Group Cohesion in

Substance Abuse Treatment

by

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Abstract

The purpose of this study was to contribute to research on group cohesion among patients attending treatment for their substance abuse. Participants (N = 102) were recruited from a residential substance abuse treatment facility and assessed for group cohesion using the Group Climate Questionnaire in relation to symptom improvement. Patients' mental health concerns and severity of distress significantly improved pre- to post-treatment. However, group cohesion did not predict treatment outcome. Hierarchical linear modeling revealed a positive relationship between linear change in Conflict over time and pre- to post-treatment change in severity of distress. Participants with greater linear change in-group conflict had greater change in severity of distress. A second analysis using regression was used to determine if treatment change could be predicted by group cohesion, client and treatment factors. The result was a 5-factor model that accounted for 56% of variance in patients' residual change with regard to severity of distress. The 5-factor model did not significantly predict treatment change in mental health concerns.

Preface

This thesis is an original work by Brenda Noreen Maire. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Group Cohesion," No. Pro00026951, Date April 4, 2012.

Dedication

To my husband Mark

and my children Jordan and Amelia.

Thank you for filling my life with love.

Acknowledgement

This thesis would not have been possible without the support of many people. I am indebted to the patients and staff at the Henwood Treatment Centre; they shared their stories and lifted my spirit. I am deeply moved by the staff's dedication to improving the lives of others and by the patients' will to recover.

I would like to express my deepest appreciation to my supervisor, Anthony S. Joyce, whose sharp eye and keen wit helped to make sense of any confusion I may have felt during this process. His high standard with regard to research and scholarship is valued. Special gratitude to Andrew Greenshaw who helped me see this out to the end and to the members of my committee.

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List of Abbreviations

DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders, 4th Edition Text Revision
AA	Alcohol Anonymous
APA	American Psychiatric Association
ASI-Lite	Addiction Severity Index Lite-Veterans Administration Version
BSCQ	Brief Situational Confidence Questionnaire
CAI	Community Assessment Inventory
CPP	Comparative Psychotherapy Process Scale
GCQ	Group Climate Questionnaire
GES	Social Group Environment
CMRS	Circumstances, Motivation, Readiness, Suitability
HLM	Hierarchical Linear Modeling
MET	Motivational Enhancement Therapy
TCS	Target Complaints Scale

List of Symbols

α	Alpha
β	Beta
b	Slope of least squares regression line.
M	Mean or average
N	Number of participants in the total sample
n	Number of participants in a portion of the sample
OR	Odds ratio
p	Probability value
R^2	r-squared
SE	Standard error
SD	Standard deviation
t	t-test
X^2	Chi-squared

Research on substance use disorder has made significant advances in establishing the efficacy of treatment (Galanter, Kleber & Brady, 2015) and identifying client factors that affect treatment outcome (Adamson, Sellman, & Frampton 2009). Yet, discontinuities remain between the methodologically rigorous, manualized treatment studies and 'real world treatment' (Wendt, 2015). Perhaps the most significant gap is that despite the fact that the vast majority of treatment for substance use disorder is provided in a group setting (Sobel, Sobel & Agrawal, 2009; Weiss, Jaffee, Menil & Cogley, 2004), research is predominantly individual therapy focused (Brook, 2015; Washington, 2015). In addition, it remains unclear what group therapeutic processes contribute to recovery from substance use disorder. Group psychotherapy theory (Yalom & Leszcz, 2005) does make specific reference to clients with substance use disorder and suggests that group processes may be particularly salient with this population. For example, it has been proposed that interpersonal interactions that provide clients an opportunity to practice altruism may have a significant impact on a stigmatized population, such as those diagnosed with substance use disorder (Yalom & Leszcz, 2005). This thesis attempted to contribute to this by examining the group process 'cohesion'. Group cohesion is the bond between clients that is thought to elicit therapeutic process (Ezquerro, 2010). Among patients attending residential treatment for substance use disorder the project described in this thesis investigated the impact group cohesion has on clients' recovery from substance abuse disorder.

Substance Use

The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-V) diagnostic criteria and codes include substance-related and addictive disorders. This category includes 10 classes of drugs and gambling; other behavioural additions are not included. Four groups of criteria define the

diagnosis of a substance use disorder. The presence of two to three criteria results in a diagnosis of mild substance use disorder, four to five a diagnosis of moderate substance use disorder and six or more a diagnosis of severe substance use disorder. The diagnostic criteria are as follows:

1. *Impaired control over substance use*:

    Criterion 1 - *The individual may take the substance in larger amounts or over a longer period than was originally intended.*

    Criterion 2 - *The individual may express a persistent desire to cut down or regulate substance use and may report multiple unsuccessful efforts to decrease or discontinue use*

    Criterion 3 – *In some instances of more severe substance use disorders, virtually all of the individual's daily activities revolve around the substance*

    Criterion 4 – *Craving is manifested by an intense desire or urge for the drug that may occur at any time but is more likely when in an environment where the drug previously was obtained or used.*

2. *Social impairment*

    Criterion 5 – *Recurrent substance use may result in a failure to fulfill major role obligations at work, school, or home.*

    Criterion 6 – *The individual may continue substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance.*

Criterion 7 - *Important social, occupational, or recreational activities may be given up or reduced because of substance use*

3. *Risky use of the substance*

Criterion 8 - *This may take the form of recurrent substance use in situations in which it is physically hazardous*

Criterion 9 - *The individual may continue substance use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance*

4. *Pharmacological criteria*

Criterion 10 – *Tolerance is signaled by requiring a markedly increased dose of the substance to achieve the desired effect or a markedly reduced effect when the usual dose is consumed.*

Criterion 11 - *Withdrawal is a syndrome that occurs when blood or tissue concentrations of a substance decline in an individual who had maintained prolonged heavy use of the substance.*

(American Psychological Association (APA), 2013, Section II Substance-Related and Addictive Disorders)

The Canadian Tobacco, Alcohol and Drugs Survey (CTADS) conducted in 2013 interviewed 14,565 respondents aged 15 years or older in 10 provinces. In

the 12 months prior to the survey, 11% of Canadians interviewed reported cannabis use and 2% reported using at least one of the following illicit drugs: cocaine or crack, speed, ecstasy, hallucinogens or heroin. Illicit use of drugs including cannabis, was higher for males (14%) than females (8%) and varied by age, with greater use among respondents 15 to 19 (23%) and 20 to 24 (27%). In 2013, 11% reported smoking daily and 4% reported occasional smoking. The prevalence of alcohol was reported according to Canada's alcohol drinking guidelines. 21% reported exceeding the guideline for low risk chronic drinking which is no more than 10 drinks per week and 2 drinks per day for women and no more than 15 drinks per week and 3 drinks per day for men. 15% reported exceeding the guideline for low risk acute drinking which is no more than 3 drinks for women and 4 drinks for men on any single occasion (Canadian Centre on Substance Abuse, 2013).

Substance Abuse Treatment

Today, there is are broad range of psychotherapy approaches used for treating substance abuse (Miller, Wilbourne, & Hettema, 2003) that demonstrate at least a modest positive effect on substance abuse outcomes and other domains of life functioning (Imel, Wampold, Miller & Fleming, 2008; Knapp, Soares, Farrell & Silva de Lima, 2007; Project MATCH Research Group, 1997). These therapies include motivational interviewing, cognitive behavioural therapy, contingency management, community reinforcement, behavioural therapies, marital therapy, behavioural social skills training, and twelve-step facilitation, among others (Magill & Ray, 2009; Knapp et al., 2007; Miller et al., 2003; Miller). Positive outcomes for substance abuse treatment have been reported across different settings, such as day treatment, therapeutic communities, community-based treatment and inpatient treatment (Galanter, Kleber & Brady, 2015). Positive outcomes have also

been reported for different treatment modalities, such as individual therapy, family treatment and brief interventions (Galanter & Kleber, 2008; Elzerbi, Donoghue & Drummond, 2015).

In addition, research has identified patient-related factors that explain differential effects of substance abuse treatment. Specific patient traits can significantly impact treatment progress and recovery. For example, prevalence of substance use varies significantly between men and women as does the rate of co-occurring psychiatric disorders (Brady & Maria, 2015). McKay and Weis' (2001) meta-analysis of 12 randomized controlled studies found that an individual's pre-treatment level of substance use, psychiatric severity, motivation and coping significantly predict subsequent treatment outcome. A more recent meta-analysis by Adamson, Sellman, and Frampton (2009), conducted on 63 published studies, found the most consistent predictors of treatment outcome were: dependence severity, self-reported and clinician psychopathology ratings, alcohol-related self-efficacy, motivation, and patient- identified treatment goals. In their analysis, Adamson et al. (2009) also found that gender and pre-treatment alcohol use, when combined into a multivariate analysis incorporating other predictors, had much less influence on treatment outcome.

Using hierarchical modeling, Ghose (2008) examined how organizational, treatment, and patient variables contributed to outcome. Factors that significantly increased post-treatment use included patient preference for marijuana (OR[1] = 4.5), cocaine (OR = 3.8) or heroin (OR = 3.6), committing an offence during

[1] The odds ratio provides the odds of post treatment substance use given the presence of a factor, compared to the odds in the absence of a factor. For example, individuals who indicate a preference for marijuana were 4.5 times more likely to use substances post treatment than those who did not have a preference for marijuana.

treatment (OR = 2.7), and intravenous drug use (OR = 2.3). Alternatively, factors that decreased the risk of post-treatment substance use included age (older patients were less likely to use after treatment) and facility accreditation. In general, this research has established that specific patient factors can affect one's recovery from substance abuse disorder during treatment.

Group Therapy

The American Psychiatric Association treatment guidelines identify group counselling as an integral and valuable part of substance abuse treatment that is comparable in effectiveness to individual counselling (APA, 2006). Group therapy is widely used for the treatment of substance use disorder (Wendt, 2015, Sobel, Sobel & Agrawal, 2009; Brook, 2015; Washington, 2015, Centre for Substance Abuse Treatment, 2005). Wendt (2015) surveyed 566 clinicians in the United Sates who facilitated substance use disorder groups. He found that open groups were predominant and session time varied considerably between respondents. In terms of therapeutic approach, there was high utilization of motivational interviewing and cognitive behavioural therapy; however, clinicians also reported varying use of individual practices and moderate use of less-effective practices.

A meta-analysis by Weiss et al., (2004) identified 24 treatment outcome studies assessing the effectiveness of group counselling for substance use disorders. Three specific findings that were identified by Weiss et al. (2004) were that: 1) specialized group counselling increased the effectiveness of treatment; 2) there were no differences in effectiveness between group counselling and individual counselling; and 3) there were few differences when a variety of group therapies were compared, and no specific type of group counselling emerged as being better than any other type. Sobell and Sobell (2009) compared the delivery of substance abuse treatment in a group versus individual format. They found no

significant differences between the two delivery methods in post treatment outcome. The researchers found that clients attending treatment in a group-based setting reported higher levels of cohesiveness and engagement, less interpersonal conflict and avoidance. In addition, they found that the group-based approach was less resource intensive, requiring substantially less therapist time.

Psychotherapy process research aims to understand the common factors that are "necessary and sufficient for change" (Laska, Gurman & Wampold, 2014, pg. 469) Psychotherapy research has illustrated the importance of therapeutic attributes that are common across various psychotherapy approaches. Lambert (1986) estimated that these non-specific therapeutic factors account for 30% of the overall treatment effect. Examples of these factors include therapist competencies, adherence to treatment protocols, the patient and counselor relationship, interdependence and group as an object-self (Frank, 1973, Grencavage & Norcross, 1990, Pfeifer & Strunk, 2015, Marogna & Caccamo, 2013). Wendt (2015) argued that group therapy required greater therapist flexibility and skill than individual therapy due to the unpredictability introduced by group interactions. In addition Wendt (2015) argued that evidence-based treatment literature, designed for individual therapy, does not provide for group processes and may not be transferable.

Research on group processes attempts to understand the complex mechanisms that underlie therapeutic change (Bakali, 2013). Group processes may include roles and relationships between different systems and sub-systems within groups as they mature over time (Bakali, 2013). These processes are complex and are influenced by theoretical orientation, group characteristics, and patient traits (Bakali, 2013, Piper et al., 2011; Kaplan & Sadock, 1993).

Specific group processes that foster positive change have been referred to as therapeutic factors. Yalom and Leszcz (2005) identified a total of 11 group therapeutic factors:

Instillation of hope

The awareness of others' successes increases feelings of optimism for one's own potential improvement.

Universality

Members recognize that others share similar problems and that they are not alone or unique.

Imparting information

Members receive education, advice and guidance from the counsellor and other group members.

Altruism

Members develop positive self-worth and esteem by helping others in the group.

Corrective recapitulation of the primary family group

Identifying maladaptive family of origin influences and developing new behaviours.

Development of socializing techniques

Members obtain feedback and instruction on social skills and develop new interpersonal behaviours.

Imitative behaviour

Members experience learning by observing other group member's personal development.

Catharsis

Group members experience relief through self-disclosure, emotional expression and insight.

Existential factors

Members develop awareness of the limitations and challenges inherent in life and accept responsibility for life decisions.

Interpersonal learning

Members develop self-awareness free of distortion and learn how one can improve interpersonal functioning.

Group cohesiveness

Throughout therapy, members develop feelings of trust and belonging with other group members and the counsellor.

Universality is a common theme that arises within substance abuse treatment groups. As patients discuss their problems, they experience a realization that their problems are abnormal yet shared and they express and experience feelings of acceptance (Yalom & Leszcz, 2005). The negative effect of substance use on social involvement is a diagnostic criterion in the DSM V, and social support has been found to be one of the strongest predictors of positive treatment outcome within this population (Broome, Simpsom & Joe, 2002). Brook (2008) further suggests that a group setting is therapeutic because "individuals who abuse substances tend to experience extremely painful emotions which often results in self-destructive behaviour; it is important for the group to provide a safe environment for the shared acknowledgment of these feelings." (p.414)

Yalom and Leszcz (2005) emphasize interpersonal relationships and the significant impact they have on an individual's health psychology and development. A group setting allows for numerous opportunities for interpersonal

learning. Yalom and Leszcz (2005) refer to the use of in-group interactions as a here-and-now therapeutic framework. For example, the therapist may use member conflict to introduce adaptive techniques to resolve disagreements. Patients' immature coping behaviour, such as developing social cliques, provides opportunities for the therapist to introduce and develop more sophisticated socialization techniques (Yalom & Leszcz, 2005). It is through working with patients to examine these group interactions that patients learn to be supportive, communicate needs, articulate and convey emotions, and elicit and provide support, while also assisting individuals in developing more mature defenses (Center for Substance Abuse Treatment, 2005). The intent is to utilize these interactions as opportunities for catharsis, to provide feedback on interpersonal behaviour, for self-disclosure and for interpersonal learning. Yalom and Leszcz (2005) argue that the group "must examine itself; study its own transactions; transcend pure experience and apply itself to the integration of that experience" (pg. 142).

Flores (2001) argued that group counselling is particularly beneficial in treatment settings for patients coping with substance abuse. Flores contends that often patients lack the ability to establish and maintain attachments to other people in part because of the mechanisms used to defend their substance abuse such as denial, projection, and rationalization. Brook (2008) states that group counselling provides a structured social environment and that this may be particularly important for patients whose substance use has disrupted many aspects of their lives and relationships. The group counsellor regulates aspects of the group and may implement direct techniques that facilitate group interactions and relationships, while group members also experience structure through shared group norms and goals and positive peer support (Brook, 2008). Group therapy

provides an opportunity for patients to see others cope with similar problems, witness recovery, and, by relating with other patients, gain new insight and information. Group therapy helps patients, stigmatized by their substance use, reduce their sense of isolation.

Group Cohesion

Group cohesion is the relationship between the therapist and group members, between group members, and between individual members and the group as a whole (Yalom & Leszcz, 2005). Group cohesion is considered an essential therapeutic factor and is the most frequently addressed construct in group treatment studies (Burlingame et al., 2011). "Groups which do not hold together, which do not exert a force of attraction or affinity for its members, will not develop enough of a capacity for the psychological work that is required to make the group a therapeutic tool" (Ezquerro, 2010, p. 503). Although group cohesion is viewed as the most important group level process and has been described as a requisite to forming and maintaining a group (Buringame et al. 2011, Ezquerro, 2010, Piper et al. 2011), little research has examined the impact of cohesion within substance use treatment. The purpose of the study described in this thesis was to extend existing research on group therapeutic process to examine cohesion as a potential non-specific factor contributing to the outcomes of substance abuse treatment.

Burlingame et al. (2011) conducted a meta-analysis of 40 studies assessing the relationship between cohesion and treatment outcome. Burlingame et al. (2011) identified four key issues that plague this area of study: lack of a common definition and assessment tools to measure cohesion, inconsistent findings on the cohesion and treatment outcome relationship, significant variability in study characteristics and sample populations, and that the majority of research is

correlational. Burlingame et al. (2011) grappled with the multitude of assessment tools and operational definitions used to assess group cohesion. Assessments of cohesion also vary in terms of the dimensions assessed: member-to-member, members-to-leader and member-to-group as a whole (Bakali, 2013).

Over the past decade, Johnson, Burlingame, Oles, Davies and Gleave (2005) have developed a general model of group therapy process. They concluded that there are two key aspects of group cohesion, reflecting the relationship quality of the group and the relationship structure. The relationship structure refers to group members' perception of the leader and relationship with the group as a whole. The quality of the relationship refers to affective cohesion (liking) and task cohesion (work). For example, within a clinical setting, a leader praising a patient's hard work and achievements demonstrates both leader-member interaction (structure) and positive work (quality) (Burlingame et al., 2011). This model identified three factors underlying group processes: positive bonding relationship, positive working relationship and negative relationship factors (Johnson et al., 2005).

"It is a general expectation for greater therapeutic gains to be associated with a group displaying higher levels of cohesion" (Crowe & Grenyer, 2008, p. 240). A significant body of research affirms this conclusion, including the most recent meta-analysis (Burlingame et al. 2011). Cohesion has been shown to predict symptom improvement with a variety of different patient populations such as patients attending cognitive behavioral therapy for partner violence (Taft, Murphy, King, Musser, & DeDeyn, 2003), anxiety and social phobia (Paulus, Hayes-Skelton & Norton, 2015; Taube–Schiff, Suvak, Antony, Bieling and McCabe, 2007), an eating disorders day treatment program (Crino & Djokvucica, 2010), interpretive and supportive short-term group therapies for complicated grief (Piper,

Ogrodniczuk, Joyce, Weidemann, & Rosie, 2007), inpatient cognitive processing therapy treatment for post-traumatic stress disorder (Ellis, Peterson, Bufford & Benson, 2014), a mixed diagnosis inpatient population (Dinger & Schauenburg, 2010) and patients in treatment for major depression (Crowe & Grenver, 2008).

Burlingame et al. (2011) found the weighted aggregate correlation between cohesion and outcome was statistically significant (r = .25), suggesting a moderate effect. However, they also found significant variation between studies. Upon closer examination, they identified five statistically significant moderators: patient age, therapy orientation, group size, number of sessions, and emphasis on member interaction. Specifically, group cohesion yielded a larger effect on outcome for groups that had younger members, involved more than 12 sessions, comprised five to nine members, employed a leader who emphasized group interaction, and featured a leader who had an interpersonal versus psychodynamic or cognitive-behavioural orientation.

Research has examined variation of cohesion and group alliance over the course of the group therapy. This research has attempted to identify clinically relevant variations. For example, research suggests clinicians should focus on group cohesion early in treatment. Research has demonstrated that early positive bonding is related to improved interpersonal problems while late positive bonding was not related to improved interpersonal problems (Lo Coco, Gullo, Di Fratello, Giordano & Kivlinghan, 2016). In addition, studies assessing the inter-relationship of cohesion with conflict suggested that it is important to overcome or resolve early conflict in the group to ensure the emergence of cohesion and a positive treatment outcome (Bakali, 2013; Piper et al., 2011). Norton and Kazantzis (2016) found that alliance was consistently associated with next session anxiety symptoms and that lack of group cohesion predicted anxiety symptoms at

sessions 8 and 10. This research demonstrated that while the relationship between alliance and anxiety remained constant throughout treatment, the relationship between cohesion and anxiety appears to have increased from earlier to latter sessions. Taube-Schiff et al. (2007) found that the increase in cohesion from mid-treatment to the end of treatment was related to positive changes in anxiety.

Group Cohesion and Substance Abuse Treatment.

To date, there are very few empirical studies that have examined group cohesion within substance abuse treatment. Outcome studies have been conducted by Gillaspy, Wright, Campbell, Stokes and Adinoff (2002) and Rice and Tonigan (2011). Additional research conducted in this area has examined group cohesion in relation to other group process variables and treatment/client characteristics or has simply used cohesion as a means to describe their study sample. Research by Crits-Christoph et al. (2011) established that substance abuse group therapy is sufficiently standard so that findings on group processes measures, including cohesion, can be generalized. Crits-Christoph et al. evaluated process ratings for 487 patients attending group therapy for cocaine dependence. An observer rated participants' group cohesion on the Harvard Health Plan Group Cohesiveness Scale (Budman, Soldz, Demby, Feldstein, Springer & Davis, 1989). This scale examines group connectedness, the extent to which group members work toward a common goal, level of patient engagement, conflict, and openness to sharing information. Crits-Christoph et al. found that patient variability had the largest main effect on group cohesion variance. When variances between counsellors, sessions and raters was assessed they did not significantly contribute to cohesion variance. It is interesting to note that Crits-Christoph et al. (2011) found a significant patient-by-counselling group interaction.

Research on group cohesion among clients attending treatment for substance abuse disorder is also supported by qualitative analysis by Greenfield, Cummings, Kuper, Wigderson and Koro-Ljungberg's (2015). Six months following treatment, semi-structured interviews were conducted with 28 women randomly assigned to either a single-gender or a mixed-gender group. Greenfield et al. (2015) found that participants' impressions of group atmosphere shaped their experiences of group therapy. Participants in single-gender group reported positive group support and chemistry, used a common language, identified with each other and expressed feelings of intimacy. Participants in mixed-gender groups reported less empathy and group support, the presence of gender-based sub-groups, sexual tension between group members and less in-depth discussions. Participants in the mixed-gender groups also identified a greater level of confrontation and accountability than participants in the single-gender groups. These findings suggest that group composition impacts group cohesion, specifically the bonding, working and conflict between group members.

Gillaspy et al. (2002) assessed the relationship between group alliance, group cohesion and symptom improvement among 49 men attending an intensive residential substance abuse program. Group cohesion was assessed after the fourth psychotherapy session. Group alliance was assessed using the Group Therapy Alliance scale (Pinsof, 1994) and cohesion was assessed with the Group Atmosphere Scale (Silbergeld, Koenig, Manderscheid, Meeker & Homung, 1975). Pre and post-treatment (30 days following treatment) patients were assessed for depression (Beck Depression Inventory), symptom distress and general functioning (Outcome Questionnaire – 45) and substance use (Inventory of Drug Use Consequences). Only symptom distress and general functioning significantly improved following treatment. Gillaspy et al.'s (2002) analysis found that group

alliance, but not group cohesion, predicted self-reported improvement in psychological functioning. One limitation of this study was that cohesion was only assessed once, following the fourth session of group psychotherapy. Research by Bakali, Wilberg, Hagtvet and Lorentzen (2010) found that length of time in treatment accounts for variance in alliance and cohesion.

Rice and Tonigan (2011) studied a sample of 253 alcohol-dependent adults, with at least one Alcoholics Anonymous (AA) meeting attended in the prior three months. They hypothesized that group cohesion would predict attendance and abstinent days from alcohol post treatment. Rice and Tonigan used the Social Group Environment (GES) cohesion subscale which focuses on closeness and support. Alcohol use and attendance were assessed at intervals following baseline assessment (3, 6, 8, 12, 18 and 24 months). Group cohesion significantly predicted AA meeting attendance, number of days of AA meeting attendance, adherence to 12 step behaviours, and perceived usefulness of AA meeting attendance. However, participants' impression of group cohesion did not predict abstinence when AA attendance was controlled for.

Several studies have examined group cohesion in relation to client and treatment variables. Pooler, Qualls, Rogers & Johnston (2014) assessed cohesion among 104 patients attending residential treatment for substance abuse. Group cohesion was assessed using the Group Cohesion Scale Revised, which assesses cohesion in terms of group members' interactions and discussions. Pooler et al. (2014) examined cohesion relative to client characteristics including self-efficacy, social support, and coping skills. They found that patients with greater self-efficacy reported a higher level of group cohesion. Pooler et al. also found a significant relationship between group cohesion and an effectiveness index, created by adding together the scores of self-efficacy, social support, and coping. The

correlation coefficient between cohesion and effectiveness; however, was small (r^2 = 0.05). Pooler et al., also studied the impact of treatment characteristics (gender, voluntary/involuntary referral, length in group, addiction to alcohol/drug/both). Pooler et. al. found that cohesion scores were significantly related to length of stay in treatment, and that group cohesion increased as length of time in treatment increased and then decreased toward the end of treatment.

Two studies have assessed group cohesion among peer support groups for substance use treatment: Kelly, Deane and Baker (2015) and Sotskova, Woodin & Cyr (2016). Kelly et al. (2015) studied group cohesion among 124 participants (male and female) attending a mutual support group, Self-Management and Recovery Training (Smart Recovery) for substance abuse disorder. Smart Recovery is a cognitive behavioural-based support group that incorporates homework activities and is led by a facilitator. Kelly et al. hypothesized that group factors would predict use of cognitive and behavioural skills. Group cohesion was assessed using the Engagement sub-scale of the Group Climate Questionnaire. They found that Engagement significantly predicted use of cognitive restructuring, with a moderate effect (r^2 = 0.23). Group cohesion did not predict use of behavioural activation.

Sotskova et al. (2016) assessed group cohesion (client involvement, support and affiliation within the group) and group therapeutic alliance (alliance among group members and with the group leader) within a secular peer support group LifeRing. LifeRing principles include sobriety, secularity and self-help. They found that group cohesion, but not group therapy alliance, was associated with active participation over and above frequency of attendance, length of involvement and AA attendance ($\beta = .39$, $p < .01$). In addition, they found that

higher group alliance was associated with higher satisfaction with the group over and above attendance variables ($\beta = .43$, $p < .01$).

Sobell, Sobell and Agrawal (2009) utilized the Group Climate Questionnaire (GCQ) (MacKenzie, 1988) to describe the sample selected for their study on substance abuse treatment in a group versus individual treatment format. In terms of group cohesion, Sobell et al. found that, after four sessions, the groups engendered high feelings of cohesiveness and engagement, had little interpersonal conflict, and demonstrated a low avoidance of group work. Unfortunately, no analysis of the relationship between cohesion and outcome was conducted in this study. In terms of treatment outcomes, at the 12-month follow-up, Sobell et al. found no significant differences between the group and individual therapy conditions. Interestingly, in a more recent publication, Sobell and Sobell (2011) argue that group cohesion is empirically supported and an essential component of substance abuse group therapy. They also provide strategies to enhance cohesion and propose aspects of the treatment process that may contribute to higher group cohesion within substance abuse treatment.

Research Question

The aim of this study was to examine group cohesion within substance abuse treatment; specifically, residential substance abuse treatment. Do patients experience greater treatment change when they report positive group cohesion and less conflict and avoidance? The average and slope of linear change of group Engagement, Conflict, and Avoidance (GCQ variables) were examined in relation to treatment drop out and pre/post treatment change in severity of distress and mental health concerns. It was hypothesized that patients who perceived higher or progressive increase in group cohesion (GCQ Engagement) would demonstrate greater symptom improvement.

Method

Treatment Context

Participants were recruited from patients attending the Alberta Health Service's Henwood Treatment Centre, located in Edmonton, Alberta. This program provides intensive treatment in a residential setting for adult patients who would benefit from group and individual counselling for abuse of alcohol and other drugs. Treatment includes intensive group counselling and optional individual counselling. Group counselling is mandatory; each group includes 6-12 patients and group membership is open, with approximately one third of the patients changing each Monday. Patients meet from Monday to Thursday for two hours a day. On Friday they meet to review their week and plan for the weekend but this is not considered a "counselling" session. This schedule continues for the 3-week program, for a total of 12 group sessions. The groups had a rolling membership structure, that is, group members join and leave the therapy group at different intervals. The same consistent group of people is therefore not represented through the course of treatment. A given member will deal with multiple arrivals and departures during their 12–session group experience.

From 0930 to 1100, the patients attend workshops including psycho-educational classes, life skills, relapse prevention and tobacco cessation. In the afternoon, from 1300 to 1500, patients attend a process group led by two counsellors. Therapeutic interventions utilized within the process group follow a Motivational Enhancement Therapy (MET) (Miller, Zweben, DiClemente & Rychtarik, 1994) approach and primarily involve using here-and-now interactions between members to highlight patterns of maladaptive behaviour and develop more adaptive interpersonal relationships. Therapist techniques also include cognitive reframing, where patients identify maladaptive thinking and attempt to

identify a more adaptive response to the cue or situation, and relapse prevention, where patients develop a plan or coping strategies to limit relapse to substance use (Gabbard, 2009). Treatment sessions assessed in the current study included only the afternoon process groups, as the morning groups are limited to psycho-educational approaches; clinically and conceptually, the afternoon group is integral to the impact of the treatment program. Also, from a methodological perspective, it was more feasible to restrict data collection to one group approach. The current study was reviewed and approved by the University of Alberta Health Research Ethics Board.

Participant Recruitment and Data Collection

Patients were informed about the study at admission by the intake worker. During the first week the researcher presented the study to all new patients, outlining the study procedures and reviewing the information and consent form. All patients were provided an opportunity to ask questions regarding the study and consent. Patients were asked to indicate on the consent form if they wished to participate in the study. The weekend following the initial meeting, the researcher collected demographic information, and participants completed questionnaires on motivation, perceived social support and self-efficacy. A meeting was also arranged for the following weekend with each participant, during which the researcher administered a pre-treatment assessment of symptom severity, mental health and substance use severity. A determination that a patient was unable to provide consent was based upon the recommendation of Henwood clinical staff.

Throughout the 3-week treatment, patient participants were asked regularly to rate group cohesion. The patients assessed group cohesion each day following the end of the group therapy session. On the final day of group

therapy, patients were interviewed and their symptom severity, mental health and substance use severity were re-assessed. Information was collected regarding patients' attendance and early discharge. Wendt (2015) highlights the complexity of substance abuse treatment which typically involves clients attending more than a single treatment program that provides a one-treatment approach, rather clients may attend multiple programs along side case management. McLellan, McKay, Forman, Cacciola and Kemp (2005) note that due to the additional substance use therapy it would be difficult to determine the extent to which post-discharge functioning was associated with the specific treatment program. Practically, a post-treatment assessment following a period of time after treatment had ended was not feasible for the current study.

The current study was conducted in a "treatment as usual" setting rather than with structured manualized therapy or specifically trained therapists. To provide insight into the therapeutic techniques used during the course of treatment, therapists were asked during the course of the study to identify a group they would be willing to have audio-recorded. Consent for audio recording was obtained from all patients who consented to participate. One treatment session was audio-recorded and the therapeutic techniques utilized were examined and rated on the Comparative Psychotherapy Process Scale (Hilsenroth, Balgays, Ackerman & Bonge, 2005). Use of the CPP aimed to capture the therapists' strategies used in the group in order to accurately describe the intervention.

Data Collection

Demographic Information. A demographic survey administered when patients initially agreed to participate in the study collected information on

gender, age, education level, employment status, marital status, living arrangement, responsibility for children, and treatment history.

Therapeutic Techniques. The Comparative Psychotherapy Process Scale is a brief observer measure of psychotherapy process intended to be a descriptive measure rather than an evaluative measure of therapist activity (Hilsenroth et al., 2005). The scale is comprised of 20 therapeutic activities which are rated on a 6 point scale from "not characteristic" to "extremely characteristic." The CPP has been described as especially useful for research attempting to assess psychotherapy in a naturalistic setting (Siefert, Defife & Baity, 2009), and has strong psychometric properties (Hilsenroth et al., 2005).

One therapy session was audio-recorded and the therapeutic techniques used were rated on the CPP (Hilsenroth et al., 2005). The CPP captured the therapists' strategies used in the group, and allows for an accurate description of the intervention. According to the CPP the group was characteristic of the Psychodynamic – Interpersonal orientation and common techniques included identifying patterns between past and present perceptions, feelings, life situations, actions and experiences. To a lesser extent, the group also provided alternative interpretations of experiences, encouraged the expression of feelings, and discussed patients' wishes, dreams and memories. There were fewer cognitive behavioural techniques used than psychodynamic and interpersonal techniques used throughout the session. The cognitive behavioural techniques engaged in included a discussion of the patients' practice of behaviours outside of therapy, future life situations and illogical beliefs.

Control Variables

A body of research has demonstrated that specific patient traits have a significant impact on treatment outcome. As previously mentioned, the meta-

analyses by McKay and Weis (2001) and Adamson et al. (2009) identified the patient characteristics that affected treatment outcome, which included age, gender, self-efficacy, motivation and perceived social support. Patients completed assessments for each of these variables during the first week of treatment. These variables were examined to determine if they predicted treatment outcome and if they were significantly related to GCQ variables.

Patient information on age, gender, self-efficacy, motivation and perceived social support was collected prior to the first group counseling session. The scales included are as follows:

Age and gender. Information on patients' age and gender was obtained during the first week of treatment. Patients completed a demographic survey in which they were asked to indicate their age and gender.

Perceived social support. The Community Assessment Inventory (CAI) (Brown, O'Grady, Battjes & Katz, 2004) assesses the patient's view of their community supports. The CAI assesses potential social support for treatment entry and engagement among: (1) the partner and/or family with whom the patient lives; (2) family living outside the home; (3) friends; and (4) the community itself (Brown et. al., 2004). The CAI is comprised of 37 items and takes 15 – 20 minutes to administer. Internal consistency alphas for the four scales ranged between .79 and .88 (Brown et al., 2004). The CAI also predicted treatment readiness and differentiated between participants who reported that they discussed crime and drug use with others in the community and those who did not (Brown et. al., 2004).

Self-efficacy. The Brief Situational Confidence Questionnaire (BSCQ) asks people to identify their level of confidence to resist drinking and drug use in eight different situations. The BSCQ consists of 8 items and has a high level of internal

consistency (α = 0.85). The global BSCQ score is significantly and negatively correlated with the Alcohol Dependence Scale (Breslin, Sobell, Sobell & Agrawal, 2000).

Motivation. Motivation was assessed by the Circumstances, Motivation, Readiness, Suitability (CMRS) scale. This scale is based upon De Leon's model of motivation (De Leon, Melnick, Kressel, & Jainchill, 1994). This model incorporates both the patients' awareness of a need to change or inner reasons for change, as well as their readiness for change and engagement (Groshkova, 2010). The CMRS includes four domains. The first is *circumstances* which assesses the external pressure the patient feels to attend or leave treatment. The next domain assessed is *motivation* which assesses the patients' awareness of the need to change and their inner reasons for changing. The third domain is *readiness* which assesses the patients' perceived need for treatment. The fourth domain is their *suitability* for residential drug rehabilitation in a therapeutic community. The CMRS consists of 18 items which are rated on a 9 point scale. The overall reliability of the CMRS has been established with Cronbach's alpha values ranging from 0.85 to 0.87 (De Leon et. al., 1994). Groshkova's (2010) review of motivation found the CMRS predicted treatment retention in substance abuse therapy. In addition, Groshkova (2010) found that the CMRS distinguished level of motivation when comparing individuals who entered substance abuse treatment and those who did not.

Independent Variable

Group Cohesion, Conflict and Avoidance. The Group Climate Questionnaires —Short Form assesses group members' perceptions of the group's therapeutic environment (GCQ; MacKenzie, 1998). The GCQ is comprised of 12 questions which comprise three subscales (GCQ variables): Engagement (self-disclosure, cognitive understanding, and confrontation), Avoidance (extent to

which group members avoid responsibility for the work of therapy), and Conflict (interpersonal conflict and distrust) (MacKenzie, 1998). Each question is rated on a 7-point Likert scale indicating degree of agreement from 1 (not at all) to 7 (extremely). Cronbach's alphas for the GCQ subscales are .94, .92, and .88, respectively (Kivlighan & Goldfine, 1991).

The GCQ is one of the most widely used instruments across a variety of settings, has been shown to be related to symptomatic improvement realized by group members, and has well established psychometric properties (Johnson, Pulsipher, Ferring, Burlingame, Davis, & Gleave, 2005). For example, the GCQ has been used to predict treatment outcomes for cardiac patients receiving cognitive-behavioral group therapy (van Andel, Erdman, Darsdorp, Appels & Trijsburg, 2003) and to assess job satisfaction among nurses involved in a team-building exercise (Birx, LaSala & Wagstaff, 2011). As well, the GCQ has been used with patients attending group psychotherapy for depression (Crowe & Grenyer, 2008), co-morbid disorders (Ryum, Hagen, Nordahl, Vogel, & Styles, 2008), and social phobia (Taube–Schiff et al., 2007). It is important to note that Gillaspy et al. (2002) used the GCQ to study the process of group counselling with patients attending substance abuse treatment.

Dependent variables.

In addition to impaired control over use and pharmacological criteria, substance use disorder is characterized by social impairment (APA, 2013). This definition suggests that any assessment of substance use requires both an evaluation of use as well as associated problems. To address a broader definition of substance use, the current study incorporated assessments of patients' substance use, mental health status, and progress on patient's specific problems as presented at admission. The scales that were used include the following:

Substance use and mental health severity. Pre-treatment substance use severity and psychiatric problems were assessed with the Addiction Severity Index Lite (Cacciola, Alterman, McLellan, Lin, & Llynch, 2007). Patients' perceptions of their addiction severity and psychiatric symptoms were assessed at pre- and post-treatment to assess symptom improvement. There are a large number of studies that rely on patients' self-report to assess substance use and treatment change. The Addiction Severity Index is a self-assessment tool that is widely used to assess substance abuse treatment outcome. The ASI-Lite is an abbreviated version of the Addiction Severity Index (Cacciola et al., 2007) and assesses current and lifetime status for alcohol and drug use, medical and psychiatric health, employment/self-support, family/social relations, and illegal activity. A total of 49 items comprise these three subscales, and the measure was administered at the beginning of treatment and again upon discharge. For the current study, a difference score calculation (pre – post assessment) for each of the ASI-Lite Clinical Factors (drug use, alcohol use, and mental health) scores was used to assess changes in drug use, alcohol use and psychiatric health. The overall reliability of the ASI-Lite has been established with internal consistency ranging from α = 0.80–0.88.

The ASI-Lite calculates two composite scores, one for alcohol use and one for drug use, each of which may range from 0.0 to 1.0. It is also important to note that although in theory each composite score range is the same, it is more difficult to receive a high score on certain indices than others (Melberg, 2004). To achieve a composite score of 1.0 for the drug index, daily use of all drugs and in addition of alcohol is required (Melberg, 2004). Therefore, the alcohol and drug composite values cannot be compared. There are no ASI-Lite normative standards available to determine clinical levels of abuse severity.

Severity of Distress. The Target Complaints Scale approach was used to assess perceived improvement in personal treatment objectives (Battle, Imber, Hoehn-Saric, Stone, Nash, & Frank, 1966). During the first week of treatment, participants were asked to identify treatment objectives. The patient and an objective observer then rated frequency, duration, intensity, pervasiveness, and disruptiveness. Post-treatment, the participant reviewed their progress during treatment and re-assessed frequency, intensity, pervasiveness and severity. The average rating was calculated to obtain an indication of severity of distress pre- and post-treatment improvement.

The TCS also provides an assessment of the participants' expected and perceived treatment change, at pre-treatment and at termination, respectively. At pre-treatment (end of first week in treatment), patients were asked to indicate how much improvement they expected for each treatment objective. On the last day of treatment, patients were asked to indicate how much improvement they perceived for each treatment objective; this represented a global improvement rating. Both ratings used an 11 point Likert scale with 1 indicating extreme worsening, 6 indicating no change, and 11 indicating extreme improvement.

Treatment retention. Treatment attendance was monitored throughout the study for all participants. Participants were asked to complete an attendance sheet and therapists were asked to indicate if the patient was asked to leave or dropped out of group prior to completing the program.

Approach to analysis.

Sample size calculation was based on previous research which suggests that group cohesion has a moderate effect (r=0.25) on treatment outcome

(Burlingame et al., 2011). Using a sample size calculation for simple regression, 70 participants were required to detect a significant correlation 80% of the time with an alpha of 0.05. Assuming a low participation rate (4 participants per group), this entailed a sample of 18 groups**.**

A descriptive analysis was conducted to outline patients' demographic characteristics, the nature of their substance use, and their clinical characteristics. Descriptive information is provided about control variables: age, gender, pre-treatment substance and alcohol use, self-efficacy, perceived community support and motivation. In addition, analysis of the control variables and the independent GCQ variables was conducted to identify any interactions. The interactions identified were then taken into account in all other analysis.

A comparison of pre- to post-treatment change was then conducted. Symptom improvement was intended to be assessed by three outcome measures, pre-post change in severity of distress on individual treatment variables (TCS – distress severity), substance use (ASI-Lite; alcohol and drug use subscales) and mental health (ASI-Lite; mental health subscale). However, the variable substance use was excluded as no post-treatment substance use was reported by participants. For the remaining dependent variables, severity of distress and mental health concerns residual gain scores were used to calculated pre–post change to account for the potential threat to validity of regression to the mean (Cronbach & Furby, 1970). The residual gain score approach first calculates the sample's regression coefficient, post-test scores are regressed on the pretest score, and then the residual change scores are calculated for each participant.

Following, analysis was used to determine if a change in cohesion (GCQ Engagement) or group climate (GCQ Conflict and Avoidance) predicted pre-to post-treatment change. This was analyzed using two approaches: a hierarchical

linear model (HLM) analysis was conducted and then a multiple regression. The HLM contained two levels of analysis. At Level 1, the analysis examines individuals' change in the GCQ variables (Engagement, Avoidance and Conflict) over time. Next, a level 2 analysis (individual level) was conducted to account for the variance in individuals' unconditional linear growth on the GCQ variables of cohesion.

Multiple regression analysis was used to predict the pre- to post-treatment change in severity of distress and mental health concerns. First, the control variables were entered into the regression, followed by group cohesion (GCQ Engagement), GCQ Conflict and GCQ Avoidance and then moderator variables were then entered. The regression was conducted first with the independent variables (GCQ Variables) as an average score across treatment sessions and then as a slope change over treatment sessions.

Finally, this study also intended to determine if patients who indicated a higher mean or linear slope increase in cohesion (GCQ Engagement) would remain in treatment longer. Analysis regarding treatment retention was not conducted as all participants who left the program early did so prior to completing any GCQ questionnaires.

Hypotheses

An individual who perceived a high average level of cohesion, or a progressive increase in cohesion over time, was expected to demonstrate greater improvement as a function of treatment. Specific hypotheses were as follows:

1. There will be a significant symptom improvement when comparing pre- and post-treatment for self-reported substance use, severity of distress and mental health concerns, pre- to post-treatment.
2. Linear change in group climate during treatment will predict symptom improvement. Specifically, participants with a positive treatment outcome

(improved mental health, severity of distress, and perceived improvement) will experience a decrease in group conflict: a; decrease in group avoidance and an increase in group cohesion-engagement will perceive greater symptom improvement.

3. Average rating and slope change for group climate across treatment session will predict symptom improvement.

i. Average rating: Participants who perceive lower group conflict and avoidance and higher level of group engagement will perceive greater symptom improvement.

ii. Slope change: Participants who reported a decrease in group conflict a decrease in group avoidance; and an increase in group cohesion-engagement will perceive greater symptom improvement.

iii. The relationship between group climate and symptom improvement will be retained when controlling for demographic and clinical variables: gender, age, pre-treatment substance use severity, social support, self-efficacy and motivation.

Results

The sample for this study was drawn from participants attending the Henwood Residential Treatment Program for substance abuse. The sample included 107 participants recruited between April 25, 2012 and September 20, 2012. Three individuals withdrew from the study and two were excluded because they had a limited capacity to provide consent and participate. The designation of limited capacity was based upon recommendation of clinical staff at Henwood. Of the total recruitment, then, 102 were included in the final sample. Of these, two participants left the program early, one for a health-related issue and the other to attend a different substance abuse program. The demographic questionnaire and

clinical questionnaires were completed by 91 participants, with the number of responses per question ranging from 66 to 91[2].

Descriptive Statistics

The mean age of the sample was 39.78 years (*SD* = 12.00 years, valid *N* = 91). The sample consisted of 68 men (77%) and 23 women (24%). The sample tended predominantly to have a high school education, with a mean of 11.33 years of education (*SD* = 1.22, *valid n* = 89). There were 48 participants who had attended post-secondary school (53%, valid *N* =91), with an average of 2.60 years of post-secondary education (Table 1). More than two thirds of the sample were single (never married, separated or divorced, *n* = 64, or 70%) and without children (*n* = 61, or 67%, valid *N* = 91) (Table 2). Participants' income and employment varied considerably, with 41% reporting an income more than $70,000 per year (*n* = 36, valid *n* = 88), 27 and income between $30,000 and $70,000 and 32% (*n* = 28) reported less than $30,000 per year (Table 3). In terms of employment, 55% indicated full-time employment (*n* = 56, valid *N* = 88), 11% part-time employment (*n* = 10), and 17% (*n* = 15) were unemployed or unable to work (Table 3).

Pre-treatment alcohol and drug use. Information on the nature and severity of participants' substance use was obtained using the ASI-Lite. The number of days of use (frequency of use) in the month prior to attending treatment was also included as an indicator of severity.

[2] The total number of participants that responded for each question is reported as the 'valid *N*'.

Frequency of use. Across participants, there was substantial variation in severity, as indicated by self-reported days of alcohol and/or drug use in the month prior to attending treatment. Days of use ranged from 0 to 30 days with an average of 17 days (*SD* = 11.20) and a mode of 30 days. A small portion of the sample (*n* = 7) reported no substance use at all in the month prior to entering treatment. There were 56 participants who reported preferred or most commonly used alcohol in the month prior to treatment and 39 who preferred or most commonly used other drugs. As would be expected, the ASI-Lite alcohol composite score was significantly higher for participants who preferred alcohol (*M* = 0.61, *SD* = 0.26) than those who preferred other drugs (*M* = 0.32, *SD* = 0.32), *F* (1, 93) = 22.57, *p* <.001. In comparison, the ASI-Lite drug composite score was significantly lower for participants who preferred alcohol (*M* = 0.04, *SD* = 0.07) in comparison to participants who preferred other drugs (*M* = 0.24, *SD* = 0.21), *F* (1, 93) = 127.08, *p* <= 0.001. The following section provides a detailed description of the different use patterns observed.

Type of substance use. Of the 102 participants who provided information on their substance use, half reported single drug use only (*n* = 52), as opposed to multiple drug use (*n* = 43). Alcohol was the most commonly reported drug used in the month prior to treatment (*n* = 83, or 81%), followed by cocaine (*n* = 29, or 28%), cannabis (*n* = 20, or 20%), sedatives/hypnotics/tranquilizers (*n* = 8, or 8%), amphetamines (*n* = 5, or 5%), opiates (*n* = 4, or 4%), and hallucinogens (*n* = 1, or 1%). In the month prior to treatment, participants reported different patterns of use. These included:

- no use, (*n* = 7, or 7%),
- alcohol use only (*n* = 44, or 43%),
- alcohol use in addition to one other illicit drug (*n* = 24, or 24%),
- use of one illicit drug only (*n* = 8, or 8%), and

- multiple illicit drug use – if an individual used multiple illicit drugs as well as alcohol they were included in this category (*n* = 19, or 19%).

Alcohol use only. The 44 participants who reported alcohol use only were on average 45.70 years of age (*SD* = 12.41). This is significantly older than participants who used alcohol and one illicit drug (*M* = 36.36 years, *SD* = 10.68) and those with multiple drug use (*M* = 32.22 years, *SD* = 8.34), $F(4, 90) = 5.69$, $p < 0.001$. Participants who reported alcohol use only consumed alcohol an average of 15 days in the month prior to treatment, and the average ASI-Lite alcohol composite score for this group was 0.61. There was no significant difference in the average ASI-Lite alcohol composite score between individuals who used alcohol alone or alcohol in addition to one or more illicit drugs.

Use of alcohol and one illicit drug. Twenty four participants (24%) indicated that they used alcohol in addition to one other illicit drug, most commonly cocaine (*n* = 14, or 14%) or cannabis (*n* = 7, or 7%). As mentioned previously, this group was significantly younger (M = 36.36 years, SD = 10.68) than participants who used alcohol only (M = 45.70 years, SD = 12.41). These participants reported that they used alcohol an average of 15 days (*SD* = 11.00 days) and illicit drugs for an average of 14 days (*SD* = 12.00 days) in the month prior to treatment. The average ASI-Lite alcohol composite score was 0.50 (*SD* = 0.32) and the average ASI-Lite drug composite score was 0.19 (*SD* = 0.12). Neither the number of days of use, nor the ASI-Lite composite scores, differed significantly from the other participants who reported alcohol or drug use.

Use of one illicit drug. Eight participants indicated they used one type of illicit drug only; these included cannabis, cocaine, amphetamines, and methadone. Their average age was 36 years (*SD* = 6.24 years). In terms of severity of use, participants reported an average of 13 days (*SD* = 11.70 days) of use in the

month prior to entering treatment. The average ASI-Lite drug composite was 0.21 (*SD* = 0 .09) and did not differ significantly from the score for participants with multiple illicit drug use (*n* = 19, *M* = 0.23; *SD* = 0.12).

Multiple drug use. Nineteen participants (19%) reported using multiple drugs prior to attending treatment. These participants may have also indicated they used alcohol during the previous month; however, alcohol was not identified as the preferred or most commonly used drug and therefore was included in this category. For this group, the average days of drug use was 18 (*SD* = 11.20) and the average days of alcohol use was 11 (*SD* = 11.60). Cocaine was the most commonly preferred drug indicated by these participants. Participants reporting multiple drug use were significantly younger (*M* = 32.00, *SD* = 8.34) than participants who used alcohol only *(M* = 36.36 years, *SD* = 10.68), *F (*4, 86) = 5.65, $p < 0.001$.

Although qualitative data were not formally collected, participants' comments also reflected substantial variation in severity and patterns of use. For example, many participants indicated that the substance use which brought them into treatment had followed a prolonged period of abstinence. Others indicated that their use was detected by workplace drug testing; however, they reported that their illicit drug use was infrequent. Alternatively, several individuals reported daily use of multiple drugs for prolonged periods with few days of abstinence. Participants commented they were involved in illegal activities and/or in dangerous/abusive situations as a direct result of their substance use. There were participants who indicated they were unable to report the number of days they drank to the point of intoxication because of their increased tolerance and the large amount of alcohol they consumed on a daily basis. While these are self-

reported comments on participants' use and lifestyle, they also reflect differences in the nature and severity of substance abuse between participants.

Age. The mean age of the sample was 39.78 years (*SD* = 12.00 years, valid *N* = 91). In addition, age was significantly correlated to pre-treatment alcohol use, $r(89) = 0.34$, $p < .001$, and pre-treatment drug use, $r(89) = 0.46$, $p < .001$.

Gender. The sample consisted of 68 men (75%) and 23 women (25%). The number of years attending post-secondary school differed significantly by sex, $t(46) = 3.08$, $p = 0.00$. Men who attended post-secondary school reported an average of 2.96 years of education at that level (*SD* = 1.27 years), longer than women who attended post-secondary school (*M* = 1.88 years, *SD* = 0.87 years) (Table 1). Although more men were single (*n* = 51, or 75%) than women (*n* = 13, or 57%) this was not a significant difference $X^2(1, N = 91) = 2.81$, $p = 0.10$ (Table 4). Relative to men, a greater proportion of women indicated that they had been referred to treatment by child welfare services and fewer had been referred by the criminal justice system. The number of responses is not sufficient to conduct a test of significance. The proportion of participants who attended prior treatment for their substance use did not differ significantly by gender, $X^2(1, N = 89) = 1.09$, $p = 0.30$ (Table 4).

Self-efficacy. The BSCQ, used to assess self-efficacy, was completed by 89 participants. The BSCQ scores range from 0 (not confident at all) to 100 (very confident) regarding the ability to avoid substance use. The mean score was 59 (*SD* = 19.90), and scores ranged from 11 to 100 (Table 5) indicating that participants in this sample tended to have positive self-efficacy.

Perceived social support. Eighty participants completed the CAI, used to assess perceived social support. The CAI scores range from 0 (perceive no social support) to 148 (perceive strong social support). The average score for this sample

was 97.15 (*SD* = 16.60), with scores ranging between 29 and 128. On average the participants sampled for this study felt that they had positive social support (Table 5).

Motivation. The CMRS, used to assess motivation, was completed by 90 participants. The CMRS consists of 18 items, each rated on a 5 point Likert scale, with higher scores indicating greater motivation for treatment. The mean score for all 18 questions was 74.10 (*SD* = 11.60), in comparison to a maximum score of 90 for all items on the questionnaire (Table 5). The sample mean represents 82% of the total possible score, suggesting that recruited patients were highly motivated for treatment.

Hypothesis 1 There will be a significant symptom improvement when comparing pre- and post-treatment for self-reported substance use, severity of distress and mental health concerns, pre- to post-treatment.

Participants' substance use, mental health concerns and severity of distress were assessed during the first week of treatment (pre-treatment) and again at the end of treatment (post-treatment) to assess symptom improvement (Table 6).

Substance use. The ASI-Lite alcohol and drug use subscales were administered to determine change in substance use. However, as Henwood was a residential treatment program no substance use was allowed and any use results in program discharge. Thus, all participants indicated that they did not use any substances while attending the treatment program. Therefore, symptom severity (as assessed by the ASI-Lite) could not be assessed and was excluded as a dependent variable.

Severity of distress. Participants' severity of distress was assessed by the TCS severity of distress residual change scores. 89 participants completed the TCS pre- and post-treatment severity of distress gain scores. Slightly more than half of the

participants interviewed (n = 46) identified substance use as a treatment objective. In addition, participants identified feelings of low self-esteem and shame (*n* = 33), difficulties related to an intimate relationship, familial relationship or interpersonal skills (*n* = 15), issues related to lifestyle such as homelessness, criminal associates and behaviour, and lack of positive recreational activities (*n* = 10). Participants also identified mental health issues such as anxiety and depression (*n* = 9), trauma and grief (*n* = 5), anger management (*n* = 2) and health (*n* = 2). Forty seven participants indicated no distress on the last day of treatment. These participants were assigned a minimum score of 1 to account for the supportive and structured in patient environment which may lead to patients' under-estimating severity of distress post-treatment. There was a significant difference between the severity of distress gain scores pre-treatment (*M* = 3.79, *SD* = 0.94) and post-treatment rating (*M* = 1.50, *SD* = 0.72); $t(87) = 2.27$, $p<0.001$. Cohen's effect size value (*d* = 2.74) suggest a large practical significance.

TCS perceived change. The TCS provided an assessment of the participants' expected and perceived treatment change, at pre- and post-treatment. When expected and perceived improvement were compared, patients did not improve as much as they expected, $t(90) = 1.99$, $p = .05$. Pre-treatment participant expected improvement ranged from 7.30 to 11.00 (*M* = 9.83, *SD* = 0.78). Ninety one participants completed the TCS post-treatment and global rating of perceived improvement ranged from 7.30 to 11.00 (*M* = 9.66, *SD* = 0.89).

Mental health. During the first week of treatment, participants were asked to complete an assessment on their mental health status. Of the 91 participants who completed the assessment, 41 indicated they attended out-patient treatment and 14 indicated they attended in-patient treatment during their lifetime for mental health related concerns. Thirty two patients indicated they were prescribed

medication during the month prior to attending treatment. In total, 76 participants reported experiencing at least one psychological or emotional problem pre-treatment including: serious depression (n = 55), serious anxiety or tension (n = 62), and trouble understanding, concentrating or remembering (n = 48), difficulty controlling violent behaviour (n = 20), serious thoughts of suicide (n = 16), hallucinations (n = 6), and a suicide attempt (n = 6). These participants reported experiencing a psychological/emotional problem(s) an average of 19.45 days (*SD* = 11.74 days) in the month prior to entering treatment.

The ASI mental health composite score differed significantly pre-treatment (*M* = 0.36, *SD* = 0.25) and post-treatment (*M* = 0.17, *SD* = 0.21); $t(89) = 8.76$, $p < .001$. Effect size provides a standardized measure of the magnitude of an effect to allow for comparison. Cohen's *d,* the difference between the mean 1 (pre-treatment assessment) and mean 2 (post-treatment assessment) divided by the pooled standard deviation, is used to provide effect size when comparing groups. Cohen's effect size value (*d* = 0.81) suggested a large practical significance.

Severity of distress did not differ significantly between male (*M* = 0.00, *SD* = 0.99) and female participants (*M* = 0.01, *SD* = 1.05); $t(100) = -0.04$, $p = 0.83$. Nor was there a significant difference found in patients pre- and post-treatment mental health concerns between male (M = -0.12, SD = 0.99) and female participants' (M = 0.38, SD = 0.94); $t(100) = -2.17$, $p<0.54$. Both male patients and female participant's severity of distress gain scores and mental health improved significantly when comparing pre- to post-treatment. Male patients' severity of distress gain scores significantly increased when comparing pre-treatment (M = 3.76, SD = 0.88) and post-treatment ratings (M = 1.44, SD = 0.70); $t(65) = -18.37$, $p<0.00$. As well, mental health concerns significantly decreased pre-treatment (M = 0.50, SD = 0.32) to post-treatment (M = 0.11, SD = 0.13); $t(77) = -9.56$, $p<0.00$.

Female patients also reported a significant decrease in severity of distress gain scores: pre-treatment (M = 3.76, SD = 0.96) and post treatment (M = 1.61, SD = 0.75), $t(21) = -9.74$, $p<0.00$. As well, female patients reported a significant reduction in mental health concerns from pre-treatment (M = 0.38, SD = 0.31) to post treatment (M = 0.16, SD = 0.14), $t(23) = -3.00$, $p<0.00$.

Hypothesis 2. Linear change in group climate during treatment will predict symptom improvement. Participants who indicate a decrease in group conflict, a decrease in group avoidance and/or an increase in group cohesion (engagement) will perceive greater symptom improvement.

Seventy-eight patients that completed at least one assessment of the GCQ and 50 participants provided responses on more than one session for all GCC variables (Table 7). HLM analysis was used to examine the progression of GCQ variables over time. Analysis found a significant decrease in GCQ Avoidance over time ($\beta = -0.12$, $p = 0.02$). There were no significant coefficients or associated t values for interactions between linear slope and time for GCQ Engagement (cohesion) or with time and GCQ Conflict.

HLM analysis examined the interactions between the linear slopes of GCQ variables and pre- to post-treatment outcomes (Engagement, Conflict, and Avoidance). No significant interaction was found between linear slopes of individuals' rating of GCQ variables in relation to mental health residual change scores. Table 9 provides the coefficients and t values for the interaction between linear slope and change in severity of distress. No interactions were found with GCQ Avoidance or GCQ Engagement; however, there was a significant interaction between GCQ Conflict linear slope and severity of distress residual change, $\beta = 0.96$, $SE = 0.36$, $t(48) = 2.65$, $p = .01$. There a positive relationship between linear

change in Conflict over time and pre- to post-treatment change in severity of distress. Participants with greater linear change in conflict had greater change in severity of distress.

Hypothesis 3 Group climate will predict symptom improvement.

Prior to conducting regression analysis each control variable was analyzed to determine if there was an interaction with the independent variables. Any variables that moderated the GCQ Variables mean or slope were then entered last the regression (Table 8).

There was a significant positive correlation between motivation and average GCQ Avoidance and Conflict, $r(88) = 0.47$, p = .03 and $r(88) = 0.27$, $p = .02$ respectively. Participants' pre-treatment drug use was significantly correlated to the linear change in GCQ Conflict over time; $r(72) = 0.27$, $p = .02$. Participants' pre-treatment alcohol use was significantly correlated to the slope change in GCQ Avoidance over time; $r(70) = 0.24$, $p = .04$.

Analysis revealed that gender interacted with patients' group avoidance during therapy. Male participants reported a higher GCQ Avoidance ($n = 64$, $M = 10.78$, $SD = 2.78$) than female participants ($n = 14$, $M = 9.26$, $SD = 1.87$), $F(1, 77) = 3.83$, $p = .05$. In addition, female participants reported a greater slope decrease in GCQ Avoidance over time ($n = 14$, $\beta = -0.69$, $SD = 1.04$) than male participants ($n = 58$, $\beta = -0.08$, $SD = 0.72$); $F(1, 70) = 6.90$, $p = .01$.

GCQ Variables- Average. It was hypothesized that participants who indicated a higher level of group cohesion will also report greater pre-post symptom improvement. A regression analysis was conducted to determine if any of the GCQ variables (Engagement, Avoidance, and Conflict) contributed to predict change. In the regression model the control variables age, pre-treatment alcohol dependence severity, pre-treatment drug dependence severity, self-efficacy and

perceived social support were entered into the model first. Next the average rating of the independent variables GCQ Engagement, Avoidance and Conflict were entered. Motivation and gender were entered last as they interact with independent variables and are therefore moderator variables.

Severity of Distress. The regression model significantly predicted pre- to post-treatment change in severity of distress R^2 = 0.39, F (10, 42) = 2.63, p = .01 (Table 10). Group cohesion did not significantly reduce the predictive error, F (1, 46) = 0.10, p = .75; however, adding GCQ Conflict did significantly change the predictive variance F (1, 45) = 4.51, p = .04. Avoidance also failed to significantly reduce the predictive error when added to the model, F (1, 44) = 0.10, p = .76.

Individual variables were only significant in the Model 3, which included age, pre-treatment alcohol use, pre-treatment drug use, self-efficacy, perceived social support, average Engagement and Average Conflict. It is plausible that the number of participants was too low to detect significance when the additional variables were added to the model. Post-hoc analysis was conducted to examine the relationship between pre-treatment drug use and GCQ Conflict – Outcome relationship (Figure 1). Individuals with high pre-treatment drug use had a higher coefficient between GCQ Conflict and change in severity of distress (R^2 = 0.21) than individuals with moderate pre-treatment drug abuse (R^2= 0.09) and low pre-treatment drug use (R^2 = 0.00). Gender and motivation were expected to moderate the relationship between the independent variables however, neither was statistically significant.

Mental Health Concerns. Patients' perceived mental health concerns was not predicted by the model R^2 = 0.20, F (10, 47) = 1.16, p = 0.34 (Table 11). As well, none of the GCQ variables significantly changed the predictive variance when entered into the regression model; GCQ Engagement F (1, 51) = 1.64, p = 0.21,

GCQ Conflict F (1, 50) = 2.31, p = 0.14, and GCQ Avoidance F (1, 49) = .00, p = 0.99. Gender was the only significant variable; *post hoc* analysis revealed a significant difference between the residual change scores for male and female patients, t(97) = 5.20, p = .03. Residual change score is assessed by calculating the sample's regression coefficient, post-test scores are regressed on the pretest score, and then the residual change scores are calculated for each participant. Male patients had lower residual change (M = -0.17, SD = 2.84) than female patients (M = 0.55, SD = 4.08).

GCQ Variables - Slope. It was hypothesized that participants who reported an increase in group engagement will demonstrate greater pre-to-post treatment symptom improvement. A hierarchical regression analysis was conducted to determine if the slope over time of the GCQ variables (Engagement, Avoidance, and Conflict) contributed to predict change. This analysis is similar to the HLM conducted, but in addition the control variables age, self-efficacy, motivation, and perceived social support and moderator variables gender, pre-treatment alcohol dependence severity and pre-treatment drug dependence severity were added to the model.

Severity of Distress. The regression model did not significantly predict severity of distress, R^2= 0.31, F (10, 39) = 1.74, p < .11 (Table 12). None of the independent variables significantly reduce the predictive error: GCQ Engagement slope, F (1, 44) = .05, p = .83, GCQ Conflict, F (1, 43) = 0.06, p = .81, GCQ Avoidance slope, F (1, 42) = 0.34, p = .54. In this regression model pre-treatment drug use was the only variable that was significantly related to change of severity of distress (β = 0.46, p =.01).

Mental Health Concerns. Patients residual change in mental health concerns was not predicted by the regression model, R^2 = 0.18, F (10, 44) = 0.93,

p = 0.51 (Table 13). The predictive variance was not significantly reduced when the GCQ Variables were added, i.e. Engagement F (1, 49) = 1.19, p = 0.28, Conflict F (1, 48) = 0.00, p = 0.99 and Avoidance F (1, 47) = 0.13, p = 0.31. Self-efficacy did approach significance, β = -0.29, p = 0.61.

Discussion

The goals of this study were to analyze group processes among patients attending therapy for their substance use. A significant change in severity of distress and mental health by the end of the three-week residential program was found; however, group cohesion did not predict pre- to post-treatment change for either dependent variable. HLM analysis revealed a positive relationship between linear change in Conflict over time and pre- to post-treatment change in severity of distress. Participants with greater linear change in group conflict had greater change in severity of distress. Regression analysis was used to identify a model that predicted treatment change. This model accounted for 56% of variance in patient's residual change with regard to severity of distress, but the model did not significantly predict change in mental health concerns.

Pre- to post-treatment change

The current study found a significant difference in patients' self-reported severity of distress and mental health concerns and a large practical difference from pre- to post-treatment. The therapeutic approach for counseling groups at the Henwood Residential Treatment program includes Motivational Enhancement Therapy (MET) and psycho-educational therapeutic approach. A therapy session was audio-recorded and rated on the CPP (Hilsenroth et al., 2005) to capture the therapists' strategies employed in the group. This rating characterized the therapy as Psychodynamic–Interpersonal orientation. This finding is consistent with

previous research (Imel et al., 2008) which has found that a broad range of therapies have a positive effect on substance abuse outcomes.

Male and female patients' severity of distress and mental health concerns significantly improved when comparing pre- to post-treatment scores. However, when residual change scores were used to estimate treatment, female patients' change in mental health concerns was significantly better than that reported by male patients. The residual change score is used to account for natural changes that would occur over time with or without intervention. Residual change score compares an individual's patient's change to the entire sample. The results suggested that male patients' mental health concerns improved less than the sample and female patients' mental health concerns improved more.

Group cohesion

HLM analysis was conducted to examine linear change in group cohesion in relation to treatment change. On average, cohesion did not increase or decrease for the duration of treatment. In the current study, average group cohesion did not contribute to the predictive models for either severity of distress or mental health concerns. These findings are consistent with research on cohesion among clients attending treatment for substance abuse. Crits-Christoph et al.'s (2011) research on patients attending treatment for cocaine use found that the variances in cohesion between sessions were small and non-significant. The study by Gillaspy et al. (2002) of patients attending residential treatment for substance abuse did not find a relationship between group cohesion (Group Atmosphere Scale) with change in psychological distress, alcohol consequences or depressive symptoms. They did report a small effect between group alliance (Group Therapy Alliance Scale) and change in psychological distress.

The findings of the study reported in this thesis were not consistent with research on cohesion with other patient populations which has demonstrated a moderate effect on symptom improvement (Burlingame et a., 2011). Factors that were identified as moderating the cohesion-outcome include greater patient age, groups providing fewer than 12 sessions, and groups that did not involve strategies to enhance cohesion or emphasize member interactions (Burlingame et al., 2011). In terms of the current study, participants tended to be older with a mean age of 40 years (*SD* = 12.00 years); this may have moderated the relationship between cohesion and treatment outcome. The rating of therapist techniques indicated that the group program emphasized cognitive reframing, problem solving and relapse prevention; emphasis on member interactions and group cohesion was not specifically identified.

Group conflict

Regression analysis found that the average GCQ Conflict rating was related to change in severity of distress. The regression model predicted 56% of patients' variance in residual change in severity of distress. The two significant factors identified in this analysis were average Conflict and pre-treatment drug use. Drug use was found to moderate the relationship between GCQ Conflict and change in severity of distress. Individuals with higher drug use had a higher conflict–outcome relationship than those with lower pre-treatment drug use. HLM analysis revealed a positive relationship between individual patient's linear change in Conflict over time with pre- to post-treatment change in severity of distress. Participants with greater linear change in conflict had a greater change in severity of distress.

The HLM findings suggest that this may be the result of an initially high level of conflict followed by a reduction over the duration of treatment. A

regression model that included linear change in group conflict over time did not support this finding; however, the power of this analysis may have been too small to detect a significant relationship.

Research investigating group conflict is inconsistent. With regard to change over time, Bakali (2013) reported an increase in conflict mid-treatment while Tasca et al. (2006) reported a decrease and Illing, Tasca, Balfour and Bissada (2011) reported no linear change. In a recent review, Johnson (2013) proposes that conflict may be detrimental to the group if it prevents the group members from meeting their goals and if it affects patients' levels of Engagement. Crowe and Grenyer (2008) found that the GCQ Conflict subscale predicted outcome (Beck Depression Inventory residual change score) for patients receiving treatment for depression. They reported that greater treatment gains were identified by patients who perceived lower levels of group conflict. This is inconsistent with research that has found that individuals who experience therapeutic ruptures that are subsequently resolved experience greater symptom improvement than those who had not (Stiles, Bringer, Isatyje & Barjgan, 2004). The discussion by Lo Coco et al. (2016) of this area found that when research measures conflict at the group level, as it was in this study, higher conflict ratings are consistently related to group member improvement and enhanced group process.

Group Avoidance

The current study found a significant decrease in group avoidance over time. HLM and regression analysis did not find that the slope change and average perceived group predict pre- to post-treatment symptom change. This finding is consistent with prior research. Illing et al. (2011) also reported a decrease in Avoidance over time as well as no significant relationship with treatment outcome.

Bonsaken et al. (2011) found no change over time or any relationship to treatment outcome.

A unique finding was that male participants' average avoidance was significantly higher than that of female participants and female participants reported greater slope decrease in avoidance over time than male participants. One male client commented that group therapy was difficult for men because they have difficulty discussing personal matters with others. "Groups are even more important for men. I entered treatment with [gestured – crossed arms turned head away], but then you listen to the other guys talking and you just, you know start talking." In addition, GCQ Avoidance is comprised of three questions, one of which is "The members depended upon the group leader(s) for direction". This aspect of group may be influenced by a different therapeutic approach between male and female groups. Only one male group therapy session was recorded and analyzed to identify therapeutic techniques and strategies, so no comparison between groups can be made.

Motivation and Self-Efficacy

Previous research on the effectiveness of substance abuse treatment has highlighted the need to include other potential sources of variance in statistical models (Adamson et al., 2009). For example the Ghose (2008) model of substance abuse treatment demonstrated that patient characteristics can both impede and facilitate the effect of treatment on one's recovery from a substance use disorder. The current study included several control variables in the statistical regression model. A finding, not specific to the hypothesis proposed, was an interaction between the variables motivation and self-efficacy when predicting change in severity of distress. When self-efficacy was entered into the model first, the contribution of motivation to the model was then non-significant and alternatively

when motivation was entered first self-efficacy did not significantly contribute to the predictive model. There was also a small but significant positive correlation between motivation and self-efficacy; a patient with greater motivation had a greater sense of self-efficacy. This suggests that the Circumstances, Motivation and Readiness scale (De Leon et al., 1994) used to assess motivation and the Brief Situational Confidence Questionnaire (Breslin et al., 2000) used to assess self-efficacy may in-part be assessing the same construct.

Treatment Retention and Early Discharge

It was hypothesised that an individual`s linear growth and average level of cohesion would predict treatment retention and early discharge. A lower average level and minimal increase in engagement was expected to predict early discharge. Of the total recruited sample, two participants left the program early, one for a health-related issue and the other to attend a different substance abuse program. The two participants did not complete any assessments of group cohesion. Consequently, this hypothesis could not be tested with the current sample. The retention rate of the Henwood program for the sample population was very high in comparison to other substance abuse treatment programs. Treatment drop out in substance abuse treatment ranges from 24% to 79% (Weisner, Mertens, Tam, & Moore, 2001; Strang et al., 2004). A study of a sample of almost 2000 patients and 36 outpatient treatment facilities found that treatment completion and longer treatment retention was related to favorable treatment outcomes (Hser, Evans, Huang, Anglin, 2004). To examine the role of group cohesion on treatment retention in programs similar to the Henwood Residential program, future research should utilize a broader operational definition of treatment outcome, such as compliance with discharge recommendation or

plans such as attendance at maintenance programs, adherence to prescribed medications, or following through on obtaining housing.

Limitations

The patient group sampled for this study presented diverse demographic traits and substance use patterns. Male and female patients ranged from 18 to 72 years of age. Patients reported a stable income and employment, others reported ongoing homelessness and others criminal behaviour. In terms of substance use, some patients reported a period of alcohol use followed by a month of abstinence prior to attending the program; another patient reported that the required week of abstinence prior to attending the program was the longest period of abstinence from cocaine in the last 20 years. In terms of clinical characteristics, participants on average perceived positive social support and had a high motivation.

Although 102 patients were sampled, not all participants completed the full protocol of assessments. As a result, the actual number of participants included in each statistical analysis varied and the statistical power may have been insufficient to detect significance. Specifically, in the regression analysis, seven control/moderator variables and three independent variables were analyzed and the number of participants included in these analyses ranged from 58 to 72. As previously mentioned, with an expected moderate effect, 70 participants were required to detect a significant correlation 80% of the time at an alpha of 0.05. With 58 participants, a significant correlation would be detected 65% of the time, at an alpha of 0.05. Data collection methods were adjusted during the study to ensure that a greater proportion of participants completed the assessment protocol.

Rolling group membership was also a constraint of the current study that may have affected these results in that each week participants graduated and left the program as new participants were admitted. This rolling admission process at the Henwood Treatment Centre may have interfered with developing group cohesion. One participant commented that her group worked very well together until the last week of treatment when a new patient joined and she no longer felt that she could openly share with the group. Chris-Christoph et al. (2011) did not conduct group level analysis due to rolling group membership, members leaving and joining the group recurrently. Tasca et al., (2010) provided a method to develop a statistical model that accounted for membership turnover; however, in the current study the number of new participants per group per admission was insufficient to allow for this analysis. Analysis was conducted to determine if there was variance in group cohesion by day of the week, but no significant difference was found.

Treatment change was assessed by using participants' self-reported ratings at the end of treatment. No post-treatment followup was completed. As a result, participant's perception of their improvements may not be a valid representation of the actual change in symptom distress or mental health. Studies assessing the relationship between group cohesion and substance abuse treatment have operationalized outcome as 1) post-discharge substance use (Crits-Christoph et al. 2009; Dearing et al. 2005; Feldstein & Forcehimes 2007; Ilgen 2006; Barber et al., 1999; Connors et al., 1997), 2) attrition from treatment (i.e. dropping out of treatment) (Boardman et al., 2006; Barber et al. 2001; De Weert-Van Oene et. al, 2001; Fenton et. al. 2001; Carrol et. al. 1997; Petry & Bickel 1999; Simpson et al. 1997; Broome et al., 1999) and 3) change in problems associated with substance use (Barber et al. 2008; Feldstein & Forcehimes 2007). McLellan, McKay, Forman,

Cacciola and Kemp (2005) argue that patients' progress should be assessed during treatment, as post-discharge functioning may only be remotely related to the direct effects of the intervention and faces challenges to implement: typically, such an assessment involves an independent external researcher, and involves methodological sophistication, significant resources and time. They argue that clients attending outpatient treatment should be assessed at regular intervals throughout outpatient treatment rather than post-discharge, as they consistently have the opportunity to use substances. It was observed in the current study that for some participants the residential treatment program was one segment in a continuous treatment plan. For example, several participants had attended in-patient detoxification prior to attending Henwood and following would attend Alcoholics or Narcotics Anonymous, an outpatient treatment, or a longer term residential program. An assessment of treatment outcome after patients had left Henwood would require that these treatments were accounted for.

The current study removed substance use as a treatment outcome as no substance use was allowed and any use resulted in program discharge. Participants did report exposure to drugs and alcohol during their weekend leave and in some cases they did experience significant cravings. Other participants noted that several times during the program they considered quitting so that they could go and use substances, but after speaking with other patients and staff chose to remain in the program. It is possible that patients did not reveal use for fear of being removed from the program as any substance use during treatment is not permitted. It is unclear if participants were concerned that the researcher would reveal their use to the treatment staff or if there was in fact no use. Several participants noted they were exposed to and may have accessed substances during their weekend leave but chose not to. For example, one participant

provided the following comment on their weekend leave: "For me to go to Edmonton and not use is a huge fucking deal. It was a compulsion when I went to Edmonton. It was anxiety, it almost made me sick [referring to driving into Edmonton]. For years going to Edmonton meant using drugs, it was bad." Other participants noted that several times during the program they considered quitting so that they could go and use substances, but after speaking with other patients and staff chose to remain in the program. It is recommended that future research incorporate a post-treatment followup assessment of severity of use. Patient's severity of distress and mental health concerns were used as a metric of symptom change. McLellan, Lewis, O'Brien and Kleber (2000) argue that an accurate assessment of treatment outcome requires that progress on client's specific problems presented at admission are considered. McLellan et al. (2000) concluded that "substance abuse may be con-committal [or occurring alongside] of other problems and thus it may be more reasonable to think of alcohol and drug abuse as a general syndrome having the common symptoms of excessive chemical use, but varying permutation of other problems." (pg 238).

The design used in the study described in this thesis was a single group pre- to post-test. This procedure has several limitations that threaten the internal validity of the findings including history, maturation, testing, instrumentation, and statistical regression (Miller, 1998). The aim of this method was to determine if participants improved after receiving treatment, and to examine what factors predicted change, but not to determine if the program *caused* changes. To do the latter, a randomized controlled clinical trial design would be required. A limited interpretation of the findings is required, as with this methodology it cannot be determined if maturation of the participants would have occurred without the treatment intervention, due to the absence of a control group. In addition to

these limitations, an additional issue that arose in the current study was attrition. There was a high number of participants who did not complete a sufficient number of GCQ ratings and therefore were excluded from analysis.

An additional threat to external validity in the current study is multiple treatments. The focus of study was the psychodynamic group therapy sessions; however, all participants also engaged in other daily and weekly activities and sessions such as psycho-educational groups, life skills, individual therapy, relapse prevention and tobacco cessation. In addition, many participants noted that prior to entering the Henwood program they had completed an intensive detoxification program and in some instances hospitalization. Each of the variables assessed in the current study may have been affected by these programs. It is recommended that future research incorporate other treatment into the study design.

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Appendix 1

Table 1

Demographic Variables: Age, Education and Employment by Gender

	All Participants			Male Participants			Female Participants		
Variable	N	M	SD	N	M	SD	N	M	SD
Age (yrs.)	91	39.78	12.00	68	41.29	12.58 *	23	35.30	8.87**
Primary Education (yrs.)	89	11.33	1.22	66	11.34	1.29	23	11.28	1.01
Secondary Education (yrs.)	48	2.60	1.25	32	2.96	1.27	16	1.88	0.87**
Employment (yrs.)	88	8.26	8.30	66	9.08	8.92**	22	5.81	5.36 *

*p<.05 **p<.01

Table 2

Demographic Variables: Marital Status and Children by Gender

	All Participants		Male Participants		Female Participants	
Variable	N	%	N	%	N	%
Marital Status						
Total	91	100	68	75	23	25
Married/Common Law	27	30	17	25	10	44
Single/Divorced/Separated	64	70	51	75	13	57
Do you have children?						
Total	91	100	68	75	23	25
Yes	30	33	20	29	10	44
No	61	67	48	71	13	57

Table 3

Demographic Variables: Employment Status and Income by Gender

	All Participants		Male Participants		Female Participants	
Variable	N	%	N	%	N	%
Employment status						
Total	87	100	65	75	22	25
Full Time	56	64	47	72	9	41
Part Time	10	12	7	11	3	14
Unemployed	7	8	4	6	3	14
Unable to work	8	9	4	6	4	18
Other	6	7	3	5	3	14
Income						
Total	88	100	65	74	23	26
Less than $30,000	28	32	16	25	12	52
$30,000-$69,999	24	27	19	29	5	22
$70,000 - $99,999	24	27	20	31	4	17
$100,000 or more	12	14	10	15	2	9

Table 4

Demographic Variables: Referral by Child Welfare and by the Criminal Justice System by Gender

	All Participants		Male Participants		Female Participants	
Variable	N	%	N	%	N	%
Referred by Child Welfare						
Yes	9	10	3	4	6	26
No	82	90	65	96	17	74
Referral by Criminal Justice System						
Yes	12	13	10	15	2	9
No	77	87	57	85	20	91
Prior Treatment						
Yes	44	49	31	46	13	59
No	45	51	36	54	9	41

Table 5

Clinical Characteristics: Self-Efficacy, Perceived Social Support and Motivation

Variable	Questionnaire	N	M	SD
Self-Efficacy	Brief Situational Confidence Questionnaire (BSCQ)	89	58.60	19.90
Perceived Social Support	Community Assessment Inventory (CAI)	80	97.15	16.6
Motivation:	Circumstances, Motivation and Readiness Scale (CMRS)	90	74.10	12.50

Table 6

Pre- to Post-Treatment Change: Mental Health, Severity of Distress and Perceived Improvement

		Pre-treatment			Post-treatment		
Variable	Questionnaire	N	M	SD	N	M	SD
Mental Health (DV)	ASI Mental Health Composite Score	100	0.36	0.25	100	0.17**	0.21
Severity of Distress: Patient	TCS Client Objective Severity of Distress	102	3.78	0.94	89	1.43**	0.72
Severity of Distress: Observer (DV)	TCS Observer Objective Severity of Distress	102	3.79	0.94	88	1.48**	0.72
Perceived Improvement	TCS Client Expected Improvement /Perceived Improvement	102	9.83	0.78	91	9.66*	0.89

*p<.05 **p<.01

Table 7

Average Group Climate Questionnaire Rating per Treatment Session (Day)

Session	Engagement			Conflict			Avoidance		
Day	N	M	SD	N	M	SD	N	M	SD
4 – Thur.	51	5.09	1.02	51	1.78	0.60	51	2.69	0.69
6 – Mon.*	54	5.17	1.03	54	1.67	0.65	54	3.43	1.13
7 – Tues.	59	4.92	0.98	59	1.75	0.66	59	3.59	1.13
8 – Wed.	61	4.92	0.98	61	1.90	0.77	61	3.48	1.24
9 – Thur.	58	5.18	1.04	58	1.62	0.62	58	3.58	1.20
11 – Mon.*	54	5.05	1.01	54	1.68	0.78	55	3.35	1.17
12 – Tue.	53	4.86	0.97	53	1.76	0.83	53	3.64	1.21
13 – Wed.	52	5.03	1.01	52	1.81	1.04	51	3.52	1.23
14 – Thur.	55	5.19	1.04	55	1.69	0.82	55	3.30	1.20

Note – Patients were recruited on the first Wednesday (evening) of the program; therefore there were no GCQ ratings for the first three days of treatment. Each Friday a graduation was held for patients who completed the program, and therefore there were no GCQ ratings on Fridays.

*New patients entered treatment

Table 8

Main Effects and Interactions: ASI Mental Health Residual Change

		Coefficient	SE	t	p
ASI Mental Health	x Avoidance with Time	-0.65	0.55	-1.17	0.25
Residual Change	x Engagement with Time	0.63	0.91	0.69	0.50
	x Conflict with Time	-0.74	0.49	-1.5	0.13
TCS Severity of	x Avoidance with Time	0.04	0.43	0.09	0.93
Distress Residual	x Engagement with Time	-0.51	0.71	-0.71	0.48
Change	x Conflict with Time	0.96	0.36	2.65	0.01

Table 9

Correlation Matrix between Independent Variables (Group Climate Questionnaire Variables) and Control Variables (Age, Self-Efficacy, Motivation, Social Support, Alcohol Use and Drug Use)

	Avg. Engagement	Avg. Conflict	Avg. Avoidance	Slope Engagement	Slope Conflict	Slope Avoidance	Self Efficacy	Social Support	Motivation	Age	ASI Alcohol	ASI Drug
Avg. Engagement	1	**-.41****	-.01	.22	-.06	-.00	.04	.20	.03	-.05	-.16	-.06
Avg. Conflict		1	**.47****	-.13	.04	.08	.00	-.13	**.27***	.09	.07	.12
Avg. Avoidance			1	.06	-.09	**.25***	-.10	-.05	**.26***	-.11	.15	.03
Slope Engagement				1	.12	-.14	-.06	.19	.14	-.14	-.04	.01
Slope Conflict					1	**-.26***	-.02	.06	.11	-.18	-.13	**.27***
Slope Avoidance						1	.16	.07	-.05	.13	**.24***	-.14
Self Efficacy							1	.10	-.27*	.06	-.08	**-.21***
Social Support								1	.06	.02	-.05	-.08
Motivation									1	.07	.15	.17
Age										1	**.34****	**-.46****
ASI Alcohol											1	**-.24***
ASI Drug												1

*p<.05 **p<.01

Table 10

Pre- to Post-Treatment Change in Severity of Distress Regressed on Average Engagement, Conflict, Avoidance, and Control and Moderator Variables

	Model 1.		Model 2.		Model 3.		Model 4.		Model 5.	
Variable	b	β	b	β	b	β	b	β	b	β
Age	.00	.05	.00	.00	-.00	-.06	-.01	.01	.01	.11
Pre-treatment Alcohol	-.35	-.14	-.37	-.37	-.23	-.12	-.28	-.34	-.34	-.14
Pre-treatment Drug	2.66	**.48****	2.62	**2.62****	1.96	**.35***	1.91	.87	1.69	.30
Self-Efficacy	-.01	-.19	-.01	-.01	.01	-.20	-.01	.01	-.01	-.15
Perceived Social Support	-.00	-.02	-.01	-.01	-.00	-.04	.00	.01	-.00	-.07
Avg. Engagement			-.01	-.01	.02	.13	.02	.03	0.02	.13
Avg. Conflict					.11	**.33***	.12	.36	.12	.34
Avg. Avoidance							-.01	-.05	-.03	-.08
Gender									-.09	-.05
Motivation									.01	.16

*p<.05 **p<.01

Note:

Model 1 includes control variables age, self-efficacy, perceived social support, pre-treatment alcohol use, and pre-treatment drug use.

Model 2 includes control variables and GCQ Engagement average (Cohesion),

Model

Model 3 includes control variables, GCQ Engagement and GCQ Conflict average

Model 4 includes control variables, GCQ Engagement, Conflict, and Avoidance average

Model 5 includes control variables, GCQ Engagement, Conflict, Avoidance and Moderator variables gender and motivation

Table 11

Pre- to Post-Treatment Change in Mental Health Concerns Regressed on Average Engagement, Conflict, Avoidance, and Control and Moderator Variables

	Model 1.		Model 2.		Model 3.		Model 4.		Model 5.	
Variable	b	β	b	β	b	β	b	β	b	β
Age	.01	.06	.02	.08	.03	.15	.03	.151	.03	.13
Pre-treatment Alcohol	-.28	-.03	.05	.01	-.23	-.03	-.23	-.03	-.84	-.09
Pre-treatment Drug	.96	.04	1.65	.07	3.26	.15	3.27	.15	4.21	.19
Self-Efficacy	-.04	-.23	-.04	-.22	-.03	-.21	-.03	-.21	-.04	-.24
Perceived Social Support	-.01	-.06	-.02	-.10	-.02	-.10	-.02	-.10	-.01	-.06
Avg. Engagement			.03	.18	.04	.05	.04	.05	.03	.04
Avg. Conflict					-.34	-.25	-.35	-.25	-.34	-.25
Avg. Avoidance							.00	.00	-.07	-.06
Gender									-2.07	**-.29***
Motivation									.01	.04

*p<.05 **p<.01

Note:

Model 1 includes control variables age, self-efficacy, perceived social support, pre-treatment alcohol use, and pre-treatment drug use.

Model 2 includes control variables and GCQ Engagement average (Cohesion),

Model

Model 3 includes control variables, GCQ Engagement and GCQ Conflict average

Model 4 includes control variables, GCQ Engagement, Conflict, and Avoidance average

Model 5 includes control variables, GCQ Engagement, Conflict, Avoidance and Moderator variables gender and motivation

Table 12.

Pre- to Post-Treatment Change in Severity of Distress Regressed on Change over Time in Engagement, Conflict, Avoidance, and Control and Moderator Variables

	Model 1.		Model 2.		Model 3.		Model 4.		Model 5.	
Variable	b	β	b	β	b	β	b	β	b	β
Age	-.02	-.24	-.02	-.24	-.02	.23	-.01	-.23	.00	.42
Self-Efficacy	-.01	-.16	-.01	-.16	-.01	-.17	-.01	-.16	-.01	-.16
Perceived Social Support	-.01	-.09	-.01	-.09	-.01	-.09	-.00	-.08	-.00	-.03
Motivation	-.02	.26	.02	.27	.02	.25	.02	.25	.01	.11
Avg. Engagement			-.04	.03	-.04	-.03	-.05	-.04	.01	.01
Avg. Conflict					.03	.03	.02	.02	.01	-.02
Avg. Avoidance							-.08	-.09	-.09	-.10
Gender									-.12	-.07
Pre-treatment Alcohol									-.27	-.11
Pre-treatment Drug									2.5	**.46****

*p<.05 **p<.01

Note:

Model 1 includes control variables age, self-efficacy, perceived social support and motivation. Model 2 includes control variables and GCQ Engagement slope (Cohesion), Model

Model 3 includes control variables, GCQ Engagement and GCQ Conflict slope

Model 4 includes control variables, GCQ Engagement, Conflict, and Avoidance slope

Model 5 includes control variables, GCQ Engagement, Conflict, Avoidance and Moderator variables gender, pre-treatment alcohol use, and pre-treatment drug use.

Table 13

Pre- to Post-Treatment Change in Mental Health Concerns Regressed on Change over Time in Engagement, Conflict, Avoidance, and Control and Moderator Variables

	Model 1.		Model 2.		Model 3.		Model 4.		Model 5.	
Variable	B	β	b	β	b	β	b	β	b	β
Age	.02	.07	.02	.10	.02	.10	.02	.10	.04	.16
Self-Efficacy	-.05	-.29	.05	-.29	-.05	-.29	-.05	-.28	-.05	-.29
Perceived Social Support	-.01	-.08	-.02	-.10	-.02	-.10	-.02	-.09	-.01	-.04
Motivation	-.03	-.09	-.04	-.11	-.04	-.1	-.04	-.11	-.04	-.13
Avg. Engagement			.81	.15	.81	.15	.77	.15	.77	.15
Avg. Conflict					-.01	-.00	-.03	-.01	-.01	-.01
Avg. Avoidance							-.18	-.05	-.45	-.14
Gender									-2.07	-.29
Pre-treatment Alcohol									-.55	-06
Pre-treatment Drug									3.73	.17

*p<.05 **p<.01

Note:

Model 1 includes control variables age, self-efficacy, perceived social support and motivation. Model 2 includes control variables and GCQ Engagement slope (Cohesion), Model

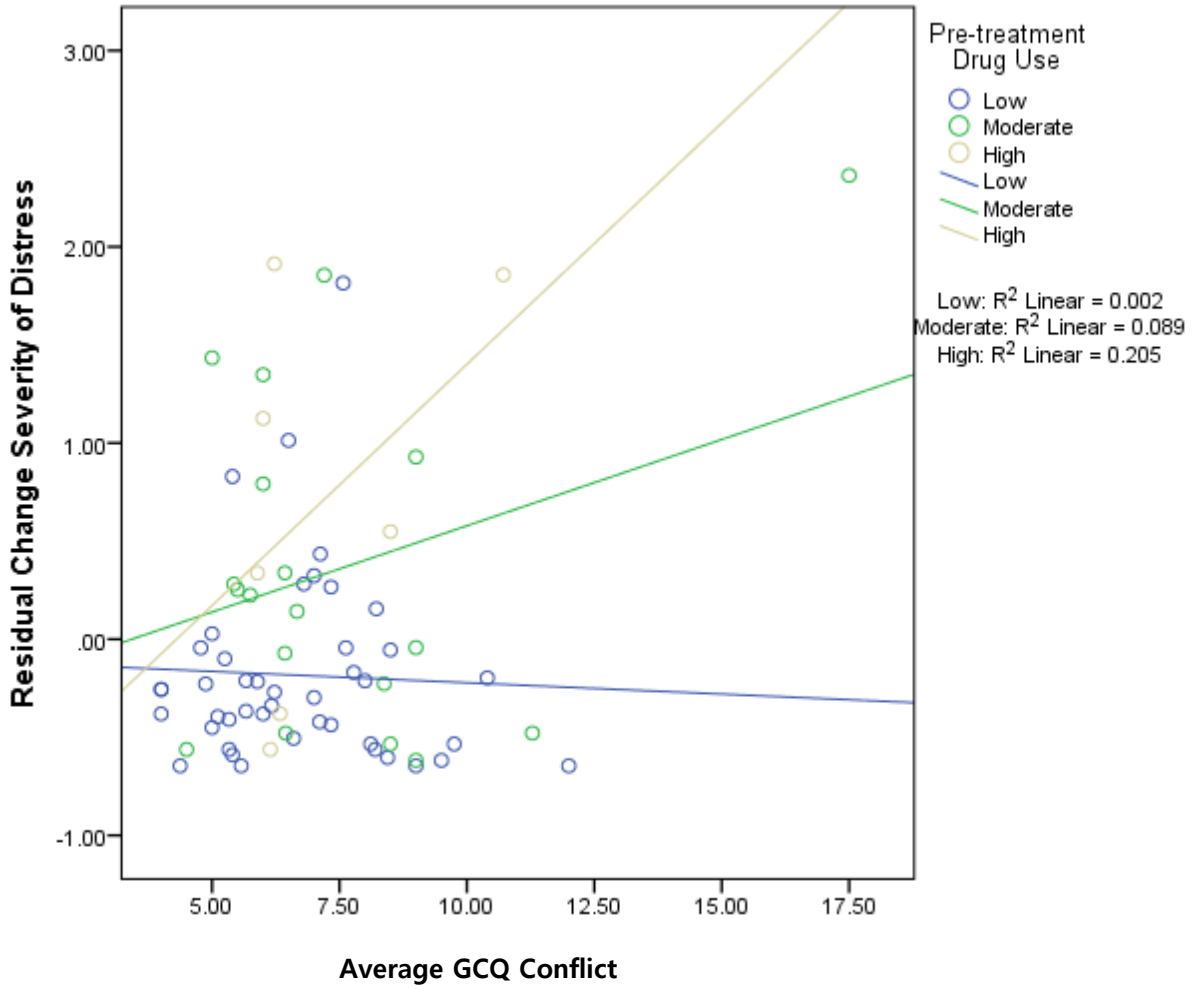
Model 3 includes control variables, GCQ Engagement and GCQ Conflict slope

Model 4 includes control variables, GCQ Engagement, Conflict, and Avoidance slope

Model 5 includes control variables, GCQ Engagement, Conflict, Avoidance and Moderator variables gender, pre-treatment alcohol use, and pre-treatment drug use.

Figure 1

GCQ Conflict Relation with Pre- to Post-Treatment Change in Severity of Distress is Moderated by Pre-Treatment Drug Use



Individuals with high pre-treatment drug use had a greater coefficient between and change in severity of distress (R^2 = 0.21) than individuals with moderate pre-treatment drug abuse (R^2= 0.09) and low pre-treatment drug use (R^2 = 0.00).