EC End Interval ADW End Interval	χ^2(2)=11.489, p=.003	81.3/75.0	78.6

Note: N = 28; GI = Giving Information; DI = Direct; EC = Emphasise Control; ADW = Advise without permission.

A Backward Logistic Regression was performed that contained all Therapist Behaviours within MET (that had been revealed as being significantly different between Outcome Groups in the Repeated Measures ANOVAs or made a valuable contribution to

[40] Hosmer and Lemeshow Test values for each model (respectively) were as follows: χ^2 *(7)* =3.896, p=.792; χ^2 *(7)* =5.869, p=.555. This indicated that each model adequately fitted the data.

[41] This only included Intervals and Sessions within Categories for which Outcome Groups had significantly different means (i.e. ADW End Interval, EC End Interval, and QUC Session 2).

the above prediction models) and a baseline drinking measure as predictors. Appendix E (Table 26) contains a correlation matrix of these Therapist Behaviours. The Regression analyses revealed that proportion of days exceeding the drinking guidelines (at baseline) was the least significant predictor of Outcome Group and was the first variable to be removed (Step χ^2 *(1)* =-.154, p=.695). Table 18 summarises the Regression Model and steps after the proportion of days exceeding the drinking guidelines (at baseline) was already removed. Table 19 contains a classification table based on predictions made from the Regression model (in Table 18) at each step. As can be seen in Table 18 and Table 19 the removal of ADW End Interval in Step 2 did not change the model's prediction ability; however; the removal of QUC Session 2 significantly decreased the model's ability to predict outcome. Thus, while the variables in the model at Step 3 (EC during the End Interval of MET Sessions, DI, and GI) were the variables that made the strongest unique contributions to the model, QUC Session 2 was clearly making a valuable contribution to the model. EC during End Interval within MET Sessions was the Therapist Behaviour that was able to make the best prediction of outcome alone[42] (71.4% accuracy; correctly identifying 75% of the Controlled Drinkers, and 68.4% of the Uncontrolled Drinkers).

[42] A model that only included EC End Interval was able to predict outcome at better than change levels χ^2 (1) =7.305, p=.007, and was an adequate fit of the data, Hosmer and Lemeshow Test χ^2 (3) =.585, p=.900.

Table 18

Backward Logistic Regression with Therapist Behaviours within MET as Predictors of Outcome Group, N= 28

Step	Variable in Equation	B (SE)	Wald (1, *N*=28)	Exp(B)
1	ADW End Interval	.381 (1.084)	.124, p =.725	1.464
	EC End Interval	20.728 (19.378)	1.144, p =.285	1E+009
	QUC Session 2	1.239 (1.282)	.934, p =.334	3.452
	Average DI	83.596 (76.949)	1.180, p =.277	2E+036
	Average GI	6.723 (6.580)	1.044, p =.307	831.664
	Model = $\chi^2(5)$= 25.317, p=.000			
2	EC End Interval	15.944 (10.677)	2.230, p =.135	8401319.100
	QUC Session 2	.883 (.596)	2.200, p =.138	2.419
	Average DI	63.912 (40.889)	2.443, p =.118	6E+027
	Average GI	4.990 (3.342)	2.229, p =.135	146.941
	Step 2= $\chi^2(1)$= -.134, p=.715; Model= $\chi^2(4)$= 25.183, p =.000			
3	EC End Interval	7.500 (3.543)	4.480, p =.034	1808.279
	Average DI	23.936 (11.532)	4.308, p =.038	2E+010
	Average GI	1.511 (.877)	2.968, p =.085	4.531
	Step 3= $\chi^2(1)$=-6.184, p=.013; Model= $\chi^2(3)$=19.000, p=.000			

Note: This model was an adequate fit of the data at each step (Hosmer & Lemeshow Test, $p > .05$). Only Therapist Behaviours that were significantly different between the two Outcome Groups or made significant contributions to the prediction of Outcome Group were included. ADW = Advise without permission; DI = Direct; EC = Emphasise Control; GI = Giving Interval; QUC = Closed Questions.

Table 19

Behavioural Outcome Group Classification for Model presented above (in Table 18)

		Predicted		
Step	**Observed**	Controlled Drinkers	Uncontrolled Drinkers	**Percent Correct**
1	Controlled Drinkers	11	1	91.7
	Uncontrolled Drinkers	1	15	93.8
				Overall: 92.9
2	Controlled Drinkers	11	1	91.7
	Uncontrolled Drinkers	1	15	93.8
				Overall: 92.9
3	Controlled Drinkers	9	3	75.0
	Uncontrolled Drinkers	3	13	81.3
				Overall: 78.6

3.5.3. Summary of the Prediction of Outcome Group

Regression models containing Client Language categories and Therapist Behaviours within MET were able to make significant predictions of drinking outcome with a high degree of accuracy, and were able to account for drinking outcome beyond a level of drinking prior to treatment (proportion of days exceeding the drinking guidelines). Ability during End Interval within MET Sessions was the Client Language measure that was the most significant single predictor of Outcome Group. Emphasise Control during End Intervals within MET was the Therapist Behaviour that was the most significant predictor of Outcome Group but not with the same degree of accuracy as

Ability during End Intervals within MET. In addition to those Therapist Behaviours for which Outcome Group differences were observed, Direct (averaged over Intervals of MET) was also able to make a significant contribution to the prediction of Outcome Group in the presence of other variables.

3.6. Global Assessment Scale (GAS) as a Measure of Outcome

The mean (SD) GAS at six month follow-up was 72.08 (7.22) for the Controlled Drinkers, 67.50 (9.66) for the Uncontrolled drinkers, and 69.46 (8.86) averaged over all clients. There were no significant differences between groups (at either baseline or follow-up), but the GAS score was significantly higher at the 6-month follow-up compared with baseline (see Table 4 for baseline GAS data), F (1, 26) = 14.744, p <0.01.

A Correlation Matrix revealed no significant associations between any of the Client or Therapist Behaviour categories and GAS at six month follow-up or change in GAS (from baseline and follow-up). Therefore no further analyses were done involving GAS at six month follow-up.

3.7. Relationships between Therapist Behaviours and Client Language within MET

Appendix E (Table 27) contains a Correlation Matrix of the Therapist Behaviours and Client Language categories (which were revealed as significantly different between the two Outcome Groups in the Repeated Measures ANOVA). Each of these Client Language categories are discussed in turn below, along with any significant correlations between Therapist Behaviours and Client Language categories. Therapist Behaviours are

averaged over all Intervals of MET unless stated otherwise. Table 20 summarises the Multiple Regression Prediction Models of each Client Language category. It must be noted that the direction of the relationship between Client Language and Therapist Behaviours cannot be inferred from the analyses conducted here. While Therapist Behaviours have been specified as the predictor variable it is also likely that Client Language/ Behaviour impacts on the Therapist's Behaviour within sessions of therapy.

3.7.1. Therapist Behaviour and Client Sustain Talk Frequency

Complex Reflection was the Therapist Behaviour that had the strongest correlation with the frequency of Sustain Talk, but this negative relationship did not quite reach significance, (r = -.375, p= .050). However, a Stepwise Multiple Regression[43] revealed that once Complex Reflections was included in the model, Neutral Type Therapist Behaviours, Emphasise Control (EC) during the End Interval within MET Sessions, and Open Questions were also able to make significant contributions to the prediction of frequency of Sustain Talk. This model accounted for 65.3% of the variation in frequency of Sustain Talk and is summarised in Table 20.

3.7.2. Therapist Behaviour and Client Ability Strength

Affirm was the only Therapist Behaviour that had a significant association with strength of Ability[44] (averaged across Intervals of MET), this relationship was positive in nature (r = .481, p= .01). A Stepwise Regression revealed that only Affirm was a

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[43] The entry level into the model was changed from p<.05 to .10 for this analysis to be computed.

[44] Complex Reflection and MICO also had positive correlations with the strength of Ability, which were nearly significant (r = .369, p= .053, and r = .372, p= .051, respectively).

significant predictor of the Average strength of Ability. This model accounted for 23.1% of the variation in the Average strength of Ability and is summarised in Table 20.

Ability strength during End Intervals (within MET Sessions) had a significant positive relationship with Affirm (r = .473, p= .011), Complex Reflection (r = .413, p= .029), and MICO (r = .402, p= .034), and a significant negative relationship with Direct (r = -.415, p= .028). A Stepwise Regression revealed that Affirm was the most significant predictor of Ability strength during the End Intervals, and once Affirm was included in the model, EC during the End Interval within MET Sessions was the only other variable that was able to make a significant contribution to the prediction model[45]. This model accounted for 35.9% of the variation in the Ability strength during End Intervals and is summarised in Table 20.

3.7.3. Therapist Behaviour and Client Commitment Strength

Direct, and Closed Questions (QUC; averaged over MET Intervals), and QUC during Session 2 were the only Therapist Behaviours that had a significant relationship (all of which were negative) with change in Commitment strength over MET (r = -.406, p = .032; r = -.471, p = .011; and r = -.474, p = .011, respectively). A Stepwise Regression revealed that QUC during Session 2 was the most significant predictor of change in Commitment strength over MET, and once it was included in the model Neutral Type

[45] Note that REC, MICO, and DI were not included in the model even though they had significant correlations with Ability strength during the End Interval within MET Sessions. This indicated that a lot of the variance in Ability strength during the End Interval that might have been explained by REC, MICO, and DI was already explained by AF. These Therapist Behaviours were among those which had the highest correlations with AF (r = .487, p = .009; r = .360, p = .06; and r = -.312, p = .105, respectively). See Table 26 in Appendix E for more correlations between Therapist Behaviours.

Therapist Behaviours, and Structure were also able to make significant contributions to the prediction model[46]. This model accounted for 47.2% of the variation in the Change of Commitment strength and is summarised in Table 20.

Structure was the only Therapist Behaviour that had a significant correlation with Commitment strength during Session 4 and this relationship was positive in nature (r = .574, p = .002). A Stepwise Multiple Regression revealed that Structure was the most significant predictor of Commitment strength during Session 4, and once it was included in the model Affirm was the only other Therapist Behaviour that was able to make an additional significant contribution to the model. This model accounted for 45.6% of the variation in Commitment strength during Session 4 and is summarised in Table 20.

3.7.4. Summary of the Relationships between Therapist Behaviours and Client Language within MET

The following Therapist Behaviours were found to have a significant relationship with and/or were able to make a significant contribution to the prediction of Client Language categories (that had a significant relationship with drinking outcome): Affirm, Direct, Closed Questions (Average and during Session 2), Open Questions, Complex Reflections, Structure, MI-Consistent, Neutral Type, and Emphasise Control during End Intervals within MET Sessions. Note that these relationships represent associations rather than causations.

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[46] Note that DI and QUC were not included in the model even though they had significant correlations with Change in Commitment strength. This indicated that a lot of the variance in Ability strength during the End Interval that might have been explained by DI and QUC was already explained by QUC during Session 2. DI and QUC both had significant correlations with QUC Session 2 (r = .480, p = .010; and r = .941, p = .000).

Table 20

Summary of separate Multiple Regression Models of Therapist Behaviours Predicting Client Language within MET

Criterion Variable	**Therapist Behaviour in Equation**	**B (SE)**	**Beta**	***t***
Average Sustain Talk Frequency	Complex Reflection	-.794 (.127)	-1.089	-6.238, *p*= .000
	Neutral Type	.289 (.058)	.948	5.366, *p*= .000
	EC End Interval	5.110(1.840)	.359	2.777, *p*= .011
	Open Question	.296 (.137)	.292	2.159, *p*= .042
	Model = F (4, 27) = 10.825, p = .000; R^2= .653; adjusted R^2= .593			
Average Ability Strength	Affirm	.218 (.078)	.481	2.797, *p*= .010
	Model = F (1, 27) = 7.825, p = .01; R^2= .231; adjusted R^2= .202			
Ability Strength End Interval	Affirm	.351 (.099)	.601	3.547, *p*= .002
	EC End Interval	-.970 (.422)	-.389	-2.297, *p*= .030
	Model = F (2, 27) = 7.010, p = .004; R^2= .359; adjusted R^2= .308			
Change in Commitment Strength	QUC Session 2	-.160 (.038)	-.683	-4.241, *p*= .000
	Neutral Type	-.043 (.014)	.544	-3.185, *p*= .004
	Structure	1.006 (.444)	.372	-2.265, *p*= .033
	Model = F (3, 27) = 7.138, p = .001; R^2= .472; adjusted R^2= .405			
Commitment Strength Session 4	Structure	.876 (.224)	.603	3.906, *p*= .001
	Affirm	.162 (.070)	.358	2.319, *p*= .030
	F (2, 25) = 9.645, p = .001; R^2= .456; adjusted R^2= .409			

Note: EC= Emphasise Control; QUC= Closed Question

4. DISCUSSION

The purpose of the present thesis was to replicate and expand on the current understanding of the link between the process engaged in during a MI-based intervention and outcome, with a specific focus on the emergent theory of the inner workings of MI (Hettema et al, 2005; Miller, 2005; see section 1.3.3 in this thesis). This thesis aimed to investigate three primary areas: (1) how Client Language during MET relates to therapeutic outcome; (2) how Therapist Behaviours during MET relate to therapeutic outcome; and (3) how Therapist Behaviours relate to Client Language within MET.

4.1. The Nature of the Treatment Delivered

Information about the nature of the treatment delivered was captured in the Behaviours Counts within MET. As is ideal in MI (Miller, 2000): therapists in this study made fewer utterances on average than their clients, client Change Talk occurred approximately three times more frequently than Sustain Talk, and MI-Consistent Therapist Behaviours (MICO) occurred far more frequently than MI-Inconsistent Therapist Behaviours (MIIN)[47]. While the presence of MIIN were virtually non-existent during the first session of MET, it increased in frequency over the subsequent sessions. Conversely, the frequency of MICO decreased over subsequent sessions and the frequency of Neutral Therapist Behaviours (those neither prescribed nor proscribed in MI) remained the same. This may indicate that the structure imposed by the MET manual

[47] F (1, 21) = 11.978, p = .002; F (1, 21) = 68.770, p = .000; and F (1, 21) = 221.067, p = .000 (respectively).

was more effective in initially shaping Therapist Behaviours. Overall, these observations confirm that the treatment investigated in this thesis was a good example of an MI-based intervention.

4.2. The Relationships between Client Language within MET and Drinking Outcome

The results indicated that clients' arguments away from change (Sustain Talk), strength of Ability and Commitment Language are important dimensions worth attending to in psychotherapy, or at least in the specific case of MET for reducing alcohol use in mild to moderate alcohol dependent clients. In this particular case, Clients who engaged in Uncontrolled Drinking uttered a higher frequency of Sustain Talk and a lower strength of Ability Language during MET (i.e. main effect) compared with the Controlled Drinkers[48]. Differences (i.e. simple effects) between the Outcome Groups were also observed for the following Client Language categories: Ability strength during End Intervals within MET Sessions and Commitment strength during Session 2 and 4. Change in Commitment Language strength over MET was the only change score for which group differences were observed. Where significant differences were observed the Controlled Drinkers had higher mean strength ratings (and increase in strength). Higher mean strength scores indicate a stronger inclination toward change. Furthermore, these particular types of Client Languages were more predictive of drinking outcome than

[48]Controlled Drinkers were those clients who drank within the national drinking guidelines during the six months following treatment, and those that exceeded the guidelines are referred to as Uncontrolled Drinkers.

drinking at baseline (estimated by the proportion of days exceeding the national drinking guidelines in the six months prior to treatment). These results confirm the link between client speech and subsequent behaviour as outlined in the theory of inner workings of MI (Miller 2006; Hettema et al., 2006).

4.2.1. Confirmation of the Hypotheses - Importance of the Strength of Ability and Commitment Language

The results of the current analyses support the hypothesis that clients who uttered higher levels of Change Talk would have better therapeutic outcomes than those with lower levels of Change Talk. However, the term "levels" needs to be qualified. It was not the frequency of Change Talk that was related to outcome; rather it was the strength of two specific Change Talk Language types (Ability and Commitment Language) that were most predictive of outcome[49]. This also supports the hypothesis that the strength of Change Talk would be more important in terms of outcome than the frequency of Change Talk.

Based on the first and only published study to date on the strength of Change Talk (Amrhein and colleagues, 2003; see section 1.3.4 in this thesis), it was hypothesised that Commitment Language would be more predictive of outcome than other Client Language Categories; however this was only partially true. While the current study did not find significant differences between Outcome Groups in terms of Commitment strength over

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[49]The frequency of each client language category alone was not analysed (only the frequency of Change Talk and Sustain Talk as conglomerate measures). So it is unknown how the frequencies of each of the Client Language categories alone (e.g. the frequency of the Commitment Language) were related to drinking outcome in this sample.

all MET, it did find that Commitment Language was the only Client Language category in which change in strength over MET (from first to last interval) related to drinking outcome. Furthermore, in addition to Ability strength, Commitment strength was the only Client Language category where a significant interaction involving Outcome Group was observed. Investigation of this significant interaction revealed that Controlled Drinkers had significantly higher Commitment strength during those Sessions which represented parts of MET in which the change plan was completed (Sellman et al 1996) and where MET terminated (Session 2 and 4, respectively). Thus, the current findings provide further support for Miller and Rollnick's (2003) emphasis on the enhancement of the strength of a client's commitment as central to the efficacy of MI-based interventions. Consistent with Amrhein and colleagues this study emphasises the importance of the pattern of Commitment strength over the course of MET, with the discussion of the Change Plan and the strength of Commitment Language at the end of MET being particularly important indicators of outcome. Interestingly, it was the pattern of Commitment Language over the whole course of MET (both in terms of an increase in strength over MET and significant differences between groups occurring during a middle session), rather than a single session, that was similar to Amrhein and colleagues' single session of MET. In their study, MET was designed as a one session intervention where therapists were required to press ahead (regardless of the client's readiness to change) in order to cover all of the topics in their MET manual (Miller, Amrhein, Yahne, & Tonigan, 2003). Since both Amrhein and colleagues' study and the present study represent a whole course of MET (i.e. all the topics in the MET manual were covered) it

can be inferred that it is the pattern of Commitment Language over the course of MET rather than within a session that is important.

Unlike Amrhein and colleagues (2003), significant differences between Outcome Groups were found in Ability Language strength during MET and specifically during the End Interval within Sessions. The latter was found to be the most significant single predictor of outcome (of all Client and Therapist Behaviours). This result challenges Amrhein and colleagues (2003) conceptualisation that Ability strength influences behaviour through Commitment strength. Instead the current findings suggest that while expressions of ability and commitment may be related, the client's expression of their own ability to change can be just as good (if not better) an indicator of outcome as expressions of commitment.

It must be acknowledged that the current study was not identical to Amrhein and colleagues (2003) which leads to multiple plausible explanations as to why the results differ in some ways. Firstly, the target behaviour change (TBC) in Amrhein and colleagues study was abstinence from drug use, whereas the TBC in the current study was reduction in drinking. It is possible that different TBC are associated with slightly different language within MET, but with Commitment strength being an important indicator of both drug abstinence and drinking within national guidelines. Secondly, the MET in Amrhein and colleagues study included assessment feedback. The portion of the session in which this feedback was given was one of the portions in which significant group differences in Commitment strength were found. In the current study similar and more detailed feedback was given to the clients by a clinician who was not their MET therapist for the trial prior to engaging in MET and was not included in the coding

analyses. Thus, it is plausible that Commitment may have been shown to have a more significant role if the feedback session had been analysed. Furthermore, perhaps having already attended a feedback session and then engaging in four sessions of MET is associated with a higher (or different) level of motivation than attending a single session (that included both feedback and MI). This different level of motivation may be related to a pattern of Client Language in which the expression of the client's sense of ability to be able to change (i.e. self-efficacy) in addition to commitment is an important indicator of behavioural change after treatment.

The importance of self-efficacy[50] revealed in this study is consistent with the theory of MI, where Miller and Rollnick (2002) emphasise that self-efficacy is a key element in motivation for change, and supporting self-efficacy is stipulated as a guiding principle. Miller and Rollick state that:

> A counselor may … develop a person's perception that he or she has an important problem. If the client perceives no hope or possibility for change, however, then no effort will be made, and the counselor's efforts have been in vain (p. 40).

The importance of self-efficacy is also central to other therapies (e.g. Relapse Prevention, Marlatt and Gordon, 1980) and is consistent with a wider body of research that has found that individuals with higher self-efficacy expectancies are healthier, more effective, and generally more successful than individuals with lower self-efficacy (Bandura, 1998).

Not only do these findings provide further support for the link between Client Language within MI and outcome, they also help explain the null findings in previous

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[50] A person's perception that they are able or capable of doing what they set out to is referred to as self-efficacy (Bandura, 1998).

research (e.g. Miller et al., 1993). Previous studies had typically examined the frequency of Change Talk during the first 20 minutes of an MI-based intervention. Similar to other studies it was found that the frequency of Change Talk did not significantly differ over all MET (i.e. no main effect), but interestingly the interaction between Outcome Group and the Interval within MET session was approaching significance ($p = .06$), with Controlled Drinkers appearing to have a higher frequency of Change Talk than Uncontrolled Drinkers during End Intervals within MET Sessions. The findings in this thesis suggest that even if the strength of different types of Client Language are not measured, the frequency of Change Talk during the end portion of sessions, rather than the start of treatment, may also be a potential marker of behaviour change.

4.2.2. Confirmation of Hypotheses - Importance of the Frequency of Sustain Talk

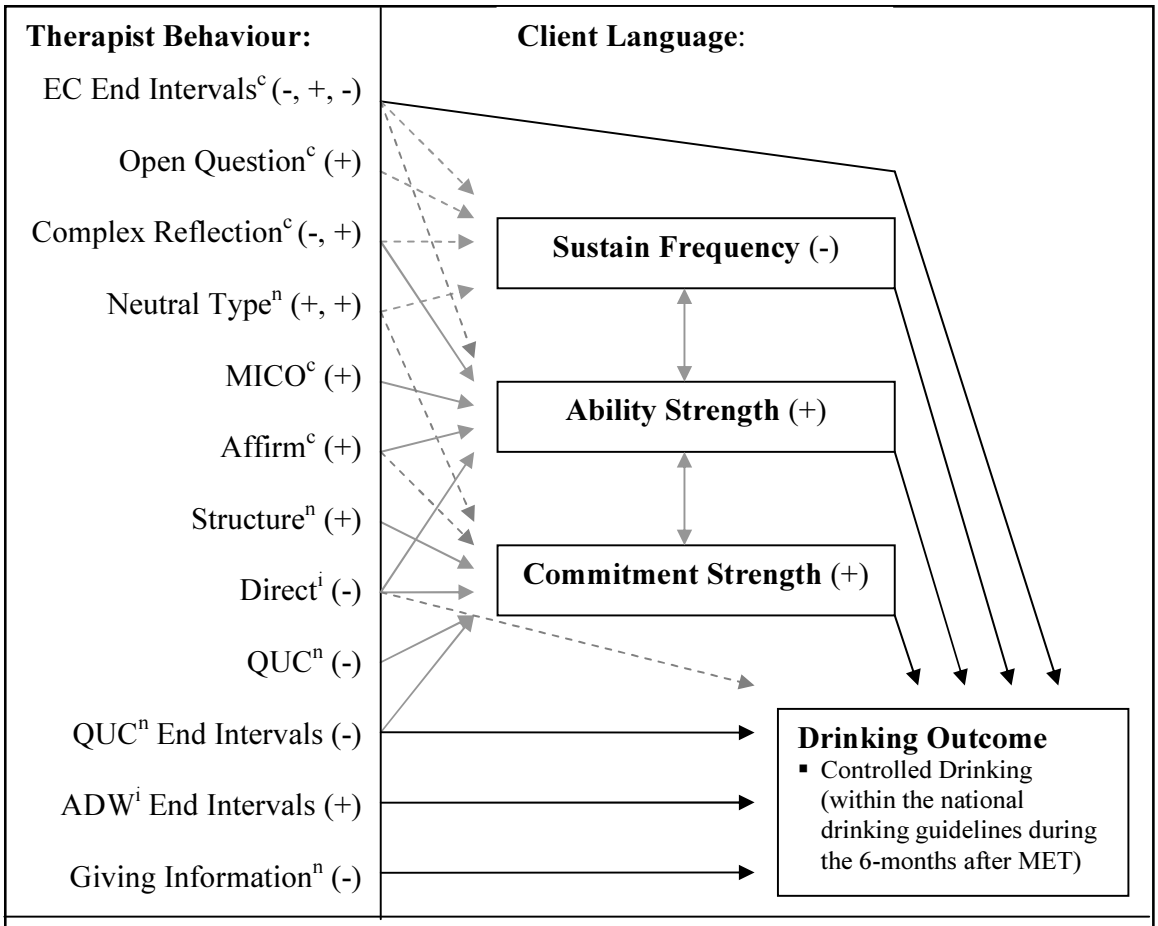
As hypothesised, Clients who uttered more Sustain Talk (expressions of inability to change; reason, desire, need, and commitment not to change, and taking steps away from change) had worse drinking outcomes than those who uttered a lower frequency of Sustain Talk during MET. While the intention was to code both Sustain Talk and Resistance, no instances of Resistance were identified by the coders. Because Resistant Behaviours (such as interrupting, disagreeing with, and discounting the therapist, and changing the subject away from change) were not coded it is unknown how these behaviours relate to drinking outcome in this sample. Previous studies have shown that these Resistant Behaviours have been found to be related to worse outcome (e.g. Miller and colleagues, 1993). However, the relationship of Sustain Talk with outcome has not been examined previously (Miller et al., 2006). In addition to Resistant Behaviour, the

current analyses suggest that high frequencies of Sustain Talk may also be an important indicator of outcome, operating within an MI session as a signal for the therapist to change tack (Miller and Rollnick, 2002) in order to avert poor outcome.

The non-coding of Resistant Behaviour suggests that it did not occur within this sample. However, it is likely that it occurred at a low frequency rather than not at all. If Resistant Behaviour was a rare response during training, the lack of practice at detecting it may have inhibited the likelihood of later detection. Another possible explanation is that the cognitively demanding task of coding Change Talk and Sustain Talk into Language subcategories with strength ratings took precedence, and thus preferential allocation of cognitive resources inhibited the detection of Resistant Behaviour.

4.3. Therapist Behaviours within MET and their Relationship with Drinking Outcome and Client Language within MET

Figure 15 summarises the relationships found between Therapist Behaviours and Client Language categories (that had a significant relationship outcome), and drinking outcome. As can be seen in Figure 15, Controlled Drinkers (compared with Uncontrolled Drinkers) received significantly lower frequencies of the following Therapist Behaviours: Giving Information (GI) over all MET, Closed Questions (QUC) during Session 2, and Emphasise Control (EC) during End Intervals. Controlled Drinkers also received a significantly higher frequency of Advise without Permission (ADW) during End Intervals. In addition to those Therapist Behaviours for which Outcome Group differences were observed, Direct (DI) was also able to make a significant contribution to the prediction of Outcome Group in the presence of other variables.



Significant Relationship with Drinking Outcome

Significant Relationship with Client Language category

Able to make a significant contribution to the prediction of the Drinking Outcome or Client Language category in the presence of other Therapist Behaviours but does not have a significant relationship with that variable on its own.

(+) Positive Relationship
(-) Negative Relationship
(Upper arrow, lower arrow)

Therapist Behaviour: EC=Emphasise Control; QUC=Closed Question; ADW=Advise without Permission

[c] Therapist Behaviour Consistent with MI (MICO)
[i] Therapist Behaviour Inconsistent with MI (MIIN)
[n] Neutral Therapist Behaviour (not MIIN or MICO)

Ability Strength - Average Ability strength and Ability strength during End Intervals within MET Sessions have a significant relationship with Outcome, and arrows indicate a relationship with either one or both of these Ability strength measures (see section 3.7.2. for more details).

Commitment Strength- Change in Commitment strength over MET and Commitment strength during Session 4 have a significant relationship with Outcome, and arrows indicate a relationship with either one or both of these Commitment strength measures (see section 3.7.3 for more details).

Figure 15: Relationships between Therapist Behaviours and Client Language within MET, and Drinking Outcome

It was hypothesised that MI proscribed Therapist Behaviours (MIIN) would be related to worse drinking outcome (as was the case with DI), not better outcome as was found for ADW during End Intervals. It was also hypothesised that MI prescribed Therapist Behaviours (MICO) such as EC (during End Intervals) would be related to better outcome not worse outcome. The hypotheses that MICO Behaviours would be associated with higher strength of Client Language categories (that are related to outcome) and a lower frequency of Sustain Talk, and that MIIN Behaviours would have the opposite pattern of results, were not well supported either.

Complex Reflections had the most significant relationship (p =.05) with the frequency of Sustain Talk (negative relationship), and only when this Therapist Behaviour was included in the prediction model of Sustain frequency were other Therapist Behaviours (i.e. End Intervals within MET, Open Questions, and Neutral type) able to make a significant contribution. Moderated by the level of Complex Reflections, unexpected positive relationships between EC and Open Questions with Sustain frequency were found. Furthermore, none of the MIIN Behaviours (or summary measure) were found to have a significant positive relationship with Sustain Talk.

As expected, MICO Behaviours (summary measure as well as specific MICO Behaviours: Affirm and Complex Reflection) had a significant positive relationship with Ability strength measures (Ability strength over all MET and/or during the End within Sessions of MET). Also as expected DI (specific MIIN) had a significant negative relationship with Ability strength during the End Interval within MET Sessions. However, EC during End Intervals made a significant contribution (that was dependant

on the level of Affirm) to the prediction of Ability strength during End Intervals in the opposite direction than expected.

In regards to Commitment strength measures that were related to Outcome, as expected DI had a significant negative relationship with change in Commitment strength over MET, and Affirm was able to make a significant contribution to the prediction of Commitment strength during Session 4. However, specific Neutral Type Therapist Behaviours (Closed Questions and Structure) had the most significant relationships with Commitment strength measures.

4.3.1. Primary Inconsistencies with Therapist Behaviour Hypotheses

It was hypothesised that MI-Inconsistent Therapist Behaviours (MIIN) would be related to worse outcome and more Sustain Talk, and that MI-Consistent Therapist Behaviours (MICO) would be related to better outcome and higher Client Language strength. The two most striking inconsistencies with these hypotheses were that Emphasise Control (EC; a specific MICO Behaviour) was related to worse outcome, and made significant contributions to the prediction models of Sustain Talk (positive relationship) and Ability strength during End Intervals of MET (negative relationship). Secondly, Advise without Permission (ADW; a specific MIIN Behaviour) was related to better drinking outcome. It must be noted that it was not the frequency of these two behaviours over all MET that differed significantly, rather only during the last Interval within each MET Session (which was approximately 10- 15 minutes duration).

In *Motivational Interviewing,* Miller and Rollnick (2002) state that early use of EC can diminish resistance. However, the impact of EC during later parts of the session

or therapy is less clearly stipulated within the text. These unexpected relationships involving EC may be explained by a process by which therapists respond to clients rather than the other way around[51]. Where perhaps on occasions when clients talk about reasons not to change, such as "I like drinking with my friends, they all drink", or inability to change "I am finding it hard to stop drinking altogether" the therapist may respond with an EC statement such as "it is your choice whether you stop drinking altogether or not". This highlights an important limitation of this study, as the results do not allow the direction of the relationships between variables to be established, nor can causation be inferred. Nevertheless, the findings suggest that a better understanding of the circumstances under which EC can enhance or diminish Sustain Talk is needed.

There are two other studies that looked at the effect of EC on Client Language. Catley and colleagues (2006) found that the frequency of EC (during the first 20 minutes) had a negative relationship with Resist Talk (and no relationship with Change Talk) and Moyers and Martin (2003) found that EC was a significant predictor of Change Talk (but not Resist Talk). However, in these studies EC represents an over all frequency for a portion of a MI Session rather than differences within Sessions. Furthermore, no published studies have investigated the relationship between the frequency of Therapist Behaviours and the strength of Change Talk.

It was hypothesised that specific MIIN Therapist Behaviours would be related to worse outcome not better outcome as was found in the case of ADW during End

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[51] A similar explanation was given by Catley and colleagues (2006) when they unexpectedly found that a specific MIIN Therapist Behaviour (Raise Concern without Permission) was associated with greater Change Talk.

Intervals. The relatively low frequency of this behaviour must be noted, where ADW occurred at its highest frequency during End Intervals and still only occurred less than two times on average for the Controlled Drinkers and less than once for the Uncontrolled Drinkers per End Interval. Thus, it cannot simply be said that these results suggest "the more advice the better", instead they suggest that a little advice during the last section of MI-based intervention sessions may be beneficial. In regards to giving advice, Miller and Rollnick (2002, p. 131) state that it "is quite possible and appropriate, within the spirit and principles of motivational interviewing, to share one's expertise with the client." They talk about advice being more appropriate during Phase 2 (strengthening commitment) than Phase 1 (building motivation to change), and it should be given in the context of the client asking for it or the therapist asking permission to give it (either explicitly or implicitly). That is, the therapist should not be too eager to give advice, and should consider whether the client's own knowledge has been elicited and whether it will enhance the clients motivation to change, before the therapist gives advice (even with permission). In the current study, even though the therapists did not ask for permission before giving the advice[52], it could be said that the therapists generally waited for the session to unfold and were not too eager to give advice (as indicated by such low frequency of ADW), and this may explain the positive relationship with outcome.

The current analyses also suggest that ADW may have an indirect relationship with outcome by enhancing Commitment to change. This fits with the theory of MI

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[52] Unfortunately, neither the relationship between Advise with Permission (ADP) and Outcome or Change Talk, nor between ADP and ADW was able to be established due to the unacceptably low reliability of ADP. It was hypothesised that ADP would have a positive relationship with outcome.

where giving advice is a strategy included in the section for strengthening Commitment to Change (Miller & Rollnick, 2002). ADW had its strongest relationship with Commitment Language strength during Session 4[53], however this relationship did not reach significance (r =.338, p =.092, n = 26). In the two other studies that specifically looked at ADW, one found that the frequency within a Session of MI was unrelated to the frequency of Change or Resist Talk (Moyers and Martin, 2003), and the other study (Catley et al., 2006) found that the frequency of ADW in the first 20 minutes of MI had a significant negative relationship with Change Talk (and was unrelated to Resist Talk). However, in Catley and colleague's study ADW was coded unreliably (ICC in poor range) which places limitations on the validity of their results regarding ADW. Similarly, the current study found that ADW over all MET was not related to Sustain Talk or Change Talk strength categories (that were related to outcome)[54].

A study by Moyers and colleagues (2005) also suggested that some Therapist Behaviours that have traditionally been seen as inconsistent with MI may in some contexts be beneficial. In their study of MI treatment for substance abuse problems they found that a set of specific techniques did not enhance or reduce client involvement alone (i.e. no main effect of MICO or MIIN); rather it was the therapists' interpersonal skills that were important[55]. Furthermore, Moyers and colleagues found that in the presence of

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[53] Commitment Language strength during Session 4 only had a stronger relationship with one other variable (Structure).

[54] ADW during End Interval's relationship with the frequency of Change Talk was not determined as the frequency of Change Talk did not have a significant relationship with outcome.

[55] MISC 1.0 Global Clients Ratings Scales: Affect, Cooperation, Disclosure were combined together to create the construct of client involvement. MISC 1.0 Global Therapist Ratings Scales: Acceptance, Egalitarianism, Empathy, Warmth and Spirit, where combined together to create the construct of clinician interpersonal skills.

therapist interpersonal skills, the role of MIIN became significantly positive (i.e. MIIN was moderated by therapist interpersonal skills), and MIIN enhanced the impact of therapist's interpersonal skill upon client involvement. Their results inferred that when MIIN Behaviours occur within an accepting, egalitarian, and empathic interpersonal context they may facilitate client involvement. This supports Miller and Rollnick's (2002) emphasis on a therapist's *way of being* with the client as more important than the specific techniques (*doing*).

Moyers and colleagues (2005) results were in contrast to earlier findings (e.g. Miller et al., 1993; Patterson & Forgatch, 1985) that indicated the potentially destructive impact of specific MIIN Behaviours. Based on those earlier studies the hypotheses that MIIN Behaviours would have a positive relationship with the frequency of Sustain Talk, and a negative relationship with outcome were formulated. Except for Direct, these hypotheses were not supported in the present study. However, both of those earlier studies contrasted a client-centered style with a confrontational (and teaching) approach that was the antithesis of MI, whereas the present study relied on the natural variation in adherence to MET by therapists who were part of a randomised trial of MET. Because the goal of such research is to evaluate the efficacy of the clinical method, this trial involved relatively few therapists, all of whom underwent the same training in MET and fortnightly supervision throughout the trial to enhance treatment fidelity. Thus, variability in expertise was minimised in order to enhance the internal reliability of the study. As a result MIIN Therapist Behaviours were rare. According to Moyers and colleagues (2005), analyses of the process between the therapist and client would ideally involve a large number of therapists with varying degrees of expertise, so that a full range of therapist

skills and client responses could be observed. It is possible that the lack of relationship between MIIN and Sustain Talk maybe be due to either the context within which the therapist engaged in MIIN Behaviours (i.e. high interpersonal skills or proficiency in MI) or that more extreme engagement in MIIN Behaviours is necessary for deleterious effects to occur. The lack of significant findings may also be due to Sustain Talk being investigated in this study rather than Resistant Behaviour. Either case suggest that further research into the contexts in which MIIN Behaviours are best employed or avoided is necessary. Another possible explanation for the null findings is the exclusion of many of the specific MIIN Behaviours due to unacceptably low reliability, or inability to determine the reliability due to low occurrence. Most notably, Confront was excluded from analyses[56]. In the study by Miller and colleagues (1993) Confront was the only specific Therapist Behaviour that was associated with Client Resistance and therapeutic outcome. In Patterson and Forgatch (1985) it was Confront and Teach that were related to within session Noncompliance/ Resistance.

4.3.2. Potentially Detrimental Therapist Behaviours within MET

Consistent with Patterson and Forgatch (1985) and other studies (e.g. Ackerman & Hilsenroth), the current analyses highlighted the possible detrimental effect of Giving Information (GI) on drinking outcome. GI was the only Therapist Behaviour category where significant differences between Outcome Groups over all MET were found (i.e. significant main effect of Outcome Group), where Uncontrolled Drinkers received a

[56] However, it is interesting to note that the three times it was coded, it was uttered to clients who exceeded the drinking guidelines in the follow-up period (but occurrence is too low to be significant).

higher frequency of GI (on average) compared with the Controlled Drinkers. The information in this study often consisted of educating the client about the national drinking guidelines and the research behind the safe drinking limits. This was due to the explicit focus in the therapy manual (Sellman et al., 1996) on educating the clients about the national drinking guidelines and on providing a rationale for reducing their alcohol consumption. It is possible that those who continued to drink more heavily during MET[57] (and would therefore be predicted to have poorer outcome) were more likely to elicit such information from the therapists. In some cases this information could have consisted of an indirect confrontation or contained a subtext of advice. For example, emphasising the size of standard drinks in response to a client saying "I only had three drinks"; or in the case where a client set their own drinking goal that exceeded the guidelines, a therapist may have responded by stating the damaging effects found in research when people drank over the guidelines[58]. Because of the indirect nature of these behaviours Confront or Advise (as defined in the MISC 1.0 and MISC 2.0) were not assigned as frequently as Giving Information[59].

The negative effect of GI is consistent with the spirit of MI (Miller & Rollnick, 2002). Education has been conceptualised by Miller and Rollnick (2002) as the mirror-image opposite therapist approach to evocation, where in true MI spirit knowledge is to

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[57] This information was not explicitly captured in the coding of the sessions.

[58] Although therapists recommended the clients to reduce their drinking to within the national drinking guidelines the BTP allowed clients to set their own goal in terms of drinks per week and per session.

[59] If doubt as to whether Confront or some other behaviour applies, the MISC 2.0 instructs the coder not to code it as Confront. With regard to differentiating advice from information, the MISC 1.0 states that it should be coded as inform when the information does not contain direct advice or suggestion and that it should not be inferred that the therapist meant to advise by giving the information.

be evoked from within the client rather than taught. Furthermore, when information is given to the client, Miller and Rollnick (2002) emphasise asking permission prior to giving information, so that respect, choice, and collaboration are conveyed. However, asking permission before Giving Information was not measured in these analyses and is not currently captured in either versions of the MISC. Inclusion of this would help facilitate further research into the way in which information is given, which is clearly warranted.

In addition to GI and EC during End Intervals within MET Sessions, other Therapist Behaviours revealed to have a potentially detrimental effect are; telling the client what to do (DI) and asking a high frequency of closed questions. Unexpectedly, a positive frequency of Open Questions was able to make a significant contribution to the prediction model of Sustain Talk even though a non-significant correlation ($p \geq .80$) between the two factors was observed[60]. This supports Miller and Rollnick's (2002) emphasis on use of reflections (particularly those that add meaning and/or emphasis when reflecting statements back to the client) rather than questions in reducing clients' arguments for not changing their behaviour.

4.3.3. Potentially Beneficial Therapist Behaviours within MET

In addition to the potential benefit of giving advice during end portions of MI-based Interventions on drinking outcome, this study also highlights the potential benefit of the following specific Therapist Behaviours on the strength of Client Language

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[60] The non-significant relationship between Sustain Talk (and Change Talk strength measures) may be a result of the therapist asking questions that elicited arguments for and against change somewhat evenly e.g. the good things and not so good things about drinking.

categories: Affirm, Complex Reflections, and Structure. Affirm was revealed as having the most significant relationship with both of the Ability strength measures, highlighting the benefit of therapists seeking opportunities to affirm and compliment the client sincerely. Such affirmations were specifically encouraged in this study with the rationale that they were beneficial in a number of ways, including: strengthening the client/therapist relationship, enhancing the attitude of self-responsibility and empowerment, reinforcing effort and self-motivational statements, and supporting client self-esteem (Sellman et al., 1996). In regards to Structure, it must be noted that this Therapist Behaviour (providing information to the client in regards to the session or the treatment) occurred at low frequencies during this study and within that context it was associated with enhancement of Commitment strength. Structure is not a prescribed behaviour in MI, whereas it is in other therapy styles. For example, in cognitive therapy structuring is a strategy employed to enhance clients comfort, understanding, and collaboration (Beck, 1995). However, research has indicated that over-structuring therapy can impact negatively on therapeutic alliance (e.g. Ackerman & Hilsenroth, 2001). Consistent with the current findings, Affirm and Reflection were highlighted as therapist techniques which impacted positively on therapeutic alliance (Ackerman & Hilsenroth, 2003), which in turn has been related to good therapeutic outcomes. Thrasher and colleagues (2006) also found that antiretroviral therapy adherence had a positive relationship with the ratio of reflections to questions and the number of affirming statements, and a negative relationship with closed questions.

4.4. Theoretical and Practical Implications

This study has provided support for the link between client speech and subsequent behaviour as outlined in the emergent theory of inner workings of MI (Miller 2006; and Hettema et al., 2006). The strength of Ability (over all MET and during End Intervals) and Commitment (Change over MET and during Session 2 and 4) Language were related to better drinking outcomes (Controlled Drinking) and Sustain Frequency (over all MET) was related to worse drinking outcomes (Uncontrolled Drinking). As hypothesised, many of the specific MICO Therapist Behaviours had a positive relationship with the strength of Client Language and/or a negative relationship with Sustain Talk; and the specific MIIN Behaviour, Direct had a negative relationship with Client Language strength and was related to worse drinking outcome. However, EC and ADW (both only during End Intervals within MET Sessions) yielded relationships with Client Language and drinking outcome were that were inconsistent with the theory of inner workings of MI (Hettema et al., 2006; Miller 2006). Neutral Therapist Behaviours were also revealed as having an important role, where Giving Information and Closed Questions had a negative relationship with the strength of Client Language and/or drinking outcome, and Structure had a positive relationship with Commitment Language strength. However, it must be noted that the analyses employed in this study do not allow for the direction between variables or the causation to be inferred. Two studies, one involving temporal analyses (Moyers and Martin, 2006) and the other a series of single subject ABAB reversal designs (Patterson and Forgatch, 1985), allow for stronger conclusions to be made about the direction of these relationships, and give strong support for the influence of Therapist Behaviours in shaping client Change and Sustain Talk.

A parsimonious explanation of how MI enhances commitment to change provided by Miller and Rollnick (2004) is as follows: MI therapists directly shape client speech by reinforcing Change Talk and Commitment Language, and these verbalisations within an interpersonal context trigger change. However, Miller and Rollnick acknowledge that the causal link between Client Language and behaviour change is only speculative. While it was found in these analyses that the strength of Client's Ability and Commitment Language and the frequency of Sustain Talk preceded and predicted drinking outcome it is unclear exactly how it would cause change. Miller and Rollnick believe that the explanation that Client Language *causes* behaviour change is too simplistic. Instead they propose that it is likely that some third variable (i.e. an as yet unspecified underlying cognitive or affective process) leads to both Client Language and to behaviour change[61].

Whether Client Language causes behaviour change or acts as a signal of the occurrence of a third variable, it does offer a way of predicting whether behaviour change will occur after the intervention, from which more accurate decisions as to whether more or alternate therapy is appropriate can be made. That is, at a practical level these results indicate that the frequency of Sustain Talk and the strength of Ability and Commitment Language during MET are worth attending to. High levels of the frequency of Sustain Talk and/or decreases in the strength of Ability (particularly during end portions of sessions) and a lack of an increase of Commitment Language (over the course over MET) may signal that the therapist needs to change tack and/or further intervention is necessary

[61] Miller and Rollnick (2004) suggest that this process may work in a similar fashion to that hypothesised to underlie cognitive therapies (i.e. shifts in beliefs that are inferred but not directly observed) or Carl Rogers' client-centered therapy (i.e. a causal relationship between acceptance and change).

to avert poor outcomes. Furthermore, a number of Therapist Behaviours (within the context of MET) have been indicated as being either potentially beneficial or detrimental in that they were either positively or negatively related to Client Language and better drinking outcome.

4.4.1. Importance of End Interval within Sessions

While these analyses did not allow direction of the relationships or causation to be inferred they did allow for investigation into which portions within sessions and across sessions were most important in terms of predicting outcome. In relation to investigated significant interactions involving Outcome Groups and Intervals within MET sessions, it was only the End Intervals (rather than Early or Mid Intervals) where significant differences were revealed. Furthermore, it was Therapist and Client Behaviours during the End Interval (Emphasise Control and Ability strength, respectively) that were the best predictors of drinking outcome. These findings emphasise the importance of attending to Therapist and Client Behaviours that occur during the last portion of sessions of MI-based interventions.

4.5. Strengths and Limitations

4.5.1. Exploratory Data Analyses

The greatest strength of this study is that it extends the current knowledge of the relationship between Therapist and Client Behaviours during MI-based interventions, and their relationship with drinking outcome. Other studies have typically investigated frequency of these behaviours during the first portion of the sessions and only a few have

related these behaviours with outcome. This is the first study that has investigated the relationship between Therapist Behaviours and the strength of client Change Talk, which has been shown to be more predictive of outcome than frequency of Change Talk. Furthermore, it is the first study to look at Therapist and Client Behaviours within session and across multiple sessions of an MI-based intervention, which allowed for analyses of processes involved within each session and across all four sessions. A number of limitations of this study should be noted when interpreting these findings. Firstly, multiple comparisons were conducted without adjusting the significance level, which increased the chance of Type I error (i.e. "false positives"). However, the process by which the data was analysed was employed in order to minimise Type I error. At each stage the data was analysed in detail before deciding whether it was appropriate to conduct further analyses (rather than simply fishing for significant results). For example, simple effects were only investigated if the relevant interaction was significant. As with all research, there was a trade-off between Type I and Type II error, and not adjusting for multiple comparisons was partly an attempt to minimise the chances of Type II error (i.e. "false negatives"), which was already compromised by the small sample size of the study. The sample consisted of secondary analyses of a subset of the participants who received MET during a clinical trial (i.e. n=42) which unfortunately ended up being even smaller (28 participants with at least three audiotaped sessions of MET) due to absent and unsuccessful audio recordings. A power analysis (unequal sample sizes, two-tailed) revealed that in terms of detecting differences between means of Controlled and Uncontrolled Drinkers (in analyses involving only one data point for each client), there was 80% power to detect large effect sizes (> 1.0). While this indicates that any

significant results are likely to be practically important it also indicates that unless a large effect size is present the results are likely to be inconclusive. Also, it is important to note that the majority of the analyses involved repeated measures ANOVAs. Repeated measures designs are particularly powerful because they control for differences between subjects. So while the data from only 22 clients (those that had four audiotaped MET sessions) was used in the ANOVAs, there were 12 data points for each client (i.e. 3 Intervals within each of the four MET Sessions), which equated to a maximum of 264 data points for some analyses[62]. Given that this research consisted of exploratory data analyses with increased chances of Type I and Type II error the results indicate areas for future research and require replication.

4.5.2. Reliability and Validity of the Coding

Other limitations concern the reliability and validity of the coding. The results clearly rely on how well the coding instrument captures what it intends to measure, and how accurately the coders are able to adhere to the instrument. The primary tool utilised in the study was a modified version of the MISC 2.0 which also included some elements of the MISC 1.0. These tools have limitations of their own, which include only measuring a restricted range of information within the therapy session. For example, while specific Therapist Behaviours (such as the microskills of MI) are coded, more complex strategies such as developing discrepancy between the client's current situation and values, or eliciting and reinforcing Change Talk are not included (Moyers et al., 2005). A further limitation is the lack of reliability and validity data for the MISC 2.0. While there are

[62] Note that data for all of the 28 clients were used in other analyses.

estimates of the psychometric properties for the MISC 1.0, there are limited estimates for the MISC 2.0. Appendix A contains details of the interrater reliability estimates of studies involving the MISC 1.0. The reliability of summary measures derived from MISC 1.0 Behaviour Counts have generally achieved adequate reliability; however, individual Behaviour Counts and Global Rating Scales have been more problematic (e.g. Boardman et al., 2006; Catley et al., 2006; de Jonge et al., 2005; and Moyers et al. 2005). Behaviour categories that occur less often, like specific MIIN Therapist Behaviours, are among those which are more likely to obtain unacceptable reliability (e.g. Moyers et al., 2003). In terms of the MISC 2.0 the most significant changes were in regard to the Client Behaviour Counts, and personal communication with T. Moyers (December 20, 2005) and B. Miller (November 27, 2006) confirmed that adequate reliability in the coding of Change Talk as defined in the MISC 2.0 was proving difficult to achieve[63]. As a result in the current analyses it was chosen *a priori* to only incorporate summary frequency and strength measures of Client Language categories. Similar to other studies, uneven reliability was a limitation in the current analyses. Acceptable reliability was not achieved on the Global Rating Scales and a number of specific Therapist Behaviours (the majority of which were MIIN), and thus were not used in the analyses as originally planned. As discussed earlier with regard to specific MIIN Therapist Behaviours, it is possible that the elimination of variables that were unreliably measured in these analyses may have lead to incomplete conclusions about the relationship between Therapist and Client Behaviours

[63] The study by Amrhein and colleagues (2003) which led to the reconceptualisation of Change Talk is the only published study that looks at Change Talk strength across a number of Categories. However, they only report two reliability estimates for the coding of six different types of client language, 10 different strength ratings, and across 10 deciles within the MI session.

and outcomes (Moyers et al., 2005). Pre-parsing (that is, separating utterances prior to assigning specific behaviour codes) is a possible solution that may increase the reliability and is currently being trialled by Moyers (2006).

Several sources of potential bias in the coding of the data also require acknowledgement. Firstly, a source of coder bias may lie in the training of the coders, as none of the individuals involved in the training were trained in the MISC 1.0 or MISC 2.0 by the original authors. The training and the coding process relied heavily on the coding manuals and the coders' interpretation. However, it is worth noting that some clarification and advice was sought directly from T. Moyers (an author of the MISC 2.0) as part of the training. While these manuals are detailed and should be self-guiding, the task was very cognitively taxing and time consuming, and error and subjective interpretation were evident in the reliability analyses, which questions the validity of the coding. In future research the reliability and validity of the coding could be strengthened by getting an external "expert" coder to code some of the reliability tapes (e.g. an author or an individual trained by an author of the MISC 2.0).

Bias in the coding reliability estimates may have occurred due to the test-retest and interrater reliability design employed in this study, where ideally the coders would have been unaware of which tapes were being used for reliability analyses and different tapes would have be used for the test-retest and interrater reliability analyses. However, the coders were blind to their previous coding and the other person's coding during the reliability phases. Compared with other studies a stricter definition for acceptable reliability was employed. Items that obtained an Intraclass correlation coefficient (ICC; a conservative estimate) in the poor range (<.40) on either interrater or test-retest reliability

were not used for any further analyses, whereas most other studies did not measure test-retest reliability in addition to interrater reliability. Also, some studies did not report any reliability statistics (e.g. Shafer, Rhode, & Chong, 2004) and others analysed Therapist Behaviours even though they obtained an ICC in the poor range (e.g. Catley et al., 2006).

A further source of bias may have occurred due to the coders not being blind to the hypotheses of the study. For example, it is possible that coders observing MICO Behaviours may have been more likely to expect positive client responses (i.e. Change Talk) rather than negative responses (i.e. Sustain Talk) and the converse for MIIN. However, the presence of such bias seems less likely given that some of the findings were in the opposite direction to that hypothesised. A possible solution to this would be to get coders who were independent of the development of the hypotheses to code Behaviours and to get different coders to code Therapist and Client Behaviours independently.

4.5.3. Generalisation of Results

A strength of the randomised trial of MET that these analyses were based on was its relevance to clinical practice (Sellman et al., 2001). The original study (BTP) took place at an outpatient alcohol and drug service, utilising assessors and therapists who worked at the service, with mild to moderate alcohol dependent clients recruited from within the service. These factors enhance the generalisability to normal practice[64].

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[64] The exclusionary criteria of the study may place some limitations on the generalisability of these results. For example, 28.6% of the clients involved in these analyses had a current co-occurring axis 1 disorder (not including other substance related or gambling disorders) which is an under representation compared with the 74% of clients in New Zealand outpatient alcohol and drug clinics estimated to have a current co-occurring disorder (Adamson, Todd, Sellman, Huriwai, & Porter, 2006). However, it is worth noting that that there were no significant differences between the Uncontrolled Drinkers and the Controlled Drinkers in terms of current co-occurring disorders at baseline.

The baseline variable by which the Outcome Groups differed the most was the proportion of who were of Maori descent (10.7% of clients). While this difference did not reach significant (p=.11), it is worth noting because all of the individuals of Maori descent exceeded the national drinking guidelines during the six months after treatment. This also indicates that Maori were underrepresented in this sample compared with the 28% of clients who attend New Zealand alcohol and drug outpatient clients who were estimated as being Maori (Adamson et al., 2000). This poses the questions as to how effective MI-based treatments are for clients of Maori descent and how well these interaction patterns found in this study generalise to Maori clients. Interestingly, Hettema and colleagues' (2005) meta-analysis found that MI-based interventions were most efficacious with ethnic minorities. However, their analysis primarily consisted of studies conducted in North America, and may not be relevant to ethic minorities in New Zealand. The efficacy of MI-based interventions for Maori is clearly an area that needs future attention.

4.5.4. Outcome Measures

Another possible limitation of this study is the outcome measures employed. Drinking within the national drinking guidelines and a measure of global functioning were the outcome measures employed. Within this study the target behaviour change was reduction in drinking, and it was recommended that clients reduce their drinking to within the national drinking guidelines (a measure which takes frequency, quantity, and gender into account). While it is clear that all of the clients included in the Controlled Drinkers group had substantially reduced their drinking, many of the Uncontrolled Drinkers also

reduced their drinking even though they exceeded the guidelines at least once. For example, amongst the Uncontrolled Drinkers group approximately 63% (compared with 100% prior to treatment) engaged in unequivocal heavy drinking[65] during the six-month follow-up. Reducing drinking to within the national drinking guidelines is somewhat of a crude dichotomous outcome measure which does not take into account the proportion of reduction for that particular client, or the client's desired amount of reduction. In the randomised trial of MET (Sellman et al., 2001) there was a significant reduction in the number of clients who exceeded the national drinking guidelines and the proportion of unequivocal heavy drinkers (p <.001) over all participants during the six-month period after treatment. However, there were no significant differences between treatment groups in terms of those who exceeded the national guidelines during the follow-up while unequivocal heavy drinking was significantly lower in the MET group compared with the two control groups (p <.04). In the current secondary analyses of the BTP, it was originally intended to analyse the data with three outcome groups[66]; however, due to the unexpected missing sessions, the number of clients in each group was too small to analyse using three outcome groups or the non/unequivocal heavy drinking split[67]. Thus, the results presented in this thesis are in terms of reduction to within guidelines which represents a more substantial reduction in drinking than a reduction in unequivocal

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[65] Unequivocal Heavy Drinking was defined as consuming ten or more standard drinks on six or more days over the six-month follow-up period.

[66] (1) Those who did not exceed the national drinking guidelines, (2) those who exceeded the guidelines but did not unequivocally heavily drink, and (3) those who did unequivocally heavily drink

[67] Furthermore, while data was obtained for most clients from which more sophisticated outcome drinking measures could be created, this would have excluded some of the already small sample and thus were not employed.

heavy; however, it was at the level of unequivocal heavy drinking that MET was found to be more efficacious than a control psychotherapy or feedback alone.

A second outcome measure, the Global Assessment Scale was chosen as a broad measure for the purpose of estimating the impact of treatment on outcome beyond symptom change (i.e. reduction in drinking). However, this outcome measure was unrelated to Outcome Group, or any of the Therapist and Client Behaviours within MET.

4.6. Summary

The above limitations of this study notwithstanding, this thesis has provided strong support for the relationship between Client Language within MI and therapeutic outcome as specified in the emergent theory of the inner workings of MI (Hettema et al, 2005; Miller, 2005). The findings of this thesis also highlighted a number of subtleties that are discussed in Miller and Rollnick's (2002) book, *Motivational Interviewing*, that are important for the therapist to consider within MI-based sessions and across MI-based interventions. The present analyses have replicated and expanded on the findings of Amrhein and colleagues (2003) that emphasised the importance of the strength rather than the frequency of Client Language, the need to look at different types of Change Talk separately, and the importance of the pattern of the strength of Commitment Language over the course of MI. This thesis has also extended these findings to include a New Zealand sample of clients with mild to moderate alcohol dependence. Furthermore, these results have demonstrated the importance of the client's strength of Ability Language and the frequency of Sustain Talk as important predictors of drinking outcome.

This is the first study to investigate the relationship between Therapist Behaviours and the strength of Client Language categories and to investigate these behaviours within sessions and across multiple sessions of an MI-based intervention (MET), demonstrating that end portions within sessions are particularly important. These findings suggest a need to apply MI flexibly, with continual sensitivity and responsiveness to fluctuations in Client Language (Amrhein et al., 2003). Increases in Sustain Talk and/or drops in strength of Ability or Commitment Language may signal the need for the therapist to change tack and/or that further intervention is necessary to avert poor outcomes. This study revealed a number of specific Therapist Behaviours within MET that were related to important Client Behaviours within MET and/or drinking outcome. These analyses indicated the potential detrimental effects of several specific Therapist Behaviours, such as Direct, Giving Information, Closed Questions, and Emphasise Control statements during End Intervals within MET Sessions; and the potential beneficial effect of Complex Reflections, Affirmations, Structure, and Giving Advice during end Intervals within MET Sessions. While these results are subject to a number of limitations and require replication, this study has expanded on the current understanding of the relationship between Therapist Behaviours and the strength of Client Language within MET and their relationship with therapeutic outcome and has demonstrated that this is an area that warrants further investigation.

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APPENDIX A: Table of the Results and Reliability of Studies using the MISC 1.0[68]

Authors (year)	Results	Interrater Reliability of Scales in analyses (range of Intraclass Correlation Coefficient [ICC])
Boardman, Catley, Grobe, Little, & Ahluwalia (2006).	MI Spirit Index Score (composite of Global Ratings of Empathy, Egalitarianism, and Collaboration) had a positive relationship with alliance and client engagement. Confront (the most powerful predictor) had a negative relationship with alliance.	- Global Therapist Rating Scale: Spirit (good) - MI Spirit Index Score (Collaboration, Egalitarian, and Empathy; all in the good range) -Therapist Behaviours Counts: specific MICO (fair – excellent) and MICO (good); specific MIIN (*DI and RCW* were in the poor range and ADW in the good, CO and WA could not be determined due to low frequency of occurrence) and MIIN (good)
Catley et al. (2006).	A composite Global Therapist Rating score and specific MICO Behaviours were significant predictors of a Global Client composite rating, Global Interaction rating, and Change Talk, but not Resist-Change Talk, with African American smoking clients.	-Global Rating Scales: Therapist scales (poor [*Acceptance*] – excellent) and composite (excellent), Composite Global Client Rating (good), Global Interaction composite (good) -Therapist Behaviour Counts: specific MICO (poor [*ADP* and *AF*] - excellent) and MICO (excellent); specific MIIN (*ADW, CO, RCW,* and *WA* were all in the poor range, and DI which was in the fair range) and MIIN (fair) - Client Behaviour Counts: Change Talk (excellent) and Resist-Change Talk (fair)
Moyers & Martin[69] (2006)	MICO behaviours were most likely to be followed by Client Change Talk and MIIN Behaviours were most likely to be followed by Counter-Change Talk. However, Client Change Talk was most likely to be preceded by Therapist Behaviours other than MICO or MIIN.	- Therapist Behaviour Counts: MIIN (*K*= .66), MICO (*K*= .68), Other Therapist Behaviours (*K*= .82), - Client Behaviour Counts: Change (*K*= .60-.70)

(Table Continues)

[68] Includes all studies found during PsycInfo and Medline database searches with Keyword = Motivational Interviewing Skill* Code*, plus additional research studies found in bibliographies and posters found on the CASAA website. Only one study employed the MISC 2.0 (Moyers and Martin, 2006), see footnote below.

[69] They employed the Sequential Code for Observing Process Exchanges (SCOPE) which was derived from the MISC 2.0, and was used to examine the temporal relationship between Therapist and Client Behaviours.

Table Continued

Authors (year)	Results	Interrater Reliability of Scales in analyses (range of ICC)
Thrasher, Golin, Earp, Tien, Porter, & Howie (2006).	In 3 out of 5 MISC 1.0 quality benchmarks, interviewers demonstrated acceptable levels of the MI skills in the majority of sessions. Antiretroviral therapy adherence had a positive relationship with the ratio of reflections to questions, and number of affirming statements; and a negative relationship with closed questions.	- Interrater reliability level of 72%
Collins, Carey, & Smith (2005)	In response to two mailed brief interventions, a greater proportion of Self-Motivational Statements [70] were associated with Personalised Normalised Feedback than Alcohol Education. The intervention effects were moderated by Self-Motivational Statements.	- Client Behaviour counts: Self-Motivational Statements (Excellent) and Total Statements (Excellent).
de Jonge, Schippers, & Schaap (2005).	Principles of MI are covered by the MISC 1.0 (but not evenly), and traps to avoid during MI are less well covered. Reliability analyses for the Global Rating Scales yielded a good rate of absolute agreement but their ICCs were generally Poor.	- Global Rating Scales: Therapist (*Acceptance, Egalitarianism, Genuineness, and Warmth* were all in the poor range and Empathy was in the fair range), Client (poor [*Cooperation and Engagement*] - fair), and Interaction (fair) - ICCs were not calculated for Behaviour Counts but the following differed significantly between coders (ADW, AF, CO, Personal Feedback, Paraphrase, Rephrase, SU, and follow.
Moyers, Martin, Manuel, Hendrickson, & Miller (2005)	Motivational Interviewing Treatment Integrity (MITI) Scale was developed based on the 10 factors yielded from a factor analysis of the MISC 1.0. In half the size the MITI accounted for 59% of the variability in the MISC 1.0. The MITI was reliable and sensitive enough to detect changes in therapists' skills after MI training.	Reliability estimates for the MITI: - Global Ratings (fair) - Behaviour Counts (fair – excellent range)
Moyers, Miller, & Hendrickson (2005)	Therapist interpersonal skills (composite of Global Therapist Rating Scales) were found to be a significant predictor of Client Involvement (composite of Global Client Rating Scales). Unexpectedly, MIIN enhanced effect of Therapist interpersonal skills.	- Global Rating Scales: Therapist (poor [*Genuineness*] - good), and Client (poor [*Engagement*] - fair) - Therapist Behaviour Counts: specific MIIN (poor [*RCW and WA*] - good) and MIIN (fair); specific MICO (poor [*ADP*, *EC and RF*] - excellent) and MICO (excellent)

(Table Continues)

[70] Based on a modified version of the MISC. Statements were based on the definition of Change talk in MISC 1.0.

Table Continued

Authors (year)	Results	Interrater Reliability of Scales in analyses (range of ICC)
Baer et al. (2004).	Therapists' proficiency increased on most MISC 1.0 measures post-training, with some decreases in skills at 2-month follow-up. Almost half of the therapists attained and maintained proficiency on the majority of the measures.	- MISC 1.0 summary scores (poor [*%MICO and %MIIN*] – excellent)
Miller, Yahne, Moyers, Martinez, & Pirritano (2004)	The MISC 1.0 had sufficient sensitivity to measure differences in MI proficiency across four workshop conditions and across follow-up.	- MISC 1.0 summary scores (fair – excellent range).
Mullins, Suarez, Ondersma, & Page (2004).	In women coerced into drug treatment, no differences in treatment retention or urine analysis between women who received MI compared with the educational control condition, even though averaged Global Therapist Ratings Scale scores were in the proficiency range.	- Composite of Global Therapist Rating Scales was .84 (unspecified coefficient).
Shafer, Rhode, & Chong (2004).	No significant differences in therapist level on MISC 1.0 proficiency measures were revealed before, during, and after distance education training in MI, even though there was an improvement in self-perceived knowledge.	
Martin & Moyers (2003)	Using the MISC 1.0 to code early sessions of Community Reinforcement Approach and Twelve-Step Facilitation, higher levels of in session client Resistance predicted lower levels of abstinence one year later.	
Moyers & Martin (2003)	Change Talk was predicted by Global Rating of Spirit and by Therapist Behaviours (e.g. Affirm, Emphasise Control, Raise Concern, and Paraphrase) most of which were MICO. Resistant speech was predicted by MIIN (e.g. Confront) and MICO (i.e. Paraphrase and Reframe) Behaviours.	

(Table Continues)

Table Continued

Authors (year)	Results	Interrater Reliability of Scales in analyses (range of ICC)
Moyers, Martin, Catley, Harris, & Ahluwalia, (2003).	Interrater reliability analyses of the MISC 1.0 yielded acceptable reliability for the majority of Global Rating Scales and Behaviour Counts. Behaviours that occurred less frequently (such as specific MIIN) were most likely to yield unacceptable reliability.	-Global Rating Scales: Therapist (poor [*Acceptance*] – excellent), Client (poor [*Affect and Cooperation*] – excellent), Interaction (fair – good). - Therapist Behaviours Counts (poor – excellent). Those in the poor range were: *ADP; ADW; CO; Information subcategories: personal feedback and self-disclosure; RCW; Reflection subcategories: Repeat with affect; Paraphrase with affect; and summarise with/out affect; ST; and WA.* The reliability for RCP could not be established - Client Behaviour Counts (fair – excellent)
Bradley et al. (2002)	Alcohol related discussion for VA clients who screened at risk of drinking primarily consisted of therapists asking questions and giving information (as measured by the MISC 1.0). The level of advice was considered lacking (i.e. key components of brief interventions).	-81% agreement between coders (assignment of the same MISC 1.0 code) ; *K*=.77
Miller & Mount (2001)	After MI training, probation and parole officers showed a significant increase (as measured by the MISC 1.0) in MICO but no decrease in MIIN behaviours. But there was a return to pre-training levels at four month follow-up.	
Tappin et al. (2000)	Analysis of the sample (pregnant mothers who were smoking) revealed that the majority of interviews were satisfactory, MICO Behaviours were frequent and MIIN were rare, and the majority of client statements were Self-Motivational rather than Resistant. They concluded that Miller's scale[71] was a valid measure for documenting quality but not practical outside of a research setting.	- Composite of Global rating scales: *Therapist* (poor), Client (fair), Interaction (fair range) - MICO (fair range) and MIIN (good range) - Client Self-motivational and Resistant Statements (excellent range)

Note: MIIN= MI-Inconsistent Therapist Behaviours; MICO = MI-Consistent Therapist Behaviours. Range of significance of ICC: poor <.40; fair .4-.59; good .6-.74; excellent ≥.75. Items in the poor range are specified and *italicised.* Blank cells indicate that reliability estimates were not reported.

[71] According to a rating scale provided by Dr W. Miller with extensive explanatory notes and examples, which appears to be a early version of the MISC

APPENDIX B: Brief Definition of the Therapist and Client Behaviour Counts

This information was obtained out of the text of the MISC 1.0 (Miller, 2000) and MISC 2.0 (Miller, Moyers, Ernst, and Amrhein, 2003). Further information and examples of these behaviours are contained in the MISC 1.0 and MISC 2.0 which are available at www.casaa.unm.edu.

Therapist Behaviour Categories (as defined in the MISC 2.0):

Advise (ADP/ ADW): The therapist gives advice, makes a suggestion, or offers a solution or possible action. Advise requires sub classification for whether the advice was given with (ADP) or without prior permission (ADW) from the client. Prior permission can be in the form of a request from the client, or in the therapist asking the client's permission to offer it. Indirect forms of permission asking may also occur, such as a therapist statement that gives the client permission to disregard the advice ("This may or may not make sense to you").

Affirm (AF): The therapist says something positive or complimentary to the client. It may be in the form of expressed appreciation, confidence or reinforcement.

Confront (CO): These are the expert-like responses that have a particular negative-parent quality, an uneven power relationship accompanied by disapproval, disagreement, or negativity. There is a sense of "expert override" of what the client says. The therapist directly disagrees, argues, corrects, shames, blames, seeks to persuade, criticizes, judges, labels, moralizes, ridicules, or questions the client's honesty.

Direct (DI): An order, command, or direction. The language is imperative.

Emphasise Control (EC): The therapist directly acknowledges, honours, or emphasizes the client's freedom of choice, autonomy, personal responsibility, etc.

Facilitate (FA): These are simple utterances that function as "keep going" acknowledgments, such as "I see" or "uh ha".

Filler (FI): This is a code for the few responses that are not codable elsewhere: pleasantries, etc.

Giving Information (GI): The therapist gives information to the client, explains something, educates or provides feedback or discloses personal information.

Question (QUC/QUO): The therapist asks a question in order to gather information, understand, or elicit the client's story. Generally these begin with a question marker word: Who, What, Why, When, How, Where, etc. A question may also be stated in imperative statement language: "Tell me about your family". Questions require sub classification as either Closed (QUC) or Open (QUO). QUC implies a short answer (e.g., yes or no, a specific fact, a number), specifies a restricted range or satisfies a questionnaire or multiple-choice format. QUO is when the therapist asks a question that allows a wide range of possible answers.

Raise Concern (RCP/RCW): The therapist points out a possible problem with a client's goal, plan, or intention. It always contains language that marks it as the therapist's concern (rather than fact). Raise Concern always requires sub classification as to whether the concern was raised with or without permission. Prior permission can be in the form of a request from the client or in the therapist asking the client's permission to offer it. Indirect forms of permission asking may also occur, such as a therapist's statement that gives the client permission to disregard the therapist's concern

Reflect (RES/REC): A reflection is a reflective listening statement made by the therapist in response to a client statement. Reflections require sub classification as either Simple (RES) or, Complex (REC). RES add little or no meaning or emphasis to what the client has said. REC typically adds substantial meaning or emphasis to what the client has said.

Reframe (RF): The therapist suggests a different meaning for an experience expressed by the client, placing it in a new light.

Structure (ST): To give information about what's going to happen directly to the client throughout the course of treatment or within a study format, in this or subsequent sessions.

Support (SU): These are generally sympathetic, compassionate, or understanding comments. They have the quality of agreeing or siding with the client.

Warn (WA): The therapist provides a warning or threat, implying negative consequences unless the client takes a certain action.

Client Behaviour Counts

Irrelevant to the Target Behaviour Change (TBC; as defined in the MISC 1.0)

Ask (?): The client requests information, asks questions, seeks advice or opinion from the therapist

Follow/ Neutral (0): The client follows along with the therapist but the client's statement is not relevant to the TBC.

Relevant to the target behaviour change (as defined by the MISC 1.0)

Change Talk (+): Client responses that directly or indirectly indicate of moving forward in the direction of change in the target behaviour. Four common types of change talk are: Problem Recognition, Concern, Desire/Intention to Change, Optimism (self-efficacy/ ability to achieve a change)

Resist Change (-): Client responses that are inconsistent with or reflect movement away from the TBC. The key is that what the client is saying favours not changing the target behaviour, and in this sense is status quo or movement backward. Four examples are: Arguing, Interrupting, Negating, and not following the therapist.

Relevant to the target behaviour change (as defined by the MISC 2.0)

Ability (A +/-): Client statements of Ability (A+) or Inability (A-) indicate personal perceptions of capability or possibility of change.

Commitment (C+/-): Client statements of Commitment imply an agreement, intention, or obligation toward (C+) the or away from the (C-) TBC.

Reasons (R+/-): Client utterances that would be classified as desire, need, or reason in the MISC 2.0 were all being classified as reason. Desire statements indicate a wanting, wishing, willing to change (+) or not to change (-). Statements of need (coded as reason) indicate a necessity, urgency, or requirement for change or non-change); and statements of Reasons usually specify a particular rationale, basis, incentive, justification, or motive for making the TBC.

Taking Steps (T +/-): Statement that the client has taken specific behavioural steps toward change. Statements of Taking Steps usually describe a particular action that the person has done in the recent past that is clearly linked to moving toward (T+) or away from (T-) the TBC but do not include the TBC itself.

Strength Ratings assigned to TBC relevant utterances (as defined by the MISC 2.0 but applied on 3 point rather than 5 point scale)

1. A highly diminished statement - I guess, kind of, a little, sort of or a moderated, somewhat qualified statement (such as mostly, pretty much, probably, not really)
2. A straightforward statement of inclination, neither amplified nor qualified; such as "I just . . ." or short answers like: "Yes" "No"
3. A statement of inclination with some amplification (really, very), or an absolute, categorical, hyperbolic, emphatic or superlative expression of inclination "in no uncertain terms". Includes emphasis modifiers (definitely, surely, absolutely, positively, no way), definitive vocal tone of expression, amplification of strength from the verb that is used ("I swear" "I promise" "I guarantee" "I will" (with vocal emphasis).

APPENDIX C: Behaviour Count Rules and Coding Forms (adapted from the MISC 1.0 and MISC 2.0)

Behaviour Count Rules: Trumps, Precedence, & Defaults

Therapist

Coding Therapist **Utterances -** Each utterance receives one and only one code

Coding of **Volleys -** A volley may contain only one of each behaviour code. Once a behaviour count is assigned within the volley it is not assigned again

Confront (CO) - If you are in **doubt** as to whether a behaviour was a confront or some other code **do *not* code it as Confront**

Emphasise Control (EC) – EC takes precedence over **Affirm or Reflect** when a therapist response could be interpreted as both

Facilitate (FA) - FA are **stand alone** utterances. Do not code as Facilitate if the vocal sound is a preface to some other therapist response like a Question or a Reflect. In these combinations, code only the second response

Questions (QUC/QUO) – If the therapist begins with a Reflect but turns it into a Question to check the accuracy of the Reflection or to move forward, then **only the Question is coded**

Raise Concern (RCP/RCW) - When a potential negative consequence is expressed as a concern of the therapist, RCP/W takes precedence over Warn

"Spoiled open question" – If the therapist begins with an open question but ends it by asking a Closed Question, then only QUC is coded

Reflect (RES/REC) – RE takes precedence (over **question**) when there are no question marker words (such as Who, What, Why, When, How, Where, etc)

Reflect (RES/REC) - When a coder cannot distinguish between a Simple and Complex Reflection, the Simple Reflection is the default category

Reflect (RES/REC) – Summary- When in doubt; code a summary reflection as complex (REC)

Reframe (RF) – RF generally **meet the criteria for Reflect.** Reframing can involve giving the client **new information** in order to see their situation from a different perspective. In this case the information is a vehicle for reframing, and the default is **Reframe**

Support (SU) - An "agreement with a twist" consists of a **Support** followed by a **Reframe**, and both would be coded.

Support (SU) - If Giving Information (such as **self-revealing statement**) is codable as Support, do so. **Support takes precedence**

Client

Any therapist utterance (except a Facilitate) **ends the client's response**, and the next client utterance is coded as a new response

Each time the client speaks; at least one code must be assigned

Non-word vocalizations (such as hmm, uh huh, ah) are not coded for clients (whereas for therapists they are coded as Facilitate) -unless it is clearly Change/Resist Talk

Coding of Multiple TBC utterances in the same turn- e.g. If a client's turn includes two statements, each of which can be assigned a different code then both are coded as utterances. This would include: two utterances that would be given different signs, or two utterances that state different content (e.g., reasons) for or against change, or two utterances that result in different strength scores

Follow/ Neutral (0)

- When you are not sure if the utterance is relevant to the TBC**(+ or -)** or not, the **default code is Follow/Neutral**
- A client turn is coded as **Follow/Neutral (0)** only if it contains no other codable utterance. That is, for a sequence of utterances within a turn, any **+ or - code trumps a zero**

Strength Rating of Client Language- The starting point for a straightforward statement of inclination is a two **(+2 or -2)**. *Note:* this rule only applies to the current study.

Ability (A+/-)

- When in doubt, and a specific Reason is stated or implied, **R takes precedence over A**
- If the two utterances are separated (by a conjunction, or as different sentences), however, then both can be coded. Separation is not provided by words that imply a causal link: because, so (that), or else, etc.

Reason (R+/-)

Client utterances of desire, need, and reason are all coded as reason. *Note:* this rule only applies to the current study.

Commitment (C+/-)

With commitment speech, if a reason is given it is also coded separately whether or not there is a separating conjunction, and **R does not trump the C code**

Taking Steps (T+/-)

- The action may not be TBC itself.
- T responses can be coded along with other change talk responses
- Statements that the person *will* take such intermediate actions in the future are coded not as Taking Steps (i.e. person hasn't done it yet), but as Commitment (coded as C+1 if the client is thinking about doing the step)

Global Rating Scales Form

Client ID #_____ Session #_____ Session Length:_____
Coder:_____ Date: / / .

Global Therapist Rating Scales (Overall Session)

Acceptance *High* - communicate acceptance, respect, and unconditional positive regard. *Low* - communicate non-acceptance, disregard, or disapproval, is disrespectful or condescending	1 2 3 4 5 6 7 Low High
Empathy/ Understanding *High* - shows active interest in understanding the client and their perceptions, situation, meaning, and feelings. *Low*- makes little effort to gain a deeper understanding of the client's perspective	1 2 3 4 5 6 7 Low High
Spirit *High*- collaborative , evocative and provide autonomous-support *Low*- confrontational, authoritarian, rigid and convey a sense of urgency - May be suspicious or cynical	1 2 3 4 5 6 7 Low High

Global Client Rating Scale (High Point)

Self Exploration 1 - No personally relevant material is revealed or discussed 2 - Avoids bringing up personal material but is responsive 3 - May respond to and elaborate on personal info brought up by therapist 4 - Elaborates on or volunteers personal info with spontaneity or feeling 5 - Elaborates on personal material with both spontaneity and feeling. 6 - Explores and discusses, discovers new feelings/perspective/or personal meanings. 7 - Active intrapersonal exploration, may experience a shift in perception	1 2 3 4 5 6 7 Low High

Global Interaction Rating Scales (Overall Session)

Collaboration *Dancing* - therapist moves with the client's efforts negotiating, collaborating, and empowering. *Wrestling* – client is uncooperative, competitive, or adversarial - may just acquiesce	1 2 3 4 5 6 7 Wrestling Dancing
Benefit *Better* - client shows movement toward beneficial change. *No Different* – no movement. *Worse* - client shows movement away from beneficial change	1 2 3 4 5 6 7 Worse No Different Better

Behaviour Counts Coding Form

Client ID #_____ Session #____ Session Length:_____ / 9 = [ ] : Interval Length
Coder:_____ Date: / / Page 1/2

1st Interval starts at: 0000.
2nd Interval starts at: | Starting Verbage=
3rd Interval starts at: |Starting Verbage=
4th Interval starts at: |Starting Verbage=
5th Interval starts at: |Starting Verbage=

Behavioural Counts Coding Form Page 2/2 Client ID #_____ Session #___

6th Interval starts at:	Starting Verbage=
7th Interval starts at:	Starting Verbage=
8th Interval starts at:	Starting Verbage=
9th Interval starts at:	Starting Verbage=

Note: The first coded word (or few words) of each interval is recorded ("Starting Verbage").

Comments:

APPENDIX D: Additional Reliability Sample Tables

Refer to the List of Acronyms or to Appendix B (a brief definition of each Behaviour Count) for specific codes listed in the Tables below.

Table 21

Mean (SD) Frequency of the Therapist Behaviour Counts per Interval for the Reliability Sample (n=36)

Measure	**Coder DE**		**Coder SC**	
	Time 1	**Time 2**	**Time 1**	**Time 2**
ADP	.17 (.74)	.08 (.28)	.11 (.40)	.11 (.40)
ADW	.67 (1.24)	.56 (.97)	.08 (.37)	.25 (.73)
AF	1.33 (1.47)	1.19 (1.38)	1.97 (1.99)	1.97 (2.21)
CO	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
DI	.06 (.23)	.03 (.17)	.17 (.61)	.08 (.37)
EC	.17 (.45)	.06 (.23)	.19 (.47)	.14 (.42)
FA	21.14 (12.25)	29.08 (16.09)	30.17(20.44)	30.08 (17.24)
FI	.75 (1.13)	.72 (1.03)	1.08 (1.54)	.58 (.87)
GI	2.06 (2.90)	1.64 (2.47)	3.67 (6.41)	3.36 (6.09)
QUC	5.42 (3.87)	4.94 (3.39)	5.25 (3.61)	5.17 (3.24)
QUO	8.94 (5.28)	8.78 (5.28)	9.33 (5.53)	9.25 (5.47)
RCP	.06 (.33)	.00 (.00)	.00 (.00)	.00 (.00)
RCW	.33 (.48)	.14 (.35)	.03 (.17)	.00 (.00)
RES	4.39 (3.96)	2.92 (2.52)	5.39 (3.86)	3.47 (2.48)
REC	10.89 (6.13)	12.67 (5.91)	11.53 (7.21)	14.44 (7.78)
RF	.25 (.60)	.06 (.23)	.19 (.52)	.42 (.84)
ST	.72 (.97)	.89 (1.01)	.89 (.95)	.69 (.86)
SU	.19 (.47)	.61 (.99)	.50 (.77)	.28 (.51)
WA	.03 (.17)	.00 (.00)	.08 (.28)	.08 (.28)

Table 22

Intraclass Correlation Coefficients of the Therapist Behaviour Counts per Interval for the Reliability Sample, n=36 (Intervals)

	Test-test Reliability		Interrater Reliability
Measure	**Coder DE**	**Coder SC**	**(at Time 2)**
ADP	*-.05*	*1.00*	*-.08*
ADW	.61	.53	.78
AF	.94	.90	.72
CO			
DI	.66	.73	.67
EC	.60	.72	.66
FA	.89	.91	.92
FI	.77	.55	.71
GI	.81	.99	.60
QUC	.80	.80	.82
QUO	.88	.96	.95
RCP	*.00*		
RCW	*.40*	*.00*	*.00*
RES	.72	.65	.70
REC	.85	.91	.76
RF	*.48*	*.59*	*.24*
ST	.70	.73	.78
SU	*.13*	*.66*	*.22*
WA	*.00*	*1.00*	*.00*

Note: Behaviour counts in *italics* yielded an ICC in the poor range in at least one of the reliability conditions. Blank cells indicate that the category was not assigned during the relevant reliability conditions (i.e. during Time 1 and Time 2 for test-retest or by either coder at Time 2 for interrater reliability) thus an ICC could not be computed.

Table 23

Mean (SD) Frequency of the Client Behaviour Counts per Interval for the Reliability Sample, n=36 (Intervals)

	Coder DE		Coder SC	
Category	**Time 1**	**Time 2**	**Time 1**	**Time 2**
0	22.72 (12.77)	21.31 (14.06)	35.28 (21.09)	38.14 (20.12)
?	1.50 (1.89)	.83 (1.30)	1.47 (1.58)	1.25 (1.66)
-3 Resist	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
-2 Resist	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
-1 Resist	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
+1 Change	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
+2 Change	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
+3 Change	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
A-3	.17 (.45)	.08 (.37)	.03 (.17)	.00 (.00)
A-2	1.83 (1.83)	.81 (2.34)	1.47 (1.99)	1.33 (1.67)
A-1	.89 (1.06)	2.06 (2.25)	.17 (.38)	.08 (.28)
A+1	.44 (.69)	2.28 (2.75)	.17 (.45)	.22 (.54)
A+2	1.06 (1.26)	.69 (1.55)	.78 (1.20)	1.03 (1.58)
A+3	.06 (.23)	.00 (.00)	.06 (.23)	.03 (.17)
C-3	.00 (.00)	.06 (.23)	.03 (.17)	.00 (.00)
C-2	.39 (.55)	.25 (.55)	.03 (.17)	.06 (.23)
C-1	.17 (.45)	.53 (1.44)	.03 (.17)	.06 (.23)
C+1	1.06 (1.33)	2.89 (3.63)	2.56 (3.45)	2.17 (2.92)
C+2	2.00 (2.64)	2.11 (2.88)	1.31 (1.60)	1.33 (1.80)
C+3	.42 (.65)	.19 (.58)	.22 (.48)	.11 (.32)
R-3	.50 (1.08)	1.31 (3.89)	.08 (.28)	.17 (.45)
R-2	5.97 (5.26)	6.83 6.28)	6.50 (6.39)	5.56 (5.56)
R-1	1.78 (2.42)	2.44 (2.20)	.58 (1.30)	.53 (1.50)
R+1	2.28 (2.02)	4.14 (6.51)	.86 (1.59)	.75 (1.16)
R+2	16.97 (9.49)	15.92 (10.48)	15.56 (11.58)	12.78 (9.05)
R+3	2.33 (2.41)	1.69 (1.85)	2.39 (2.66)	1.72 (1.91)
T-3	.03 (.17)	.08 (.37)	.00 (.00)	.00 (.00)
T-2	1.08 (1.32)	1.22 (1.59)	1.08 (2.53)	.58 (.94)
T-1	.33 (.96)	.61 (1.13)	.00 (.00)	.00 (.00)
T+1	.36 (.54)	1.56 (2.12)	.19 (.86)	.31 (.58)
T+2	3.03 (2.88)	3.06 (2.97)	2.97 (2.70)	2.78 (2.44)
T+3	.14 (.42)	1.25 (4.72)	.08 (.28)	.06 (.23)

Note: 0= Neutral/ Follow; ?= Asks a questions; A= Ability; C= Commitment; R= Reason; T= Taking Steps; Strength ratings range from -3 to +3 (strong inclination away from TBC to strong inclination toward TBC)

Table 24

Reliability of the Client Behaviour Counts per Interval, n=36 (Intervals)

	Test-retest Reliability		**Interrater Reliability**
Category	**Coder DE**	**Coder SC**	**(at Time 2)**
0	.82	.95	.78
?	.73	.90	.81
A-3	*-.09*	*.00*	*.00*
A-2	*.54*	*.74*	*.20*
A-1	*.39*	*.13*	*.06*
A+1	*-.00*	*.19*	*.01*
A+2	.74	.65	.87
A+3	*.00*	*-.04*	*.00*
C-3	*.00*	*.00*	*.00*
C-2	*.61*	*-.04*	*.40*
C-1	*.02*	*-.04*	*.16*
C+1	*.25*	*.91*	*.76*
C+2	*.26*	*.48*	*.65*
C+3	*.23*	*.53*	*.56*
R-3	*.04*	*.31*	*.09*
R-2	.71	.87	.55
R-1	.65	.90	.41
R+1	*.14*	*.60*	*.06*
R+2	.68	.88	.77
R+3	.65	.80	.71
T-3	*-.03*		*.00*
T-2	*.41*	*.39*	*.37*
T-1	*.38*		*.00*
T+1	*.08*	*-.01*	*-.03*
T+2	.75	.85	.52
T+3	*-.02*	*.79*	*.01*

Note: 0= Neutral/ Follow; ?= Asks a questions; A= Ability; C= Commitment; R= Reason; T= Taking Steps; Strength ratings range from -3 to +3 (strong inclination away from TBC to strong inclination toward TBC). Behaviour counts in *italics* yielded an ICC in the poor range in at least one of the reliability conditions. Blank cells indicate that this category was not assigned at Time 1 or Time 2 by coder SE, thus an ICC could not be computed.

APPENDIX E: Correlation Matrices

The following Correlation Matrices included *N*=28 apart from correlations that involved Commitment Session 4 (*n* =26). Refer to the List of Acronyms for specific codes.

Table 25

Correlation Matrix of Client Behaviours that were revealed as significant Predictors of Outcome Group

Categories	**1**	**2**	**3**	**4**	**5**
1. Average Sustain					
2. Average Ability	-.60**				
3. Ability End Interval	-.57**	.83**			
4. Commitment Session 2	-.22	.32	.39*		
5. Commitment Session 4	-.22	.55**	.43*	.37	
6. Change in Commitment over MET	.01	.04	.23	.18	.38

Note: * $p < .05$; ** $p < .01$; All of the categories involve strength scores apart from Sustain (which is a frequency measure).

Table 26

Correlation Matrix of Therapist Behaviours (averaged over Intervals of MET) that have a significant relationship with Client Behaviours or Outcome Group

Category	1	2	3	4	5	6	7	8	9	10	11	12
1. AF												
2. DI	-.31											
3. GI	-.21	.05										
4. QUC	-.24	.53**	.29									
5. QUO	-.25	.25	-.04	.59**								
6. REC	.49**	-.26	.21	.29	.02							
7. ST	-.11	.11	-.14	.24	.42*	.03						
Summary Measures												
8. MICO	.36	-.06	.10	.57**	.54**	.82**	.27					
9. MIIN	-.27	.20	-.24	-.14	-.05	-.51**	.39*	-.39*				
10. Neutral	.31	-.16	.17	.15	-.27	.66**	-.36	.38*	-.31			
Intervals and Sessions												
11. ADW End Interval	-.12	-.04	-.39*	-.35	-.09	-.50**	.30	-.42*	.91**	-.31		
12. EC End Interval	.33	.07	.27	-.03	-.16	.25	-.04	.16	-.05	.14	-.09	
12. QUC Session 2	-.15	.48*	.38*	.94**	.45*	.35	.13	.56**	-.22	.30	-.43	.13

* $p < .05$; ** $p < .01$

Table 27

Correlation Matrix of Therapist Behaviours (averaged over Intervals of MET) and Client Language that have a significant relationship with Outcome Group

Therapist Behaviour Category	**Sustain Talk Frequency** (Average)	**Ability Strength** Average	End Intervals	**Commitment Strength** Change over MET	Session 4
ADW	.09	-.04	-.08	.05	.26
AF	-.23	.48** [c]	.47* [c]	.13	.31 [c]
DI	.25	-.17	-.42*	-.41*	-.24
EC	.16	.11	-.15	.02	.20
FA	.18	-.05	.04	.36	.07
FI	-.35	.26	.23	-.05	.33
GI	.17	-.15	-.25	-.27	-.12
QUC	.03	.08	-.05	-.47 [*]	-.13
QUO	-.04 [c]	.07	.10	-.15	-.00
RES	-.13	.10	.14	-.31	.07
REC	-.37 [c]	.37	.41*	.04	.21
ST	-.20	.25	.18	.09 [c]	.57* [c]
Summary Measures					
MICO	-.31	.37	.40*	-.11	.21
MIIN	.19	-.09	-.17	-.01	.23
Neutral	.21 [c]	-.04	-.01	.21 [c]	.04
Intervals and Sessions					
QUC Session 2	.12	-.06	-.21	-.47** [c]	-.19
EC End Interval	.18 [c]	.01	-.19 [c]	-.29	-.08
ADW End Interval	.06	.01	-.02	.08	.34

Note: * $p < .05$; ** $p < .01$; [c] Contributed to the prediction model of that particular Client Language category determined through Stepwise Regression.