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## Motivational Interviewing Via Co-Active Life Coaching as an Intervention for Tobacco Control

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Graduate Program in Health and Rehabilitation Sciences  
A thesis submitted in partial fulfillment of the requirements for the degree in Doctor of Philosophy  
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MOTIVATIONAL INTERVIEWING VIA CO-ACTIVE LIFE COACHING AS AN  
INTERVENTION FOR TOBACCO CONTROL

(Thesis format: Integrated Article)

by

Tara Mantler

Graduate Program in  
Health and Rehabilitation Sciences

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Doctor in Philosophy

The School of Graduate and Postdoctoral Studies  
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## **Abstract**

The purpose of this Motivational Interviewing (MI) via Co-Active Life Coaching (CALC) research program in tobacco control was to assess the effectiveness of this individualized, interactive intervention. This was achieved through a critical appraisal and literature review of the individual dimensions of MI currently used in cognitive-behavioural smoking cessation interventions, as well as MI applied via CALC intervention studies at both the individual- and population-levels.

Article 1 provides the critically appraised and systematic review of literature exploring three dimensions of MI (social support, motivation, and tailored interventions) which were implemented independently in cognitive-behavioural cessation interventions. The effectiveness of these dimensions at promoting cessation was assessed and yielded mixed results. The purpose of Article 2 was to assess the impact of MI-via-CALC on selected cessation outcomes among young adults (19-25 years) and found the immediate intervention group, compared to the waitlist group, had a significant reduction in smoking behaviours (number of cigarettes smoked per day and cigarette dependency) and significant increases in personal competency (self-esteem and self-efficacy). Additionally, at 12-months post-intervention a cessation rate of 31.4% was reported and biochemically verified. Lastly, Article 3 assessed the impact of a full-day application-based MI-via-CALC training on the perceived competency of employees of a national smokers' telephone hotline to facilitate behaviour change among callers. Post- training participants described skill development, increased competency at facilitating behaviour change, and desire for additional training.

This research program was comprised of three unique studies. This was the first critical appraisal and literature review to assess cognitive-behavioural cessation interventions through an

MI lens. The core components of MI-via-CALC are similar to components already utilized individually in cessation interventions; however, unique to MI-via-CALC is the incorporation of these components into one intervention. Moreover, this was the largest individual MI-via-CALC intervention tobacco study to date and the only one with a control group. Furthermore, the cessation rates observed in this intervention study are beyond those currently observed in other cognitive-behavioural interventions as well as nicotine replacement therapy studies. Lastly, the MI-via-CALC training offered to employees of a national smoker's hotline was also a first, as the hotline typically does not allow outside researchers within their organization.

Overwhelmingly, the training was well received, and the impact was self-reported behaviour change resulting in ameliorated client interactions to promote cessation. Together, the important findings of these ground-breaking studies underscore the need for continued investigation of MI-via-CALC as an intervention for tobacco control.

Keywords: Co-active life coaching; motivational interviewing; smoking; tobacco; health promotion.

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## **Purpose and Introduction**

Throughout this dissertation, the effectiveness of Motivational Interviewing applied via Co-Active Life Coaching tools (MI-via-CALC) as an intervention for tobacco control was examined. This line of research stemmed from a pilot study which assessed both the feasibility and efficacy of MI-via-CALC in a small (n=9) sample of university students and found a cessation rate of 22%. This finding was noteworthy as it was comparably higher than other cognitive-behavioural cessation interventions by 7% and therefore additional, research was warranted. To continue the comprehensive evaluation of MI-via-CALC for tobacco control three distinct studies were undertaken: 1) a systematic literature review; 2) an individual-intervention study; and 3) a population-based training intervention study.

The integrated-article format was selected for the structure of this dissertation and each section represents a separate manuscript focused on gaining a theoretical understanding of MI components for cessation, or on an individual- or population- level MI-via-CALC intervention study. As a result of this format choice some of the information presented herein will be repetitious. The introductory article, presented next, is a systematic literature review of current cognitive-behavioural interventions which individually utilized dimensions of MI to promote cessation.

# **Article 1--Motivational Interviewing and Smoking Behaviors: A Critical Appraisal and Literature Review of Selected Cessation Initiatives<sup>1</sup>**

## **Introduction**

Half of the world's smokers, or approximately 650 million people, will be killed by tobacco-related diseases, establishing smoking as a leading cause of preventable death (Fagerstrom, 2002). In North America, an estimated 20% of people 12 years of age and older were smokers in 2005, marking a 6% decline since 2000 (Shields, 2007). Despite this lower prevalence, the number of deaths attributed to smoking has been increasing (Shields, 2007). The worldwide high prevalence of smoking, established negative health outcomes of smoking and benefits of cessation, and the addictive nature of cigarettes indicate the continued need for efficacious smoking cessation programs (Fagerstrom, 2002; Edwards, 2004; Perkin, Conklin, & Levine, 2007; Shields, 2007; Lindblom, 2009).

Motivational interviewing (MI) has been applied in smoking cessation initiatives and is a client-centered directive method focused on enabling change through the enhancement of intrinsic motivation and the exploration and resolution of ambivalence (Miller & Rollnick, 1991; Miller, 1996). The method is based on five foundational principles: identifying discrepancies between thought and action, supporting client autonomy, being empathetic toward the client, avoiding confrontation, and adjusting to resistance (Miller & Rollnick, 1991). These principles have been broadly applied to

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<sup>1</sup>A version of this chapter has been published in *Psychological Reports*. The copyright release forms for accepted manuscripts from this dissertation are included in Appendix A. Reproduced with permission of publisher: Mantler, T., Irwin, J.D. & Morrow, D. (2012). Motivational interviewing and smoking behaviors: a critical appraisal and literature review of selected cessation initiatives, *Psychological Reports*, 110(2), 445-460 © Psychological Reports 2012.

strategies currently employed in cessation interventions, namely, the first facilitates motivation, the second is achieved through social support (Edwards & Orford, 1977), and the latter three empower change through tailoring the intervention to the individual.

This literature review had a two-fold purpose. First, primary studies were selected *a priori* based on the three different dimensions of MI (social support, motivation, and tailoring the intervention). These dimensions of MI and their overall efficacies at facilitating cessation were compared. Second, each study's methodology was appraised critically and problems of design and methods were addressed where appropriate.

### **Method**

Four relevant electronic databases related to health and behavior were searched for smoking cessation programs employing cognitive-behavioral interventions: CINAHL, Sage Journals, SCOPUS, and SocINDEX. Utilizing these databases, this literature review attempted to identify all studies that used a formal program or intervention for cessation of smoking. The intervention had to extend at least 6 weeks, using samples of adults in the age range of 18 to 64 years, who did not have any comorbidities, and deal with cognitive behavior approaches, social support, and identified motivations. These database searches generated 57 potential articles, and each article's reference list was also hand-searched for additional suitable studies.

### ***Inclusion/Exclusion Criteria***

Each article was reviewed carefully for the following inclusion criteria: an intervention study that described at least one of the aforementioned dimensions of MI: English speaking adults between 18 to 64 years, no co-morbidities, had smoking cessation statistics, and a follow-up period of a minimum of 6 weeks. Six weeks was



selected to ensure an adequate number of studies was included in the review; the authors acknowledge this 6-week time-frame is not sufficiently long to ensure sustained behavior change. Studies which combined the intervention with other intervention strategies (i.e., cognitive behavioral techniques, nicotine replacement therapy, etc.), and/or the absence of a control or comparison group, were also included as variables for analysis in this review. Exclusion criteria were: participants with comorbidities, as the aim of this review was to assess the three dimensions of motivational interviewing with participants who could fully focus on the intervention; and studies without statistics. Seventeen of 57 studies met the aforementioned inclusion criteria.

### ***Data Extraction***

Once each study was determined as eligible for the study design, sample sizes, setting, participants, intervention, and outcome data were extracted. Subsequently, the potential biases were identified by examining sampling, blinding, and selective reporting, as well as other factors including attrition, compliance, and adequacy of procedures. Both the data extraction form (Appendix B) and the assessment of bias (Appendix C) were created based on headings described by the Cochrane Protocol (Higgins & Green, 2008). Studies were summarized in alphabetical order as presented in Table 1, with smoking statistics being reported for the last follow-up time available. Studies which used more than one dimension of MI were categorized into the dimension of MI that was primary to the intervention. Results were presented utilizing the three different dimensions and validity as subheadings (Table 1).

## Results

### *Social Support*

Social support is commonly understood to mean “leading the subject to believe that [s]he is cared for and loved, esteemed, and a member of a network of mutual obligations” (Cobb, 1976, p. 300). Social support, when implemented in smoking cessation programs, typically involves providing participants with an individual who supports them in the achievement of their cessation goal (May, West, Hajek, McEwen, & McRobbie, 2006). This method was utilized in May, *et al.*'s study (2006) in which participants were assigned randomly either to a control ( $n = 326$ ) or intervention ( $n = 237$ ) group. Both groups received group-based treatment. However, the participants in the intervention group were matched with a partner from their group, to provide support *to* and receive support *from* (May, *et al.*, 2006). The cessation rates, at 24 weeks, for the control and intervention groups were comparable at 15% and 13%, respectively (odds ratio = 1.45). These researchers suggested all participants had pre-existing social support from family members and friends that masked the social support effect in this study.

A study by Andrews, Felton, Wewers, Waller, and Tinggen (2007) examined changes in social support as a possible predictor of continued smoking cessation. The authors compared a control group ( $n = 52$ ) to an empowerment counseling group ( $n = 51$ ). The control group was provided with written self-help and smoking cessation educational materials. The intervention group consisted of six sessions and two booster sessions, nicotine replacement therapy, and social and spiritual support. Andrews, *et al.* (2007) reported cessation rates of 5.7% for the control group and 27.5% for the intervention group at six-month follow-up. When baseline differences were controlled,

the results were significant (odds ratio = 6.25). The authors determined that changes in total social support did not affect abstinence outcomes significantly.

A study by Killen, Fortmann, Schatzberg, Arredondo, Murphy, Hayward, *et al.* (2008) used both nicotine replacement therapy and social support to aid in cessation attempts. The control group ( $n = 147$ ) received four sessions that focused on resisting the urge to smoke, and then four follow up scripted telephone sessions. The intervention group ( $n = 154$ ) received the same initial sessions and made weekly calls to a voicemail service that tracked progress to cessation. Also, if participants indicated they were having urges to smoke, then a phone call from a staff member was made to provide social support (Killen, *et al.*, 2008). Prior to the intervention, both groups received 17 weeks of nicotine replacement therapy (Killen, *et al.*, 2008). Cessation results at one-year follow-up were not statistically significant, with 27% of the control group and 31% of the intervention group reporting abstinence (Killen, *et al.*, 2008).

Free, Whittaker, Knight, Abramsky, Rodgers, and Roberts (2008) used a text-messaging-based intervention. Participants were randomly assigned to the control ( $n = 98$ ) or intervention ( $n = 102$ ) group. The control group received regular generic text messages regarding cessation. The intervention group received text messages offering support in their cessation attempt; the latter were based on elements identified as effective through a previous evaluation (Free, *et al.*, 2008). At six-month follow-up, 6.7% of the control group and 8.5% of the intervention group had their cessation claims verified biochemically, although the results were not significant (relative risk = 1.28). These four studies indicate that social support had mixed results in promoting smoking cessation.

## ***Motivation***

Four studies focused on MI. Motivation is generally understood in terms of individual drives to achieve a desired behavior or outcome (White, 1959). Williams, McGregor, Sharp, Levesque, Kouides, Ryan, *et al.* (2006) tested the utility of self-determination theory as an intervention for smoking cessation. Self-Determination Theory assumes an individual's autonomy and intrinsic motivation together facilitates a desired behavioral change (Williams, *et al.*, 2006). Participants were assigned randomly to a control ( $n = 292$ ) or intervention ( $n = 714$ ) group, and both groups received public health services booklets and a list of cessation programs available in the area (Williams, *et al.*, 2006). The intervention group also received four one-on-one counseling sessions focused on augmenting intrinsic motivation (Williams, *et al.*, 2006). Cessation rates were 3.8% and 11.2% (odds ratio = 3.22;  $p < .001$ ) for the control and intervention groups, respectively, at six-month follow-up (Williams, *et al.*, 2006). These results supported the application of self-determination theory and, more specifically, intrinsic motivation enhancement to facilitate smoking cessation (Williams, *et al.*, 2006).

A study by Zernig, Wallner, Grohs, Kriechbaum, Kemmler, and Saria (2008) compared psychotherapy ( $n = 366$ ) and a nine-week pharmacological intervention ( $n = 413$ ). Psychotherapy focused on increasing motivation through guided imagery techniques aimed at self-determination, competence, self-worth, and autonomy. The pharmacological intervention used was Zyban®, as it eases nicotine withdrawal symptoms and reduces urges by acting on neurotransmitters (Shiffman *et al.*, 2000). The researchers found the psychotherapy group results were significant compared to the

Zyban® group, with cessation rates of 39.1% and 12.3%, respectively, at one-year follow-up (odds ratio = 4.55;  $p < .001$ ).

Conversely, in a study which involved proactive phone calls to participants from Quitline, a telephone service available to individuals trying to quit smoking, Gilbert and Sutton (2006) found cessation rates were not statistically significant between the control ( $n = 704$ ) and intervention ( $n = 753$ ) groups at one-year follow-up (9.5% and 9.3%, respectively). The proactive calls from the Quitline counselors attempted to instill motivation in the participants (Gilbert & Sutton, 2006). The authors suggested motivation to quit smoking cannot be instilled in participants; rather participants must be intrinsically motivated to quit.

Two studies, one by Carlson, Taenzer, Koopmans, and Bultz (2000) and another by Carlson, Taenzer, Koopmans, and Casebeer (2003), used eight 90-minute group sessions focused on education, self-monitoring, nicotine fading, motivation, and behavioral modifications to promote cessation ( $ns = 971$  and  $1,800$ , respectively). The former study followed participants for eight years and had a self-report quit rate of 16.2%. The latter study followed-participants for three months and reported a self-report quit rate of 39.5% (Carlson, *et al.*, 2000; Carlson, *et al.*, 2003).

A study by Hernández-López, Luciano, Bricker, Roales-Nieto, and Montesinos (2009) compared acceptance and commitment therapy to cognitive- behavioral therapy. Acceptance and commitment therapy assessed value clarification as a means to increase motivation to quit whereas Cognitive Behavioral Therapy focused on preparing participants to quit. At one-year follow-up, the authors found higher results for the acceptance and commitment therapy group ( $n = 43$ ), with cessation rates of 30.3%

compared to 13.2% in the cognitive behavioral therapy group ( $n = 38$ ); however, the differences between the two groups were non-significant due to the small sample size and group differences observed at baseline (odds ratio = 5.13). These four studies did not give a clear indication of how motivation-enhancing strategies affect smoking cessation.

### ***Tailoring Cessation Programs to the Individual or Group***

Three studies assessed programs tailored to reflect and better address participants' specific cultural and personal factors to facilitate cessation. A study by Swartz, Noell, Schroeder, and Ary (2006) randomly assigned participants to either a control ( $n = 180$ ) or an intervention ( $n = 171$ ) group. The control group was wait-listed for 90 days and subsequently given access to the program. The intervention group received access to a website-based platform that provided users with cessation material tailored to each participant's ethnicity, sex, and age. These researchers reported significant differences in cessation between the control group, 5.0%, and the intervention group, 12.3%, at three-month follow-up (odds ratio = 2.66;  $p < .02$ ). The results suggest tailoring programs to individuals can be a useful application.

Similarly, Rodgers, Corbett, Bramley, Riddell, Wills, Lin, *et al.* (2005) randomly assigned participants to two groups. In the control group ( $n = 853$ ), participants received a text message every two weeks reminding them they were participating in the study. Participants in the intervention group ( $n = 852$ ) received regular personalized text messages offering education about smoking cessation and distraction from smoking. Cessation rates for the control group, 13%, and intervention group, 28%, were significant at six-week follow-up (relative risk = 2.66;  $p < .0001$ ; Rodgers, *et al.*, 2005). Likewise, in a study by Te Poel, Bolman, Reubsaet, and de Vries (2009), participants were randomly

assigned to two groups. The control group ( $n = 234$ ) received a non-tailored e-mail with facts and information about cessation. The intervention group ( $n = 224$ ) received tailored feedback in an e-mail (using information participants provided in a previous questionnaire). When the control group was compared to the tailored feedback group, the seven-day abstinence rates reported at six months were significantly different, 7.8 and 20.4%, respectively (odds ratio = 4.40;  $p < .01$ ).

Cohn, Dodson, French, Ervin, Ciarlariello, and Wilson (2000) recruited 111 smoking parents of children with respiratory diseases and offered them a cessation program tailored to inform the parents how smoking negatively affected their children. This program resulted in cessation for 44% of participants immediately following the program. Although the three studies discussed above had increased cessation rates, not all programs using tailored interventions have resulted in statistically higher cessation rates than control groups. A study by Tindle, Barbeau, Davis, Eisenberg, Park, Phillips, *et al.* (2006) randomly assigned participants to either a control group ( $n = 17$ ), where participants were wait-listed, or an intervention group ( $n = 17$ ) which utilized participant-generated guided imagery to promote smoking cessation. Results were non-significant at 12-week follow-up between the control and intervention groups, with cessation rates of 12% and 29%, respectively (Tindle, *et al.*, 2006). The researchers proposed the lack of difference was likely due to the small sample size.

A study by Resnicow, Vaughan, Futterman, Weston, Royce, Parns, *et al.* (1997) randomly assigned participants into two groups. The control group ( $n = 541$ ) received generic educational material on smoking cessation. The intervention group ( $n = 703$ ) received educational material for cessation based on cultural values of African-American

women. The material also included a reminder call tailored to their stage of change and encouragement to complete the educational material. Cessation results were not significant at six-month follow-up (odds ratio = 2.03).

Another study which utilized tailored cessation material distributed to women of low socioeconomic status was conducted by O'Loughlin, Paradis, Renaud, Meshefedgian, and Barnett (1997). The control group ( $n = 299$ ) had a baseline assessment only. The intervention group ( $n = 113$ ) consisted of five two-hour weekly sessions focusing on cessation skills, motivation and coping strategies as well as a booster session two weeks later. A six-month cessation rate of 22.3% was reported for the intervention group. However, no assessment was undertaken to examine the effect of the tailored intervention compared to the control group and the significance of this result was not assessed. Based on the above review of tailored methods, personalizing smoking cessation programs for the individual or the culture generates mixed results with respect to promoting cessation.

## **Discussion**

This literature review examined three dimensions of MI (social support, motivation, and tailoring the intervention) used in primary smoking cessation studies for adults, and assessed the efficacy of MI in promoting cessation. Overall, the results were mixed. Intrinsic motivation was found to be a better predictor of cessation success (Williams, *et al.*, 2006) when compared to attempts to instill external motivation (Gilbert & Sutton, 2006). Studies in which programs were tailored to individuals, or were client-centered, demonstrated mixed results with regard to facilitating smoking cessation (Resnicow, *et al.*, 1997; Cohn, *et al.*, 2000; Rodgers, *et al.*, 2005; Swartz, *et al.*, 2006).



There were several threats to validity which merit underlining. The primary threat to validity common to nine of the studies reviewed was the use of self-report as the only measure of cessation (O'Loughlin, *et al.*, 1997; Resnicow, *et al.*, 1997; Carlson, *et al.*, 2000; Cohn, *et al.*, 2000; Carlson, *et al.*, 2003; Gilbert & Sutton, 2006; May, *et al.*, 2006; Swartz, *et al.*, 2006; Te Poel, *et al.*, 2009). Self-report was problematic because quit rate was the key variable in cessation intervention studies and it lacked validity. Also, of the eight studies that used some form of biochemical cessation verification, either carbon monoxide testing or cotinine tests, there were additional concerns. Specifically, four studies did not biochemically verify *all* claims of cessation (Rodgers, *et al.*, 2005; Williams, *et al.*, 2006; Free, *et al.*, 2008; Killen, *et al.*, 2008), and one study did not present the results of the tests (Andrews, *et al.*, 2007). The use of self-report was problematic as there was the possibility of a spurious relationship between variables and the possibility of inflated cessation rates (Benowitz, Jacob, Ahijevych, Jarvis, Hall, LeHouezec, *et al.*, 2002). The validity concerns of utilizing self-report were further amplified as four of the eight studies, which employed some form of biochemical verification of cessation, yielded mixed results regarding statistically significant cessation rates when compared with control groups (Rodgers, *et al.*, 2005; Tindle, *et al.*, 2006; Williams, *et al.*, 2006; Andrews, *et al.*, 2007; Free, *et al.*, 2008; Killen, *et al.*, 2008; Zernig, *et al.*, 2008; Hernández-López, *et al.*, 2009). Furthermore, when valid independent measures of cessation were used, cessation rates were much lower and frequently did not differ significantly from control groups' rates.

Another threat to validity was the inconsistency of follow-up periods. Cessation vacillates over time with relapse being more common than prolonged cessation in the

first six months of a quit attempt (Fisher & Katz, 1999; Gutmann, Carter, Sobell, Prevo, Toll, Levin Gutwein, Sobell, *et al.*, 2004). A standard time frame required to be fairly confident relapse will not occur has not been established; however, the Surgeon General and several researchers suggest a minimum of two years (Ockene, Emmons, Mermilstein, Perkins, Bonollo, Voorhees, *et al.*, 2000; Gutmann, *et al.*, 2004). Although a minimum of six weeks was chosen for studies to be included in this literature review, the ideal follow-up period of two years was met only in one study (Hernández-López, *et al.*, 2009). Moreover, 12 of the studies examined in this review did not meet the one-year standard follow-up widely accepted in cessation studies. The highest quit rates reported in this review were from studies with follow-up periods of less than one year (Carlson, *et al.*, 2003; Tindle, *et al.*, 2006). Follow-up periods of at least one year, and preferably two years, are required to gain a more realistic understanding of the ability of interventions to both enable and maintain cessation.

Further threats to validity included sample size, *a priori* differences, and interventions where dose was hard to ensure. Three studies had small sample sizes (Andrews, *et al.*, 2007; Hernández-López, *et al.*, 2009; Tindle, *et al.*, 2009). These small sample sizes led to low statistical power. Moreover, several studies had major *a priori* differences between groups; these included, for example, the sex distribution of the sample, tobacco use, and age (O'Loughlin, *et al.*, 1997; Gilbert & Sutton, 2006; Killen, *et al.*, 2008). Lastly, four studies used web-based methods, or text messages which resulted in concerns surrounding external validity, consistency in the delivery and dose of the intervention, as well as the circumstances in which the intervention was received (Rodgers, *et al.*, 2005; Swartz, *et al.*, 2006; Free, *et al.*, 2008; Te Poel, *et al.*, 2009).

By far, the major limitations to current research on smoking cessation programs are the reliance on self-report tools and the inconsistency in the use of biochemical verification and inadequate follow-up periods. Without biochemical verification of all cessation claims, there is the possibility that social desirability bias artificially inflates cessation results (King & Burner, 2000). This important issue points to the absolute need for further research into smoking cessation programs to include biochemical verification of cessation within the research design. Biochemical verification, as opposed to self-report alone, will eliminate the potential effect of social desirability bias and allow for a definitive determination that the observed cessation rates accurately match individuals' claims to have quit smoking. Furthermore, given that relapse is so prevalent within the first six months of a quit attempt, the lack of consistency in follow-up periods, and the use of follow-up periods of less than one year brings the efficacy of interventions at maintaining cessation into question (Brownell, Marlatt, Lichtenstein, & Wilson, 1986; Ockene, *et al.*, 2000; Gutmann, *et al.*, 2004). Extending follow-up periods to a minimum of one year would allow a better assessment of the effect of interventions at not only initiating but also maintaining cessation, thereby providing a more accurate portrayal of the efficacy of cessation programs for the long term.

Given the massive detriments to health caused by smoking and the well-established benefits of cessation, the prevalence of smoking in North America is alarming. There is an urgent need for efficacious smoking cessation programs. These smoking cessation programs must be constructed based on stringent criteria, and the replication of findings needs to be assured to be confident the most efficacious cessation programs are being offered. Therefore, future research should be based on and derived

from sound empirical methods with a focus on determining the most efficacious strategies for smoking cessation.

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Table 1

**Table 1. Summary of Motivational Interviewing Strategies in Smoking Cessation Programs 1995-2010**

Table 1

*Summary of Motivational Interviewing Strategies in Smoking Cessation Programs 1995-2010*

Author	Population		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
Andrews et al. (2007)	N = 51 women living in subsidized housing in Georgia Population Statistics M age = 40.2 yrs M number of cigarettes per day 13.27 * motivated to quit	N= 52 women living in another subsidized housing development in Georgia * motivated to quit	Intervention: Empowerment counseling in a group (6 sessions and 2 booster sessions), nicotine replacement therapy, social support, and spiritual support Control: Self-help written smoking cessation materials and education	1.CO results were not described 2. Intervention and control group differed on baseline several demographics 3. Varying dosages of intervention 4. Lack of defined protocol for spiritual enhancement	Self-report and CO testing at 6 mos Intervention: 27.5% Control: 5.7% Odds ratio=6.25 *Significant
Carlson et al. (2000)	N = 971 M age = 39.9 yrs 66.1 % were female M number of cigarettes per day 25.1 * motivated to quit		Intervention: Eight 90-minute group sessions over four-months utilizing education, self-monitoring, nicotine fading, motivation, and behavioral modifications	1. Self-report 2. Only 33.9% of sample was contacted at 8 years 3. Participants valued intervention but qualitative methods were not discussed	Self-report at 8 yrs Intervention: 16.2%
Carlson et al. (2003)	N = 1800 M age = 42.2 yrs 63.1 % were female M number of cigarettes per day 21.4 * motivated to quit		Intervention: Eight 90-minute group sessions over four-months utilizing education, self-monitoring, nicotine fading, motivation, and behavioral modifications	1. Self-report 2. 23% of participants did not complete all assessments, and analysis revealed those who completed analysis where less dependent on tobacco	Self-report at 3 mos Intervention: 39.5%

Table 1 (continued). Summary of cessation programs 1995-2010

Author	Population		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
Cohn et al. (2000)	N = 111 57 people smoked 20 + cigarettes a day and 54 smoked between 10-20 cigarettes a day		Intervention- Six-week, seven session program with education and prevention for relapse based on “Freedom from Smoking” program.	1. Self-report 2. Only 51% of participants completed the program 3. 23 of the 57 participants who completed the study reported using NRT outside the scope of the study	Self-report at 6 weeks Intervention: 44%
Free et al. (2009)	N= 102 M age= 36 yrs for entire sample 48% were female in entire sample Median number of cigarettes per day 20 in entire sample	N=98	Intervention: 4 weeks of text messages which include key elements of support for successful cessation as identified in systematic reviews Control:49 simple, short, generic text messages	1. Biochemical verification was not provided for all participants who claimed cessation 2. No restriction of use of other cessation strategies during intervention 3. 7 day point prevalence was used	Self-report and saliva test at 6 mos Intervention:8.5% Control:6.7% p=0.6 Relative risk=1.28 Chi square test Not statistically significant
Gilbert & Sutton (2006)	N = 753 M age = 39.3 yrs 65.8 % were female * motivated to quit	N = 704 M age = 39.1 yrs 64.2% were female * motivated to quit	Intervention: Quitline, a hotline smokers can call to receive smoking cessation support and 0-4 proactive calls by counselors at Quitline Control: No intervention	1. Self-report 2. Approximately 60% of participants completed 1 year assessment 3. No protocol for content of calls	Self-report at 1 yr Intervention: 9.3% Control: 9.5% F test Nonsignificant

Table 1 (continued). Summary of cessation programs 1995-2010

Author	Population		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
Hernandez-Lopez et al. (2009)	CBT N= 38 M age = 42.43 years for entire sample 64% of entire sample were female M number of cigarettes per day 23.9 for entire sample	ACT N= 43	CBT: Seven weekly 90-minute group cessation of 8-10 individuals focused on preparation for quitting, quitting, and maintenance/relapse prevention ACT: Seven weekly 90-minute group cessation of 8-10 individuals focused on clarifying value of quitting and acceptance of quitting	1. Of the 81 participants, only 56 received all 5 sessions, and only 42 completed the 1 year follow-up 2. Non- random assignment, participants who contacted one agency received CBT and the other agency received ACT	Self-report and CO test at 1 yr CBT:13.2% ACT:30.2% p=0.06 Odds ratio=5.13 Nonsignificant
Killen et al. (2008)	Telephone counseling N= 154 M age= 45.57yrs 38.3% were female M number of cigarettes smoked per day 20.55	General support N=147 M age = 46.07 yrs 42.2% were female M number of cigarettes smoked per day 19.37	Tel. counseling: Four 30-minute treatment sessions to develop skills to resist urges, as well as weekly calls to a check in and track progress, and 9 weeks of Zyban® and 8 weeks of NRT Comparison: same as intervention instead of weekly calls 4 five-minute calls providing general support	1. Approximately 50% NRT compliance 2. Only 83% of reported cessation were verified	Self-report and CO test at 1 yr Tel.: 31% Comparison: 27% Nonsignificant

Table 1 (continued). Summary of cessation programs 1995-2010

Author	Population		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
May et al. (2006)	N = 237 Given as entire population M age = 43.6 yrs 62 % were female M number of cigarettes per day 23 * motivated to quit	N = 326 * motivated to quit	Intervention: Group-based treatment consisting of 6 weekly sessions based on the 'withdrawal-oriented' model of cessation and assigned buddy Control: Same as intervention without buddy component * 113 participants were offered NRT	1. Self-report 2. No limit on utilizing additional cessation resources 3. Some participants were offered NRT, but not equally across groups	Self-report at 24 weeks Intervention: 13% Control: 15% Odds ratio=1.45 Nonsignificant
O'Loughlin et al. (1997)	N =113 M age = 44.8 yrs 73.5 % were female M number of cigarettes per day 27.5 * motivated to quit	N = 299 M age = 38.6 yrs 51.4 % were female M number of cigarettes per day 20.8 * motivated to quit	Intervention: "Yes, I Quit" -5 two-hour group sessions at one week intervals with one booster session after the intervention and 2 booster mail-outs at three- and six-months after the intervention Control: Baseline assessment only	1. Self-report 2. Only 12.2% of participants attended all sessions 3. Comparison group was based on a 1992 survey 4. No assessment impact of tailored intervention 5. Excluded participants lost to follow-up from cessation rates	Self-report at 6 mos 22.3% of subjects reported cessation

Table 1 (continued). Summary of cessation programs 1995-2010

Author	Population		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
Resnicow et al. (1997)	N =703 M age = 44 yrs 58% were female M number of cigarettes per day 15.3 * motivated to quit	N= 541 M age = 46.4 yrs 65% were female M number of cigarettes per day 16.5 *motivated to quit	Intervention: Health education materials (booklet and video) plus booster call asking them to complete health education material Control: Health education material (booklet and video)	1. Self-report 2. Only 1/3 of intervention sample were reached for booster call (due to quick recruitment and not checking for completeness of recruitment form at intake)	Self-report at 6 mos Intervention: 11.2% Control: 7.9% Chi square p = .06 Odds ratio=2.03 Nonsignificant
Rodgers et al. (2005)	N = 852 18+ years of age * motivated to quit	N = 853 18+ years of age * motivated to quit	Intervention: Regular text messaging providing education and distraction Control: 1 text message every 2 weeks reminding them they were in the study	1.125 participants reported quitting and were invited to take a saliva test: 23 were not smoking, 26 had levels indicating they were still smoking, and 76 did not attend 2. Possible confound as use of other cessation strategies was not limited, and information on government subsidy for NRT was provided to participants 3. Incentive of one month free text messaging was provided to participants 4. Participants were not blinded to group allocation	Self-report and some saliva testing at 6 weeks Intervention: 28% Control: 13% Confidence intervals p < .0001 Relative risk=2.20 *Significant

Table 1 (continued). Summary of cessation programs 1995-2010

Author	Populations		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
Swartz et al. (2006)	N = 171 18 + years of age 53.2 % were female * motivated to quit	N = 180 18+ years of age 50.6% were female * motivated to quit	Intervention: Internet site that presented current strategies for smoking cessation and motivational material tailored to participants' ethnicity, sex, and age Control: Waitlisted for 90 days	1. Self-report 2. Only 6.1% of participants provided a complete final assessment 3. 56% of users set a quit date, which was study criteria	Self-report at 3 mos Intervention: 12.3% Control: 5.0% Chi square p = 0.015 Odds ratio=2.66 *Significant
Te Poel et al. (2009)	N= 224 M age for entire sample= 46.1 years 56.1% of sample were females M number of tobacco products per day 22	N= 234 M number of tobacco products per day 20	Intervention: Received a computer tailored e-mail letter between seven to nine pages Control: Received a generic non-tailored seven page e-mail	1. Self-report 2. Over 50% of participants were lost to follow-up 3. Feedback on intervention was provided 6 months post-intervention inhibiting accurate recall	Self-report at 6 mos Intervention:20.4% had not smoked in past week Control: 7.8% had not smoked in past week p= 0.01 Odds ratio=4.04 *Significant
Tindle et al. (2006)	N = 17 M age = 48 yrs Gender =11 female, 6 male 20 < cigarettes per day = 11 20 + cigarettes per day = 6 * motivated to quit	N= 17 M age = 49 yrs Gender = 11 female , 6 male 20 < cigarettes per day = 11 20 + cigarettes per day = 6 * motivated to quit	Intervention: Six guided imagery sessions and a home study which included a workbook and four audio CDs Control: Wait-listed	1. Majority of participants did not meet recommend use of guided imagery per week 2. Small sample size 3. Participants were not blinded to group allocation 4. Participants had higher use of complementary therapies than National average	Self-report and saliva Cotinine at 12 weeks Intervention: 29% Control: 12% Nonsignificant

Table 1 (continued). Summary of cessation programs 1995-2010

Author	Population		Intervention Description	Limitations	Cessation Results
	Intervention	Control			
Williams et al. (2006)	N =714 M age = 45.5 yrs 62.7 % were females M cigarettes per day 20.3 30.8% used pharmacological intervention	N= 292 M age = 44.8 yrs 66.8 % were females M cigarettes per day 20.9 15.8% used pharmacological intervention	Intervention: Self-Determination Theory - Meet with counselors 4 times, received Public Health Services booklet 'You can stop Smoking' and list of active cessation programs in their area. Control: Received Public Health Services booklet 'You can stop Smoking' and list of active cessation programs in their area.	1. Biochemical verification only took place for some cessation measures 2. Attrition rate of 303 participants, with significantly more non-whites than whites dropping out of the study 3. Accepted only a small portion of the population with mental illness, not representative sample	Self-report and saliva testing at 6 mos Intervention: 11.2% Control: 3.7% Chi Square test with $p < 0.001$ Odds ratio=3.22 *Significant
Zernig et al. (2008)	N=366 M age=43.3 yrs 56.6% were females Fagerstrom score=5.3	N=413 M age= 43.6 yrs 58.1% were females Fagerstrom score=5.5	Intervention: 1.5 day psychotherapeutic intervention consisting of psychoeducation and training in autosuggestion techniques Pharmacological: 9 weeks of Zyban®	1. Only 587 participants completed 1 year assessment 2. 38.5% of participants rejected the pharmacological aid	Self-report at 1 yr CO test and cotinine Intervention: 39.1% Pharm: 12.3% $p < 0.001$ Odds ratio=4.55 *Significant

Note. N= number of participants; M = mean; yrs= years; mos= months; pharm= pharmacological; NRT= nicotine replacement therapy



## **Article 2--Assessing Motivational Interviewing via Co-Active Life Coaching on Selected Smoking Cessation Outcomes<sup>2</sup>**

### **Introduction**

Smoking is a leading cause of preventable death in the world, and in 2008, there were approximately 4.9 million smokers in Canada [Canadian Tobacco Use Monitoring Survey (CTUMS), 2008]. Of particular concern, is the recent rise of smoking initiation rates among adolescents which had reached a plateau in the 1970s and remained stable through the 1980s (Falomir & Invernizzi, 1999; Lynch & Bonnie, 1994). The most effective and cost-efficient way smokers can improve their health is through cessation (Edwards, 2004). Specifically, the age at which smokers quit is directly proportional to the number of years added to their life, and quitting smoking by age 30 results in an average potential life gain of 10 years (Doll, Peto, Boreham, & Sutherland, 2004; Taylor, Hasselblad, Henley, Thun, & Sloan, 2002). The adverse health risks attributed to smoking are well documented, widely accepted, and cost Canadians an estimated 17 billion dollars annually in both direct and indirect expenditures (Public Health Agency of Canada, 2009). Among the numerous health risks associated with smoking, the most deleterious is mortality, with tobacco accounting for 18% of North American deaths annually (Doll et al., 2004). Consequently, the economic and human losses, as well as potential years and quality of life gained that are associated with smoking and cessation, respectively, position tobacco research as a societal necessity.

As many as 69% of smokers want to quit and in 2010, 52% attempted cessation (Centers for Disease Control and Prevention, 2011). To that end, numerous smoking

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<sup>2</sup>A version of this chapter is currently under review and consideration for publication

cessation programs and medications have been devised and introduced to help smokers reach cessation goals, each with varying degrees of success (Samet, 1990). Among adult smokers wanting to quit, most struggle to do so using available interventions, evident by the limited cessation success (Centers for Disease Control and Prevention, 2011; Simon 2011). Consequently, smokers' desires and struggles to quit point to the need for both empirical assessments of current cessation strategies to inform best practices, and innovative approaches to increase success. Underscoring the need for effective cessation strategies, the World Health Organization's Framework Convention for Tobacco Control - an initiative attempting to avert 1 billion tobacco-related deaths in 171 countries during the 21<sup>st</sup> century, created a mandate to identify evidence to guide actions (Lavack & Clark, 2007).

One innovative cessation approach showing evidence-based promise is Motivational Interviewing (MI). In a meta-analysis by Lai and colleagues (2010), the authors found 14 MI interventions compared to either advice or usual care resulted in significant, albeit modest, increases in cessation (RR=1.27). Moreover, when a physician or counsellor delivered MI there was either an increase or maintenance in cessation success (RR=3.49 and 1.27). However, there was insufficient data to determine if multiple sessions were more effective than a single session. The main concerns highlighted by this meta-analysis, and since corroborated by additional research, were treatment fidelity, consistency of MI delivery, lack of training description, and ambiguity in content of MI sessions (Hettema & Hendricks, 2010; Lai et al., 2010; Mesters, 2009).

To address the above concerns, a recent innovative smoking cessation pilot study assessed the efficacy of delivering MI via the model and techniques of Co-Active Life

Coaching (CALC; Mantler, Irwin, & Morrow, 2010). Research indicates MI principles are contained entirely within and brought to fruition by CALC; the latter is a theoretically grounded, application-based and tool-oriented model requiring thorough and professional training to obtain certification (Newnham-Kanas, Morrow, & Irwin, 2010). In a 2010 pilot study of 9 smokers aged 19-29, 22% quit and remained smoke-free at six-month follow-up when MI-via-CALC was implemented for an average of nine sessions over a three month period (Mantler et al., 2010). The cessation rate for the study was comparatively higher than other MI interventions, which report cessation rates ranging from 5-18% (Soria, Legido, Escolano, Yeste, & Montoya, 2006; Wakefield, Olver, Whitford, & Rosenfeld, 2004). The pairing of MI with CALC addressed two implementation weaknesses of MI highlighted in previous studies, namely, the lack of application-based training and consistent implementation (Hetteema & Hendricks, 2010; Mesters, 2009). The CALC model overcomes the aforementioned weaknesses because there is an extensive training program (five, three-day training courses, totaling over 100 hours, followed by an extensive 25 week certification program) all of which ensures the acquisition of concrete skills facilitating the consistent implementation of principles (Kimsey-House, Kimsey-Houes, Sandahl, & Withworth, 2011; Whitworth, Kimsey-House, & Sandahl, 1998; Whitworth, Kimsey-House, Kimsey-House, & Sandahl, 2007). However, the limitations of this pilot study were the obvious lack of statistical power due to limited sample size (n=9), no control group for comparison, and shorter than ideal follow-up period. Those limitations aside, the promising findings pointed to the need for further study.

## **Methods**

### ***Objective***

The objective of this study was to assess the impact of MI-via-CALC on: smoking behaviours; personal competency; and perceptions of identity, smoking, quitting, and the intervention itself among young adults. Smoking behaviours were assessed in terms of number of cigarettes smoked per day, cigarette dependency, and biochemically verified cessation (cotinine saliva test). Personal competency was assessed via self-esteem and self-efficacy measures/scales related to avoiding the temptation to smoke. Perceptions of identity, smoking, quitting, and the intervention were explored through one-on-one semi-structured interviews.

### ***Participants***

Thirty-five smokers, aged 19 to 29 years were recruited in Ontario from September 2010 to January 2011 via mass email and posters at an academic institution in South-Western Ontario (Appendix D). Media recruitment was also employed, consisting of radio and newspaper interviews. Over 300 individuals expressed an interest to participate within five days of recruitment and the first 40 eligible participants were invited to participate (i.e., English speaking, aged 19 to 29, and willing to set a quit date within the next four weeks). Thirty-five participants completed the entire intervention protocol; two participants dropped out due to family or personal emergencies unrelated to the study; two participants dropped out prior to the second and third intervention sessions with the coach and could not be contacted by the researcher or coach; and one participant together with his/her coach decided counselling was a more appropriate intervention.

### ***Study Procedure***

Participants were randomly assigned to either an immediate-intervention group 1 (n=18); or waitlist-intervention for 3 months followed by an assessment and subsequently the intervention, group 2 (n= 17). Data was collected in six distinct phases (baseline, post-intervention, 3-,6-, and 12- month post intervention) with both: 1) structured questionnaires aimed at gathering data pertaining to smoking behaviour, cigarette dependency, self-esteem, and self-efficacy; and 2) a one-on-one semi-structured interview which probed perceptions of identity, smoking, quitting, and the intervention (Appendix E). Standardized self-report measures and survey questions measuring variables of interest were collected either over the telephone or in-person via assessments (both questionnaire and interview) lasting between 30 and 60 minutes. Prior to completing both the questionnaires and engaging in the in-depth semi-structured interviews, which lasted 30 and 45 minutes, honesty demands were utilized to reduce demand characteristics (i.e., participants were told there are not right or wrong answers, and asked to please respond as honestly as possible to all questions; Bates, 1992). Furthermore, to promote participant trust via confidentiality assurance, participants were informed that the research team members were not privy to the content of MI-via-CALC sessions between each participant-coach pairing. Ethical approval was obtained through Western University's Office of Research Ethics prior to recruitment and written consent was obtained from each participant prior to beginning the study (Appendix F and G). Participants were provided with telephone calling cards to cover costs of both the telephone-based coaching sessions and research follow-up assessments.

## ***Intervention***

The intervention consisted of between eight and ten, 30-minute sessions with a Certified Professional Co-Active Coach (CPCC) over the telephone or by Skype over three months. Coaches had no affiliation with the study or research team and were recruited via an electronic post on the Co-Active Coaches Network, which sought coaches interested in donating time for a smoking cessation research study (Appendix H). Thirteen coaches from all over North America were interested and responded to the post and participated by coaching between one and four participant(s) for the duration of the intervention (8 to 10 sessions), and three coaches enrolled for both groups 1 and 2. Coaches ranged in experience from less than one year post-certification to more than 10 years; however, all coaches were certified CALC coaches and agreed to utilize only CALC tools during the sessions (in case they had additional, unrelated training). During each session participants were asked to initiate both contact with the coach at a pre-arranged time and have a specific focus for that session although the focus did not have to be smoking- or cessation- related. The coach asked mainly open-ended questions to promote insight and help the participant access his/her own answers. Although specific content of the sessions remained confidential between the coach and participant pairs, CALC techniques utilized included: designing an alliance (i.e. how the coach/participant relationship would work); asking thought provoking questions; being genuinely curious about the participant; championing and acknowledging the participant's actions; challenging and holding the participant accountable to set, work toward, and attain goals; and holding the participant's agenda (for a complete description of the CALC model refer to Kimsey-House and colleagues, 2011). Finally, MI-via-CALC is foundationally about

supporting and encouraging autonomy. This premise resulted in several participants deciding, during their MI sessions, to incorporate additional supports as part of their cessation strategy, specifically, the use of nicotine replacement therapy (NRT). Where the use of additional supports might be considered a concern in terms of confounding the intervention, it is considered a success in the current study, given the MI-via-CALC approach is about supporting clients in making decisions/or taking actions in service of their goals (and the choice to adopt NRT fits this approach).

### ***Measures***

Given the theoretical complexity of the variables under investigation, multiple indicators were utilized to encapsulate the dimensions of each construct. Scores were computed based on previously validated scales and main outcome variables included: smoking behaviour and personal competency.

*Smoking Behaviour* was measured by three conventional indicators: number of cigarettes smoked per day; cigarette dependency; and cessation. First, a single item question asked participants to report an average of number of cigarettes smoked per day over the last seven days (Appendix I). Patrick and colleagues (1994) confirmed that self-report cessation is a reasonably valid approach to ascertain this information.

Additionally, the Cigarette Dependency Scale (CDS), a uni-dimensional, continuous measure that reflects the Diagnostic and Statistical Manual for mental disorders, fourth edition (DSM-IV) criteria for dependency and is considered both valid and reliable (Cronbach's  $\alpha > 0.84$ ; Etter, 2008), was utilized to assess addiction (Appendix J).

Cigarette dependency was measured by summing scores with higher scores denoting increased addiction. Finally, cessation was based on both a self-report to a yes/no

question at all assessment points and via a cotinine saliva test at 12-month follow-up (to verify biochemically cessation claims). Cotinine is a major metabolite of nicotine and is used as cessation verification instead of nicotine due to its greater stability and longer biological half-life (Zeven, Jacob, & Benowitz, 1997; Appendix K). The saliva test protocol consisted of a swab being placed under the participant's tongue for approximately two minutes; subsequently, the swab was placed in a sealed tube for analysis and given a unique identification number (as advised by Salimetrics). Samples were packaged in dry ice and shipped to Salimetrics, an independent laboratory specializing in analysis of biological samples. Salimetrics assessed cessation via a duplicate analysis of a single sample using gas-liquid chromatography with scores less than 15 ng/ml denoting cessation.

*Personal Competency* was measured using two measures of self-esteem and self-efficacy. The Rosenberg Self-Esteem Scale (RSES;1989), a previously validated 10 – item tool that assesses global self-esteem using a four point likert scale was utilized (Cronbach's  $\alpha > 0.77$  and convergent validity of 0.83; Appendix L). Self-efficacy was measured via the 12-item Smoking Self-Efficacy Questionnaire (SEQ) which is comprised of two sub-scales (internal and external stimuli with Cronbach's  $\alpha$  of 0.95 and 0.94, respectively; Appendix M). Internal self-efficacy refers to the temptation to smoke based on emotional states (e.g., feeling stressed or anxious) whereas external self-efficacy considers the temptation to smoke based on environmental situations (e.g., smoking with friends or when drinking alcohol). SEQ is scored on a 5 point Likert scale, with lower scores (or decreases in scores over time) representing less temptation to smoke and therefore higher self-efficacy (Etter, Bergman, Humair, & Perneger, 2000).



## ***Interviews***

The baseline and 12-month follow-up one-on-one individual interviews were conducted in person at a mutually convenient location for the lead researcher (TM) and each participant and the remainder of follow-ups (post intervention, 3-months post waitlist, 3-, and 6- month post intervention follow-ups) were completed over the telephone with either the lead researcher or trained research assistant (TM/RF). The interviews consisted of eight to ten questions and focused on ascertaining an understanding of participants' perceptions of identity, smoking, quitting, and the intervention (e.g. what is it like being you now compared to the start of the intervention; what is a barrier to quitting; what is a facilitator to quitting; what is important to you about quitting/smoking; what was your experience of being in the study; etc.) at each time point. Interviews were audio-recorded, transcribed verbatim, and a number of data trustworthiness steps suggested by Guba and Lincoln (1989) were utilized, as summarized in Table 1.

## ***Analysis***

For the quantitative data, the main analysis was a 2 (group) X 2 (time: baseline and post-intervention) repeated measures ANOVA. Thus, the waitlist group served as a control condition as they did not receive the intervention until after the post-intervention assessment. The secondary analysis was a repeated measures ANOVA over time for both groups combined at immediate, 3-, 6-, and 12- month post-intervention. For the qualitative data, inductive content analysis, as described by Elo and Kyngas (2008) and Patton (1987), was conducted by two independent researchers (TM and RF/VS) who coded and categorized data based on emergent themes.

## Results

### *Demographics*

Participants in this study were typically undergraduate University students between 19 and 25 years (mean= 23.06 years) and 68.6% were male. The majority of participants engaged in nine MI-via-CALC sessions (range= 7-10). Descriptive statistics of participants and self-report cessation at all five-time points are presented in Table 2.

### *Main Analysis*

While the repeated measures ANOVAs revealed (for Pillai's Trace) several main effects for group and time, of primary interest are the Group X Time interactions. For number of cigarettes there was a significant interaction,  $F(1,33)=7.135$ ,  $p < 0.012$ , partial  $\text{Eta}^2=0.178$ , showing the intervention group decreased their number of cigarettes smoked (see Figure 1). The interaction was also significant for CDS,  $F(1,33)=10.493$ ,  $p < 0.003$ , partial  $\text{Eta}^2=0.241$ , with the intervention group again demonstrating a significant reduction (see Figure 2). The interactions for all three of the personal competency variables also proved to be significant and the descriptive statistics for these are given in Table 3. The intervention group showed a significant increase in self-esteem,  $F(1,33)=3.866$ ,  $p < 0.058$ , partial  $\text{Eta}^2=0.105$ . There was also a significant decrease in both internal and external self-efficacy for the intervention group,  $F(1,33)=9.303$ ,  $p < 0.004$ , partial  $\text{Eta}^2=0.220$ , and  $F(1,33)=14.357$ ,  $p < 0.001$ , partial  $\text{Eta}^2=0.303$ , respectively. Overall, these interactions demonstrate the intervention group had greater decreases in smoking behaviours (the number of cigarettes smoked per day and CDS) and increases in personal competence (self-esteem and internal and external self-efficacy [in terms of temptation to smoke]) compared to the control group over time.

### ***Secondary Analysis***

To examine changes in smoking behaviours and personal competency over time following the administration of the intervention, both groups were combined, at the same time points, and a repeated measures ANOVA was conducted comparing post-intervention for the entire sample (N=35) to 3-, 6-, and 12- month post-intervention. For average number of cigarettes smoked per day, CDS, self-esteem, and internal self-efficacy there was no significant effect for time ( $p < 0.05$ ). However, with respect to external self-efficacy there was an effect for time,  $F(1,33)=3.135$ ,  $p < 0.045$ , partial  $\eta^2=0.290$ . Further analysis revealed external self-efficacy at immediate post-intervention ( $M = 12.57$ ,  $SD = 7.79$ ) was significantly lower compared to 3-months ( $M = 15.03$ ,  $SD = 7.87$ ;  $p < 0.007$ ), 6-months ( $M = 13.78$ ,  $SD = 7.81$ ;  $p < 0.027$ ), and 12-months ( $M = 14.61$ ,  $SD = 8.41$ ;  $p < 0.016$ ). This indicates gains in resisting temptations to smoke from the environment were not maintained but rather individuals experienced greater environmental temptations to smoke from post-intervention to 12-month follow-up.

### ***Biochemical Verification***

Cessation reports at 12-month follow-up were verified by a cotinine saliva test with the exception of two individuals who no longer lived in the province. Results of cotinine saliva tests were consistent with all participants' reports and thus, the two living outside of the province were deemed to have provided accurate information (Table 4).

### ***Qualitative Data***

Qualitative findings for all time points were categorized broadly into four themes: 1) identity, encapsulating the changing relationship among identity/smoking and self; 2) smoking, highlighting changes in various aspects of smoking behaviour; 3) quitting,

encompassing changes resulting from cessation attempts; and 4) intervention, consisting of participants' perceptions of their participation in MI-via-CALC intervention. More specific themes at each time point are presented below.

### ***Baseline***

There were six themes derived from baseline interviews; these contextualized participants' understanding of their relationship with smoking/cigarettes and underscored past issues and future needs for cessation. The first theme 'smoking and identity' stressed smoking not only as a behaviour but also as a component of identity. The second theme 'smoking as a coping mechanism' highlighted the use of cigarettes to deal with negative emotions such as stress, anger, and anxiousness. With respect to 'smoking as a social experience' participants underscored the easily forged social bonds through smoking as a mutual behaviour. Additionally, many participants identified 'smoking and control' as problematic, in particular, the realization of loss of control over smoking or the insight that the perception of being in control of smoking was an illusion. Regarding past cessation attempts, many 'stumbling blocks to quitting' were identified, such as procrastination, or the idealization of the spontaneous emergence of the 'right' day to quit. Lastly, 'what I need to quit' was identified and entailed personal competency, motivation, and unwavering support. Illustrative quotations supporting each theme are presented in Table 5, with the number of participants who reported each theme in brackets.

### ***Immediate Post-Intervention***

Five themes emerged during post-intervention, with 'smoking and identity shift' reflecting both the realization of addiction as a part of participants' identity and the need

to create a new non-smoker identity. ‘Increased personal competency’ was prevalent and participants expressed feelings of empowerment and increased self-worth. Participants also realized ‘smoking is a choice’ and the power of shifting from smoking as a habit to making a conscious decision. Participants also identified several tailored ‘quitting strategies’ and despite the vast differences in execution, the underlying purpose was to either avoid smoking or promote continued cessation. Furthermore, there was an overwhelmingly positive attitude about the ‘impact of coaching’ with participants highlighting beneficial elements of MI-via-CALC such as support, value clarification, and championing of successes. Quotations illustrating each theme are presented in Table 6.

### ***Three-Month Follow-Up***

During the three-month follow-up interviews, five themes emerged. ‘Learning about myself’ was a salient theme encapsulating self-realization and participants’ journey to both better self-understanding and being gentler with themselves. A continued theme from immediate post-intervention was ‘increased personal competency’ with the associated impact on participants’ lives beyond smoking/quitting. Participants also gained insights into underlying reasons for smoking as described in the ‘learning why I smoke’ theme. Moreover, there was ‘increased awareness about quitting’ underscoring the appreciation of the intensity of the quitting processes and the perceived need for a psychological shift. The ‘impact of coaching’ continued to be underscored by participants with living true to values, gaining/changing perspectives, and accountability being highlighted as behaviour change assets. Illustrative quotations for each new theme are presented in Table 7.

### ***Six-Month Follow-Up***

During the six-month follow-up interviews, three themes re-occurred and two new themes consistent with the broad categories emerged. There was continued ‘learning about myself’ for participants regarding understanding their addiction and triggers. ‘Increased personal competency’ continued to be prevalent and participants described an overall feeling of empowerment and a new belief in their ability to succeed. ‘Fear of failure’ was identified as a significant obstacle to trying to quit by participants who continued to smoke. Additionally, several participants highlighted ‘life changes along with quitting’; these encompassed the drive for a healthier lifestyle and the need to live true to personal values. Lastly, the ‘impact of coaching’ was reiterated with participants’ continued identification of the strength of changing perspectives to facilitate behaviour change. Illustrative quotations for each new theme are presented in Table 8.

### ***Twelve-Month Follow-Up***

During the 12-month assessment there were three reoccurring themes and two new themes. As previously highlighted, participants described personal accountability, greater self-awareness, and believing in themselves in the ‘learning about myself’ theme. Participants further underscored ‘increased personal competency’ not only related to smoking but also the associated impact on other areas of their lives. ‘Social temptations’ were highlighted as the most significant barrier to quitting and remaining smoke-free and typically consisted of alcohol consumption with peers. Participants noticed a ‘change in relationship with smoking’. In this regard, they describing a shift from a reliance on cigarettes as a coping mechanism to the realization that smoking cigarettes was simply a detrimental coping strategy. Moreover, the ‘impact of coaching’ was reiterated as a

positive transformational experience and the importance of goal setting and perspectives were highlighted as key tools that facilitated success. Illustrative quotations for each new theme are presented in Table 9.

## **Discussion**

The purpose of this study was to assess the impact of MI-via-CALC on: smoking behaviours; personal competency; and perceptions of identity, smoking, quitting, and the intervention itself among young adults. The results of this longitudinal MI-via-CALC study found a significant reduction in smoking behaviours and increased personal competency among young adults in the immediate-intervention compared to waitlist-intervention group. Specifically, smoking behaviours including number of cigarettes smoked per day and CDS scores were reduced significantly and personal competency in terms of self-esteem and self-efficacy both improved significantly for the intervention group from baseline to post-intervention while these variables did not change for the waitlist-intervention (control) group. These significant findings, specifically related to personal competence, self-esteem and self-efficacy are well-documented significant predictors of attempting and sustaining future cessation attempts (Cohen et al., 1989; Kowalski, 1997; Matheny & Weatherman, 1998; Mothersill, McDowell, & Rosser, 1988; Ockene, Benfari, Nuttall, Hurwitz, & Ockene, 1982).

There were no significant differences in average number of cigarettes smoked per day, CDS, self-esteem, and internal self-efficacy from post-intervention to 3-, 6-, and 12-month post-intervention assessment for the combined sample; however, there was a significance increase in external self-efficacy, denoting an increase in temptation to smoke from environmental triggers. Qualitative assessments were consistent with the

quantitative findings in that the assessments illuminated the specific strengths of MI-via-CALC together with changes in re-shaping identity, increasing personal competency, altering perceptions of smoking behaviours and quitting behaviours, as well as the overwhelmingly positive experience of participating in the intervention.

A main study finding was the one-year follow-up Cotinine-verified 31.4% cessation rate. Because this rate is so much higher than most reported smoking cessation rates, it is essential both to underscore the finding as well as to discuss the reasons the rate is so comparatively high. In a Cochrane review, Stead and colleagues (2008) suggest a research-based consensus that an approximation of the quit rate with pharmacotherapy shown in most smoking cessation studies – whether NRT interventions, other medications such as antidepressants, lozenges, gum, clinician-assisted (physician, dentist) and/or some combination of these and other interpolations – is around 15%; if some form of behavioural support coincides with the pharmacotherapy treatment, then the reported cessation rate is about 23%. In the same vein, the 31.4% cessation rate of this intervention at 12-month follow-up was comparatively much higher than other MI interventions which ranged from 5-18% (Soria et al., 2006; Wakefield et al., 2004). With respect to comparisons with other MI interventions, this study utilized MI-via-CALC; the latter is a very specific way to apply the tenets of MI and was done via professional, certified coaches whereas other MI approaches may use minimally-trained MI personnel and/or demonstrate a considerable variability in the manner of applying the principles of MI. MI-via-CALC offers a standard protocol of the intervention across all participants. In comparison to the established quit rates of 15-23% in most studies, the 31.4% demonstrated in this intervention, at the very least, would point toward the potential



impact of using MI-via-CALC as a primary intervention in more cessation studies, as well as to the more salient implication for the vast majority of smokers who do want to quit and the concomitant health amelioration benefits. We suggest that the underlying reasons for our 31.4% success rate stem from the fact that MI-via-CALC allows participants to deal with the underlying causes of their smoking behaviour (stress, social choices, etc) and not merely with the act of smoking itself – smoking is about so much more than smoking itself. This interpretation is consistent with both our quantitative and qualitative findings concerning significant decreases in smoking behaviours and escalations in personal competency.

The study findings were consistent with and expand on results from the previous MI-via-CALC demonstration study (Mantler et al., 2010), which was limited by the lack of a control group and found only positive trends (due to a small sample size).

Thematically, prevalent qualitative findings in the demonstration study such as smoking and identity, smoking and control, barriers to quitting, and the positive impact of the MI-via-CALC were reiterated in the present study. Of specific interest is the parallel finding of the maintenance of significant behaviour change and cessation rate at one year after follow-up. Once again, this along with the statistically significant differences between the intervention and control groups underscores the powerful impact of MI-via-CALC at facilitating cessation.

The need for continued evaluation of MI-via-CALC along with the identification and improvement of study limitations would further enhance this research protocol. Limitations include: lack intervention implementation information, attrition, limited age range, and limited follow-up for waitlist group. The content of the MI-via-CALC

intervention, beyond adherence to the CALC model, was outside the scope of this study but merits investigation to ensure fidelity. The attrition rate for this study was high, 25%, but consistent with both similar smoking cessation studies and the finding that attrition is more common among young adults aged 15 to 29 years (Borland, Segan, Livingston, & Owen, 2002; Risser & Belcher, 1990). Moreover, the limited age range of this study affects generalizability of results. Replicating this study with a broader smoking population would likely overcome both attrition concerns and allow for increased generalizability of results. Moreover, the limited follow-up for the control group portion of this study resulted in an inability to ascertain if changes observed in the intervention compared to control group were maintained overtime. Future studies should extend the follow-ups for the control group to match the intervention group. Furthermore, although a small portion of subjects in the current study chose NRT as a result of their MI-via-CALC sessions, future studies should overtly compare MI-via-CALC with and to NRT (the current study design did not allow for any MI-via-CALC with and without NRT comparisons due to insufficient power for this statistical model).

Participants themselves offered suggestions to enhance the acceptability of the MI-via-CALC intervention. Firstly, several participants expressed the desire for a tapered end to the intervention and tailoring around session number and length. These changes would allow the intervention format to be more reflective of the client-centeredness of MI-via-CALC method. Finally, the timing and length of the intervention, despite coinciding with well-documented times of interest for cessation, namely September and January, resulted in the MI-via-CALC sessions ending around final examinations for participants. This was especially problematic given the large number of

university students within the study and the high stress associated with examinations. Future studies should look at increasing the number of sessions so the intervention ends at a low stress time in participants' lives to promote better success.

The implications of MI-via-CALC for standard care, for frontline health care workers, and for research are driven by the overwhelming success of the intervention coupled with the clear need for more efficacious cessation strategies (Lavack & Clark, 2007). Standard care in terms of availability of cessation strategies largely are limited to NRT, the Smokers' Helpline, and self-help interventions. The reality of the success of these interventions is 10% to 15% cessation (Etter & Stapleton, 2006; Lai et al., 2010; Lancaster & Stead, 2005). The considerably higher cessation rates of MI-via-CALC for both this study and the previous demonstration study underscore the need to integrate MI-via-CALC into current cessation strategies. There is a need for frontline health care workers to examine and encourage smokers to utilize the most efficacious strategies to facilitate change, given the immense difficulty associated with achieving cessation. There is a need for continued research, to investigate both the benefits of MI-via-CALC in relation to standards of care and to extend this intervention to a broader population of smokers. There is a need to extend these findings into both frontline health care practices and research protocols because MI-via-CALC offers a theoretically grounded, practical, and efficacious cessation strategy for smokers.

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Table 1

Data Trustworthiness Measures

Measure	Implementation within the Study
Credibility	<p>Prior to the interview, honesty demands were utilized.</p> <p>To ensure participant comprehension of interview questions and interviewer's understanding of participant responses member checking was utilized throughout interviews.</p> <p>Interviews were audio-recorded and transcribed verbatim allowing participants' responses to be quoted.</p>
Dependability	<p>To reduce potential biases, rich descriptions of data protocol as outlined in this paper are provided.</p>
Confirmability	<p>Inductive content analysis by two independent researchers for each time point was utilized to determine themes. Data was analyzed simultaneously, and subsequently compared and emergent themes were ratified.</p>
Transferability	<p>The research process and protocol has been described in detail thereby allowing others to determine the transferability of results to other settings and participants.</p>

Source: Guba and Lincoln (1989) adapted from Irwin, He, Bouck, Tucker, and Pollett, (2005)

Table 2

## Characteristics of Study Population at Baseline and Quit Status over Follow-up Periods (N=35)

Population characteristics	N	%
<b>Gender</b>		
Male	24	68.6%
Female	11	31.4%
<b>Age</b>		
<20	3	8.6%
21-25	27	77.1%
>26	5	14.3%
<b>Highest education level achieved</b>		
High School	2	5.7%
Some University	17	48.6%
University	9	25.7%
Some Graduate School	3	8.6%
Graduate School	4	11.4%
<b>Smoke Free at Assessment</b>		
T1 (baseline 2)	0	0.0%
T2 (post-intervention)	19	54.3%
T3 (three months post-intervention)	10	28.6%
T4 (six months post-intervention)	12	34.3%
T5 (12 months post-intervention)	11	31.4%
	<b>Quit</b>	<b>Smoking</b>
<b>Quit Aid Usage<sup>a</sup></b>		
None	6 (17.1%)	16 (45.7%)
Patch	4 (11.4%)	4 (11.4%)
Gum	1 (2.9%)	3 (8.6%)
Electronic cigarette	0 (0.0%)	1 (2.9%)
<b>Number of MI-via-CALC Sessions<sup>a</sup></b>		
7	2 (5.7%)	2 (5.7%)
8	1 (2.9%)	0 (0.0%)
9	7 (20.0%)	22 (62.8%)
10	1 (2.9%)	1 (2.9%)
	<b>Mean(SD)</b>	<b>Range</b>
Average number of cigarettes per day	10.37(6.39)	2-25
Age started smoking (years)	16.57(2.31)	12-21
Longest previous cessation (days)	134.57(254.09)	1-1460

*Note. An intent-to-treat model was utilized wherein participant lost to follow-up were assumed to be smoking*

*a. Results at 12-month follow-up assessment is presented*

Table 3

Descriptive Statistics for Personal Competency Outcome Measures at Baseline and Post-Intervention for Both Groups

Variable	Baseline		Post Intervention	
	Intervention Mean(SD)	Control Mean(SD)	Intervention Mean(SD)	Control Mean(SD)
Self-Esteem <sup>*</sup>	20.89(1.07)	20.47(1.33)	23.00(0.74)	20.23(1.19)
Internal Self-Efficacy <sup>**</sup>	22.37(0.91)	23.12(0.85)	15.78(1.80)	23.06(0.92)
External Self-Efficacy <sup>**</sup>	25.39(0.90)	24.82(1.03)	16.72(1.89)	24.76(1.15)

<sup>\*</sup>Note: Higher scores denoted higher self-esteem

<sup>\*\*</sup>Note: Lower scores denote increased self-efficacy to resist the temptation to smoke where internal refers to emotional temptations, and external refers to environmental temptations.

Table 4

## Cotinine Saliva Test Results at 12-Month Follow-Up

Smoke Free Individual	Test 1	Test 2	Mean (ng/mL)	Significance
1	1.32	1.27	1.29	Smoke free (SF)
	18.68	18.61	18.65	SF; Lives with 4 heavy smokers
2				
3	1.21	1.25	1.23	Smoke free
4	266.87	233.10	249.98*	SF; Quit 2 days earlier
5	1.24	1.77	1.50	SF
6	0.04	0.18	0.11	SF
7	0.27	0.21	0.24	SF
8	0.34	0.29	0.32	SF
9	1.45	1.30	1.37	SF

*Note.* <15.00 ng/mL denotes cessation

\*This participant was a previous heavy smoker who had quit 2 days earlier and lived in a house with 4 other smokers

Table 5

Quotations Illustrating Baseline Themes

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Themes

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**Identity**

*Smoking and Identity (n=22)*

- “[Smoking] is part of my identity... I’ve smoked for over half of my life...”  
“There are two different versions of me, a version that smokes and a version that doesn’t.”  
“[Smoking] it is who I am and what I do....”

**Smoking**

*Smoking as a Coping Mechanism (n=25)*

- “When I don’t do well I want to smoke...if I’m stressed I want to smoke”  
“[Smoking] is kind of a safety net... it really relieves me when I’m upset, when I’m angry, when I’m anxious or nervous....”  
“[Smoking] is just an escape ...when things are all screwed up and everything is going wrong, I have a cigarette.”

*Smoking as a Social Experience (n=32)*

- “[Smoking] is part of the way I interact with people.”  
“I’ve met a lot of good friends through smoking.”  
“... the first thing I did when I came to University was went outside and looked for someone who was smoking and that was how I made friends.”  
“Smoking brings people together; you know it makes strangers talk.”

*Smoking and Control (n=19)*

- “I really don’t know whether or not I can control myself [when it comes to smoking].”  
“I thought I was totally in control of smoking...but I know that I’m addicted now.”  
“...something the size of my pinkie really controls me.”  
“Sometimes I feel that [smoking] is the one thing that, as ironic as it sounds, ...that I can control whether I smoke or don’t smoke; however, that is juxtaposed by the fact that I can’t quit.”

**Quitting**

*Stumbling Blocks to Quitting (n=21)*

- “I tell myself ‘I’ll do it tomorrow’... I’m constantly putting [quitting] off.”  
“I tell myself that I’ll quit once I have kid or get married or something.”  
“I’ve always told myself when I have more freedom, and when I don’t have to work I will quit.”  
“I tell myself it is like one magical day, I’m going to wake up and I’m not going to have the urges ... but I know that won’t happen.”

*What I need to Quit (n=17)*

- “I think I need to believe in myself.”  
“...self-discipline and motivation.”  
“...will power and determination.”  
“If I was 100% certain that I could expect, not that I deserve it, but expect some support through the [quitting] process I think that would help.”
-

Table 6

Quotations Illustrating Immediate Post-Intervention Themes

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Themes

**Identity**

*Smoking and Identity Shift (n=23)*

“I learned I’m truly an addict, and I can’t just smoke casually ever anymore.”

“[Quitting] means a whole new identity...being a non-smoker means I have a new identity.”

“[Smoking] really is a part of you, but you have to realize that in order to quit.”

*Increased Personal Competency (n=25)*

“I feel so much more empowered.”

“I have become a stronger person that I respect and value, there are things that I want for myself now in the future.”

“I feel great knowing that I have the mental strength to overcome adversity.”

“I was really down on myself for smoking, but now my sense of self-worth is higher I mean whatever, I [feel I] can take over the world!”

**Smoking**

*Smoking is a Choice (n=24)*

“I just realized there is no need for [smoking], so [I am] making the decision that I no longer want to.”

“I learned that [quitting] is definitely a possibility... I’m not a prisoner of cigarettes.”

“My mind-set shifted, I realized that I don’t need to smoke, it is a choice.”

**Quitting**

*Quitting Strategies (n=26)*

“[My coach and I] came up with a lot of strategies [to help me quit], like a playlist for when I have the urge to smoke.”

“I’m trying new activities, to help me avoid smoking... I started playing squash.”

“I’m learning to rely on family and friends for support to help me quit.”

“Instead of avoiding the addiction or craving, I focus on it, you know kind of like mentally attacking it.”

**Intervention**

*Impact of Coaching (n=31)*

“Speaking with someone else about [smoking] and him/her not having any judgment was really beneficial.”

“[Coaching] gets the mind thinking about what it really wants.”

“[My coach] helped me to take the time and give myself credit for everything I have accomplished...it was nice to have somebody who was dedicated to my success.”

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Table 7

Quotations Illustrating Three-Month Follow-up Themes

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Themes

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***Identity***

*Learning about Myself (n=22)*

“I learned that I’d been cutting myself short.”

“I’m more inclined after [coaching] to look at something I want with my life and say, okay, what are the steps I have to do and it’s doable.”

“My experience with [my coach] made me more self-aware.”

“I learned not to be too hard on myself and to give myself some down time.”

***Smoking***

*Learning Why I Smoke (n=23)*

“I’m more aware of how much I smoke and why I smoke.”

“I wasn’t aware of some problems and those are the reasons I smoke, so after talking with the coach, we identified those problems and I was able to quit and no longer rely on smoking.”

“I needed to wrap my mind around why I always gave into something that I didn’t ultimately want to do.”

***Quitting***

*Increased Awareness about Quitting (n=27)*

“I tend to make things a bigger deal or a bigger obstacle than they actually are and with the coach I put that into perspective.”

“I learned to take it not even a day at a time, but an hour at a time.”

“It’s just you, like you make the decision to smoke or not.”

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Table 8

Quotations Illustrating Six-Month Follow-up Themes

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Themes

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***Smoking***

*Fear of Failure (n=12)*

“I realize I sound like a real egotistical person but I’m fairly success driven...I like to succeed and I’m afraid I can’t [quit].”

“It’s almost like it’s too hard, so why try. I don’t think I will be able to do [quit].”

“I still really want [to quit] but I don’t know if I can.”

***Quitting***

*Life Changes Along with Quitting (n=13)*

“I’m more dedicated to a healthier lifestyle, not just quitting smoking but eating better, exercising more and just focusing on what is important in my life.”

“I learned I have a strong set of values and beliefs and how to speak for myself.”

“I’ve applied [the coaching] to other parts of my life as well and it has been really positive.”

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Table 9

Quotations Illustrating Twelve-Month Follow-up Themes

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Themes

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***Smoking***

*Social Temptations (n=18)*

“My biggest challenge was definitely being around friend when I go to the bar.”

“It was hard to overcome smoking while I was drinking.”

“My biggest temptation [for smoking] is always when I’m drinking with friends.”

***Quitting***

*Change in Relationship with Smoking (n=22)*

“My biggest success was convincing myself that I don’t need to smoke.”

“Now, I know I can quit, I don’t need [smoking] to cope with stress.”

“I don’t idealize cigarettes anymore, because they aren’t helping me deal with stress or make friends, they are just hurting me.”

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## Figures

Figure 1. Change in Number of Cigarettes Smoked per Day for Intervention and Control Groups

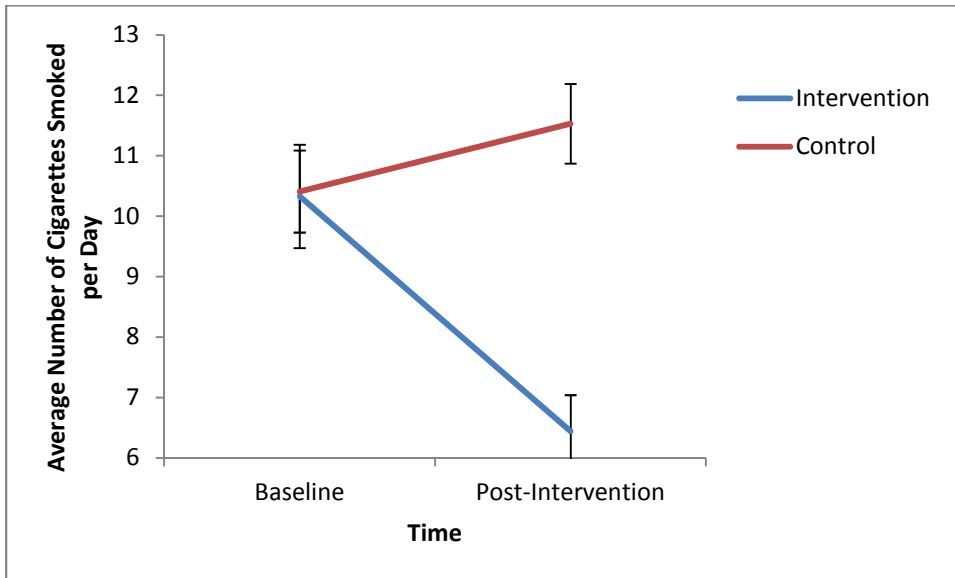
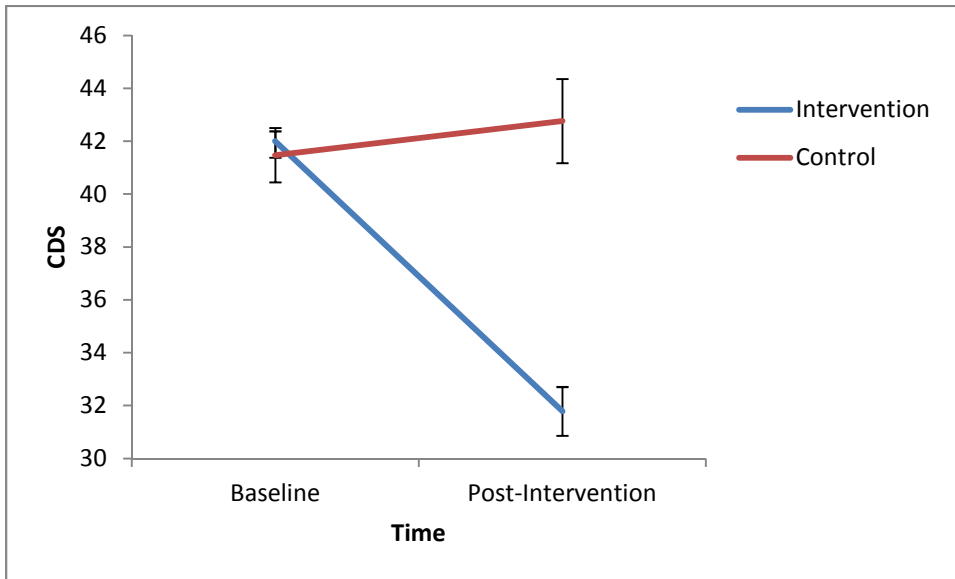


Figure 2. Change in CDS for Intervention and Control Groups



### **Article 3--The Experience and Impact of Motivational Interviewing-via-Coaching Tools on National Smokers' Telephone Hotline Employees<sup>1</sup>**

#### **Introduction**

An estimated 21.8% of Canadians aged 12 years and older, or approximately 5.9 million citizens, were smokers in 2005 (Shields, 2007). Many smokers (as many as 69%) report that they want to quit and in 2010, 52% of them made a quit attempt (Centers for Disease Control and Prevention, 2011). While some quit attempts are done without any form of formalized assistance, many are facilitated by either individual or population-based interventions. One example of population-based cessation interventions is smokers' *hotlines* (hereafter referred to as hotlines). Due to their wide-spread accessibility and no-cost user fees, hotlines have the potential to be an efficacious cessation strategy (Stead, Perera, & Lancaster, 2006). However, despite the potential, from 2005 to 2009, less than a combined seven per cent of Canadian smokers took advantage of hotlines, websites, 'quit and win' contests, and workplace cessation programs (Reid, 2009). However, rates do seem to be increasing and from 2005 to 2006 a Canadian hotline received 15,000 reactive calls and made 4,000 proactive calls, representing a 43% increase from previous years (Canadian Cancer Society, 2012). Despite this drastic increase, hotlines are attracting only a small percentage of smokers (Lichtenstein, Glasgow, Lando, Ossip-Klein, & Boles, 1996). As such, although hotlines have outstanding potential as a population-based cessation strategy, they represent a current underutilized opportunity to impact many smokers and thus, continued study is warranted.

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<sup>1</sup>A version of this chapter has been published in *The International Journal of Evidence Based Coaching and Mentoring*. The copyright release forms for accepted manuscripts from this dissertation are included in Appendix A.

Hotlines emerged in the 1970s, are now offered all around the world, and their collective success is difficult to determine as few trials have evaluated them. The evaluation difficulty stems from a lack of comparison of hotlines to control groups (Lichtenstein et al., 1996). However, some studies have reported positive results, lending support to the use of hotlines (Lichtenstein et al., 1996; Zhu et al., 2002). Hotlines are free services run typically through non-profit organizations and when called, staff offer confidential support and individualized cessation plans for smokers via the telephone, text-messaging, and/or an online community (Stead, Perar, & Lancaster, 2007). Employees of hotlines are available to answer questions, share current cessation information, and provide advice on specific quit strategies. Moreover, recently hotlines have added a proactive call back component to their service which has proved successful (Pan, 2006). The main approach reportedly utilized by some hotlines to facilitate change is Motivational Interviewing (MI;Lai, Cahill, Qin, & Tang, 2010; Lichtenstein et al., 1996; Zhu, Tedeschi, Anderson, & Pierce, 1996). MI posits motivation as a state of readiness to change as opposed to a personality trait and it works to facilitate behaviour change is through the exploration and resolution of clients' ambivalence (Miller, 1983; Miller & Rollnick, 2002; Rollnick & Miller, 1995). Its creators suggest that MI is unique from other forms of counselling because of its focus on clients' values and desires without the use of coercive tools (Miller & Rollnick, 2002).

Although it is theoretically sound, MI is often criticized for the challenge of translating its core principles or spirit into practice. Hettema and colleagues (2005) and Mesters (2009) propose that despite the tenets of MI being described in many publications, the variability in its implementation may be due to diverse training approaches which have resulted in unpredictable degrees of success. For example, in a study by Soria and colleagues (2006), MI was associated with an 18.4% reduction in smoking rates, while Wakefield, Olver, Whitford, and Rosenfeld (2004)

found only an 5% reduction; no or little information was provided to the readers to determine how the principles of MI were actually implemented in either intervention and the training protocol of the MI counsellors was not provided. Moreover, another concern raised by Rubak and colleagues (2005) is the crossover training and implementation of MI skills from non-clinical to clinical settings. Specifically, the authors raise concerns about the inconsistent ability of MI practitioners to transfer skills learned from training into practice (Rubak et al., 2005). Consequently, a need exists for a standardized application of MI to ensure fidelity and adherence with MI principles.

Previous research indicates the tenets and premises of MI are contained entirely within, and brought to fruition via Co-Active Life Coaching (CALC; Newnham-Kanas, Morrow, & Irwin, 2010). Although CALC creators did not design the approach with MI in mind, implementing MI-via-CALC overcomes the aforementioned criticisms of MI because CALC has an extensive training program (five, three-day training courses, totalling over 100 hours, followed by a rigorous 25 week certification program) and concrete skills to facilitate the consistent implementation of core principles (Kimsey-House, Kimsey-House, Sandahl, & Whitworth, 2011; Whitworth, Kimsey-House, & Sandahl, 1998; Whitworth, Kimsey-House, Kimsey-House, & Sandahl, 2007). Furthermore, utilizing MI-via-CALC has been deemed to offer a practical method for promoting behaviour change (Newnham-Kanas et al., 2010), thereby transcending the non-clinical/clinical barrier, as demonstrated in several behaviour change studies which evaluated the impact of CALC and found significant improvements in the behaviour(s) of focus (Newnham-Kanas, Irwin, & Morrow, 2008; Newnham-Kanas et al., 2010; van Zandvoort, Irwin, & Morrow, 2009). More specific to smokers, a recent pilot study assessed the utility of MI-via-CALC among 18-29 year-old smokers and found 22% of participants were smoke-free at six months post-intervention (Mantler, Irwin, & Morrow, 2010), a rate that is 10% higher than the average quit rate for other cognitive-

behavioural interventions (Lancaster & Stead, 2008). The larger and longer follow-up study found even higher cessation rates, with 31.4% of smokers having quit one-year post intervention (Mantler et al., under review). Given the previous successes of interventions applying MI-via-CALC at facilitating behaviour change, and in particular the promising results from the above-noted smoking studies, integrating MI-via-CALC tools (an easy adaptation as most coaching takes place over the telephone) into a hotline offers an important extension of the existing strategy that overcomes current MI barriers.

## **Methods**

### ***Purpose***

The purpose of this study was to assess the experience and impact of a full-day application-based MI-via-CALC training (by two CALC certified and MI trained individuals) on employees' perceived competence to facilitate behaviour change among callers of a national smokers' telephone hotline.

### ***Participants***

Ethical approval was obtained through The University of Western Ontario (now named Western University; Appendix F). Ten employees of a national smokers' telephone hotline (hereafter referred to as hotline), a free service that employs individuals to answer the telephone and make proactive call backs to provide cessation support, were recruited to participate via a workplace advertisement and letter that provided information about an upcoming voluntary training (Appendix D). Interested participants were asked to contact the Research Coordinator (TM) via e-mail or telephone and the only inclusion criterion for this study was that the individual be employed by or volunteer with the hotline in the capacity of manager or 'cessation specialist'. Upon contact, the



Research Coordinator explained the study in detail and provided a letter of information and the opportunity to ask questions (Appendix G). All ten participants who contacted the Research Coordinator were included the study. Please see Table 1 for the demographic information of the study participants.

### ***Study Design***

This mixed method repeated measure design consisted of assessments at baseline, post-training and three-month follow-up. Due to the relatively small sample size, the mixed methods approach allowed for a more comprehensive appreciation of the experience and impact of the training on employees. At baseline, participants completed a demographic questionnaire (Appendix H), and at all three assessment points, they engaged in a 30-45 minute semi-structured interview consisting of 10 to 12 questions focusing on participants' current practices, barriers and facilitators to implementing MI (Appendix E), and completed the Self-Perceived Competence questionnaire for facilitating behaviour change questionnaire (PCS; Williams, Freedman, & Deci, 1998; Appendix N). Quality assurance strategies described by Guba and Lincoln (1989) and Irwin and colleagues (2005) were used throughout qualitative data collection (see Table 2). The PCS is a 5-item scale measuring perceived competency for facilitating behaviour change among patients in daily clinical practice, is scored on a 7 point likert scale, and has an internal consistency ranging from Cronbach  $\alpha$  0.80-0.94 (Williams et al., 1998). Two weeks after baseline assessments were completed, the training took place at a local hospital (lunch and snacks were provided for participants). The post-training assessments were completed within three days of the training and the final assessment was conducted three months post-training. During the final assessment, participants were given a small monetary token of appreciation.

## ***Training***

Two Certified Professional Co-active Coaches also trained in MI, with extensive experience facilitating application-based workshops on MI-via-CALC for health care practitioners (JDI & DM), provided a seven and a half hour interactive and experiential training. This experienced MI-delivery/training team has conducted over 50 MI-via-CALC workshops to allied health care professionals and the focus of the training was on applying components of CALC found to work best in behaviour change situations. Specific tools and skills taught included: helping to anchor behaviour change goals to clients' personal values; adopting a competency worldview; dropping assumptions in service of helping the public change behaviours; learning to ask effective questions; using 'tangible' agreements to help clients follow through on their desired behaviours; and helping people change their perspective in service of making healthier choices (Kimsey-House et al., 2011; Miller, 1983; Miller & Rollnick, 2002; Rollnick & Miller, 1995; Whitworth et al., 1998; Whitworth et al., 2007).

## ***Analysis***

Two researchers independently completed inductive content analysis on the interview transcriptions as described by Elo and Kyngas (2008). Once themes were identified, the researchers met to ascertain similarities and resolve differences in emergent themes. Ultimately, common themes were identified for baseline, post-training, and three-month follow-up. Moreover, to capture a more complete understanding of the training's impact (i.e. qualitative and quantitative), trends in the PCS for all three assessments were evaluated.

## **Results**

### ***Baseline Themes***

Baseline interviews were designed to contextualize participants' current understandings of what MI entails, confidence about implementing MI, as well as to understand challenges currently experienced. Three themes were identified. The first theme entitled 'understanding MI' captured participants' collective knowledge about MI's principles relative to their work. To gain insight into participants' levels of understanding MI, if any of their descriptions were consistent with Miller and Rollnick's (2002) eight principles of MI, they were deemed to have an accurate understanding (eight participants); if their descriptions conflicted with the basic tenets, they were deemed to have a less accurate understanding (two participants). The second theme of 'client barriers' encapsulated difficulties participants had engaging with clients for various reasons including: a lack of caller responsiveness (six participants); callers' stated unwillingness to engage (four participants); a lack of focus among callers (two participants); client trust issues (two participants); mental health issues of callers (three participants); challenges to building rapport (four participants); and clients trying the same cessation strategies repeatedly without success (three participants). The third theme of 'changes to practice' described structural changes participants wanted implemented including: different software (three participants); more learning opportunities (six participants); and regular MI training sessions (four participants). Illustrative comments supporting each theme are presented in Table 3.

### ***Post-Training Themes***

Immediately following the training, participants were focused on the similarities and differences of tools learned at the training compared to their current practices. The first of the two themes identified was 'reinforcement of current skills and re-energized

participants’; all 10 participants described the training as re-energizing for them and reinforcing some knowledge and tools currently utilized. In the second theme, participants acknowledged several ‘new skills’ as a result of the training including perspectives work and balance coaching (nine participants), importance of values (nine participants), dropping assumptions (three participants), and realizing the client’s whole life is involved in cessation attempts (five participants). Supporting quotations for each theme are presented in Table 4.

### ***Three-Month Post-Training Themes***

During the three-month post-training assessment, participants revealed feeling re-energized and an overall perspective of increased motivation surrounding their job. Specifically, participants built upon the themes identified during the previous assessment and two salient themes emerged. The first theme that ‘training increased confidence to put MI into action’ was described by nine participants. The almost unanimous perception was attributed to employees’ successful implementation of the new skills learned at the training and the practical training approach. The second theme of a ‘desire for continued professional development’ via training and learning was identified by all ten participants. Quotations exemplifying each theme are presented in Table 5.

### ***Common Theme among Assessment Points: Implementation Constraints***

During all three assessments, ‘implementation challenges’ emerged as a salient theme. Implementation constraints consisted of: limitations around call duration (six participants); having different clients each time (four participants); offering the service over the telephone (four participants); and data collection (four participants). Moreover, the internal structures of the hotline resulted in formal and informal constraints,

specifically the aforementioned data collection requirements, and call duration, respectively. Supporting quotations are presented in Table 6.

### ***Quantitative Results***

Quantitatively, due to the small sample size, only averages in the PCS can be reported. Post-training, there was an increase in perceived competence for facilitating behaviour change. These gains, compared to baseline, were maintained at three-month post-training although a slight decrease from post-training was observed (see Table 7). The trend observed in these findings was consistent with the qualitative findings that highlight participants increased confidence over time to put MI-via-CALC into action.

### **Discussion**

The purpose of this study was to assess hotline employees' experience and perceived competency to facilitate behaviour changes of callers as a result of training in MI-via-CALC. Participants attributed this training to increases in competency leading to augmented confidence to use MI in daily practice; these increases were supported by both the qualitative and the quantitative findings. The results of this study suggest that offering an MI-via-CALC training to participants of the smoking cessation hotline had a positive impact on participants' perceived competency to implement MI, reinforcing skills currently being utilized, and providing participants with new concrete behaviour change tools. Prior to the training participants reported a mixed understanding of the tenets of MI, specific barriers in dealing with clients, as well as desired changes to the hotline's internal structures such as informal call duration limitations and data gathering requirements. After the training, participants reported a reinforcement of skills currently being utilized and new skills learned. Participants also identified increased motivation to do their job and feeling re-energized as a result of the training. Finally, three-months post-training, participants

reported a continued increase in confidence to put MI into action, as well as a desire for continued professional development and strategies to bring professional development opportunities to fruition. Moreover, implementation constraints in terms inconsistency in clients, and a telephone-based service as well as formal and informal internal structures such as data collection requirement and call duration limitations were identified and reiterated at all three assessments. Quantitatively, trends observed from the PCS over time were congruent with the self-reported increase in perceived confidence and utility of MI-via-CALC training described by participants.

This study provides new and important insights into the perceived impact of integrating MI-via-CALC into the hotline by providing a window into this integration's effectiveness, as assessed from employees' perspectives. The MI-via-CALC training provided a concrete and effective way to improve on the service, resulting in increased employee confidence at delivering the service and thus, enhancing client care regardless of previous training experience and duration of employment. Additionally, participants' underscored areas for improvement such as the desire for more MI training to further enhance their roles This desire for more MI training was pronounced in the in-depth interviews, and participants displayed an eagerness to provide concrete and tangible solutions to overcome this gap with such ideas as an opportunity to reflect on calls, attend seminars/webinars, and have more training offered through the hotline. The barriers due to formal and informal hotline structures expressed by participants at all three assessments merit further examination and problem-solving by the hotline personnel. The participants perceived implementing MI as challenging for two reasons: short call length and service offered via telephone. However, based on MI and CALC research, lengthy and in-person sessions are not a requirement for success (Butler et al., 1999; Lando, Hellerstedt, Pirie, & McGovern, 1992; Lichtenstein et al., 1996; Rollnick, Butler, & Stott, 1997; Rollnick, Mason, & Butler, 1999).

Consequently, there is a need to re-frame these perceived barriers for participants, within training based on empirical evidence that contradicts current participant perceptions in order to overcome this misconception.

The importance of the current study's findings stem from the fact this was the first independent study of its kind examining the impact of an external training on staff at this hotline. This alone underscores the need for continued study of the hotline and the associated impact. At the same time, this need highlights one of the main limitations of this study, namely, the inability to gain access to data on client change. In response to requests for data on cessation rates, call numbers, and service use for the period of time prior to the training and post-training, the research team was informed this information was not available. Consequently, this study is limited to perceived changes reported by participants. Future studies should work in collaboration with the organization's personnel to identify suitable data that can be available to corroborate the impact of training on participants and clients. Moreover, a longer employee follow-up time of one year would be desirable to allow researchers to ascertain if changes were maintained and to determine if any changes to formal or informal internal structures resulted from the study. However, given the time constraints described by the hotline personnel this was unable to occur and the study was required to conclude within three months of the training. Furthermore, the training offered had both participants and managerial staff at the same training; this may have impacted the context in which information from the training was understood. Future studies should offer separate trainings for participants and managers to eliminate any potential bias. To determine which skills and tools are most associated with client behaviour change, future studies should record and analyse calls, if ethically feasible, to determine what skills are being implemented most and how they correlate to caller smoking behaviours.

Overall, the training was well received by participants and a desire for additional training was expressed. This, in and of itself, highlights the success of the training. Further to this, participants also reported the training increased their overall confidence to put MI into action. Additionally, the tools learned in the training allowed for the implementation of these new and useful skills into the hotline and helped to re-energize participants. In conclusion, the marked change in participants' perceptions of the impact of a single, one-day theoretically-based MI-via-CALC training session demonstrates the power of professional development for the participants of this particular hotline. The power of professional development is underscored given that after only one day of MI-via-CALC training, the hotline participants increased their feelings of confidence to put MI into action and repertoire of strategies to aid clients in cessation attempts.



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Table 1

Demographic Data for All Study Participants

<i>Measure</i>	<i>Description</i>
N	10
Age (years)	27-59 years Average: 41.9 years
Gender	100% Female
Length of Time Working for Hotline	1.5-120 months Average: 49.35 months
Reported number of MI Trainings (prior to training)*	0-18 Average 4.6
Highest Level of Education Achieved	Some university/college – 1 individual University/college- 8 individuals Graduate school- 1 individual

---

\**Note:* Prior training was defined as any MI-related direction provided to an employee that she considered a training, regardless of duration.

Table 2

Measures to Ensure Data Trustworthiness

<i>Measure</i>	<i>Description</i>
Credibility	<p>Honesty demands and member checking were done to encourage honest responses and to ensure the researcher correctly understood responses, respectively.</p> <p>Interviews were audio recorded and transcribed verbatim to provide accurate quotations reflecting identified themes.</p>
Dependability	<p>Study process has been identified in detail with the protocol being consistent for all participants.</p>
Confirmability	<p>Inductive content analysis was performed simultaneously and independently by TM and RF/AS. Subsequently, analyses were compared and similarities and differences across time discussed and emergent themes identified.</p>
Transferability	<p>The research process was documented in detail, enabling individuals to draw their own conclusions about the transferability of these results to other settings.</p>

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*Source:* Based on Guba and Lincoln (1989) and adapted from Irwin, et al., 2005.

Table 3

Quotations Supporting Each Theme from Baseline Interviews

---

*Understanding MI*

“[MI is] an approach that works with the client ... where they’re at, at the time. And helps them recognize where they want to be, and moving them towards that goal.”

“Motivational interviewing is an approach to elicit change in someone, behaviour change. And, the idea behind is it for [the client] to come up with their own solutions.”

“...[Participants] are so passionate at trying to get the caller to change that the advice-giving is just ... first nature.”

“[B]ecause if, their motivation doesn’t work...they need more advice-giving.”

*Client barriers*

“... [F]orced to quit by a health professional or a family member....”

“...[S]till calling in and have zero interest in quitting, and zero interest in trying anything.”

“ [Some callers are] very chatty and difficult to keep on topic, and it’s hard to sort of guide the conversation any one way.”

“Everything else that they’ve done hasn’t worked, so they don’t even trust us.”

“... [F]or me definitely it’s about building the rapport; it’s [hard to get the] conversation going so that you can find out a little bit about them.”

“...[T]rying to get them to see that what they’ve done in the past really isn’t effective. Because sometimes people don’t look back to past quit attempts, I find.”

*Desired changes to practice*

“...[A]fter some of the substructures to make [the service] more MI friendly.”

“... [W]e work with a software program that helps support caller interaction, so I thought that maybe there could be some changes we could make in the software program, that would sort of help to flag or you know, sort of help with this process of moving the client along.”

“...[T]he opportunity to listen to more [my own] calls.”

“If there were opportunities to talk about challenging clients, you know more often, all of that would be more helpful.”

“More training!”

---

Table 4

Quotations Supporting Themes From Post-Training

---

*Reinforcement of current skills and re-energized participants*

“...[I]t helped to reinforce many strategies that we’ve been wanting us to use ...and really, I felt that it really re-energized [us].”

“...[The training] was definitely helpful. I felt like it was a refresher in some areas ... and to be reminded of how important some of those things are.”

“... I found the workshop very valuable, I thought that we discussed a lot of things that some were refreshers and some were new, but ... the concepts that we discussed and some of the activities we did, I think focused on really valuable skills.”

*New skills*

“... [T]he one activity related to taking a different perspective... that’s not something we’ve covered ...”

“... I think anchoring a value to change, would be very helpful because again, it really solidifies, if you make it important to them then it will help them to remember it and help them to focus on that change.”

“... [I]t’s really important developing a relationship... an element of respect is very important.”

“... [T]he relationship with the client ... with every call, the idea of dropping assumptions and coming in with this genuine curiosity.”

“... [W]hen people feel heard or understood I think that that fosters stronger relationships and change.”

“...the co-active coaching was again the idea of looking at the whole person, because we’re really trained to only deal with smoking cessation, I found that I sort forgot about the rest of the person.... And those other parts of their lives really do affect their smoking or them being able to quit.”

“...[T]o acknowledge that they have the tools and they have the ability to really move forward and you’re just there to help them, identify what those tools are, what the next step is, and it’s really them doing the work, it’s not you.”

“...[T]he take home message was that the client has the answers, and our job is to find the best way to help the client reveal that to themselves.”

---



Table 5

Quotations Supporting Three-Month Post-Training Assessment

---

*Increased confidence to put MI into action*

“... [T]he accountability piece too right would be like a physical reminder...that was good.”

“...I felt really grateful that I was able to participate and I feel like it’s something that has changed me, and changed the way I kind of work.”

“...[Y]ou know, I feel that I’ve um, it’s, it has given me more self-confidence since I took the course, um, I think mainly, partly because of the examples and the hands-on um, the hands-on experience....”

“...I feel like, you know, my confidence around implementing it is more ... because I’ve had the chance to see it working and ... it’s really a wonderful thing to hear someone start to think about their life in a different way....”

“I find that as a result of this [training] I’m more on top of my own game ... there’s a lot of things that have really shifted. Like before, it was a job and I loved it, but I’m liking it even more now.”

“I’ve tried ... changing perspectives and I found that one to be the most helpful. It’s the one I’ve put and used the most.”

“... [J]ust about changing your perspective, um, just trying to think of different ways to [quit] because sometimes if you’re stuck in a problem and you don’t know how to fix it, just kind of changing the way you look at it can sometimes open up a whole new array of possibilities.”

“...[We] came from the workshop feeling more motivated, and ... [the training] helped to increase their skill level and confidence.”

*Desire for professional development*

“... [I]t’s this you know, lifelong learning, right? You can’t attend a short seminar and say, ‘I’m good’ right? ...So I think if it was more [training], I’m saying a yearly thing, maybe six months, you attend a seminar.”

“...[B]ut some kind of a way to, like, in between follow-ups...maybe like a [tele]phone conference or a webinar...”

“...[I]f you don’t make the commitment to yourself to try [new skills], then it’s kind of lost. So maybe like having some kind of, you know, an email every couple of weeks or something, like reminding us of one of the skills, and saying, why don’t you try this, this week.”

---

Table 6

Quotations Illustrating Implementation Challenges Across All Three Assessments

---

*Call Duration*

“...[I]t’s challenging for them and I... because we don’t have a full hour.”

“... [T]here never seems to be enough time...”

“... [T]ime constraints for each call is a big [challenge].”

“...I had a call yesterday that was like almost an hour long...because we have so many clients if I talk to one person for an hour that’s three people that I could’ve spoken with who didn’t get counselling.”

*Different Clients each time*

“... [It is challenging] you don’t get the same person every time.”

“...[Y]ou may only talk to somebody once, and to somebody else, and somebody else so there’s not that continuity.”

*Offering the Service over the Telephone*

“... [T]his is over the [tele]phone, so there are constantly challenges, you know, it’s maybe a little bit harder to develop a rapport.”

*Data Collection*

“... [W]e’re also gathering data which can take away from the actual counselling session.”

“... [W]ell it is our position to gather some information as well, so sometimes those are barriers to actually getting all those other things done....”

“...[P]art of our job is not only to provide that service to clients, but it’s also to collect data on the clients...and sometimes [counselling and data collection] can interfere with the other.”

---

Table 7

Results of the Self-Perceived Competence Questionnaire for Facilitating Behaviour Overtime

<i>Time</i>	<i>Average PCS (Max=30)</i>
Baseline	26.33
Post-Training	28.6
Three-Month Follow-Up	28.2

## **Summary, Conclusions, and Future Directions**

### **Summary**

The purpose of this dissertation was to examine the effectiveness of Motivational Interviewing through Co-Active Life Coaching (MI-via-CALC) tools for tobacco control and was assessed using a critical appraisal and literature review, as well as intervention studies on an individual- and population-level. Three distinct, but interrelated articles were written to provide insight into: three dimensions of MI currently implemented independently in cognitive-behavioural cessation interventions; the impact of MI-via-CALC on selected cessation outcomes among young adults (19-25 years); and the impact of a full-day application-based MI-via-CALC training on perceived competency of employees of a national smokers' telephone hotline to facilitate behaviour change among callers.

Article 1 systematically assessed cognitive-behavioural cessation interventions that used at least one component of MI and were published from 1995 to 2010. Seventeen articles were included and critically appraised in this review. The manuscript examined study design and methodology as well as the overall efficacy of the MI component at facilitating cessation in service of determining the efficacy of the different dimensions of MI. Given this was the first critical appraisal and literature review to look at cognitive-behavioural interventions through the lens of MI dimensions, it is hoped this information will be used by researchers to inform the empirically rigorous assessments of cognitive-behavioural interventions and ensure the development and utilization of the most efficacious cessation interventions among smokers who want to quit.

Article 2 explored the impact of 8 to 10 MI-via-CALC sessions among 35 young adults on smoking behaviours and personal competencies. Both significant decreases in smoking behaviours and increases in personal competencies were observed among immediate- intervention participants compared to waitlist participants. A biochemically verified cessation rate of 31.4% was found at 12 month post-intervention. Together these findings indicated: 1) MI-via-CALC was effective at reducing smoking behaviours and increasing participants' personal competencies compared to a waitlist condition; and 2) further established the merits of MI-via-CALC as an efficacious cessation intervention, particularly because this cessation rate was substantially higher than other cognitive-behavioural and NRT cessation interventions. Moreover, significant decreases in external self-efficacy were observed at 3-,6-, and 12- month post-intervention compared to immediate post-intervention; this suggests that the substantial gains experienced in confidence to resist environmental temptations to smoke at immediate post-intervention were not maintained at that same levels during post-intervention follow-ups. It would seem that external self-efficacy was likely moderated by another variable such as stress and/or depression (Cinciripini *et al.*, 2003).

Article 3 examined the impact of a full-day interactive MI-via-CALC training on a national smokers' helpline employees' perception of their ability to facilitate behaviour change among callers. At baseline participants described client barriers and desired changes to practices as the main issues impeding their ability to help callers quit smoking; however, immediate post-intervention participants described perceived enhanced skill development and a feeling of being re-energized. Moreover, at post-intervention, participants described increased competency to facilitate change as well as a

desire for additional training. Quantitatively, trends on the perceived competency scale were consistent with qualitative findings. These findings indicated: 1) participants found the MI-via-CALC training useful in terms of increasing their perceived competency to facilitate behaviour change among callers; and 2) participants felt additional MI-via-CALC training would be an asset.

### **Conclusions and Future Directions**

Several conclusions can be drawn from these three articles both individually and in combination. The results of the critical appraisal and literature review suggested the utility of MI stems from the integration of the three dimensions of MI (tailored intervention, social support, and motivation) within a single intervention, as compared to individual dimensions within cognitive-behavioural interventions. A meta-analysis is the next logical step to ascertain if differences in effect sizes among dimensions of MI are evident as well as to compare these findings to the effect sizes of MI interventions.

In accordance with Mantler *et al.* (2010) findings, MI-via-CALC appeared to be an efficacious smoking cessation strategy that supports behaviour change for individuals with cigarette addictions. The individual MI-via-CALC study presented in this dissertation was the first smoking cessation study conducted to date that used a control group. Furthermore, within the study some smokers voluntarily or decided of their own volition to use NRT; the latter was a choice consistent with the tailored and client-centered focus of MI-via-CALC. However, given the evidence of NRT for supporting cessation (Stead, Perara, Bullen, Mant, & Lancaster, 2008) future studies should look at comparing MI-via-CALC to and with NRT to ascertain the impact on cessation.

The MI-via-CALC training was the first known intervention study to date

conducted at the particular national smokers' hotline to assess the impact of a specific training on perceptions of employees' abilities to facilitate behaviour change among callers. Changes in caller statistics, specifically cessation and associated behaviours, was beyond the scope of this study due to stipulations to that effect from the national smokers' helpline to the research team. However, future studies should extend the training program as suggested by employees' and assess the impact on callers' behaviour to corroborate further perceived changes described by employees.

All studies considered, the efficacy of MI-via-CALC as an intervention for tobacco control among young adults was supported. Given the cessation rate observed in the individual MI-via-CALC study, there is merit to increasing the accessibility of this program to all smokers committed to quitting. An estimated 10 years of life can be gained if a smoker quits by age 30 (Doll et al., 2004; Taylor, Hasselblad, Henley, Thun, & Sloan, 2002). Considering the associated benefits of early cessation, there is a need to increase the accessibility of effective interventions to young adults. Moreover, the fact that this intervention can to be administered over the telephone and potentially through an already existing national platform points to the potential to increase the reach of this intervention cost-effectively. Therefore, from a public health and disease prevention perspective, this intervention merits continued investigation and implementation on a larger scale.

In conclusion, MI-via-CALC as an intervention for tobacco control has provided important insights into mechanisms by which behaviour change is promoted, as well as the impact of this interactive approach on cessation behaviours and psychosocial predictors for cessation (self-esteem and self-efficacy; Stuart, Borland, & McMurray,

1994; Zimmermann, Hofer, Holzner, Strobl, & Gunther, 2004). MI-via-CALC offers a unique framework for the future development of cessation initiatives on both an individual and population levels.



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Appendix A  
Copyright Release

Article 1

February 15, 2013



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### Article 3

Dear Tara

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Best Wishes

XXXXXX

XXXXXXx, Director of Postgraduate Coaching and Mentoring Programmes

Appendix B  
Data Extraction Form

## Data Extraction Form

Reviewer: \_\_\_\_\_ Study ID: \_\_\_\_\_

GENERAL  
Title: \_\_\_\_\_

Author(s): \_\_\_\_\_

Journal: \_\_\_\_\_

Volume: \_\_\_\_\_ Issue: \_\_\_\_\_ Pages: \_\_\_\_\_

Year: \_\_\_\_\_ Country: \_\_\_\_\_ Language: \_\_\_\_\_

Sponsorship/Funding: \_\_\_\_\_

Other: \_\_\_\_\_

### METHODS

Study design: Experimental Parallel Group Crossover Open-Label Other  
Description: \_\_\_\_\_

Intervention: \_\_\_\_\_

Comparator(s): \_\_\_\_\_

Dose: \_\_\_\_\_ Frequency: \_\_\_\_\_ Duration: \_\_\_\_\_

Method of administration: \_\_\_\_\_

Allocation Concealment: Completely Unclear Inadequate Not Used

Blinding: Double Single Open Investigator Patient Assessor

Analysis- Intent to treat:

Yes

No

**PARTICIPANTS**

Inclusion:

---

Exclusion:

---

*Baseline*

	Intervention	Control	
Age			Pretreatment group differences:
Gender			
Cigarette dependency			
Smoking duration			
Quit attempts			
Co-morbidity			
Concurrent treatment			
Lost to follow-up			
Other			

Adverse Effects

Patient Specific

Overall statistic

No

**RESULTS**

*Outcome Measures Continuous*

Description	Intervention	Comparator	Baseline (N, mean, sd)	F/u: _____ (N, mean, sd)	F/u: _____ (N, mean, sd)	F/u: _____ (N, mean, sd)	F/u: _____ (N, mean, sd)	F/u: _____ (N, mean, sd)

*Outcome Measures Dictomous*

Description	Intervention	Comparator	Baseline (n, N)	F/u: _____ (n, N)	F/u: _____ (n, N)	F/u: _____ (n, N)	F/u: _____ (n, N)	

*Adverse Events*

Intervention	Description	n/%
Comparator		

Other time intervals available:

Yes                  No

Description:

*Withdrawals due to Adverse Events*

Intervention	Description	n/%
Comparator		

Outcome for patient subgroups:

---

Other Key Information:



Appendix C  
Assessment of Bias Tool

## Assessment of Bias Tool

### SELECTION BIAS (2)

*Sequence Generation- adequate to produce equal groups*

Low Risk	High Risk	Description:	Judgment	
Random Number Table	Birth Date		Low Risk	
Computer random number generation	Date of admission		High Risk	
Coin toss	Record number		Unclear	
Shuffle cards/envelops	Professional judgment			
Dice	Preference			
Drawing of lots	Results of tests			
Other: _____	Availability of intervention			
	Other: _____			

*Allocation Concealment- intervention assignment could not have been foreseen by participants*

Low Risk	High Risk	Description:	Judgment	
Central allocation	Open allocation schedule		Low Risk	
Sequential numbers, identical package	Envelopes without safeguards		High Risk	
Sequential numbers, opaque, sealed	Alteration/Rotation		Unclear	
Other: _____	Date of birth/Record number			
	Other: _____			

*Attrition Bias- Systematic differences in withdrawals between groups*

Present	Not Present	Description	Judgment	
			Low Risk	
			High Risk	
			Unclear	

*Performance Bias and Detection bias- Blinding*

Low Risk	High Risk	Description	Judgment	
Blinding ensured and unlikely broken	No blinding but likely to impact outcome		Low Risk	
Some blinding but non blinding unlikely to introduce bias	Blinding but likely was broken		High Risk	
No blinding but not likely to influence	Key individuals not blinded		Unclear	

outcome measures	likely to introduce bias
Other: _____	Other: _____

**REPORTING BIAS (2)**

*Incomplete Outcome Data*

Low Risk		High Risk		Judgment	
No missing outcome data		Missing data likely related to true outcome		Description	Low Risk
Reasons for missing data unlikely to be related to true outcome		Proportion of missing outcome is large enough to impact results			High Risk
Missing outcome data balanced across intervention groups		Inappropriate use of imputed data (i.e. mean of group)			Unclear
Missing data proportional to plausible effect size and not into to impact results		As treated' with departure of intervention received from randomization			
Missing data imputed using appropriate methods		Other: _____			
Other: _____					

*Selective Outcome Reporting*

Low Risk		High Risk		Judgment	
Protocol available and outcomes were reported on		Not all pre-specified outcomes were reported on		Description	Low Risk
Protocol not available but it is clear all outcomes are reported		One or more outcomes was reported using analysis or data not pre-specified			High Risk
Other: _____		One or more outcome was reported but not pre-specified			Unclear
		One ore more outcome is reported incompletely			
		Study fails to report key outcomes			
		Other: _____			

*Other Sources of Bias*

		Description		Judgment	
Present				Low Risk	
Not Present				High Risk	

Appendix D  
Participant Recruitment

## Mass Email- Article 2

Dr. Jennifer Irwin and Dr. Don Morrow in the Faculty of Health Sciences at Western are seeking participants for a life coaching and smoking cessation study. Adults between the ages of 20 -24, who have smoked for longer than 6 months, and speak English fluently are eligible to take part in this study.

If you meet the criteria, and are interested in participating please contact Tara Mantler at [XXXXXXX](#)

Posters- Article 2

Want to quit smoking?

Dr. Jennifer Irwin and Dr. Don Morrow in the Faculty of Health Sciences at Western are seeking participants for a life coaching and smoking cessation study. Adults between the ages of 20 -24, who have smoked for longer than 6 months, and speak English fluently are eligible to take part in this study.

If you meet the criteria, please contact Tara Mantler at XXXXXXXX

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## **Motivational Interviewing & Coaching Tools for Health Practitioners Workshop**

*A brief outline of what to expect...*

Motivational Interviewing & Coaching Tools for Health Practitioners is a full-day (9:00am– 4:30pm) interactive workshop in which participants learn and practice tools for effective health-related behaviour change.

The workshop begins with an introduction to motivational interviewing and coaching as a model for health promotion and health behaviour change. We introduce the specifics of the client-centred model, and inform participants about how the day will unfold...this highly interactive workshop is *not* a lecture-style sit-down-and-take-notes all day type of experience. During the workshop we focus practical tools that can be used when working with clients who want to prevent a health-related problem or promote a health-related goal. We demonstrate to teach the tools/skills, and participants start working with the tools during the workshop. We have break-out sessions during which participants partner-up and practice the tools with each other, and we provide feedback/assistance as they are practicing the tools. We focus on applying basic components of the model that we have found work best in behaviour change situations.

Participants leave the workshop with additional tools to add to their professional “tool boxes”, and these tools can help them work with individuals to facilitate positive health behaviours and help reduce negative ones. Some of the specific tools/skills used include: helping to anchor behaviour change goals to clients’ personal values; dropping assumptions in service of helping the public change behaviours; learning to ask powerful questions; using ‘tangible’ agreements for helping to get clients’ following through on their desired behaviours; and helping people change their perspective in service of making better choices for themselves. The value of this model in health promotion while helping to reduce practitioner burn-out is also discussed and explored. Each participant receives a workshop folder which includes additional resources.

**If you are interested in participating in this workshop please contact Tara Mantler at [XXXXXXX](#) to reserve your space**

Appendix E  
Semi-Structured Interview Guides



## Baseline Interview Guide-Article 2

- What is it like being you?
- In your wildest dreams, what would your life look like? In what way would it be different from now?
- What does smoking represent?
- What would you have to say yes and no to, to make quitting smoking possible?
- What is the story you tell yourself about quitting smoking? What does the voice in your head say?
- What is challenging about quitting smoking?
- What do you need to facilitate your quitting smoking? And to be successful?

## Immediate Post Intervention Interview Guide-Article 2

- What have you learned about yourself and smoking?
- What strategies will you use to help you quit?
- What will your biggest challenge be?
- What does quitting smoking mean to you?
- What is success for you, when it comes to smoking?
- What is preventing you from quitting smoking?
- What is driving you to quit smoking?
- How will quitting smoking impact you physically? Emotionally? Psychologically?

### 3-, 6-, and 12-Month Interview Guide- Article 2

- What is it like being you now compared to the beginning of the intervention?
- What have you learned from your coaching experience? Your quitting experience?
- What has changed since the beginning of the study?
- What will help you stay on track?
- What actions have you taken, and do you attribute those actions to coaching?
- How do you see what you have learned impacting you over the next six months?
- How long since your last cigarette (for participant who reported quitting)?
- Is there anything else you would like to tell me regarding your participation in the study?

### Baseline Interview Guide-Article 3

1. In our own words, how would you define Motivational Interviewing?
2. What is important to you about helping people quit smoking?
3. What are your experiences with Motivational Interviewing? Where did you first encounter Motivational Interviewing?
4. Describe your perceived knowledge level of Motivational Interviewing?
5. How confident are you in your ability to put motivational interviewing skills into action?
6. If I were to follow you through a typical call what would I see as some of the things you experience that make it difficult to put Motivational Interviewing into action?
7. Why do you consider these things as barriers? (i.e. how do these things make it challenging for you?)
8. Where do you find these barriers? What do they look like?
9. How do those barriers make you feel?
10. How do you handle those barriers?
11. If I followed you through a typical call what would I see as some of the things you experience that make it easier to put Motivational Interviewing skills into action?
12. Why would you consider them facilitators?
13. Where do you find these facilitators? What do they look like?
14. How do these facilitators make you feel?
15. What do you need to help you improve your Motivational Interviewing skills?
16. If you could design a program to help you improve your ability to put motivational interviewing into action what components would you include?
17. What would be the most important thing of all the ones you listed? Why?
18. What would make you actually use this program if it was developed? Why?
19. What would help Quit Line employees accomplish the goal of putting Motivational interviewing into action? What do you think the obstacles would be?
20. Where would you offer this program?
21. Do you think current coaches would use the program? What would be appealing?
22. What do you think is the most important thing we discussed today?
23. Is there anything else you would like to add?

### Immediate Post-Intervention Interview Guide-Article 3

1. How useful was the training at teaching you a new skill? Adding a skill to your tool belt?
2. How useful was the training at showing you how to put MI into action?
3. In your own works how you would describe co-active coaching tools?
4. How confident are you in your ability to put MI into action through co-active tools?
5. How useful do you think co-active coaching tools will be in your calls?
6. What makes co-active coaching tools useful? Different then MI?
7. What makes co-active coaching tools not-useful? The same as what you are already doing?
8. What is the most challenging about using co-active coaching?
9. What are the barriers to using co-active coaching tools? What do they look like?
10. How do the barriers make you feel?
11. How will you handle these barriers?
12. What is easy/the facilitators to using co-active coaching tools? What do they look like?
13. How do the facilitators make you feel?
14. What co-active tools do you think you are most going to use to help smokers?
15. What do you think would be the most important thing of all the ones you listed? Why?
16. What would help coaches to accomplish the goal of putting MI into action?
17. What would the obstacles be? Why do you think these are obstacles?
18. Do you think you are going to use the tools you learned today? Why?
19. What is appealing about the tools you learned today? What is challenging?
20. What do you think is the most important thing we discussed today?
21. Is there anything else you would like to add?

### Post-Intervention Interview Guide-Article 3

1. How useful was the training at teaching you a new skill? Adding a skill to your tool belt?
2. How useful was the training at showing you how to put MI into action?
3. In your own works how you would describe co-active coaching tools?
4. How confident are you in your ability to put MI into action through co-active tools?
5. How useful do you think co-active coaching tools is in your calls?
6. What makes co-active coaching tools useful? Different then MI?
7. What makes co-active coaching tools not-useful? The same as what you are already doing?
8. What is the most challenging about using co-active coaching?
9. What are the barriers to using co-active coaching tools? What do they look like?
10. How do the barriers make you feel?
11. How will you handle these barriers?
12. What is easy/the facilitators to using co-active coaching tools? What do they look like?
13. How do the facilitators make you feel?
14. What co-active tools do you think most help smokers?
15. What do you think would be the most important thing of all the ones you listed? Why?
16. What would help coaches to accomplish the goal of putting MI into action?
17. What would the obstacles be? Why do you think these are obstacles?
18. Do you use the tools you learned at the training? Why?
19. What is appealing about the tools you learned? What is challenging?
20. What do you think is the most important thing we discussed today?
21. Is there anything else you would like to add?

Appendix E  
Ethics Approval Notices

## Western University- Article 2

Western		Use of Human Subjects - Ethics Approval Notice	
<b>Principal Investigator:</b> Dr. J.D. Inwin		<b>Review Level:</b> Expedited	
<b>Review Number:</b> 16763E		<b>Approved Local # of Participants:</b> 48	
<b>Review Date:</b> January 13, 2010			
<b>Protocol Title:</b> A Pilot Project Assessing Motivational Interviewing via Co-Active Life Coaching as an Intervention for Smoking Cessation			
<b>Department and Institution:</b> Health & Rehabilitation Sciences, University of Western Ontario			
<b>Sponsor:</b>			
<b>Ethics Approval Date:</b> January 21, 2010		<b>Expiry Date:</b> September 30, 2011	
<b>Documents Reviewed and Approved:</b> UWO Protocol, Letter of Information and Consent, Letter of Information and Consent, Debriefing Letter. Mass Email.			
<b>Documents Received for Information:</b>			
<p>This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced study on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.</p> <p>The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.</p> <p>During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.</p> <p>Investigators must promptly also report to the HSREB:</p> <ul style="list-style-type: none"><li>a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;</li><li>b) all adverse and unexpected experiences or events that are both serious and unexpected;</li><li>c) new information that may adversely affect the safety of the subjects or the conduct of the study.</li></ul> <p>If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.</p> <p>Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.</p>			
		Chair of HSREB: Dr. Joseph Gilbert FDA Ref. #: IRB 00000940	
<b>Ethics Officer to Contact for Further Information</b>			



Fanshawe College- Article 2



**Fanshawe College Research Ethics Review Board**  
**Approval Notification of Proposed Research**  
 Protocol # 10-03-10-1  
 Involving Staff/Students and/or facilities at Fanshawe College

<b>Principal Researcher(s):</b>	Dr. Jennifer Irwin
<b>Research Protocol Title:</b>	A Pilot Project Assessing Motivational Interviewing via Co-Active Life Coaching as an Intervention for Smoking cessation
<b>Research Project Start Date:</b>	Sept 2010
<b>Expected date of termination:</b>	Sept 2011
<b>Documents Reviewed:</b>	Protocol, Letter of Information, Debriefing Letter, Recruitment Email, Ads, Appendices C,D, E,G, I, J, K, L.

The Research Ethics Board has completed its expedited review of the above Research Proposal and **Approves** the Project.

**Comments and Conditions:**

Please note that the REB requires that you adhere to the protocol reviewed and approved by the REB. The REB must approve any modifications to the protocol before they can be implemented.

Researchers must report to the Fanshawe REB:

- a) any changes which increase the risk to the participants;
- b) any changes which significantly affect the conduct of the study
- c) all adverse and/or unexpected experiences in the course of carrying out the study;
- d) any new information which may adversely affect the safety of the subjects or the conduct of the study.

Researchers must submit a Progress Report annually for all ongoing research projects. In addition, researchers must submit a final report at the conclusion of the project.

**ETHICS APPROVAL DOES NOT CONSTITUTE PERMISSION TO CONDUCT THE RESEARCH, AND APPROVAL FOR CONDUCTING THE PROJECT MUST BE OBTAINED FROM THE DEAN OF THE FACULTY IN WHOSE AREA THE RESEARCH WILL TAKE PLACE, OR IN THE CASE OF COLLEGE WIDE SURVEYS THE OFFICE OF INSTITUTIONAL RESEARCH AND PLANNING.**

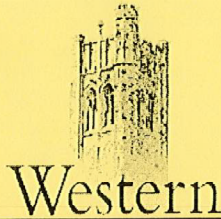
Members of the FCREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the FCREB.

[Signature Box]

Chair, REB  
Fanshawe College

M. ... / 2010  
Date

## Western University- Article 3



### Office of Research Ethics

The University of Western Ontario  
Room 4180 Support Services Building, London, ON, Canada N6A 5C1  
Telephone: (519) 661-3036 Fax: (519) 850-2466 Email: ethics@uwo.ca  
Website: www.uwo.ca/research/ethics

### Use of Human Subjects - Ethics Approval Notice

**Principal Investigator:** Dr. J. Irwin

**Review Number:** 17588E

**Review Level:** Expedited

**Review Date:** November 12, 2010

**Approved Local # of Participants:** 25

**Protocol Title:** Assessing the utility and efficacy of offering motivational interviewing via life coaching through the Smoker's Help Line

**Department and Institution:** Faculty of Health Sciences, University of Western Ontario

**Sponsor:** CIHR-CANADIAN INSTITUTE OF HEALTH RESEARCH

**Ethics Approval Date:** November 24, 2010

**Expiry Date:** November 30, 2011

**Documents Reviewed and Approved:** UWO Protocol, Letter of Information and Consent, Debriefing Form.

#### Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced study on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:

- changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- all adverse and unexpected experiences or events that are both serious and unexpected;
- new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.



Chair of HSREB: Dr. Joseph Gilbert  
FDA Ref. #: IRB 0000940

#### Ethics Officer to Contact for Further Information

<input type="checkbox"/> Janice Sutherland (jsutherf@uwo.ca)	<input type="checkbox"/> Elizabeth Wambolt (ewambolt@uwo.ca)	<input checked="" type="checkbox"/> Grace Kelly (grace.kelly@uwo.ca)
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This is an official document. Please retain the original in your files.

cc: ORE File

## Appendix F

### Letter of Information, Informed Consent, and Debriefing Forms

## Intervention Group-Article 2



### A Pilot Project Assessing Motivational Interviewing via Co-Active Life Coaching as an Intervention for Smoking Cessation

#### **Investigators**

Dr. Jennifer D Irwin, Faculty of Health Sciences, University of Western Ontario

Dr. Don Morrow, Faculty of Health Sciences, University of Western Ontario

#### **Background**

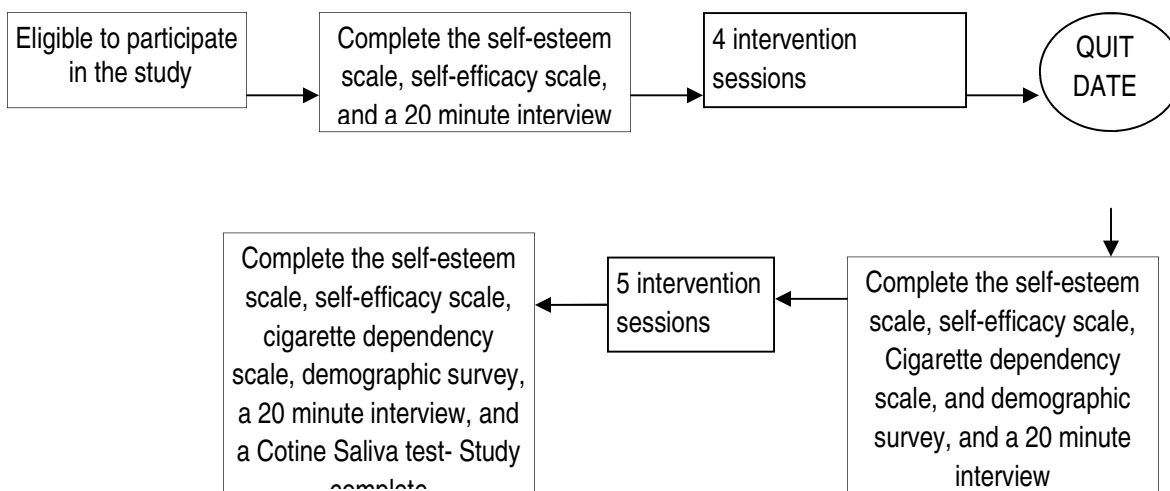
Dr. Irwin and Dr. Morrow are conducting research to determine the effectiveness of Motivational Interviewing put into action through life coaching as an intervention for smoking cessation. If you speak English fluently; are between the ages 19-29; have a high nicotine dependence, operationally defined as a score of 45 or more on the Cigarette Dependency Scale (this scale will be completed at your first screening); have been smoking for a minimum of 6 months; agree to the standard quit date of four weeks into the intervention; and agree to complete a Cotinine saliva test (placing a swab under your tongue for 2 minutes; please note that declining to participate in Cotinine saliva testing does not preclude participation in the full study), then researchers would like to invite you to participate in the study. As far as research shows, Cotinine itself is not harmful. There will be a total of 48 participants in this study.

#### **Possible benefits and risks to you for participating in the study**

There are many benefits associated with quitting smoking namely: medical benefits including improved cardiovascular health; and financial benefits including money saved from cigarettes not purchased. Moreover, quitting smoking helps reduce pollution in our environment. However, there are physical and psychological risks associated with smoking cessation including withdrawal symptoms. Withdrawal symptoms include but are not limited to: stress, fatigue, frustration, sadness, and cravings. Should you experience withdrawal symptoms and would like help please contact the London Distress centre- 519-667-6711; your family physician; and / or a walk-in clinic or emergency department). You may not benefit personally from your participation.

## What will happen in this study?

If you agree to participate you will be assigned a coach and will receive 9 intervention sessions over the telephone lasting approximately 30 minutes. At the beginning of the study you will be asked to complete a series of questionnaires and an interview with the researcher. You will be asked to set a quit date of 4 weeks into the study. At your quit date time you will be requested to complete the questionnaires and an interview again. The study will run for approximately 3 months. At the end of the study you will be asked to complete the questionnaires and interview for a final time. Additionally, at the end of the study you will be asked to complete a Cotinine saliva test. Moreover, past research has shown that Cotinine itself is not harmful. Cotinine is used simply to measure how much tobacco smoke has entered your body. The Cotinine saliva test will consist of placing a swab under your tongue and holding it there for two minutes. The swab will then have all identifying markers removed and sent to Salimetrics lab in Pennsylvania to be analyzed. Salimetrics will not keep any record of your results.



The purpose of the study is to determine the effectiveness of the Coaching at promoting smoking cessation, smoking reduction, increasing self-esteem and self-efficacy, as well as providing insight into the psychological mechanisms associated with smoking and to gain knowledge into the impact coaching has on goal attainment.

## Alternative and your right to withdraw from the study

Your participation in this study is voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time and your data will be destroyed.

### **Confidentiality**

The researchers will keep your identity, comments, written data, questionnaire responses, and Cotinine Saliva tests confidential and secure. The Cotinine samples will be sent off site, to Salimetrics a lab in Pennsylvania with no identifiers that can be traced back to you. The samples are being sent to Salimetrics a lab in Pennsylvania as they are the closest facility capable of analyzing Cotinine saliva tests. The Cotinine saliva swab will be taken off site via the swabs being placed in the storage tube provided by Salimetrics and frozen in a freezer under lock and key. The samples will then be packed in a corrugated cardboard box with an insulating Styrofoam box (provided by Fisher). Dry ice will be placed in the cardboard box followed by several layers of newspaper, then the samples which will be stored in a Ziploc freezer bag. The remaining space in the box will be fixed with crumpled paper and the numbered list will be included in the box. The box will then be shipped via FedEx Priority Overnight service and an e-mail will be sent to Salimetrics informing them the samples are in the mail and a tracking number will be provided. The samples will have all identifiers removed prior to shipping the swabs to Salimetrics and only the Investigator and Co-investigators will have access to the master list. The master list will be securely stored under lock and key. Once Salimetrics has performed analysis the samples will be disposed of. Disposal procedure will include disinfecting the sample with a bleach solution of 1:10 (final dilution) prior to being poured into the sewer system. Proper care and personal protective equipment will be utilized. This method of disposal is in accordance with the Pennsylvania Environmental Protection Agency Regulations (PaDEP). Results from the analysis will be mailed to the researcher via a secure carrier. The data will be retained off-site long enough for the analysis to be run (incubation time of 2 hours).

If the results of the study are published, your name will not be used and no information that discloses you identity will be released or published without your explicit consent to the disclosure.

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to you study-related records to monitor the conduct of the research.

### **Costs and compensation**

There is a \$10 cost per session for participating in this study.

If you would like to receive a copy of the overall results of the study, please put your name on a blank piece of paper and give it to the researcher.

**Contact Person (should you have any further questions about the study)**

Dr. Don Morrow, University of Western Ontario. Phone: XXXXXX

If you have any further questions regarding your rights as a study participant, please contact The Office of Research Ethics at XXXXXX

**This letter is yours to keep. You will also be given a copy of the consent form once it has been signed.**

## Informed Consent Form

I have read the Letter of Information, (have had the nature of the study explained to me) and I agree to participate. All questions have been answered to my satisfaction.

I agree to participate in the study.

\_\_\_\_\_  
(Date)                      (Participant's Name)                      (Participant's Signature)

\_\_\_\_\_  
(Date)                      (Researcher's Name)                      (Researcher's Signature)





## Waitlist Group-Article 2

### A Pilot Project Assessing Motivational Interviewing via Co-Active

#### Life Coaching as an Intervention for Smoking Cessation

#### **Investigators**

Dr. Jennifer D Irwin, Faculty of Health Sciences, University of Western Ontario

Dr. Don Morrow, Faculty of Health Sciences, University of Western Ontario

#### **Background**

Dr. Iriwn and Dr. Morrow are conducting research to determine the effectiveness of Motivational Interviewing put into action through life coaching skills as an intervention for smoking cessation. If you speak English fluently; are between the ages 19-29; have a high nicotine dependence, operationally defined as a score of 45 or more on the Cigarette Dependency Scale (this scale will be completed at your first screening); have been smoking for a minimum of 6 months; agree to the standard quit date of four weeks into the intervention; and agree to complete a Cotinine saliva test (placing a swab under you tongue for 2; please note that declining to participate in Cotinine saliva testing does not preclude participation in the full study), then researchers would like you to invite you to participate in the study. As far as research shows, Cotinine itself is not harmful. There will be a total of 48 participants in this study.

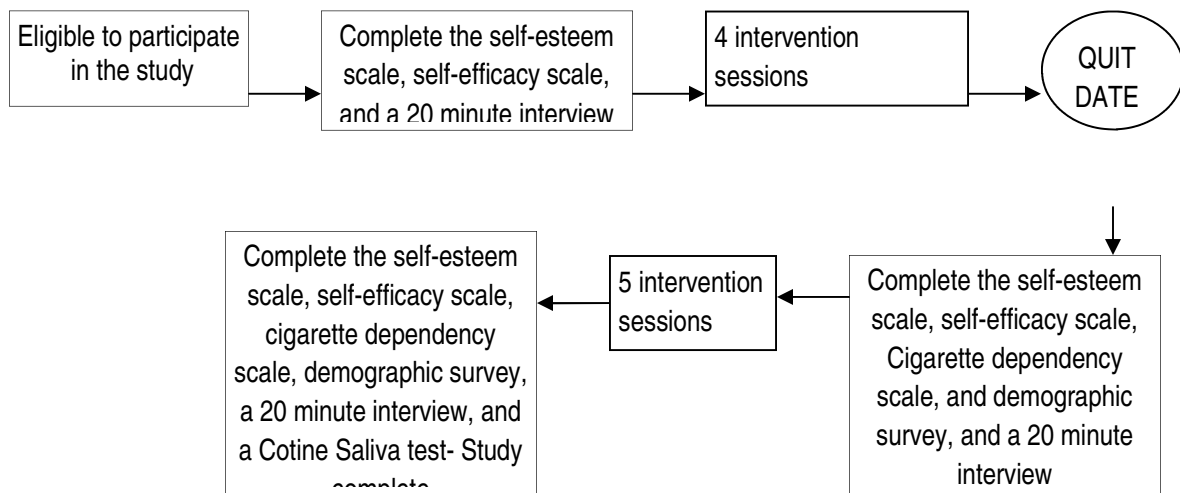
#### **Possible benefits and risks to you for participating in the study**

There are many benefits associated with quitting smoking namely: medical benefits including improved cardiovascular health; and financial benefits including money saved from cigarettes not purchased. Moreover, quitting smoking helps reduce pollution in our environment. However, there are physical and psychological risks associated with smoking cessation including withdrawal symptoms. Withdrawal symptoms include but are not limited to: stress, fatigue, frustration, sadness, and cravings. Should you experience withdrawal symptoms and would like help please contact the London Distress

centre- 519-667-6711; your family physician; and / or a walk-in clinic or emergency department). You may not benefit personally from your participation.

### What will happen in this study?

If you agree to participate you will be assigned a coach and will receive 9 intervention sessions over the telephone lasting approximately 30 minutes. At the beginning of the study you will be asked to complete a series of questionnaires and an interview with the researcher. You will be asked to set a quit date of 4 weeks into the study. At your quit date time you will be requested to complete the questionnaires and an interview again. The study will run for approximately 3 months. At the end of the study you will be asked to complete the questionnaires and interview for a final time. Additionally, at the end of the study you will be asked to complete a Cotinine saliva test. Moreover, past research has shown that Cotinine itself is not harmful. Cotinine is used simply to measure how much tobacco smoke has entered your body. The Cotinine saliva test will consist of placing a swab under your tongue and holding it there for two minutes. The swab will then have all identifying markers removed and sent to Salimetrics lab in Pennsylvania to be analyzed. Salimetrics will not keep any record of your results.



The purpose of the study is to determine the effectiveness of the Coaching at promoting smoking cessation, smoking reduction, increasing self-esteem and self-efficacy, as well as providing insight into the psychological mechanisms associated with smoking and to gain knowledge into the impact coaching has on goal attainment. However, at this time coaches are still in the process of being recruited as such you will be placed on a wait-list until coaches can be recruited.

### Alternative and your right to withdraw from the study

Your participation in this study is voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time and your data will be destroyed.

### **Confidentiality**

The researchers will keep your identity, comments, written data, questionnaire responses, and Cotinine Saliva tests confidential and secure. The Cotinine samples will be sent off site, to Salimetrics a lab in Pennsylvania with no identifiers that can be traced back to you. The samples are being sent to Salimetrics a lab in Pennsylvania as they are the closest facility capable of analyzing Cotinine saliva tests. The Cotinine saliva swab will be taken off site via the swabs being placed in the storage tube provided by Salimetrics and frozen in a freezer under lock and key. The samples will then be packed in a corrugated cardboard box with an insulating Styrofoam box (provided by Fisher). Dry ice will be placed in the cardboard box followed by several layers of newspaper, then the samples which will be stored in a Ziploc freezer bag. The remaining space in the box will be fixed with crumpled paper and the numbered list will be included in the box. The box will then be shipped via FedEx Priority Overnight service and an e-mail will be sent to Salimetrics informing them the samples are in the mail and a tracking number will be provided. The samples will have all identifiers removed prior to shipping the swabs to Salimetrics and only the Investigator and Co-investigators will have access to the master list. The master list will be securely stored under lock and key. Once Salimetrics has performed analysis the samples will be disposed of. Disposal procedure will include disinfecting the sample with a bleach solution of 1:10 (final dilution) prior to being poured into the sewer system. Proper care and personal protective equipment will be utilized. This method of disposal is in accordance with the Pennsylvania Environmental Protection Agency Regulations (PaDEP). Results from the analysis will be mailed to the researcher via a secure carrier. The data will be retained off-site long enough for the analysis to be run (incubation time of 2 hours).

If the results of the study are published, your name will not be used and no information that discloses you identity will be released or published without your explicit consent to the disclosure.

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to you study-related records to monitor the conduct of the research.

### **Costs and compensation**

There is a \$10 cost per session for participating in this study.

If you would like to receive a copy of the overall results of the study, please put your name on a blank piece of paper and give it to the researcher.

**Contact Person (should you have any further questions about the study)**

Dr. Don Morrow, University of Western Ontario. Phone: XXXXXXXXX

If you have any further questions regarding your rights as a study participant, please contact The Office of Research Ethics at XXXXXXXXXX

**This letter is yours to keep. You will also be given a copy of the consent form once it has been signed.**

## Informed Consent Form

I have read the Letter of Information, (have had the nature of the study explained to me) and I agree to participate. All questions have been answered to my satisfaction.

I agree to participate in the study.

\_\_\_\_\_  
(Date)                      (Participant's Name)                      (Participant's Signature)

\_\_\_\_\_  
(Date)                      (Researcher's Name)                      (Researcher's Signature)

## Debriefing Letter

Thank you for your participation in this study. As indicated in the letter of information the purpose of this study was to assess the impact of coaching on smoking cessation, average number of cigarettes smoked per day, self-esteem, self-efficacy, psychological mechanisms of smoking cessation, and the impact on attaining smoking cessation goals.

However, what you were unaware of is that there were two groups and participants were randomly assigned (like the flipping of a coin) to either the Motivational Interviewing group (which was put into action using Life Coaching skills) or a wait-list. The Motivational Interviewing group received coaching sessions from a Certified Profession Co-Active Coach (CPCC) which lasted approximately 30 minutes and they were coached based on the Co-Active Model. Regardless of which group you were assigned to you will have your \$10 fee per session returned to you. Additionally, if you would like the opportunity to seek the coaching services of a CPCC coach here are names and numbers of the coaches utilized during this study:

Coach 1: Phone Number      Coach 2: Phone Number      Coach 3: Phone Number

To properly perform this study we needed participants to be unaware of which group they had been randomly assigned to in order to comparatively assess smoking cessation, number of cigarettes smoked per day, self-esteem, and self-efficacy between the Motivational Interviewing group and the control group.

If you have any questions regarding this study please feel free to ask the researcher at this time, or Dr. Jennifer D Irwin (XXXXXXXXXX).

Thank you again for your participation.

## Article 3

### Letter of information



### Assessing the feasibility and efficacy of offering motivational interviewing via life coaching through the Smokers Help Line

#### Investigators

Dr. Jennifer D Irwin, Faculty of Health Sciences, University of Western Ontario

Dr. Don Morrow, Faculty of Health Sciences, University of Western Ontario

#### Background

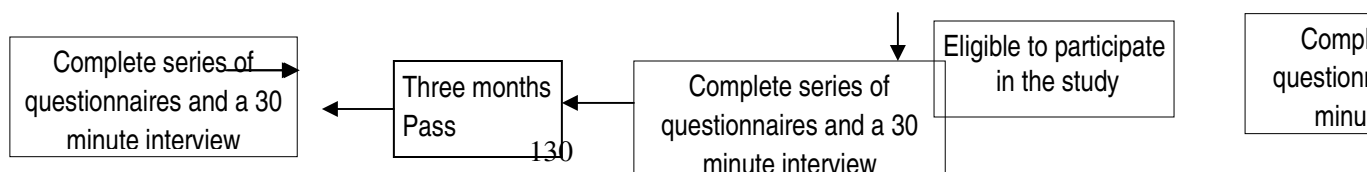
Dr. Irwin and Dr. Morrow are conducting research to determine the effectiveness of Motivational Interviewing put into action through life coaching in the Smokers Help Line. If you are currently a quit smoking coach at the Smokers Help Line, then the researchers would like you to invite you to participate in the study. All quit smoking coaches will be given the opportunity to participate.

#### Possible benefits and risks to you for participating in the study

The main benefit associated with participating is the ability to learn a new tool to facilitate cessation among callers. There are no known risks associated with participation in the study and you may not benefit personally from your participation. Participation in this study and any responses or information disclosed will not impact your employment in any way.

#### What will happen in this study?

If you agree to participate you will be asked to complete a series of questionnaires and an interview with the researcher lasting approximately 30 minutes. Subsequently you will receive Motivational Interviewing Training via Co-Active Life Coach tools by two certified professional co-active coaches lasting approximately 8 hours. Immediately following the training you will be asked to completed a series of questionnaires and an interview as well as 3 months following the training. This study will run approximately 4 months.



The purpose of the study is to determine the utility and effectiveness of the Motivational Interviewing put into Action through Co-Active Coaching tools at the Smokers Help Line.

**Alternative and your right to withdraw from the study**

Your participation in this study is voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time and your data will be destroyed.

**Confidentiality**

The researchers will keep your identity, comments, written data, questionnaire responses, and interviews confidential and secure.

If the results of the study are published, your name will not be used and no information that discloses your identity will be released or published without your explicit consent to the disclosure.

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research.

**Costs and compensation**

There is no cost associated with participating in this study.

At the three-month follow-up assessment participants will be provided with a \$25.00 gift as a token of appreciation for participating in this study.

If you would like to receive a copy of the overall results of the study, please put your name on a blank piece of paper and give it to the researcher.

**Contact Person (should you have any further questions about the study)**

Dr. Don Morrow, University of Western Ontario. Phone: XXXXXXXX

If you have any further questions regarding your rights as a study participant, please contact The Office of Research Ethics at XXXXXXXX

**This letter is yours to keep. You will also be given a copy of the consent form once it has been signed.**



## Informed Consent Form

I have read the Letter of Information, (have had the nature of the study explained to me) and I agree to participate. All questions have been answered to my satisfaction.

I agree to participate in the study.

---

(Date)

---

(Participant's Name)

---

(Participant's Signature)

---

(Date)

---

(Researcher's Name)

---

(Researcher's Signature)

### Debriefing Letter

Thank you for your participation in this study. As indicated in the letter of information the purpose of this study was to assess the feasibility and efficacy of offering motivational interviewing via life coaching through the Smokers Help Line by looking at your level of perceived confidence at implementing MI prior to the training and after the training.

If you have any questions regarding this study please feel free to ask the researcher at this time, or Dr. Jennifer D Irwin (XXXXXXX).

Thank you again for your participation.

## Appendix H

### Co-Active Coaches Recruitment Post

## Co-Active Coaches Recruitment Post

Dear Coach,

My name is Tara Mantler and I am looking for CPCC Coaches who are willing to take on clients pro-bono in an upcoming smoking cessation study that is being conducting with Dr. Morrow and Dr. Irwin at the University of Western Ontario. I will have 40 participants in need of coaches, 20 in late September to early October and another 20 in January. These participants will need to receive 3 coaching sessions per month for 3 months (30 minutes sessions).

There are several benefits to coaching for this study including the participants may decide to continue on with coaching after the study which would then become between you and the participant. Additionally, coaching for this study would offer you the opportunity to expand your business to a demographic previously unknown to you.

My involvement in the coaching is limited to pairing you with the client. Other than that I have no involvement in the coaching sessions.

I am looking for the fewest number of coaches possible to coach the 40 participants. If you are interested or would like more information please feel free to contact me at (phone number) or via e-mail at XXXXXXXX

Many thanks,

Tara Mantler

Appendix I  
Demographic Questionnaire

Article 2

Please complete the following questionnaire:

1. Gender                    Male / Female
2. Age \_\_\_\_\_
3. Do you speak English proficiently?                    Yes / No
4. Average number of cigarettes smoked per day                    \_\_\_\_\_
5. At what age did you start smoking?                    \_\_\_\_\_
6. How many attempts to quit smoking have you made?                    \_\_\_\_\_
7. Are you willing to set a quit date of 4 weeks into the intervention?                    Yes / No
8. What is the longest period of time you have quit smoking for?                    \_\_\_\_\_
9. Highest education level achieved
  - Some high school                    \_\_\_\_\_
  - High school                    \_\_\_\_\_
  - Some University                    \_\_\_\_\_
  - University                    \_\_\_\_\_
  - Some Graduate School                    \_\_\_\_\_
  - Graduate School                    \_\_\_\_\_
10. Are you willing to complete a Cotinine Saliva test?                    Yes / No

(Declining to participate in Cotinine saliva testing does not preclude participation in the full study)

### Article 3

1. Gender                    Male /        Female
2. Age                    \_\_\_\_\_
3. Length of time working for Smokers Help Line \_\_\_\_\_
4. Total length of time working for quit lines \_\_\_\_\_
5. Total number of previous trainings in Motivational Interviewing \_\_\_\_\_
6. Highest level of educational achieved    a) Some High school  
    b) High school  
    c) Some University/College  
    d) University/College  
    e) Post graduate work

Appendix J  
Cigarette Dependency Scale



Cigarette Dependence Scale (CDS-12)

1. Please rate your addiction to cigarettes on a scale of 0 to 100, with 0 = I am NOT addicted to cigarettes at all, and 100 = I am extremely addicted to cigarettes

\_\_\_\_\_

2. On average, how many cigarettes do you smoke each day  
cig/day

\_\_\_\_\_

3. Usually, how soon after waking up do you smoke your first cigarette?  
\_\_\_\_\_ minutes

4. For you, quitting smoking for good would be:

Impossible    Very difficult    Fairly difficult    Fairly easy    Very easy

*Please indicate whether you agree with each the following statements:*

5. After a few hours without smoking I feel an irresistible urge to smoke

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

6. The idea of not having any cigarettes causes me stress

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

7. Before going out, I always make sure that I have cigarettes with me

Totally disagree  
Somewhat disagree  
Neither agree nor disagree

Somewhat agree  
Fully agree

8. I am a prisoner of cigarettes

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

9. I smoke too much

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

10. Sometimes I drop everything to go out and buy cigarettes

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

11. I smoke all the time

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

12. I smoke despite the risks to my health

Totally disagree  
Somewhat disagree  
Neither agree nor disagree  
Somewhat agree  
Fully agree

\*\* Scoring is completed by adding up the score column. A score over 40 represents high nicotine dependence.

Source: Etter, Houezec, & Perneger, (2003)

Appendix K  
Cotinine Saliva Test Information

## Cotinine Saliva Test Information

**Q** What is cotinine?

**A.** Cotinine [COAT-e-noon] is a chemical that is made by the body from nicotine, which is found in cigarette smoke. Since cotinine can be made only from nicotine, and since nicotine enters the body with cigarette smoke, cotinine measurements can show how much cigarette smoke enters your body.

**Q** Is cotinine harmful?

**A.** As far as we know, cotinine itself is not harmful. Cotinine is used simply to measure how much tobacco smoke has entered your body. However, many studies show that some of the 4,000 other chemicals found in tobacco smoke are harmful.

**Q** Why should I have a cotinine test?

**A.** If you are serious about stopping or reducing your smoking, or if you are interested in the amount of smoke that has entered your body, this test can be very useful. By knowing what your starting level of cotinine is, you can see how successful your efforts to stop smoking are.

**Q** How is cotinine measured?

**A.** A simple laboratory test can measure cotinine in blood, urine, or saliva.

**Q.** Why don't you just ask how much I smoke?

**A.** Smoking behavior varies. For example, two people could each smoke a pack of cigarettes a day. One may smoke unfiltered cigarettes, inhaling deeply with each puff, while the other may smoke a low tar, filtered cigarette, puffing lightly and smoking only half of each cigarette. The cotinine test would be able to show a difference in the amount of cigarette smoke entering the bodies of these two smokers.

**Q.** How much cotinine is normal?

**A.** People who do not smoke or who are not exposed to other peoples' smoke should not have measurable cotinine. People who do smoke will have a cotinine level of 10 or higher in their blood, and a typical smoker has levels of 150 to 450 units. Levels in urine are ten times higher.

**Q.** How can I reduce my cotinine?

**A.** The only way to reduce your cotinine level is to stop or reduce your exposure to cigarette smoke.

**Q.** How long should it take for me to see a drop in my cotinine level if I stop smoking today?

**A.** Depending on how high your level is to begin with, your level could drop to that of a nonsmoker in 7 to 10 days.

**Q.** If I stop smoking, then start again, how soon will cotinine show up in my body?

**A.** Laboratory testing will detect cotinine within hours after you've had a cigarette.

**Q** If I switch to a low nicotine cigarette, will my cotinine level drop?

**A.** It might, but it depends on how you smoke low nicotine cigarettes. To satisfy a craving for nicotine, some people smoke more low nicotine cigarettes than they would regular cigarettes, and their cotinine level may actually increase.

**Q** Do nicotine patches, gum, or aerosols have an effect on cotinine levels?

**A.** Because they all use nicotine, these devices can increase cotinine levels. If you are having a cotinine test, make sure that you mention on the lab slip that you are using nicotine replacement products.

**Q** What about other people's smoke? Won't my cotinine level increase if I breathe other people's smoke?

**A.** If you breathe a lot of cigarette smoke even though you yourself don't smoke, your cotinine level may be higher than that of a non-smoker. If so, you should try to avoid places where there is a lot of smoke.

**Q** How can I stop smoking?

There are many different ways to stop smoking, but there is no one way that's best for everybody. The cotinine test will help you to measure the success of whatever way you try. Ask your doctor for advice, or contact organizations that are experienced in helping people give up cigarettes.

Source: Foundation for Blood Research (2008).  
<http://www.fbr.org/publications/pamphlets/cotinine.html>

Appendix L

Rosenberg's Self-Esteem Scale

### Rosenberg's Self-Esteem Scale (RSE)

Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**

- |  |    |   |   |    |
|--|----|---|---|----|
| 1. On the whole, I am satisfied with myself.                                     | SA | A | D | SD |
| 2. At times, I think I am no good at all.  | SA | A | D | SD |
| 3. I feel that I have a number of good qualities.                                | SA | A | D | SD |
| 4. I am able to do things as well as most other people.                          | SA | A | D | SD |
| 5. I feel I do not have much to be proud of.                                     | SA | A | D | SD |
| 6. I certainly feel useless at times.  | SA | A | D | SD |
| 7. I feel that I'm a person of worth, at least on an equal plane<br>with others. | SA | A | D | SD |
| 8. I wish I could have more respect for myself.                                  | SA | A | D | SD |
| 9. All in all, I am inclined to feel that I am a failure.                        | SA | A | D | SD |
| 10. I take a positive attitude toward myself.                                    | SA | A | D | SD |

\*\* Scoring: SA = 3, A = 2, D = 1, SD = 0. Questions numbered 2,5,6,8,9 are reversed scored. The sum of the 10 items is used to determine self-esteem with higher scores meaning higher self-esteem.

Source: Rosenberg, 1965



Appendix M  
Smoking Self-Efficacy Questionnaire

### Smoking Self-Efficacy Questionnaire (SEQ)

The following are some situations in which certain people might be tempted to smoke. Please indicate how much you are *tempted* to smoke in each situation.

1. When I feel nervous.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

2. When I feel depressed.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

3. When I am angry.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

4. When I feel very anxious.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

5. When I want to think about a difficult problem.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

6. When I feel the urge to smoke.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

7. When having a drink with friends.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

8. When celebrating something.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

9. When drinking beer, wine or other spirits.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

10. When I am with smokers.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

11. After a meal.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

12. When having coffee or tea.

Not at all tempted   Not very tempted   Somewhat tempted   Very tempted   Extremely tempted

\*\* Questions 1-6 speak to internal stimuli impacted self-efficacy and questions 7-12 speak to external stimuli impacting self-efficacy.

Source: Etter, Bergman, Humair, & Perneger, 2000

Appendix N  
Self-Perceived Competence Scale

### Self-Perceived Competence for Facilitating Behaviour Change

Please respond to each of the following items in terms of how true it is for you with respect to dealing with facilitating behaviour change among your patients in daily clinical practice. Use the scale:

**1. I feel confident in my ability to effectively facilitate behaviour change among smokers.**

1	2	3	4	5	6	7
not at all true		somewhat true				very true

**2. I am capable of facilitating behaviour change among smokers.**

1	2	3	4	5	6	7
not at all true		somewhat true				very true

**3. I have the skills necessary to help smokers change their behaviour**

1	2	3	4	5	6	7
not at all true		somewhat true				very true

**4. I feel able to meet the challenge of communicating with smokers effectively to facilitate behaviour changes.**

1	2	3	4	5	6	7
not at all true		somewhat true				very true

**5. I have confidence that I can effectively facilitate behavior change among smokers who are currently non-compliant with health behavior recommendations.**

1	2	3	4	5	6	7
not at all true		somewhat true				very true

*Adapted From: Perceived Competence for Diabetes (Williams, Freedman & Deci, 1998)*

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Curriculum Vitae  
Tara Mantler

## **Tara Mantler, MSc, PhD (candidate)**

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### **Education**

- 2009- Present  
(Projected Graduation: August, 2013)      PhD, (Candidate), Health Promotion  
Faculty of Health Sciences, Western University
- 2007-2009      MSc, Health Promotion  
Faculty of Health Sciences, Western University
- 2003-2007      BHSc, Honours Specialization in Health Sciences/  
Major in Psychology  
Faculty of Health Sciences, Western University

### **Theses**

- Mantler, T. (In Progress). Assessing the impact of motivational interviewing via co-active life coaching on tobacco control. Western University, London, Ontario, Canada.
- Mantler, T. (2009). Assessing the impact of co-active life coaching as an intervention for smoking cessation: A demonstration study. Master of Science Thesis. University of Western Ontario, London, Ontario, Canada.

### **Teaching Experience**

- 2013      Lecturer: Social Determinants of Health (HS1002B- Intercession May-June 2013)  
Registered: 36
- 2010-2013      Teaching Assistant: Advanced Health Promotion at The University of Western Ontario (HS4200G)
- 2012      Guest Lecturer: HS3290B - Special Topics in Health Promotion - The Psychology of Lifestyle  
*Presented: Tobacco Control: Health Promotion*
- 2011      Guest Lecturer: Advanced Health Promotion (HS 4200G)  
*Presented: Assessing the impact of co-active life coaching as an intervention for smoking cessation: A demonstration Study*
- 2010      Guest Lecturer: Models and Theories in Health Sciences at The University of Western Ontario (HS 2250)  
*Presented: Motivational interviewing, co-active coaching, and smoking cessation*
- 2009      Teaching Assistant: Health Promotion at The University of Western Ontario (HS 2250)
- 2009-2012      Guest Lecturer: Health Promotion at The University of Western Ontario (HS4091A)  
*Presented: Assessing the impact of co-active life coaching as an intervention for smoking cessation: A demonstration Study*
- 2008      Teaching Assistant: Anatomy
- 2007      Teaching Assistant: Communication Sciences Disorders

### **Research Employment**

2012-Present	<p>Research Assistant (Dr. Irwin) Western University</p> <ul style="list-style-type: none"> <li>• Sakai website development/maintenance</li> <li>• Marks management for undergraduate course</li> </ul>
2010-Present	<p>Research Assistant (Dr. Ford-Gilboe) Western University</p> <ul style="list-style-type: none"> <li>• EQUIP protocol development</li> <li>• Literature search</li> <li>• iHEAL project coordination</li> </ul>
2009- Present	<p>Research Coordinator (Dr. McWilliam) Western University</p> <ul style="list-style-type: none"> <li>• Literature searches</li> <li>• SPSS database creation</li> <li>• SPSS basic analysis</li> <li>• ‘Testing a Model’ years 2 and 3 project coordination</li> </ul>

## **Publications**

*Lifetime Summary of Publications, Conferences and Honours/Awards:*

Articles in Peer Reviewed Journals: 5  
 Articles in Press: 0  
 Articles Under Review: 3  
 Articles in Preparation: 2  
 Chapters in Books: 1  
 Presentations at Conferences: 3  
 Presentations at Student Meetings: 2  
 Academic Honours/Awards: 10

### *Articles in Peer Reviewed Journals*

- Mantler, T.,** Irwin, J., & Morrow, D. (2013). The experience and impact of motivational interviewing-via-coaching tools on national smokers’ telephone hotline employees. *International Journal of Evidence Based Coaching and Mentoring*, 11(1), 55-68.
- Mantler, T.** (2012) A systematic review of youths’ perceptions of addiction and health risks associated with smoking: Utilizing the framework of the health belief model. *Addiction, Research & Theory*, DOI:10.3109/16066359.2012.727505.
- Mantler, T.,** Irwin, J.D., & Morrow, D. (2012). Motivational interviewing and smoking behaviors: A critical appraisal and literature review of selected cessation initiatives. *Psychological Reports*, 110(2), 445-460.
- Mantler, T.,** Irwin, J.D., & Morrow, D. (2010). Assessing motivational interviewing through co-active life coaching tools as a smoking cessation intervention. *International Journal of Evidence Based Coaching and Mentoring*, 8(2), 49-63.
- Walter J., MacMillan B., Chou Q., Wasser N., **Scott T.,** Kawa S., & King H. (2007). Optimal Surgical Management of Early Onset Pelvic Organ Prolapse. *Journal of Obstetrics and Gynaecology Canada*, 29(6): S19-S26.

\*Note: nee Scott



*Papers Under Review*

- Mantler, T.** Smokers and identity perceptions: A systematic appraisal regarding cessation implications (Submitted January 2013). SageOpen.
- McWilliam, C., Ward-Griffin, C., Higuchi, K., Vingilis, E., Stewart, M., **Mantler, T.**, & Gao, R. An evaluation of the effectiveness of engaging clients as partners in in-home care (Submitted January 2013). Health and Social Care in the Community.
- Mantler, T.**, Irwin, J., Morrow, D., Hall, C., & Mandich, A. Assessing the impact of motivational interviewing via co-active life coaching on selected tobacco cessation outcomes among young adults. (Submitted January 2013). Addiction Research and Theory.

*Papers in Preparation*

- Ford-Gilboe, M., Wuest, J., Varcoe, J., **Mantler, T.**, & Noh, M. Rural-urban comparisons in health, intimate partner violence, and help seeking: Analysis of a Canadian community sample of women who have left their abusive partner. In Preparation for Health & Place.
- Ford-Gilboe, M., Wuest, J., Varcoe, J., **Mantler, T.**, & Hammerton, J. Initial testing of the intervention for health enhancement after leaving (iHEAL): feasibility, acceptability, and efficacy. In Preparation for Journal of Family Violence.

*Chapters in Books*

- Mantler, T.** (2012). Toward a Tobacco Free Self and Society, In Insel, P. M., Roth, W. T., Irwin, J. D., & Burke, S. M. (2012) Core Concepts in Health: Canadian edition. Oshawa, ON: McGraw-Hill Ryerson.

*Presentation at Conferences*

- Mantler, T.**, Irwin, J.D., & Morrow, D. (June 2013). Assessing the Perceived Impact of Offering Motivational Interviewing via Co-Active Life Coaching Training to Participants of a National Smokers' Telephone Hotline. Canadian Public Health Association 2013 Annual Conference. June 9-12, 2013, Ottawa, Ontario. Poster presentation (Accepted)
- Mantler, T.**, Irwin, J.D., Morrow, D., Hall, C., & Mandich, A. (June 2013). Assessing the Impact of Motivational Interviewing via Co-Active Life Coaching on Selected Smoking Cessation Outcomes among Young Adults Canadian Public Health Association 2013 Annual Conference. June 9-12, 2013, Ottawa, Ontario. Poster presentation (Accepted).
- Mantler, T.**, Irwin, J.D., & Morrow, D. (Feb 2013). Assessing the Perceived Impact of Offering Motivational Interviewing via Co-Active Life Coaching Training to Participants of a National Smokers' Telephone Hotline. [The 5th Annual Ottawa Conference: State of the Art Clinical Approaches to Smoking Cessation.](#) February 1<sup>st</sup>, 2013, Ottawa, Ontario. Poster presentation.
- Mantler, T.**, Irwin, J.D., Morrow, D., Hall, C., & Mandich, A. (Feb 2013). Assessing the Impact of Motivational Interviewing via Co-Active Life Coaching on Selected Smoking Cessation Outcomes among Young Adults The [5th Annual Ottawa Conference: State of the Art Clinical Approaches to Smoking Cessation.](#) February 1<sup>st</sup>, 2013, Ottawa, Ontario. Poster presentation.
- Ford-Gilboe, M., Dietrich, P., **Mantler, T.**, Hammerton, J., Wathen, N., Wuest, J., Merritt-Gray, M. (2012). Initial testing of the intervention for health enhancement after leaving (i-HEAL): Feasibility, acceptability, and efficacy. STTI Iota Omicron Chapter 25<sup>th</sup> Annual Research Conference. May 4, 2012. London, Ontario. Oral Presentation.

McWilliam, C., Higuchi, K., Ward-Griffin, C., Vingilis, E., Stewart, M., Ferguson, K. & **Mantler, T.** (2010). Evaluation of a relational health promotion approach. International Union of Health Promotion and Education, World Congress on Health Promotion, Geneva, Switzerland, July 11-15, 2010.

**Mantler T.**, Morrow D, & Irwin JD. (2008) Assessing the impact of co-active coaching as an intervention for smoking cessation in adults. Ontario Tobacco Research Unit's conference on Tobacco Control for the 21st Century: Challenges in Research and Evaluation. November 10-12, 2008. Toronto, Ontario. Poster presentation.

#### *Presentations at Student Meetings*

**Mantler, T.**, Irwin, J.D., & Morrow, D. (March 2013). Assessing the Perceived Impact of Offering Motivational Interviewing via Co-Active Life Coaching Training to Participants of a National Smokers' Telephone Hotline. Faculty of health Sciences Research Day. March 13, 2013, London, Ontario. Poster presentation

**Mantler, T.**, Irwin, J.D., Morrow, D., Hall, C., & Mandich, A. (March 2013). Assessing the Impact of Motivational Interviewing via Co-Active Life Coaching on Selected Smoking Cessation Outcomes among Young Adults. Faculty of health Sciences Research Day. March 13, 2013, London, Ontario. Poster presentation

McWilliam, C., Ward-Griffin, C., Stewart, M., Higuchi, K., Hoch, J., Ferguson, K., **Mantler, T.**, & SW CCAC Home Care Research Collaboration (2011). Testing a relational health promotion approach for optimizing chronically ill seniors' health through partnering in their in-home care. Faculty of Health Sciences Research Day. March 25<sup>th</sup>, 2011. London, Ontario. Poster Presentation.

**Mantler, T.**, McWilliam, C., Higuchi, K., Ward-Griffin, C., Stewart, M., Vingilis, E., et al. (2010). Testing a model to engage clients as partners in home-care. Faculty of Health Sciences Research day. March 22, 2010. London, Ontario. Poster presentation.

#### **Awards**

2013	HRS Student Travel Award (\$400)
2013	FHS Student Travel Award (\$400)
2013	CIHR Travel Award (\$1,500)
2012-2013	Ontario Graduate Research Award (\$15,000)
2011-2012	Ontario Graduate Research Award (\$15,000)
2010-2011	CIHR Training Grant in Population Intervention for Chronic Disease Prevention: A Pan-Canadian Program (\$17,850)
2010-2011	Graduate Thesis Research Award (\$670)
2009-2010	Graduate Bursary (\$23,700)
2008-2009	Ontario Graduate Scholarship in Science and Technology (\$15,000)
2007-2008	Graduate Bursary (\$15,000)
2003-2007	Queen Elizabeth the Second Aiming for the Top Scholarship (\$14,000)
2003-2007	Dean's Honor List