

Testing a Self-Determination Theory Model of Recovery from Problematic Alcohol Use
Through Peer-Support Attendance.

by

Tyler M. Carey
B.A., University of Windsor, 2011

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF SCIENCE

in the Department of Psychology

© Tyler Carey, 2013
University of Victoria

All rights reserved. This thesis may not be reproduced in whole or in part, by photocopy or other means, without the permission of the author.

Supervisory Committee

Testing a Self-Determination Theory Model of Recovery from Problematic Alcohol Use
Through Peer-Support Attendance.

by

Tyler M. Carey
B.A., University of Windsor, 2011

Supervisory Committee

Dr. Frederick M. E. Grouzet, (Department of Psychology)
Co-Supervisor

Dr. Erica M. Woodin, (Department of Psychology)
Co-Supervisor

Abstract

Supervisory Committee

Dr. Frederick M. E. Grouzet, (Department of Psychology)

Co-Supervisor

Dr. Erica M. Woodin, (Department of Psychology)

Co-Supervisor

Over the last century, peer-support programs have emerged as viable treatment options for individuals in recovery from problematic alcohol use (White, 2009). During this time, researchers have generated a considerable amount of evidence suggesting that peer-support programs promote widespread benefits among group members (e.g., White, 2009). Despite a growing body of research in this area, little is currently known about the processes explaining how peer-support groups help people achieve positive recovery outcomes. The current study adopts a self-determination theory (Ryan & Deci, 2000) framework to explore the means by which peer-support programs promote well-being, group satisfaction, and sustainable behaviour regulation for limiting alcohol use. Eighty-one peer-support attendees responded to a brief web-survey about self-regulation, well-being, and peer-support group experiences. These participants were recruited as part of a larger longitudinal project (entitled “Sober Together”) on peer-support for problematic alcohol use. Preliminary findings indicated that peer-support attendees who perceived group environments as need supportive were more likely to experience psychological need fulfillment, and in turn, greater well-being, group satisfaction, and autonomous regulation for limiting alcohol use. Notably, participants who perceived a congruent “spiritual-fit” with secular or spiritually-based peer-support programs also appeared more likely to experience their

group as need supportive, which in turn, bolstered perceptions of psychological need fulfillment.

Findings highlight the importance of structuring peer-support environments in a manner that supports psychological needs

Table of Contents

Supervisory Committee	ii
Abstract	iii
Table of Contents	v
List of Tables	vi
List of Figures	vii
Acknowledgments	viii
Introduction	1
Limiting Alcohol Use: A Self-Determination Theory Perspective	5
Addictions-Related Peer Support Programs	15
Spirituality	22
The Current Study	29
Method	34
Participants	34
Procedure	35
Measures	37
Analytic Plan	42
Results	44
Psychometrics	44
Outliers and Missing Data	52
Primary Analyses	53
Supplementary (Post-Hoc) Analyses	62
Discussion	68
Perceived Need Support and Need Fulfillment	68
The Role of Spiritual-Fit	69
Mediated Pathways	71
Clinical Implications	74
Limitations and Directions for Future Research	75
Conclusion	78
References	79
Appendix A	88
Appendix B	89
Appendix C	90
Appendix D	91
Appendix E	92

List of Tables

Table 1: Exploratory Factor Analysis on Perceived Need Support Items using Principle Axis Factoring and Direct Oblimin Rotation	45
Table 2: Exploratory Factor Analysis on Perceived Need Fulfillment Items using Principle Axis Factoring and Direct Oblimin Rotation	47
Table 3: Exploratory Factor Analysis on TSRQ Items using Principle Axis Factoring and Direct Oblimin Rotation	48
Table 4: Exploratory Factor Analysis on Affective Items using Principle Axis Factoring and Direct Oblimin Rotation	51
Table 5: Descriptive Statistics and Zero-Order Correlations for Main Study Constrcuts	54

List of Figures

Figure 1: The Self-Determination Theory Continuum	8
Figure 2: Theoretical Model	30
Figure 3: A Mediational Test of Hypothesis 5 (H5; SWB)	58
Figure 4: A Mediational Test of Hypothesis 5 (H5; Flourishing)	60
Figure 5: A Mediational Test of Hypothesis 6 (H6)	61
Figure 6: A Mediational Test of Post-Hoc Hypothesis 1 (PHP1).....	64
Figure 7: A Mediational Test of Post-Hoc Hypothesis 2 (PHP2).....	66

Acknowledgements

This thesis is part of a broader longitudinal project on peer-support for problematic alcohol use led by Dr. Frederick Grouzet. Findings presented in this thesis are based on preliminary data collected in May 2013 as part of the longitudinal project, entitled “Sober Together.” The theoretical model tested in this thesis was developed by Dr. Grouzet, and presented at the 2012 Biannual International Network for Personal Meaning (INPM) conference in Toronto, Ontario.

I would like to acknowledge a number of individuals and institutions for their support and contributions toward the completion of this thesis. This work would not have been possible without the support of Dr. Frederick Grouzet, who devoted many hours of his time toward this project and developing the online system used for data collection. I will also be forever grateful for the training, emotional support, and guidance Dr. Grouzet provided to me during the last two years of my life. Next, I would like to acknowledge my clinical supervisor, Dr. Erica Woodin, for all of the time and effort she has invested in me, and this project at large. I am deeply thankful for all of her support and feedback throughout the writing process, as well as her willingness to share invaluable clinical knowledge and experience with me about mental health and addictions. During the last two years, Drs. Grouzet and Woodin have nurtured my passion for integrating social psychological theory into the realm of clinical psychology and addictions research. For this, I owe them both my deepest gratitude. Next, I would like to acknowledge Ryan Lim, who spent many hours helping format and modify the online system used to collect data for this thesis. I must also acknowledge my Mom, Dad, brother, and grandparents for helping me through the “ups and downs” of the past two years. During this time, I have truly come to realize how much I rely upon each of them for emotional support and guidance. Finally,

I would like to acknowledge the funding that I received during my Master's degree from The Social Sciences and Humanities Research Council of Canada (SSHRC) and the University of Victoria.

Testing a Self-Determination Theory Model of Recovery from Problematic Alcohol Use through Attending Peer-Support Groups.

Since its inception, the field of clinical psychology has mainly identified itself with a medical model of health-care provision rooted in the “illness ideology” (Maddux, Snyder, & Lopez, 2004). Working from this frame of reference, clinical practitioners and addictions counsellors have been focussed primarily on remediating illness and pathology rather than promoting well-being. Although psychological knowledge has grown exponentially as a result of adopting this ideological framework, researchers in the fledgling field of positive psychology have begun to advocate for a “positive clinical psychology” that emphasizes a balanced focus on alleviating pathology *and* promoting well-being (Maddux, Snyder, & Lopez, 2004). Thus, applied positive psychologists primarily strive to identify how psychological impairment can be counteracted by promoting and nurturing positive psychological functioning (e.g., experiencing positive emotions; positive relationships, etc.). The emergence of positive clinical psychology is not intended to supplant the illness ideology, but rather to complement it with a more balanced approach to health-care provision. Joseph and Linley (2006), however, underscore the counterfeit nature of any supposed antagonism between these ideologies, stating that, “[a]ny intervention that serves to decrease the negative also serves to increase the positive, and any intervention that increases the positive also decreases the negative, by definition” (p. 333).

While the positive psychology movement has been unfolding largely within the confines of the academic sphere, the field of addictions has been undergoing a similar ideological shift and social movement in non-academic territory. This ideological shift, dubbed the “recovery movement” (see Krentzman, 2013), has been heavily influenced by the growth and expansion of different peer-support programs that promote a multiple pathways approach toward recovery

(White & Kurtz, 2005). Although this movement is currently unfolding within recovery circles, Alcoholics Anonymous (AA) continues to be a widely available and frequently utilized peer-support option for individuals in recovery from problematic alcohol use (Sharma & Branscum, 2010). This particular peer-support organization has been frequently noted for its *highly structured* (12-step) recovery format. Accordingly, AA's structured format suggests that variability may exist among peer-support groups in terms of their relative emphasis on a flexible "multiple pathways" approach to recovery. It is important to note, however, that researchers have found considerable heterogeneity among the beliefs and recovery practices of AA attendees around the world (e.g., Emrick, 2004). Such findings suggest that multiple recovery pathways may be pursued even within the confines of a highly structured 12-step format.

The emergence of a *multiple pathways* approach to recovery seems to overlap nicely with the aims and objectives of positive psychology, which advocates for a balanced approach to psychological treatment. For example, proponents of both positive psychology and the recovery movement may see value in offering a menu of treatment options (i.e., positive psychotherapy, psychopharmacology, motivational interviewing, cognitive-behavioural therapy, etc.) to individuals in recovery from problematic alcohol use. Both parties might also contend that ancillary treatment approaches (such as those designed to bolster well-being) should not be overlooked or forgotten about in the formulation of holistic recovery plans designed to meet all (or most) of the client's needs.

Quality-of-life (QoL) has been increasingly adopted by addictions researchers as a recovery-related outcome and predictor of abstinence (e.g., Laudet, Becker, & White, 2009; Laudet & Stanick, 2010). This increased enthusiasm for studying diverse outcomes (including QoL and well-being) of persons in recovery appears to have jumpstarted a budding interest

among academics who seek to integrate positive psychological concepts and theoretical models into the realm of addictions (see Kretzmann, 2013). Tonigan (2008) has stated that addictions researchers are now conceptualizing the term “outcome”... “[as] including such behaviours as good citizenship and quality of life. While not specifically relevant to substance use, such behaviours, attitudes, and beliefs may offset substance use relapse and hence be important (...) outcomes” (p.361). Among Canadian First Nations circles, the term “wellbriety” has also been used to reference attainment of sobriety plus global health and well-being (e.g., Coyhis, 1999).

The timing seems appropriate to critically evaluate whether a medical model rooted in the illness ideology represents the only (or best) framework to guide psychological knowledge and treatment related to addictions recovery. Are clinically impaired populations of alcohol misusers able to experience well-being? Are they able to flourish? What impact will positive psychological functioning and well-being have on the recovery of these individuals? These questions are ripe for exploration as notions of well-being and resilience begin to permeate the culture surrounding addictions treatment. Moreover, these questions are important for addictions researchers to consider, given that current trends show high rates of relapse and unpredictable circumstances for individuals pursuing recovery from problematic alcohol use (e.g., Feliz, 2012; Moos & Moos, 2006; White, 2012; Whitford, Widner, Mellick, & Elkins, 2009).

In the current study, *successful recovery* is conceptualized as extending beyond the mere absence of drinking behaviours. This formulation has been adopted since individuals who abstain from alcohol may do so unwillingly and be quite dissatisfied in recovery (and life in general). Under this condition, former alcohol misusers may be adversely affected by their addiction despite overt displays of abstinence. Notably, individuals exhibiting this profile have not been described as sober; instead, they have been labelled as having “dry drunk syndrome” (Solberg,

1983). This case conceptualization includes a bleak prognosis for long-term remission from problematic alcohol use since it does not imply that important life changes have occurred beyond short-term or transient periods of abstinence.

Comparatively, *successful recovery* is conceptualized in accordance with humanistic and positive psychology influences that suggest the overall well-being of persons in recovery is an instrumental component for overcoming addiction. The well-being of former alcohol misusers is projected as being attainable when basic psychological needs are nurtured and fulfilled in need supportive recovery environments. Under these conditions, former alcohol misusers may begin to fully endorse the idea of limiting alcohol use, rather than feeling controlled or forced to engage in recovery-related behaviours. This case conceptualization includes an optimistic prognosis whereby individuals may begin to flourish in life and achieve long-term, sustainable recovery from problematic alcohol use.

Using a self-determination theory (SDT; Ryan & Deci, 2000) framework, the current study tests whether peer-support programs for problematic alcohol use (sometimes referred to as “mutual-aid” groups) provide needs-supportive environments that are facilitative of positive psychological functioning and well-being. Peer-support programs also maintain spiritual (or non-spiritual) ideologies of recovery, which influence official group policies and practices. Existing peer-support programs are often bifurcated into groups that offer spiritually-guided recovery formats and groups that offer secular-based (or non-spiritual) recovery formats. Twelve-step groups such as Alcoholics Anonymous (AA) are often considered spiritual programs (Li, Feifer & Strohm, 2000; Miller & Kurtz, 1994), whereas groups such as LifeRing and SMART Recovery tend to follow secularist formats whereby discourses revolving around a “God” or “Higher Power” are not encouraged (White & Nicolaus, 2005). The relative emphasis placed on

spirituality during the recovery process, therefore, appears to represent an important distinction between spiritually-guided and secular-based peer-support groups. Whether or not individuals perceive the spiritual (or non-spiritual) ideology of peer-support programs as being well aligned with their own, personally held spiritual (or non-spiritual) beliefs may constitute another important variable influencing whether or not these recovery environments yield positive outcomes (e.g. well-being) to group attendees.

Limiting Alcohol Use: A Self-Determination Theory Perspective

For many years, researchers and practitioners within the area of addictions treatment have debated vigorously about the definition of “recovery” (e.g., Van Wormer & Davis, 2003; White, 2007). The quest to establish a set of outcomes indicative of “successful recovery” has therefore, monopolized a great deal of attention. A harm reductionist position defines recovery as diminished substance-related consequences without requiring total abstinence from the substances themselves (e.g., Riley et al., 1999). Conversely, an abstinence-related position defines recovery as completely overcoming physical and psychological dependence on substances (e.g., Steindler, 1998). Although outcome-focussed conceptual debates are productive and important to the advancement of knowledge, it is important that equal attention is allotted to the *underlying processes* of “recovery” (i.e. the mechanisms explaining how people are able to “recover” – however one chooses to define the term). Notably, the processes discussed in the current thesis are speculated to enhance positive psychological functioning and well-being. Although beyond the scope of the current thesis, these processes are intended to have beneficial effects on consumption-based outcomes frequently equated with “recovery” (e.g. abstinence; limiting alcohol, etc.). Using SDT (Ryan & Deci, 2000), the current thesis tests a model developed by Grouzet (2012) that predicts how secular- and spiritually-based peer-support

programs can promote positive psychological benefits (e.g., psychological well-being and sustainable behaviour regulation for limiting alcohol use) to individuals in recovery. However, the issue of whether or not such benefits are subsequently linked to consumption-related outcomes is not explicitly tested in this thesis.

Basic Propositions of Self-Determination Theory. Within an SDT framework, the position that all persons have inherent growth tendencies toward health and well-being is maintained. However, interactions taking place between people and their environments are also sufficiently important for determining whether or not innate growth tendencies actually become realized. According to SDT, if a person is to eventually achieve health and well-being, they must receive three universal needs or “nutriments” from the social environment: (1) autonomy; (2) relatedness; and (3) competence (Deci & Ryan, 2012; Ryan & Deci, 2000). If varying circumstances prevent an individual from realizing psychological growth and well-being, needs-supportive environments may provide the necessary means to realign them back along a positive growth trajectory (Deci & Ryan, 1985). In this way, the social environment truly lies at the heart of therapeutic benefit.

Need Support and Need Fulfillment. According to Deci and Ryan (2012), basic psychological needs of autonomy, relatedness, and competence comprise a subset of “*organismic necessities for health*” (p. 87). As such, fulfillment of these needs is critical for the healthy growth and development of clinical and nonclinical populations alike. To have psychological needs fulfilled, they must be supported by the surrounding environment. First, environments that support the psychological need for autonomy encourage individuals to view themselves as the origin of their own behaviour (Deci, 1975). Second, environments that support the psychological need for relatedness encourage individuals to feel a sense of belongingness or connectedness to

others (Baumeister & Leary, 1995). Lastly, environments that support the psychological need for competence encourage individuals to perceive themselves as capable of influencing or causing desired outcomes during optimally challenging tasks (Reiss, Sheldon, Gable, Roscoe, & Ryan, 2000; White, 1959). As alluded to previously, needs-supportive qualities of the social environment may impact whether or not individuals actually perceive their basic psychological needs as being fulfilled. In turn, perceived need fulfillment is theoretically linked to the regulatory processes underlying various types of human behaviour (Deci & Ryan, 2000).

Self-Determination Theory and Behaviour Regulation. The capacity to predict human behaviour has been a core objective of SDT since its inception in the mid 1980's (Ryan & Deci, 2000). As a result, SDT posits the existence of many types of behaviour regulation, each with a different influence on observable human behaviour. According to SDT, these regulatory styles exist along a continuum ranging from controlled regulation on the left side of the continuum to autonomous regulation on the right side of the continuum (*See Figure 1*). Moving from left to right along the continuum, the specific regulatory styles include: (1) external regulation, (2) introjected regulation, (3) identified regulation, and (4) integrated regulation (Deci & Ryan, 2000).

Controlled Behaviour Regulation. The first regulatory style existing along the continuum corresponds to *external regulation* (Deci & Ryan, 2000). In accordance with principles of operant conditioning (e.g., B. F. Skinner, 1953), externally regulated behaviours are performed primarily as a means to attain some reward or to avoid some punishment (Deci & Ryan, 2000). Because externally regulated behaviours are not always performed with a full sense of personal endorsement or willingness, they may be unlikely to persist after reinforcement contingencies have been removed from the environment. For example, a man who quits drinking

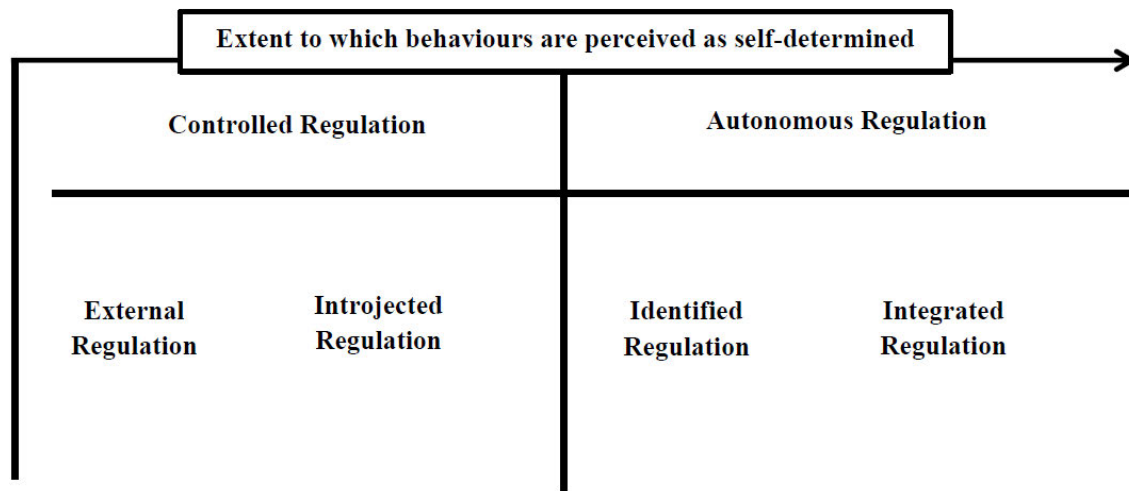


Figure 1. Four different regulatory styles placed along the self-determination continuum. Adapted from “The ‘What’ and ‘Why’ of Goal Pursuits: Human Needs and the Self-Determination of Behaviour,” by E. L. Deci, & R. M. Ryan, 2000, *Psychological Inquiry*, 11, p.23

to avoid the financial burden associated with purchasing alcohol (i.e., “negative reinforcement”) may be more likely to experience self-regulatory failure and relapse after inheriting a large sum of money. Instead of whole-heartedly endorsing the value of limiting alcohol use, this particular individual’s drinking behaviour had, for the most part, become dictated by the negative reinforcement contingencies in his environment.

A second type of regulatory style, *introjected regulation*, is also quite commonly associated with self-regulatory failure (Koestner, Losier, Vallerand, & Carducci, 1996). Like external regulation, this type of behaviour regulation is based upon principles of operant conditioning. However, in this instance individuals are motivated to enact (or inhibit) a particular behaviour to: a) avoid feeling an internal sense of guilt that would otherwise follow from the inability to perform (or inhibit) that behaviour, or b) obtain an internal sense of pride that would otherwise follow from the successful enactment (or inhibition) of that behaviour. Deci and Ryan

(2000) suggest that introjected regulations are particularly interesting because “*they are within the person, but still relatively external to the self*” (p. 236). The latter part of this statement (i.e., “*they are still relatively external to the self*”) merely denotes the fact that introjected behaviours are enacted without a full sense of willingness or personal endorsement. An example of introjected regulation can be seen when a woman during pregnancy opts to avoid drinking alcohol in order to circumvent internal feelings of guilt related to harming the developing child. In this instance, avoidance of guilt is the primary motive underlying the woman’s positive behaviour change. Instead of personally endorsing the value of limiting alcohol use, this woman is merely trying to avoid feelings of guilt that would otherwise accompany the occurrence of a drinking episode. Notably, the internal contingency of guilt avoidance may no longer exist after the pregnancy takes place. In this instance, the woman may be increasingly susceptible to self-regulatory failure and relapse.

Autonomous Behaviour Regulation. The two other regulatory styles located successively along the SDT continuum are likely to be associated with long-term and sustainable self-regulation. The third regulatory style, *identified regulation*, involves consciously valuing a behavioural goal to the extent in which goal congruent actions are perceived as personally important (Ryan & Deci, 2000). In this instance, a former alcohol misuser may come to consciously value sobriety after joining a supportive network of recovering alcohol misusers. As a result of consciously valuing the process of recovery, the individual in this example may be more likely to perceive his or her sobriety-related behaviours (e.g., declining an alcoholic beverage) as value-consistent and personally important. Accordingly, the underlying motivation for enacting these behaviours will likely be experienced as emanating from within, rather than from external sources (e.g., reinforcement contingencies) in the environment. This phenomenon,

dubbed “internal perceived locus of causality” (deCharms, 1968; Heider, 1958) is critical toward perceiving behaviours as self-determined.

The fourth regulatory style located successively along the SDT continuum is referred to as *integrated regulation*. Similar to identified regulation, integrated behaviours are also perceived as being consistent with personally held values and/or value systems. However, during the integration process, behavioural goals that were formerly valued (i.e., identification) become fully assimilated into the very core or essence of one’s self-concept (Ryan, 1995). Thus, enactment of integrated behaviours is experienced as personally important, *and as an expression of the self* (Deci, Eghrari, Patrick, & Leone, 1994). This type of behaviour regulation is evidenced by a man who pours all of the alcohol in his house down the drain after having integrated the value of sobriety into his self-concept. If the man were asked, “*Why did you do that?*” he may simply respond, “*Because I am a sober individual – that’s who I am.*” This man would almost surely experience his goal-directed behaviour as having an “internal perceived locus of causality.”

Although identified and integrated behaviours tend to be enacted with a full sense of willingness and personal volition, they are still driven by the underlying influence of “extrinsic motivation” (Deci & Ryan, 2000, 2012). While this may seem paradoxical with their classification as autonomous types of behaviour regulation, identified and integrated regulations are actually fuelled by internalized social norms and values (e.g., internalizing the socially valued ideal of “sobriety”). According to the theoretical tenets of SDT, the process of internalization occurs when individuals find themselves embedded within needs-supportive environments capable of satisfying basic needs of autonomy, relatedness, and competence (Ryan & Deci, 2000). Internalization may be especially important for individuals pursuing the goal of

long-term and sustainable sobriety since inhibitory- or performance-based behaviours with an “internal perceived locus of causality” tend to persist over longer periods of time (see Deci & Ryan, 1987).

As a final point of emphasis, it should be noted that Figure 1 represents somewhat of an oversimplification of the regulatory processes underlying human behaviour. In particular, one might interpret this figure as suggesting that one (and only one) regulatory style can exist for a given behaviour. This is not true, however, since different types of regulation can coexist for the same behaviour and fluctuate across time and context. For example, someone might inhibit their alcohol consumption because they feel guilty for taking a drink (introjected regulation), and because their spouse provides positive reinforcement for long periods of abstinence (external regulation). Of course, these regulatory processes could change over time and across varying environmental circumstances. At any given time, in any specific context, what matters most is that a given behaviour has greater autonomous than controlled regulation (Ryan & Connell, 1989). This idea underlies one of the main outcomes included in the current study model – “Relative Autonomous Regulation.”

Self-Determination Theory and Addictions Treatment: Empirical Evidence. A number of studies have adopted SDT as a theoretical framework to explain the regulation of health-related behaviours. Specifically, SDT has been applied in studies exploring the regulation of exercise behaviours (e.g., Silva et al., 2008), dieting behaviours (e.g., Verstuyf, Patrick, Vansteenkiste, & Teixeira, 2012), and addictive behaviours (e.g., Ryan, Plant, & O’Malley, 2005). In the area of addictions, Zeldman, Ryan, and Fiscella (2004) found a significant inverse association between perceived autonomy support and the likelihood of relapsing (as assessed by positive urine tests) among a sample of former opioid users undergoing methadone maintenance

(MM). Interestingly, this effect persisted even after controlling for the client's initial source of motivation for attending MM (e.g. controlled vs. autonomous regulation for seeking treatment). In this same study, Zeldman and colleagues found that perceived autonomy support was also significantly associated with fewer missed MM appointments.

In a more recent study, Williams, Niemiec, Patrick, Ryan, and Deci (2009) sought to evaluate the effectiveness of an SDT-based tobacco-dependence intervention designed to facilitate long-term tobacco abstinence. To carry out this objective, 714 smokers were randomized to an SDT tobacco intervention intended to increase perceived fulfillment of competency and autonomy needs. The 6-month intervention involved *“taking a medical and smoking history, eliciting and acknowledging participants' perspectives on their smoking and the health risks smoking poses, and discussing how stopping might improve health”* (p. 317). Additionally, the SDT intervention incorporated an introspective and self-reflective component whereby participants engaged in discussions about their perceived capacity to quit smoking. An alternative group of 292 smokers were randomized to a community care condition that did not include a unique focus on fulfilling basic psychological needs. Results showed that individuals randomized to the SDT intervention were significantly more likely to report prolonged tobacco abstinence at a 24-month follow-up phase compared to their counterparts receiving community care. Notably, the relationship between treatment condition and 24-month tobacco abstinence was partially mediated by autonomous self-regulation and perceived competence.

Foote and colleagues (1998) described the development of a Group Motivational Intervention (GMI) based on the theoretical underpinnings of SDT. The components of GMI were represented by the acronym FRAMES, denoting: (1) feedback; (2) responsibility; (3) advice; (4) menu of options; (5) empathy; and (6) self-efficacy. These researchers discuss

similarities between the FRAMES approach and SDT, stating that elements of FRAMES contribute to the provision of an autonomy-supportive environment (e.g., “menu of options”). They further maintain that GMI is an autonomy-supportive motivational intervention designed to facilitate positive treatment outcomes. This claim was corroborated in a randomized clinical trial showing that patients who received the GMI intervention perceived the group setting as more autonomy-supportive than individuals in an alternative outpatient control condition.¹ Furthermore, perceived autonomy-support was found to be significantly related to the frequency of GMI attendance in the first four treatment sessions. Interestingly, persons in GMI also displayed more ambivalence about the costs associated with stopping substance misuse. Like other SDT-related therapy techniques (e.g., Motivational Interviewing), patient ambivalence in the GMI intervention was interpreted as a positive first step in recovery.

With respect to alcohol-related studies, few researchers have empirically investigated the association between perceived need fulfillment *during* treatment and positive recovery outcomes. Conversely, a greater proportion of existing research provides information about the link between *preliminary* or *initial* treatment motivation and positive recovery outcomes. For example, Ryan, Plant, & O’Malley (1995) investigated the impact of having internal treatment motivation in relation to various 8-week follow-up outcomes. Their findings suggested that individuals with greater internal motivation for seeking alcohol treatment were more likely to have higher rates of treatment attendance and treatment involvement than individuals seeking treatment for extrinsic reasons. Notably, these researchers also found a significant negative association between internal treatment motivation and treatment drop-out 8-weeks later.

¹ These findings were presented as preliminary evaluation results of an unfinished and ongoing GMI study. Details pertaining to sample size and demographic information were not provided.

Contrary to Ryan and colleagues' (1995) findings, studies looking objectively at the source of treatment motivation rather than individual perceptions of treatment motivation have yielded discrepant results (see Urbanoski, 2010). In particular, these studies paradoxically show external sources of treatment motivation (e.g., legal pressures) to occasionally be associated with positive recovery outcomes (e.g., Brecht, Anglin, & Dylan, 2005; Copeland & Maxwell, 2007). Such contradictory findings are not surprising, however, when evaluated in the context of SDT. Specifically, SDT accounts for the possibility that someone might *feel* autonomous in their decision to enter treatment despite the fact that objectively, the source of treatment motivation does not stem from within the self. For example, a person may perceive his or her treatment seeking behaviour as having an internal locus of causality even though objectively, the cause of treatment attendance was triggered by the request of a loved family member. Paradoxical findings reported by Urbanoski (2010) are, therefore, logically accounted for since external sources of treatment motivation may be subjectively reappraised as stemming from the self. Also, treatment motivation may gradually transition from being less external (and increasingly internal) because of the needs-supportive qualities of some therapeutic environments. As demonstrated in MM and tobacco abstinence studies noted previously, needs-support during the course of treatment may precipitate autonomous regulation and lead to positive recovery outcomes.

As can be discerned from the previous discussion, most of the existing studies on SDT-based interventions are predominantly concerned with examining treatment or consumption-related outcomes. In the present thesis, a process-oriented focus is taken with a unique emphasis on recovery-related outcomes (e.g., well-being) that are not explicit indicators of alcohol

consumption. These outcomes are consistent with a “multiple pathways” ideology of addictions recovery and in need of an empirical evidence base demonstrating how they may be promoted.

Addictions-Related Peer Support Programs

The origin of addictions-related peer support programs pre-dated professional interventions. Indeed, there were no early “treatments” for addiction because it was considered to be a moral failing (see Freed, 2012). More recently, professional treatments have been established because all persons do not benefit from peer-support programs alone. Subpopulations of underprivileged individuals, however, cannot afford professional addiction services (which are not always covered through health insurance), so peer-support programs continue to fill an important gap. For this reason, many individuals continue to acknowledge non-professionally-guided peer-support programs as important and viable options for addressing addictions-related health concerns (Kessler et al., 1997; Room & Greenfield, 1993).

According to the official Alcoholics Anonymous (AA) website, approximately 2,133,842 members across the globe use their services (Alcoholics Anonymous World Services, 2012). By necessity, the cumulative number of individuals using addictions-related peer-support services is even greater after accounting for individuals who also attend other (non-AA) programs.

Although some individuals are involuntarily mandated to attend peer-support programs (e.g., through court mandate), it is worth asking why so many people appear to voluntarily seek out, and maintain attendance within peer-support programs during recovery. Within the current study, one explanation is considered. Specifically, it is posited that peer-support programs offer a warm and needs-supportive environment where individuals are afforded the unique opportunity to regain a lost sense of well-being.

Similarities and Differences among Peer-Support Programs. Despite the existence of considerable heterogeneity among addictions-related peer-support groups, common ground can be found among each of them at a broad level of analysis. White (2009) highlighted the following components as being defining characteristics of most peer-based recovery support services (PBRSS)²: (1) they are *peer-based* meaning that services are maintained by individuals sharing a common problem; (2) they are focussed on providing *recovery support*, which means promotion of sobriety, health, and citizenship through informal emotional, social, and/or material aid; (3) they are *non-professional*, meaning that relationships within the group resemble friendships more than doctor-patient relationships; (4) they are *non-clinical* and do not involve professional diagnosis and/or treatment by health care professionals; (5) support persons are *experientially credentialed*, meaning that support is based on life experiences rather than formal education; and (6) they are primarily concerned with promoting *long-term recovery*. White (2009) elaborates further on what is meant by “long-term recovery.”

“...The implicit focus is on moving beyond reducing addiction-related pathology to building sustainable personal, family, and community recovery capital. This is a vision of global health (wellness), life meaning and purpose, and enhanced service to community. It reflects the view that long-term recovery is far more than the alleviation of alcohol and drug problems from an otherwise unchanged life.” (p. 18).

Based on this description, peer-support groups seem to attribute a great deal of importance to the *process of recovery*. They do not focus solely on the desired outcome of remediating problematic alcohol consumption (although this is certainly a main area of emphasis). Instead, these groups strive to promote widespread recovery benefits (i.e., “personal,

² SMART Recovery provides an exception to numbers 1, 3, 4, and 5. These meetings may be facilitated by individuals without a history of drug and/or alcohol misuse or professionals working in the field of addictions.

family, and community recovery capital”) en route to mitigating problematic alcohol use behaviours.

Despite their similarities, peer-support programs are typically bifurcated into opposing “camps” based on divergent ideological beliefs about addictive behaviour change. The first peer-support camp includes programs such as AA that practice a spiritually guided twelve-step philosophy of addictive behaviour change. Conversely, programs such as SMART Recovery and LifeRing follow a secularist philosophy of addictive behaviour change that is frequently held in contrast to the more traditional twelve-step recovery format. Dating back to the 1930’s, twelve-step programs have been the more visible recovery format for people in western civilization (Alcoholics Anonymous, 1939). In fact, a professionally-guided outgrowth of AA’s twelve-step recovery format, the Minnesota model, has been recognized as one of the most commonly used therapeutic approaches for addictions treatment in the US (Allen, 1989). By way of contrast, many popular secular-based peer-support programs are still in their infancy, having only carved their niche in the recovery community during the last fifteen to twenty years. Despite their differences, it should be noted that thousands of individuals have benefitted from both twelve-step and secular-based recovery formats (White & Nicolaus, 2005).

As previously noted, Alcoholics Anonymous (AA) adopts a twelve-step format as the guiding framework for the recovery process. Perhaps the most widely recognized and commonly discussed of the twelve-steps are the initial first two stages. While Step 1 requires individuals to acknowledge their powerlessness over addiction, Step 2 states that addiction may be overcome only through putting one’s faith in a higher power (Alcoholics Anonymous, 2001). According to AA, the meaning(s) attached to labels of “Higher Power” and “God” remain flexible and open to

the subjective interpretation of group affiliates. It is, however, still apparent that AA considers an external or divine intervention to be the driving force behind addictive behaviour change.

In comparison to the twelve-step approach of AA, secular-based groups such as LifeRing, SMART Recovery, and Rational Recovery offer a different ideological slant on the recovery process. Specifically, White and Nicolaus (2005) suggest the most fundamental difference between secular and twelve-step philosophies lies in the source through which addictive behaviours are presumed to be corrected. In contrast to the twelve-step focus on sources of behaviour change external to the self (e.g. a “higher power”), the emphasis within secular-based programs is on personal agency and one’s own volition to influence or cause addictive behaviour change. In accordance with this theme, discourses revolving around a “higher power” are typically discouraged within the context of secular-based peer-support meetings. In addition to this distinction, other subtle differences exist between each “camp” of peer-support. In fact, there are even slight differences between groups existing *within* a given “camp” of peer-support. A comprehensive review of these differences is beyond the scope of the current review; however, a thorough discussion of peer-support programs can be found elsewhere (e.g. White, 2009; White & Kurtz, 2005).

Empirical Evaluation of Peer-Support Programs. While anecdotal reports of positive recovery outcomes associated with peer-support programs have permeated Western civilization for years, little is known empirically about their long-term effects. Furthermore, most of what is currently known about the effectiveness of peer-support programs originates from empirical research on twelve-step groups such as AA (White, 2009). Within these studies, findings generally point to a positive association between twelve-step involvement and various long-term recovery benefits (Gossop et al. 2003; Moos & Moos, 2006). Despite the presence of such

findings, a body of contradictory evidence also exists that fails to corroborate results linking twelve-step involvement to positive recovery outcomes (see Kownacki & Sadish, 1999 for a review). Methodological variation across studies, however, may partially account for mixed findings in this area. In a recent literature review by Kaskutas (2009), the effectiveness of AA was evaluated while simultaneously taking methodological strengths and weaknesses of existing research into consideration. Although Kaskutas's conclusions were not definitive, most of the empirical evidence included in his literature review seemed to validate AA's effectiveness as a therapeutic recovery environment.

In another outcome-focussed review of AA research, Tonigan (2008) cited a number of studies demonstrating significant positive recovery outcomes associated with various indices of AA involvement (e.g., frequency of AA attendance, 12-step progress, etc.). For example, one study by Ouimette, Finney, and Moos (1997) found that frequency of AA attendance during and after formal substance use treatment predicted 12-month abstinence among a sample of 3,018 psychiatric inpatients ($r = .34$). Moreover, these researchers found the beneficial effect of AA attendance to persist after controlling for effects related to prior substance abuse treatment and Axis I diagnoses.

Timko, Moos, Finney, and Lesar (2000) conducted an alternative 8-year longitudinal investigation of AA's effectiveness involving subsamples of problem drinkers who either sought help from AA ($n = 66$), or who did not seek help at all ($n = 78$). Findings at a 1-year follow-up phase indicated that 47.5% of the AA help-seeking group reported abstinence compared to only 19.6% of the non-help-seeking group. This distinction was evident across all follow-up phases

including the final 8-year follow-up whereby 48.5% of the AA help-seeking group reported abstinence compared to only 25.6% of the non-help-seeking group.³

This finding seems to replicate well across AA studies. For example, Tonigan (2008) performed an analysis of 33 studies conducted between 1945 and 1990, each of which reported an association between the frequency of AA attendance and abstinence. Based on his analysis of these 33 studies, Tonigan concluded that a moderate positive association ($r = .21$) exists between the frequency of AA attendance and abstinence. Although data are relatively abundant for twelve-step programs such as AA, it is important to acknowledge that little is known empirically about short- and long-term outcomes associated with secular-based peer-support program attendance. This gap in the literature limits the extent to which AA findings can be accurately generalized to other existing peer-support groups.

Despite the fact that most AA studies are correlational (Emrick, Tonigan, Montgomery, & Little, 1993), randomized control trials (RCT's) have been conducted to evaluate the efficacy of AA (e.g., Brandsma, Maultsby, & Welsh, 1980; Ditman, Crawford, Forgy, Moskowitz, & MacAndrew, 1967). For instance, Ditman and colleagues conducted an RCT by randomly assigning a group of 301 "chronic alcohol offenders" (defined as committing 2 drunken arrests in the past three months) to one of three conditions: a psychiatrically oriented community alcohol treatment clinic, AA, or no treatment at all. Chi-square analyses revealed no significant differences between each of the three groups on outcomes including recidivism (i.e., "not drinking"), number of rearrests, and time elapsed prior to rearrest. This particular study is often cited as evidence supporting the ineffectiveness of AA; however, Tonigan (2008) has highlighted methodological weaknesses of this study including the usage of insensitive outcome measures

³Because participants were not randomly assigned to different groups, a number of alternative factors (e.g., motivation to change) may have influenced follow-up rates of abstinence success.

and poor monitoring of AA attendance (for all groups). In relation to the latter point of contention, researchers have consistently found that clients randomized to non-AA groups are likely to attend AA anyways (Tonigan, Connors, & Miller, 2003). This point is important to consider when evaluating the methodological rigour and statistical conclusion validity of other RCT's which also fail to support AA's effectiveness as a recovery environment (e.g., Brandsma, Maultsby, & Welsh, 1980; Walsh et al., 1999). Lastly, it should be noted that AA attendance was coerced rather than voluntary in all of the available RCT's. This poses a significant limitation to the generalizability of RCT findings since many AA (and other peer-support group) attendees choose to voluntarily attend group meetings. For a more exhaustive review of controlled studies evaluating AA's effectiveness, individuals are encouraged to read Kownacki and Sadish (1999).

Although behavioural outcomes such as abstinence have been commonly employed as the yardstick used to evaluate peer-support programs, some researchers have also considered the impact these groups might have on group members' motivation. Many of these studies, however, have typically incorporated motivation as a process variable into pathway models involving variables such as treatment attendance or abstinence as eventual treatment outcomes (e.g., Kelly, Myers, & Brown; Morgenstern, Labouvie, McCray, Kahler, & Frey, 1997). Using a longitudinal prospective design, these studies have demonstrated a positive association between initial AA attendance and motivation for abstinence at a later time point. Over time, AA group members involved in these studies showed greater commitment to abstinence, and recognized the goal of sobriety as having greater personal importance – an idea similar to SDT's process of “identification.”

The accumulation of evidence supporting the efficacy of peer-support programs (predominantly AA) has triggered a growing interest in the factors explaining *how* peer-support

groups work or operate to promote positive recovery-related outcomes. After reviewing the literature on this topic, White (2009) compiled a list of factors that he labelled “potent ingredients” of peer-support programs. His list has been derived from existing empirical work and consists of factors such as increased self-efficacy (Morgenstern, Labouvie, McCray, Kahler, & Frey, 1997), regular re-motivation to continue change efforts (adolescent sample used; Kelly, Myers, & Brown, 2000), social support that offsets pro-drinking networks (Laudet, Cleland, Magura, Vogel, & Knight, 2004), participation in rewarding sober activities (see Moos, 2008), and exposure to sober role models who provide experience-based advice about how to stay sober (Kaskutas, Bond, & Humphreys, 2002). While a number of factors appear on White’s list, psychological need support and need fulfillment are not subsumed under his classification system of “potent ingredients.” Nevertheless, some of the existing factors on White’s list do bear conceptual similarity to psychological need fulfillment. For example, *increased self-efficacy* is closely related to fulfillment of the need for competence. In the present study, basic psychological need support and need fulfillment are posited to be additional “potent ingredients” of peer-support programs that may be associated with positive recovery outcomes.

Spirituality

Despite being a topic of considerable interest for many years, researchers have been unable to unanimously agree upon a unified definition of spirituality (see Zinnbauer, Pargament, & Scott, 1999). Many researchers today do, however, seem to acknowledge that spirituality involves some sort of “search for the sacred” (Snyder & Lopez, 2007). According to Pargament and Mahoney (2002), people can achieve spirituality by searching for, and relating to the sacred in a number of ways. In fact, a spiritual search for the sacred can take place in the presence *or* absence of a religious doctrine. Thus, spirituality assumes a much broader scope than the related

concept of religion which Hill and colleagues (2000) have suggested involves unanimous agreement amongst members on what is believed and what is practiced. Within a religious context, there is only one accepted way to search for and relate to the sacred whereas spirituality does not necessarily involve this restriction.

The diversity in which people can relate to the sacred is reflected in Worthington and Aten's (2009) conceptualization of spirituality. In particular, Worthington and Aten acknowledge four different subtypes of spirituality that differ according to the sacred object to which one relates. These subtypes include: (1) religious spirituality, (2) humanistic spirituality, (3) nature spirituality, and (4) cosmos spirituality. First, religious spirituality encompasses a sense of connection with the sacred, as defined within the confines of a particular religious doctrine (e.g. Christianity). Second, humanistic spirituality involves a sense of connection to humankind. Third, nature spirituality encompasses a sense of connection to the environment or nature. Lastly, cosmos spirituality involves a sense of connection to the whole of reality that one might experience as a result of contemplating the nature of the cosmos or the boundaries of creation. Therefore, it is evident that spirituality encompasses a diverse range of possible orientations toward the sacred including, but not limited to religious figures.

Spirituality and the Self. For over a century, the idea of a self-concept – one's sense of self – has been of primary interest to the field of psychology, making it one of the earliest topics of inquiry within the social sciences. In this area of scholarship, William James' (1890; 1902) contributions have been of chief importance. In fact, his early ideas are often considered as the first ever theory of the self-concept.

According to James, the self can be divided into two parts: The “me and the “I.” The “me” refers to the self as an empirical object that is known and differentiated from all else in the world. Conversely, the “I” refers to the part of the self that does the differentiating and self-reflexive work; the “I” does the knowing. James theorized about three types of “me” that are consciously created by the “I” and integrated to comprise ones self-concept. These three types of “me” include: (1) the “material me,” (2) the “social me,” and (3) the “spiritual me.” The “material me” consists of the physical elements and possessions that are connected to, and owned by the self. One’s body, clothes, home, property, and wealth are all considered to be elements comprising the “material me.” Accordingly, the “material me” is observable and obvious to others in the environment. Next, the “social me” is characterized by a dynamic relationship between one’s external and internal worlds. Relationships in the external environment may become internalized and integrated into the self-concept such that the death of any valued family member might also be experienced as the death of part of oneself. Finally, the “spiritual me” manifests itself entirely within oneself. The “spiritual me” is not always obvious to others in the social environment and similarly, it is not always discernible to the self. The “spiritual me” comprises one’s inner thinking and feeling self, and is posited to be a more advanced “me” than both the “material me” and the “social me.” This aspect of the self can be thought of as a meta-state in which individuals think of themselves as thinkers.

What is particularly interesting about James’ theory of the self-concept, is the notion that *everyone* is presumed to have a “spiritual me.” Because the “spiritual me” is posited as a highly advanced component of the self, James assumed that all persons are not in touch with their inner thinking and feeling self. Therefore, James’ theory contends that all persons have a “spiritual-

me” even though they may not be aware of it. If experienced, James (1890) believed that the “spiritual me” could primarily be understood through psychological and physiological processes. However, he also considered the possibility that incorporeal or metaphysical processes could play a role in one’s experience of their “spiritual me.”

Since James’ writings, others have conceptualized the self as consisting of elements extending beyond those that are objectively visible and consistent with the notion of a “material me.” For example, Victor Frankl (1996) conceptualized the self as an open system, rather than one that is closed-off and restricted to include only those features that are objectively or physically present. In this respect, the self-concept can include internalized relations with non-physical objects or objects that are not objectively present such as people, nature, or divine entities. More recently, Grouzet and colleagues (2005) investigated the structure of goal contents across fifteen different cultures. In their analysis, they found that goal contents across cultures could be organized within a circumplex model consisting of two dimensions. Of particular relevance is their second dimension, which encompasses goal contents more consistent with a physical-self at one end of the continuum (e.g., hedonistic goals), to goal contents more consistent with self-transcendence at the opposite end of the continuum (e.g., spiritual goals). This circumplex model has been further developed and applied to the Self as a whole (Grouzet, 2011).

Spirituality and Peer-Support Programs. Over the last several years, the degree of religious affiliation accorded to twelve-step groups such as AA has proved to be a contentious topic of debate. Despite contrasting opinions (e.g., Rudy & Griel, 1989), AA continues to uphold the position that they are a spiritually guided organization, rather than one that is affiliated with a

specific religious doctrine. Interestingly, a recent study by Galanter, Dermatis, and Santucci (2012) demonstrated the proportion of self-reported religious AA members to be much less than the proportion of self-reported religious individuals in a general community probability sample (19% vs. 64%, respectively). Conversely, almost 100% of the AA sample endorsed having a spiritual orientation. This number was much higher than self-reported rates of spirituality in the community probability sample (99% vs. 79%, respectively). Thus, to the extent that any group can be defined by the sum of its members, it may be more sensible to think of AA as a spiritually guided peer-support program rather than one that is religious.

The twelve-step philosophy of AA bears some resemblance to religious doctrines such as Christianity that put emphasis on faith in God. The difference, however, is that within AA the specific meaning(s) accorded to terms like “higher power” and “God” are open to subjective interpretation rather than to a predefined religious interpretation. Yet, it is still possible for one’s own understanding of a “higher power” or “God” to exist within the context of a religious doctrine. While individual definitions of “higher power” and “God” are inextricably linked to socio-cultural factors, AA does not exert power or impose any fixed meaning(s) onto these terms. As such, AA members can choose how to interpret and relate to the sacred. Within any random sampling of AA affiliates, one might find persons relating to the sacred in a variety of different ways. This flexibility in relating to the sacred appears to coincide strongly with Worthington and Aten’s (2009) previously discussed conceptualization of spirituality. Again, this logic suggests that AA is a spiritual organization rather than one that is religious.

As noted previously, secular-based peer-support groups do not acknowledge the need for transcendent resources in the quest for sobriety. Instead, they focus on instilling a sense of personal agency. Any relation that one might have to a sacred or divine entity is not openly

discussed during meetings. Accordingly, secular-based groups do not appear to willingly integrate spirituality into their recovery ideology. However, all members of secular-based peer-support groups do not seem opposed to the idea of a “higher power” or “God.” In a 2010 SMART recovery membership survey (www.smartrecovery.org), approximately 45% of the sample reported a belief in a “higher power” or “God” that either intervenes and cures defects (Theist), or grants individuals the ability to change themselves (Deist). Comparatively, 16% of members reported being unsure of whether a “higher power” or “God” exists (Agnostic), and 23% of members reported no belief in a “higher power” or “God” (Non-theist). The remaining 13% of individuals reported believing in a “higher power” or “God,” but not one capable of intervening in their lives or granting miracles (Pan-deist). These statistics suggest a great deal of heterogeneity in the spiritual orientation of individuals attending SMART Recovery. Thus, based on group membership it is less clear as to whether secular-based groups might still be considered spiritual, despite their apparent opposition to spiritual discourses. Thus, an important distinction exists between the official policies of secular-based groups and the spiritual and religious beliefs maintained by group members.

Spiritual-Fit. Given that spiritual beliefs differ among peer-group attendees *within the same group*, it is interesting to consider whether or not the degree of concordance or “fit” between one’s own spiritual beliefs and the ideology of the group to which that person belongs might influence recovery outcomes. The degree of fit between one’s own spiritual orientation and the ideology of the group to which they belong will be referred to as “spiritual-fit” from this point forward.

Within the previously discussed SMART Recovery membership survey, some evidence exists to suggest that a congruent person-group spiritual-fit might influence the amount of benefit

derived from peer-support meetings. In particular, almost sixty percent of SMART Recovery members said they either strongly agree or agree that their own level of religiosity impacts their relationship with SMART Recovery. Although members were asked about their level of “religious-fit” with SMART recovery, it is plausible to assume that the perceived level of “spiritual-fit” might also have a similar impact on individuals’ experiences during group meetings.

In one of the largest addictions-related studies to ever be conducted, Project MATCH (1997), a major objective was to investigate different types of treatments that worked best for different types of people. Thus, examining the “fit” between individuals and their assigned treatment modality was of chief importance to Project MATCH researchers. Individuals were randomly assigned to one of three treatment modalities: (1) Twelve-step facilitation treatment (TSF), (2) cognitive-behavioural therapy (CBT), and (3) motivational enhancement therapy (MET). These treatment modalities were selected based on their popularity among individuals working in the field of addictions. Results obtained at a one and three year follow-up periods showed client improvement in all three treatment modalities. Interestingly, findings also showed that individuals scoring high on religiosity and meaning seeking inventories tended to do better in the TSF treatment design⁴. In recognition of close similarities between spirituality, religiosity, and meaning seeking, it could be inferred that spiritual persons might also do better in a TSF treatment design. Again, this small extrapolation suggests that spiritual-fit may be an important factor in recovery.

⁴ TSF is a professional treatment approach based on the 12-step philosophy of AA. Individuals in TSF are also encouraged to actively attend AA peer-support groups (see Nowinski, Baker, & Carroll, 1992).

In another study by Tonigan, Miller, and Schermer (2002), “spiritual-fit” was directly assessed and evaluated in relation to a variety of recovery outcomes. Results of this investigation showed that AA members who self-reported as religious or spiritual persons were significantly more likely to attend AA meetings over time. However, it is interesting to note that Tonigan and colleagues found AA attendance to be significantly associated with increased abstinence regardless of religious or spiritual affiliation. These findings appear to suggest that a harmonious “spiritual-fit” may be linked indirectly rather than directly to greater abstinence through increased AA meeting attendance. These findings may also suggest that spiritual-fit comprises just one of many pathways explaining how AA helps individuals in recovery.

The Current Study

In the current study, a SDT-based model of addictions recovery (Grouzet, 2012) comprising six primary hypotheses is proposed (see Figure 2 for a visual representation of the proposed study model). To start, it is posited that perceived need support will be associated with perceived need fulfillment (H1). However, within the proposed theoretical model, spiritual-fit is predicted to moderate the initial relationship between perceived need support and perceived need fulfillment (H2). In addition, spiritual-fit is also projected to have a direct positive relationship with group satisfaction (H3). The next section of the model involves a series of three different mediational relationships: First, perceived need fulfillment is hypothesized to mediate the association between perceived need support and relative autonomous regulation for limiting alcohol use (H4). Second, perceived need fulfillment is hypothesized to mediate the association between perceived need support and (psychological and subjective) well-being (H5). Lastly, perceived need fulfillment is hypothesized to mediate the association between perceived need support and group satisfaction (H6).

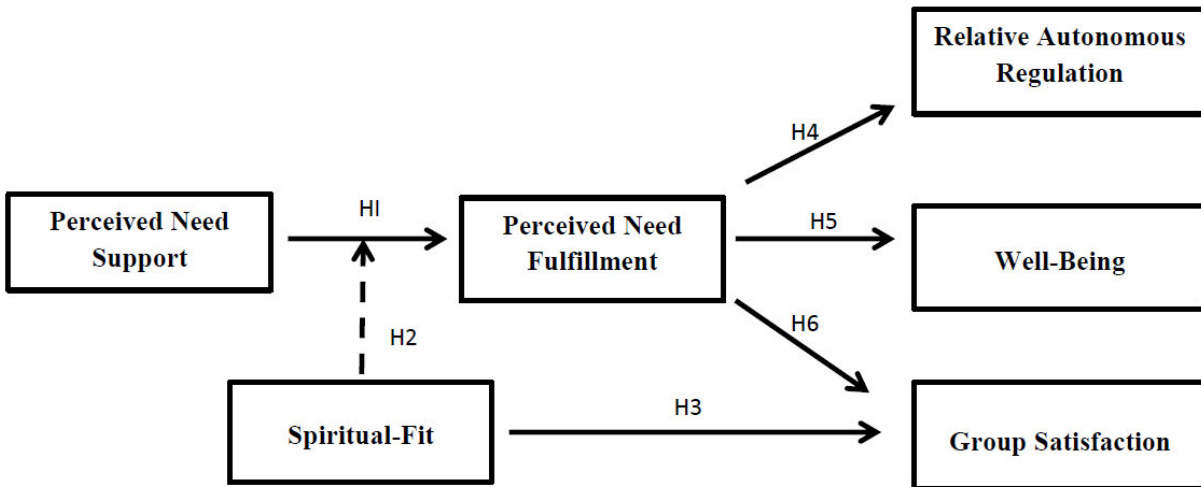


Figure 2. Key study variables and their placement within a process-oriented theoretical model. Theoretical model derived from Grouzet (2012)

Theoretical Foundations of the Proposed Study Model. Connell's (1990) motivational self-systems theory has been applied as the theoretical framework for the first hypothesized link between perceived need support and perceived need fulfillment. This theory views the self as an active member within the social context rather than a passive recipient of environmental inputs. Accordingly, individuals are deemed responsible for organizing the self-system across the lifespan by constantly evaluating their status within the social environment. Self-evaluations are made in particular social contexts with respect to SDT-positing psychological needs of autonomy, relatedness, and competence. These needs comprise the focal point around which self-organization ensues. Within this framework, three specific attributes of the social context are speculated to bolster perceptions of psychological needs fulfillment (Connell & Wellborn, 1991). These attributes include: (1) *structure* (facilitates perceived fulfillment of the need for competence), (2) *autonomy support* (facilitates perceived fulfillment of the need for autonomy),

and (3) *involvement* (facilitates perceived fulfillment of the need for relatedness). A novel development in the present study includes spiritual-fit as a potential moderator of the relationship between perceived need support and perceived need fulfillment.

Predicted relationships between perceived need fulfillment and each outcome variable (See Figure 2) originate from various empirical and theoretical linkages highlighted in SDT literature (e.g., Niemiec et al., 2006; Ryan & Deci, 2000). It is hypothesized that perceived need fulfillment from peer-support attendance will lead to the internalization of socially derived values such as sobriety. Therefore, greater perceptions of having psychological needs fulfilled during peer-support meetings may be expected to facilitate greater internalization of sober behaviours. As the internalization process unfolds, those who integrate the concept of sobriety into their self-concept should feel autonomous in regulating inhibitory behaviours related to limiting alcohol use. Rather than feeling controlled during the enactment of such behaviours, these individuals may perceive that their actions as originating from the self. These theoretical assumptions are central to the proposed linkage between perceived need fulfillment and autonomous regulation.

Perceived need fulfillment is also hypothesized to facilitate organismic growth and well-being. This theoretical assumption is a central component of SDT that has been repeatedly corroborated in empirical research (e.g., Church et al., 2012; Reis, Sheldon, Gable, Roscoe and Ryan, 2000). Whereas environments that promote basic psychological need fulfillment provide a good foundation for healthy personality development and well-being, environments that thwart fulfillment of psychological needs stifle organismic growth and prevent individuals from reaching their fullest potentials (Deci & Ryan, 2000). In the present thesis, two conceptions of

well-being are examined as potential correlates of psychological need fulfillment:

a) psychological well-being (PWB), and b) subjective well-being (SWB).

While PWB is conceptualized in accordance with an objective blueprint for “flourishing” (e.g., positive relationships, meaning in life, etc.), SWB (as the name implies) involves a subjective appraisal made by the participant about his or her own happiness. The latter concept has been conceptualized as a multifaceted construct consisting of high frequencies of positive affect, low frequencies of negative affect, and a global cognitive evaluation of life as satisfying (Diener, Suh, Lucas, & Smith, 1999). Whereas SWB is typically equated with the terms like “happiness” and discussed as a *hedonic* indicator of well-being, PWB is generally equated with terms like “flourishing” and discussed as a *eudaimonic* indicator of well-being (Deci & Ryan, 2008; Waterman, 2013).

Lastly, SDT provides the theoretical foundation underlying the hypothesized linkage between perceived need fulfillment and group satisfaction. As stated elsewhere, SDT predicts that having psychological needs fulfilled within the peer-support environment will facilitate internalization of recovery-related values (e.g. sobriety). As this value is integrated into the self-concept, individuals may become increasingly satisfied with groups operating in harmony with self-defining values. Not only are peer-support groups expected to provide the psychological nutrients necessary for organismic growth (i.e., through internalization of healthy values); they may also provide the social context through which individuals can practice pursuing self-concordant and personally expressive goals.

Summary of Main Study Hypotheses. Within the current study, six primary hypotheses will be tested within the context of the proposed model (see Figure 2).

(H1) Perceived Need Support will be positively associated with Perceived Need Fulfillment.

(H2) Spiritual-Fit will moderate the relationship between Perceived Need Support and Perceived Need Fulfillment.

(H3) Spiritual-fit will be positively associated with Group Satisfaction.

(H4) Perceived Need Fulfillment will mediate the relationship between Perceived Need Support and Relative Autonomous Regulation for limiting alcohol use.

(H5) Perceived Need Fulfillment will mediate the relationship between Perceived Need Support and (Psychological and Subjective) Well-Being.

(H6) Perceived Need Fulfillment will mediate the relationship between Perceived Need Support and Group Satisfaction.

Method

Participants

As part of a longitudinal study, 67 US- and Canadian-based peer-support organizations, inpatient treatment facilities, and online forums were contacted during April and May of the year 2013. In response to our e-mail invitation, 15 of these contacts agreed to distribute the web-survey among their peer-support attending affiliates (see procedure section for more information about the recruitment strategy). Assuming that each of these contacts services (approximately) 100-200 individuals, 1500-2000 peer-support attendees are estimated to have received information about the web-survey. Of this estimated quota of peer-support attendees, 120 began completing the web-survey and 106 finished all of the sections by the end of May 2013. The majority of participants were current peer-support attendees as opposed to former peer-support attendees and alumni. After retaining all current peer-support attendees, the final sample size ended up being 81. The recruitment phase continued after May 2013, but only participants who completed the web-survey in May were included in this sample.⁵

The sample consisted of individuals in early, middle, and late adulthood spanning the age range of 22 to 77 years old. The average age of participants was approximately 51 years old. There was a fairly equal representation of both male and female participants; however, a slightly greater percentage of males (56%) responded to the web-survey than females (43%). The majority of participants indicated joining their most frequently attended peer-support group over 2 years ago (65%), whereas the remaining fraction of participants indicated joining their most

⁵ Participants comprise a subsample coming from a larger project entitled "Sober Together." Since data collection for this project is still in progress, some demographic information (e.g., related to ethnicity, SES, etc.) is not provided to protect the anonymity of participants in the current study. Information about the specific peer-support groups participants were attending (e.g., AA, LifeRing, SMART Recovery, etc.) has also been omitted for the same reason.

frequently attended peer-support group: between 1-2 years ago (16%), 1 year ago (3%), more than 1 month ago (9%), 1 month ago (1%), more than 1 week ago (3%), and 1 week ago (3%).

Most participants indicated attending only 1 meeting during a typical week (47%), whereas the remaining portion of participants indicated attending: 2 meetings per week (22%), 3 meetings per week (16%), 4 meetings per week (1%), 5 meetings per week (3%), 6 meetings per week (3%), and every day of the week (6%).

Procedure

Participants were sought for participation in a larger (longitudinal) study entitled “Sober Together.” To avoid potential language barriers, individuals residing within North American, English speaking cities were deliberately targeted for participation. Peer-support attendees located in this geographic region were contacted using four primary recruitment strategies:

- First, executive directors of peer-support programs were contacted (mainly through e-mail) and offered the opportunity to have attendees and alumni of their program participate in the web-survey. The executive director was provided with a special “reviewers” invitation code so that he/she could approve of the survey before broadcasting the URL and formal invitation code to attendees and/or alumni of the program.
- Second, peer-support attendees were contacted remotely through staffing contacts at different substance abuse treatment facilities dispersed throughout North America. This strategy was employed after considering the possibility that individuals attending inpatient treatment facilities might also be attending non-professionally guided peer-support programs as part of their overall recovery plan.

- Third, information posters and invitations were displayed on various addictions-related web-forums, social media websites, and message boards (note: this occurred only after receiving the permission of forum and/or message board administrators).
- The fourth and final recruitment strategy involved communicating with personal contacts affiliated with peer-support groups and substance abuse treatment facilities.

While each of these recruitment strategies involved a communication channel between the researcher and community members, it is possible that a snowball technique involving peer-to-peer communication aided the recruitment process (i.e., since participants were all embedded within groups). Since it can be difficult to contact and recruit participants directly from the community, word-of-mouth and peer communication was envisioned beforehand as an essential component of the recruitment strategy. To help facilitate positive peer-to-peer communication about the web-survey, the primary web-developer (Dr. Frederick Grouzet) and I invested a great deal of time and effort into creating an user-friendly interface.

Upon arriving at the survey homepage, participants became familiarized with various aspects of the research project. They were then asked to enter an invitation code before receiving permission to navigate onward to the informed consent page. Participants were asked to provide their e-mail address to indicate their informed consent, and to receive an access link to the main questionnaire battery. Notably, participant e-mail addresses were also gathered in order to identify cross-interval participants involved in this larger longitudinal project. After receiving the access link (i.e., in their e-mail inboxes), participants were able to click the URL link and proceed onward to the main questionnaire battery. After entering the main body of the web-survey, participants were afforded the opportunity to navigate freely throughout the various survey elements. Of course, this also meant that participants were able to transition back and

forth between survey elements in order to change or modify any of their responses. Since data were available for both initial and altered responses, it became necessary to make a decision about which of these values to use for study analyses. As a general rule for this thesis project, participants' last responses were used for study analyses unless they constituted missing data. With the exception of 2-3 questionnaire items, participants were also instructed to skip any question(s) they did not wish to answer.

Questionnaires were screened carefully prior to their inclusion in the main battery. This procedure involved reviewing survey items, and obtaining feedback from a preliminary launching phase with colleagues and friends. The main objective of this procedure was to minimize participant burden, time requirements, and anticipated levels of frustration. In total, the questionnaire battery took approximately 30-40 minutes to complete, and no honorarium was awarded for participation.

Measures

Perceived Need Support. The extent to which respondents perceived peer-support groups as needs-supportive was assessed using an adapted version of the Teacher as a Social Context Questionnaire (TASC; Belmont, Skinner, Wellborn, & Connell, 1988). Numerous editions of the TASC exist, including both a teacher report version and a student report version of the classroom environment. Both versions assess the degree to which classrooms are perceived as needs-supportive environments. For this project, the student report version of the TASC was adapted to apply specifically to peer-support contexts, rather than to classroom settings. Accordingly, this adapted version of the TASC assessed individuals' perceptions about the needs-supportive qualities of peer-support groups.

The student report version of the short-form TASC includes 21 items grouped into three dimensions: (1) perceptions about others *involvement* in the environment, (2) perceptions about the *structure* of the environment, and (3) perceptions about the *autonomy-supportive qualities* of the environment. Two items were omitted from the original TASC prior to administration because of their semantic redundancy with other items on the scale. This adaptation yielded a final 19-item version of the TASC. Adapted sample items for each of the above dimensions include, “*The people in my group seem to really care about me*” (involvement); “*My group doesn’t tell me what they expect of me during meetings*” (structure); “*The people in my group always seem to be telling me what to do*” (autonomy-support) (see Appendix A for full list of items). Responses to each of the adapted TASC items were provided on a seven point Likert scale (1 = Very Untrue, 7 = Very True).

Spiritual-Fit. Spiritual-fit between participants and peer-support groups was assessed using a single-item measure worded as follows: “*Please indicate how well the spiritual beliefs of [name of current group attended frequently] align with your own beliefs.*” The main strategy behind constructing this item involved asking participants to indicate how well group beliefs align with personal beliefs rather than vice versa (i.e., how well personal beliefs align with group beliefs). This method of item construction was used under the assumption that participants would feel more as though their own beliefs are “right” or “correct,” and that it is the responsibility of the group to align its recovery philosophy in accordance with such personally held beliefs. Responses to this single-item measure were provided on a 5-point Likert scale (1 = the group beliefs do not align with my beliefs at all; 5 = the group beliefs are perfectly aligned with my own beliefs).

Perceived Need Fulfillment. Perceived need fulfillment was assessed using a slightly adapted version of the Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012). This scale was originally developed to assess perceived need fulfillment on a global scale, rather than in any specific context. For the current project, however, the BMPN was adapted to assess perceived need fulfillment in the context of peer-support groups. In accordance with the theoretical tenants of SDT, this measure is composed of 18 items grouped into three latent need factors: (1) autonomy, (2) relatedness, and (3) competence. Notably, there are 6 items corresponding to each psychological need. The BMPN also contains two latent method factors corresponding to: (1) satisfaction of psychological needs, and (2) dissatisfaction of psychological needs.

The adapted BMPN asks participants to think about their experiences during a typical peer-support meeting (i.e., for the peer-support group that participants attend most frequently). Sample items from the adapted BMPN include, *“I am free to do things my own way”* (autonomy); *“I feel a sense of contact with other group members”* (relatedness); and *“I take on and master hard challenges”* (competence) (see Appendix B for full list of items). Responses to adapted BMPN items were made on a seven point Likert scale (1 = strongly disagree, 7 = strongly agree).

Self-Regulation. Participants’ regulation of drinking behaviours (i.e., limiting alcohol use) was assessed using a modified version of the Treatment Self-Regulation Questionnaire (TSRQ; Williams, Grow, Freedman, Ryan, & Deci, 1996) designed by experts in the field (i.e., Christopher Niemiec, Geoffrey Williams, and Frederick Grouzet). This modification yielded a final 14-item TSRQ with 7 items each for autonomous (i.e., identified and integrated) and controlled regulation (i.e., introjected and external regulation) subcategories

Instructions for this measure ask participants to consider reasons why they would limit their alcohol use. Sample items appearing on the questionnaire include, “...*because others (e.g., family, friends) would be upset with me if I did not limit my alcohol use*” (controlled regulation), and “...*because limiting my alcohol use is consistent with my personal goals and values*” (autonomous regulation).⁶ Responses to each of the items were made on a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree).

Subjective Well-Being. Subjective well-being (SWB) has been conceptualized as consisting of high frequencies of positive affect, low frequencies of negative affect, and a global cognitive evaluation of life as satisfying (Diener, Suh, Lucas, & Smith, 1999). In accordance with this conceptualization, two separate measures were used to assess SWB: (1) A newly developed measure of positive and negative affect, and (2) the Satisfaction with Life Scale (Diener, Emmons, Larson, and Griffin, 1985).

The positive and negative affect measure, developed by Grouzet (2013), was comprised of new items, as well as existing items from the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) and the Scale of Positive and Negative Experience (SPANE; Diener et al., 2010). The resulting measure included 20 basic emotions with both positive and negative valences (10 each). The main strengths of this measure include: (1) lessening the semantic complexity of items on existing measures of positive and negative affect (e.g., “jittery” in the PANAS), and (2) achieving good balance between low and high arousal items.⁷ Instructions asked participants to think about their feelings and emotions during the last two weeks before responding on a five point, frequency-based Likert scale (1 = very slightly or not at all, 5 = very frequently).

⁶ This scale is not published yet. Requests of copies of the scale should be sent to fgrouzet@uvic.ca.

⁷ This scale is not published yet. Requests of copies of the scale should be sent to fgrouzet@uvic.ca.

To assess the cognitive component of SWB, the last four items existing on the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larson, and Griffin, 1985) were used. Each item was presented to participants on a seven point Likert scale (1 = strongly disagree, 7 = strongly agree). Two sample items from the SWLS include, “*In most ways my life is close to my ideal,*” and “*the conditions of my life are excellent.*”

Psychological Well-Being. Psychological Well-Being (PWB) was assessed using Diener and colleagues’ (2010) Flourishing Scale (FS). This measure assesses well-being from a eudaimonic perspective, thereby tapping dimensions of participant well-being extending beyond affective experience. Specifically, the FS includes 8-items assessing participants’ self-perceived success in important domains such as: relationships, self-esteem, life purpose, and optimism. Examples of FS items include “*I lead a purposeful and meaningful life,*” “*I am a good person and live a good life,*” and “*My social relationships are supportive and rewarding.*” Responses were provided on a 7 point Likert scale (1 = strongly disagree, 7 = strongly agree).

Group Satisfaction. To assess peer-support group satisfaction, the Client Satisfaction Questionnaire (CSQ; Larsen, Attkisson, Hargreaves, & Nguyen, 1979) was used. The CSQ is an eight item measure assessing individuals’ satisfaction with a health or human service program. This scale was developed from an initial pool of 81 items grouped into nine separate dimensions of client satisfaction (e.g. support staff, physical surroundings, outcome of service, general satisfaction, etc.). The initial 81 item pool was reduced to 31 items based on professional ratings of the degree of fit between each item and its respective client satisfaction dimension. A principle component analysis conducted on the remaining 31 items yielded a single factor solution, and the final eight items comprising the CSQ were selected based upon their high loadings on this main factor. One of the main strengths of the CSQ is its wide range of

applicability to a number of different settings. In the current thesis, the CSQ was slightly modified to apply specifically to peer-support groups.

Sample items from the adapted CSQ include, “*How would you rate the quality of this peer-support group?*,” “*If a friend were in need of similar help, would you recommend this peer-support group to him/her?*” and, “*If you were to seek help again, would you come back to the same peer-support group?*” An additional item (not included on the original CSQ) was also included as an addendum to the original 8 CSQ items. This item (item #9) was included to assess participants’ intentions to continue involvement in their most frequently attended peer-support group.

The number of response options for adapted CSQ items was not uniform across items. In order to remedy this problem, items 2-4, 6, and 8 were each coded on a 5-point metric. Since this cluster of items did not include a neutral response option, the 5-point metric only comprised numerical values of 1, 2, 4, and 5. Accordingly, a value of 3 (corresponding to neutral responses) was not used in the coding system for this cluster of items. Item 1 was also coded using a 5-point metric; however, the numerical values corresponding to each response option were slightly different and inputted as follows: poor = 1; fair = 2.25; good = 3.5; excellent = 5. As can be deciphered from this coding system, the psychological distance between “good” and “excellent” was assumed to be slightly greater than the psychological distance between: a) “poor” and “fair,” and b) “fair” and “good.”

Analytic Plan

Before carrying out primary analyses, the psychometric properties of each construct will be assessed using exploratory factor analysis. This statistical procedure will be conducted on a number of measures pertaining to constructs of perceived need support, perceived need

fulfillment, self-regulation, and positive and negative affect. After exploring the factor structure of these variables, reliability analyses will be conducted to explore internal consistencies of each construct or sub-construct identified during factor analyses. The next step following analyses of psychometric reliability will involve computing and analyzing descriptive statistics to gauge the normality of distributions corresponding to each construct or sub-construct.

After exploring the psychometric properties of the observed data, each of the main study hypotheses will be tested using linear regression. For Hypotheses 3-6, mediation will be explored using conventional statistical approaches discussed by Baron and Kenny (1986) as well as a more recent strategies such as SOBEL tests and bootstrapping advocated by Preacher and Hayes (2004, 2008a, 2008b). Bootstrapping is a computationally intensive strategy that is widely regarded as an acceptable technique for assessing the magnitude and significance of indirect effects. It involves repeated sampling from the observed dataset to form numerous estimates of a “product-of-coefficients statistic” for each resampled dataset (Preacher & Hayes, 2008b).⁸ Accordingly, this technique creates a sampling distribution of the product-of-coefficients statistic, which permits extraction of a more robust approximation of indirect effects. This technique is important to use because it allows researchers to explore the size and significance of indirect effects. More traditional approaches to mediation analyses (e.g., Baron & Kenny, 1986) generally only permit researchers to examine fluctuations in statistical significance between total and direct effects. Therefore, bootstrapping will permit an increasingly thorough and comprehensive exploration of all mediational hypotheses.

⁸ Product-of-coefficients (indirect effect) = (the coefficient for the mediator regressed onto the IV X the coefficient for the DV regressed onto the mediator controlling for the IV)

Results

Psychometrics

Perceived Need Support. An exploratory factor analysis using principle axis factoring and direct oblimin rotation was conducted to evaluate the underlying factor structure of Perceived Need Support. First, the factorability of Perceived Need Support was assessed using Bartlett's test of sphericity. The null hypothesis of Bartlett's test of sphericity states that the correlation matrix is an identity matrix and that there is no shared variance between Perceived Need Support items. Bartlett's test of sphericity was significant ($\chi^2_{171} = 1093.96, p < .001$), thus indicating that the data were factorable. Direct oblimin was selected as the method of rotation since there was no theoretical rationale for predicting orthogonal relationships between elements of involvement, structure, and autonomy-support.

Three factors were extracted explaining 61.21% of the total variance. However, the pattern matrix did not support a three factor solution corresponding to elements of involvement, structure, and autonomy support (see Table 1 for factor loadings). The scree plot also showed a sharp decline and "levelling off" pattern after the first extracted factor, thus indicating that a single factor solution may provide a better fit for the data.

Based on findings obtained from the preceding factor analysis, Perceived Need Support was assessed for its internal consistency as a single factor construct. Results of this analysis showed that Perceived Need Support had good internal consistency across all 19 items ($\alpha = .93$). Following this analysis, mean scores for Perceived Need Support were computed for each participant. The assumption of normality for the mean score distribution appeared to be satisfied after closely examining the associated histogram. The mean score distribution also had acceptable skewness and kurtosis statistics of -1.11 and 1.43, respectively.

Table 1. Exploratory Factor Analysis on Perceived Need Support Items using Principle Axis Factoring and Direct Oblimin Rotation

	Factor		
	1	2	3
Autonomy-Support 5	.83		
Autonomy-Support 4	.76		
Autonomy-Support 6	.75		
Structure 2	.61		
Structure 1	.56		
Involvement 5		-.92	
Involvement 6		-.84	
Involvement 2	.49	-.69	
Involvement 3		-.68	
Involvement 7		-.52	
Involvement 1	.40	-.51	
Involvement 4		-.47	
Autonomy-Support 3			.78
Autonomy-Support 2			.73
Structure 4			.72
Structure 5			.61
Structure 6			.58
Autonomy-Support 1			.49
Structure 3			
Percentage of total variance	45.89	9.29	6.04

Note: Loadings less than .3 are suppressed

Spiritual-Fit. The internal consistency of the Spiritual-Fit construct was not evaluated since it was assessed using a single item measure (see Method section). The assumption of normality for the Spiritual-Fit distribution appeared to be satisfied after closely examining the associated histogram. The distribution also had acceptable skewness and kurtosis statistics of -1.01 and 0.85, respectively.

Perceived Need Fulfillment. An exploratory factor analysis using principle axis factoring and direct oblimin rotation was conducted to evaluate the underlying factor structure of Perceived Need Fulfillment. First, the factorability of Perceived Need Fulfillment was assessed using Bartlett's test of sphericity. The null hypothesis of Bartlett's test of sphericity states that the correlation matrix is an identity matrix and that there is no shared variance between Perceived Need Fulfillment items. Bartlett's test of sphericity was significant ($\chi^2_{153} = 789.05$, $p < .001$), thus indicating that the data were factorable. Direct oblimin was used as the rotation method because there was no theoretical rationale for expecting orthogonal relationships between elements of autonomy, relatedness, and competence. However, based on SDT, I decided to test for the existence of a three-factor solution corresponding to each psychological need.

Three factors were extracted explaining 57.4% of the total variance. However, the pattern matrix did not support an interpretable three factor need solution corresponding to autonomy, relatedness, and competence (see Table 2 for factor loadings). The scree plot also showed a sharp decline and "levelling off" pattern after the first extracted factor, thus indicating that a single factor solution may provide a better fit for the data.

Based on the results of the preceding factor analysis, Perceived Need Fulfillment was evaluated for its internal consistency as a single factor construct. Results showed Perceived Need Fulfillment to have good internal consistency across all 18 items ($\alpha = .93$). Following this analysis, mean scores for Perceived Need Fulfillment were computed for each participant. The assumption of normality for the mean score distribution appeared to be satisfied after closely examining the associated histogram. The mean score distribution also had acceptable skewness and kurtosis statistics of -1.13 and 1.10, respectively.

Table 2. Exploratory Factor Analysis on Perceived Need Fulfillment Items using Principle Axis Factoring and Direct Oblimin Rotation

	Factor		
	1	2	3
Competence 3 (Negatively Worded)	.76		
Relatedness 3 (Negatively Worded)	.67		
Relatedness 2 (Negatively Worded)	.67		
Competence 2 (Negatively Worded)	.65		
Competence 1 (Negatively Worded)	.59		
Autonomy 3 (Negatively Worded)	.54		
Autonomy 2 (Negatively Worded)	.52		
Relatedness 1 (Negatively Worded)	.47	-.36	
Autonomy 1 (Negatively Worded)			
Relatedness 2 (Positively Worded)		-.95	
Relatedness 3 (Positively Worded)		-.75	
Relatedness 1 (Positively Worded)		-.47	
Autonomy 3 (Positively Worded)	.31	-.35	
Competence 3 (Positively Worded)	.31	-.35	-.35
Competence 1 (Positively Worded)			-.83
Competence 2 (Positively Worded)			-.68
Autonomy 2 (Positively Worded)			-.55
Autonomy 1 (Positively Worded)			-.52
Percentage of total variance	45.92	8.20	3.32

Note: Loadings less than .3 are suppressed

Self-Regulation. An exploratory factor analysis using principle axis factoring and direct oblimin rotation was conducted to evaluate the underlying factor structure of the self-regulation questionnaire. The factorability of self-regulation items was assessed using Bartlett's test of sphericity. The null hypothesis of Bartlett's test of sphericity states that the correlation matrix is

Table 3. Exploratory Factor Analysis on Self-Regulation Items using Principle Axis Factoring and Direct Oblimin Rotation

	Factor			
	1	2	3	4
Autonomous Regulation 3	.99			
Autonomous Regulation 2	.91			
Autonomous Regulation 4	.88			
Autonomous Regulation 1	.75			
Controlled Regulation 6		.91		
Controlled Regulation 7		.90		
Controlled Regulation 4		.60		
Autonomous Regulation 7			.71	
Autonomous Regulation 5			.66	
Autonomous Regulation 6			.52	
Controlled Regulation 1				-.82
Controlled Regulation 5				-.74
Controlled Regulation 3				-.70
Controlled Regulation 2	.32			-.35
Percentage of total variance	42.48	13.69	7.48	4.55

Note: Loadings less than .30 are suppressed

an identity matrix and that there is no shared variance between TSRQ items. Bartlett's test of sphericity was significant ($\chi^2_{91} = 716.45, p < .001$), thus indicating that the data were factorable. Direct oblimin was used as the rotation method because there was no reason to expect an orthogonal relationship between different regulatory styles (i.e., External, Introjected, Identified, and Integrated Regulation). Four factors were extracted explaining 68.20% of the total variance. The pattern matrix yielded a relatively clean four factor solution with items for each regulatory style loading onto a different factor (see Table 3 for factor loadings). There was only one External Regulation item (i.e., Controlled Regulation 2) that did not load with other External

Regulation items onto the second factor. In fact, this item cross-loaded onto the first and last factor, which corresponded to identified and introjected regulation items, respectively.

For theoretical reasons, Identified and Integrated Regulation items loading onto Factors 1 and 3 were clustered together to form an Autonomous Regulation Index. Similarly, External and Introjected Regulation items loading onto Factors 2 and 4 were clustered together to form a Controlled Regulation Index. The cross-loading External Regulation item noted previously was omitted from the Controlled Regulation Index since it did not load onto the same factor as other External Regulation items. Accordingly, internal consistencies were computed separately for a 7-item Autonomous Regulation Index and 6-item Controlled Regulation Index. Results showed adequate internal consistencies for Autonomous Regulation ($\alpha = .84$) and Controlled Regulation ($\alpha = .87$) Indices. Mean scores were computed for both indices to be used in the formation of a Relative Autonomy Index (RAI). The assumption of normality for Autonomous and Controlled Regulation mean score distributions appeared to be satisfied after closely examining their associated histograms. These distributions also had acceptable skewness and kurtosis statistics within the range of ± 3.00 . The histogram corresponding to RAI scores also appeared to resemble a normal distribution, with acceptable skewness and kurtosis statistics of 0.71 and 0.33, respectively.

Subjective Well-Being. An exploratory factor analysis was conducted on the affective measure used in the current study to examine its underlying factor structure. The factorability of affective items was assessed using Bartlett's test of sphericity. The null hypothesis of Bartlett's test of sphericity states that the correlation matrix is an identity matrix and that there is no shared variance between affective items. Bartlett's test of sphericity was significant ($\chi^2_{190} = 897.79$, $p < .001$), thus indicating that the data were factorable. Principle axis factoring was used with

direct oblimin rotation. This method of rotation was used since positive and negative affect were not expected to be orthogonally related to one another.

Two factors were extracted explaining 51.20% of the total variance. Examination of the pattern matrix showed evidence for an interpretable two factor solution with 10 positive emotions loading onto the first factor, and 10 negative emotions loading onto the second factor (see Table 4 for factor loadings). There was only one unexpected finding characterized by a significant cross-loading of Fear (Negative Affect 9) onto the first factor. Matsunaga (2010) has argued that small discrepancies between primary and secondary factor loadings (e.g., less than .30) may provide a justifiable rationale for omitting cross-loading items. However, since the discrepancy between primary and secondary loadings in this case was relatively large (i.e., greater than .30), the decision was made to keep “Fear” as an indicator of Negative Affect.

Based on the results of the preceding factor analysis, internal consistencies were computed separately for each facet of SWB (i.e., Life Satisfaction, Positive Affect, and Negative Affect). Results showed adequate internal consistencies for each of these elements (Life Satisfaction $\alpha = .78$; Positive Affect $\alpha = .90$; Negative Affect $\alpha = .89$). Following these analyses, mean scores were computed separately for each facet of SWB. Later, mean scores for each facet of SWB were used to calculate an overall SWB score for each participant (see Method section). The assumption of normality for Life Satisfaction, Positive Affect, and Negative Affect mean score distributions appeared to be satisfied after closely examining their associated histograms. Additionally, mean score distributions for each factor had acceptable skewness and kurtosis statistics falling within the range of ± 3.00 . The histogram corresponding to SWB scores also appeared to resemble a normal distribution, with acceptable skewness and kurtosis statistics of $-.85$ and 0.47 , respectively.

Table 4. Exploratory Factor Analysis on Affective Items using Principle Axis Factoring and Direct Oblimin Rotation

	Factor	
	1	2
Positive Affect 5	.82	
Positive Affect 2	.78	
Positive Affect 1	.75	
Positive Affect 4	.74	
Positive Affect 7	.74	
Positive Affect 8	.63	
Positive Affect 3	.58	
Positive Affect 10	.55	
Positive Affect 6	.54	
Positive Affect 9	.44	-.38
Negative Affect 10	-.38	.31
Negative Affect 3		.86
Negative Affect 9	.36	.80
Negative Affect 8		.72
Negative Affect 4		.70
Negative Affect 6		.64
Negative Affect 5		.64
Negative Affect 2		.55
Negative Affect 7		.53
Negative Affect 1		.52
Percentage of total variance	40.46	10.74

Note: Loadings less than .30 are suppressed

Flourishing. The Flourishing Scale (Diener et al., 2010) was shown to have good internal consistency across all 8 items ($\alpha = .94$). Consequently, Flourishing mean scores were computed for each participant to be used for primary analyses. The assumption of normality for the mean score distribution appeared to be satisfied after closely examining the associated histogram. The mean score distribution had an acceptable skewness statistic of -1.10; however, the kurtosis statistic was slightly elevated with a majority of scores clustered around the mean (kurtosis statistic = 3.10).

Group Satisfaction. The modified client satisfaction scale (CSQ; Larsen, Attkisson, Hargreaves, & Nguyen, 1979) was shown to have a good internal consistency across all 9 items ($\alpha = .94$). Consequently, Group Satisfaction mean scores were computed for each participant to be used for primary analyses. Although the mean score distribution appeared to have a relatively shark peak, the assumption of normality did not appear to be seriously compromised after closely examining the associated histogram. The mean score distribution had an acceptable skewness statistic of -2.06; however, the kurtosis statistic was slightly elevated with a majority of scores clustered around the mean (kurtosis statistic = 4.46).

Outliers and Missing Data

After establishing the psychometric properties of each construct, the data were tested for univariate and multivariate outliers. Z-scores were calculated for each of the main constructs to test for the presence of univariate outliers. Notably, scores extending beyond ± 3.00 standard deviations from the mean were flagged as univariate outliers. This method of flagging univariate outliers has frequently been employed as an effective and relatively easy screening procedure (see Osborne & Overbay, 2004). Using this identification criterion, 9 univariate outlier cases were flagged among 7 different participants. One of these participants had univariate outlier cases for: Perceived Need Support, Group Satisfaction, and Flourishing. The remaining 6 participants were identified as having only one univariate outlier case each. These 6 univariate outlier cases were dispersed equally among variables including: Autonomous Regulation, Spiritual-Fit, and Group Satisfaction (i.e., two univariate outlier cases per variable). Next, Mahalanobis Distances were calculated to test for the presence of multivariate outliers. Since Mahalanobis Distances calculated for each participant did not exceed the critical value of 24.32, no multivariate outliers were identified in the dataset. Primary and post-hoc analyses were conducted with and without

the inclusion of univariate outlier cases. It is important to note that all analyses reported from this point forward include univariate outlier cases. This procedure was followed for all analyses except under circumstances in which omitting univariate outlier cases changed the interpretability of results. In such instances, results are reported both with and without univariate outlier cases.

To account for missing data, a pairwise deletion method was used for all primary and post-hoc analyses. Additionally, mean scores were computed only if participants responded to at least 80% of the items used to assess each construct. This value was arbitrarily selected as a way to compromise between: a) safeguarding the accuracy of mean scores, and b) retaining as much data as possible to be used in the computation of mean scores.

Primary Analyses

Descriptive statistics and zero-order correlations are reported in Table 6 for each of the main study constructs. This Table provides preliminary evidence for a number of hypothesized links outlined in the main theoretical model (see Figure 2). In particular, Perceived Need Support was found to be positively associated with: Perceived Need Fulfillment ($r = .86$), SWB ($r = .63$), Flourishing ($r = .67$), and Group Satisfaction ($r = .83$). Moreover, Perceived Need Fulfillment was found to be positively associated with: Perceived Need Support ($r = .86$), Relative Autonomous Regulation ($r = .25$), SWB ($r = .69$), Flourishing ($r = .79$), and Group Satisfaction ($r = .83$). All of these correlations were significant at $p < .001$ except for the link between Perceived Need Fulfillment and Relative Autonomous Regulation, which was significant at $p = .037$.

Although no theories can justify controlling for demographic variables, Gender was included as a demographic covariate in the regression models for all subsequent analyses. However, because Gender (and other demographic variables) was not significantly correlated with any of the primary constructs (see Table 5), findings were the same as regression models without inclusion of Gender.

Table 5. Descriptive Statistics and Zero-Order Correlations for Main Study Constructs

	α	M	SD	1	2	3	4	5	6	7	8	9
<i>Demographic Covariate</i>												
1. Gender	--	1.56	0.06	--								
<i>Constructs</i>												
2. Need Support	.93	5.51	0.93	-.01	--							
3. Spiritual-Fit	--	3.96	0.97	-.04	.53***	--						
4. Need Fulfillment	.93	5.64	0.98	.01	.86***	.46***	--					
5. Autonomous Regulation	.88	6.53	0.70	-.17	.33**	.16	.32**	--				
6. Controlled Regulation	.72	5.22	1.37	-.16	.06	-.02	-.07	.44***	--			
7. Relative Autonomy Index (RAI)	--	1.52	1.22	.08	.12	.11	.25*	.05	-.87***	--		
8. Subjective Well-Being (SWB)	--	6.42	2.24	-.09	.63***	.41***	.69***	.30**	-.02	.18	--	
9. Flourishing	.94	5.99	0.98	-.07	.67***	.44***	.71***	.32**	-.02	.19	.84***	--
10. Group Satisfaction	.94	4.52	0.68	-.01	.83***	.55***	.83***	.36**	.03	.16	.65***	.74***

Notes: Values computed with univariate outlier cases; n range = 66-78.

* $p < .05$; ** $p < .01$; *** $p < .001$

Testing the relationship between Perceived Need Support and Perceived Need

Fulfillment (H1): A regression analysis was conducted to test the first hypothesized link outlined in the main theoretical model (see Figure 2). Accordingly, this analysis involved regressing Perceived Need Fulfillment onto Perceived Need Support. Results showed that Perceived Need Support explained a significant portion of variance in Perceived Need Fulfillment ($R^2 = .74$, $F_{2,70} = 95.15$, $p < .001$). In addition, Perceived Need Support was shown to be a significant unique predictor of Perceived Need Fulfillment ($\beta = .86$, $p < .001$).

Testing whether or not Spiritual-Fit moderates the relationship between Perceived Need Support and Perceived Need Fulfillment (H2): A hierarchical regression was conducted to test the second hypothesis outlined in the main theoretical model (see Figure 2). In the first Step of the model, Perceived Need Fulfillment was regressed onto Perceived Need Support and Spiritual-Fit. In the second Step of the model, Perceived Need Fulfillment was regressed onto the interaction term, Perceived Need Support X Spiritual-Fit. The full regression model accounted for a significant portion of the variance in Perceived Need Fulfillment ($R^2 = .74$, $F_{4,67} = 45.02$, $p < .001$).

In Step 1 of the model, Perceived Need Support had a significant main effect on Perceived Need Fulfillment ($\beta = .83$, $p < .001$). Conversely, Spiritual-Fit did not have a significant main effect on Perceived Need Fulfillment ($\beta = .06$, $p = .426$). Overall, the combined influence of these variables accounted for a significant portion of variance in Perceived Need Fulfillment ($R^2 = .74$, $F_{3,67} = 60.49$, $p < .001$). In Step 2 of the regression model, the interaction term was not found to be a significant unique predictor of Perceived Need Fulfillment ($\beta = -.05$, $p = .542$). Moreover, the interaction term did not explain a significant portion of residual variance in Perceived Need Fulfillment ($\Delta R^2 = .002$, $p = .542$).

Testing the relationship between Spiritual-Fit and Group Satisfaction (H3): A multiple regression was conducted to test the third hypothesis outlined in the main theoretical model (see Figure 2). The model involved regressing Group Satisfaction onto both Spiritual-Fit and Perceived Need Fulfillment. Perceived Need Fulfillment was incorporated into the model because this variable was also hypothesized to be associated with Group Satisfaction (i.e., H6). Results indicated that Spiritual-Fit and Perceived Need Fulfillment explained a significant portion of variance in Group Satisfaction ($R^2 = .73$, $F_{3,68} = 57.54$, $p < .001$). Results also showed that Spiritual-Fit made a significant unique contribution toward predicting Group Satisfaction ($\beta = .21$, $p = .005$).

When univariate outliers were deleted from the dataset, the regression analysis yielded different findings. Although Spiritual-Fit and Perceived Need Fulfillment still explained a significant portion of the overall variance in Group Satisfaction, the proportion of explained variance was substantially diminished relative to the previous analysis ($R^2 = .55$, $F_{3,66} = 37.39$, $p < .001$). In addition, Spiritual-Fit no longer made a significant unique contribution toward predicting Group Satisfaction ($\beta = .10$, $p = .312$).

Testing whether or not Perceived Need Fulfillment mediates the relationship between Perceived Need Support and Relative Autonomous Regulation (H4): A mediation analysis was conducted to test the fourth hypothesis outlined in the main theoretical model. In Step 1 of the mediation model, the regression of Relative Autonomous Regulation onto Perceived Need Support, ignoring the mediator, was statistically non-significant ($\beta = .12$, $p = .302$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was statistically significant ($\beta = .86$, $p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Fulfillment) was

significantly related to RAI after controlling for the effects of Perceived Need Support ($\beta = .57$, $p = .015$). The final stage of the mediation analysis revealed that after controlling for the mediator (Perceived Need Fulfillment), Perceived Need Support was not significantly related to RAI ($\beta = -.36$, $p = .119$). Results of a Sobel Test did not show Perceived Need Fulfillment to be a significant mediator of the relationship between Perceived Need Support and RAI ($z = 1.62$, $p = .107$).

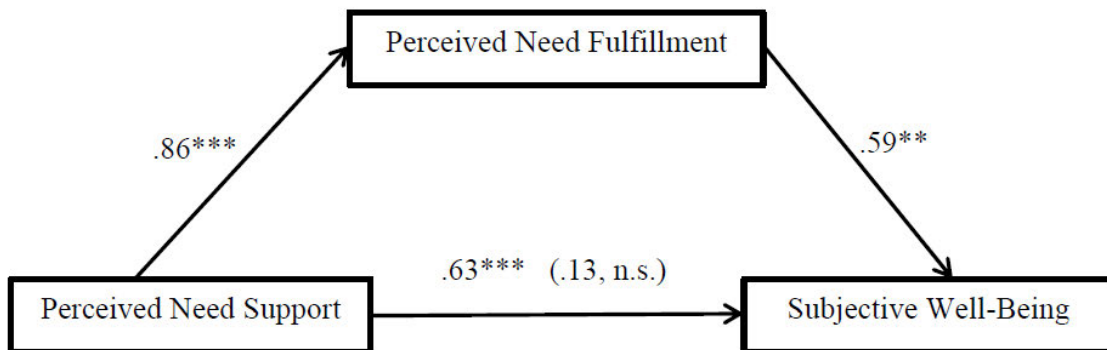
Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on RAI through Perceived Need Fulfillment of $\beta = .33$ ($SE = .21$) with 95% confidence that the indirect effect lies somewhere between $-.05$ and $.78$. Once again, Perceived Need Fulfillment was not shown to be a significant mediator of the relationship between Perceived Need Support and RAI since the value of 0 was contained within the 95% confidence interval for the indirect effect.

Testing whether or not Perceived Need Fulfillment mediates the relationship between Perceived Need Support and Well-Being (H5): A mediation analysis was conducted to test the fifth hypothesis outlined in the main theoretical model. Two variations of the mediation analysis were conducted: One using subjective well-being (SWB) as the outcome variable, and one using Flourishing as the outcome variable. The first variation using SWB as the outcome variable is reported next.

Mediation analysis using SWB. In Step 1 of the mediation analysis, the regression of SWB onto Perceived Need Support, ignoring the mediator, was statistically significant ($\beta = .63$, $p < .001$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was also statistically significant ($\beta = .86$, $p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need

Fulfillment) was significantly related to SWB after controlling for the effects of Perceived Need Support ($\beta = .59, p = .001$). The final stage of the mediation analysis revealed that after controlling for the mediator (Perceived Need Fulfillment), Perceived Need Support was no longer significantly related to SWB ($\beta = .13, p = .474$). Results of a Sobel Test showed that Perceived Need Fulfillment significantly mediates the relationship between Perceived Need Support and SWB ($z = 2.84, p = .005$).

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on SWB through Perceived Need Fulfillment of $\beta = .44$ ($SE = .17$) with 95% confidence that the indirect effect lies somewhere between .10 and .79. It can once again be concluded that Perceived Need Fulfillment significantly mediates the relationship between Perceived Need Support and SWB since 0 does not fall within the 95% confidence interval for the indirect effect.

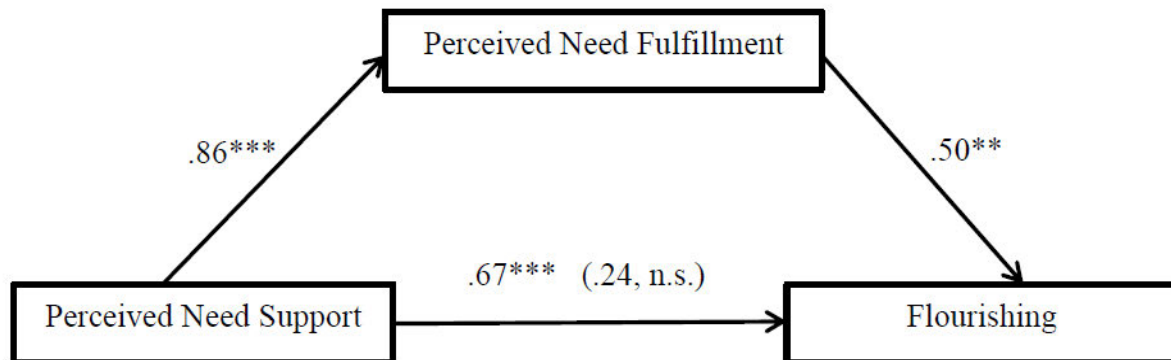


Note: ** $p < .01$; *** $p < .001$; Gender was included as a covariate in all regression analyses

Figure 3. A mediation analysis testing whether Perceived Need Fulfillment mediates the association between Perceived Need Support and Subjective Well-Being.

Mediation analysis using Flourishing. In Step 1 of the mediation analysis, the regression of Flourishing onto Perceived Need Support, ignoring the mediator, was statistically significant ($\beta = .67, p < .001$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was also statistically significant ($\beta = .86, p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Fulfillment) was significantly related to Flourishing after controlling for the effects of Perceived Need Support ($\beta = .50, p = .005$). The final stage of the mediation analysis revealed that after controlling for the mediator (Perceived Need Fulfillment), Perceived Need Support was no longer significantly related to Flourishing ($\beta = .24, p = .160$). Results of a Sobel Test showed that Perceived Need Fulfillment significantly mediates the association between Perceived Need Support and Flourishing ($z = 2.50, p = .012$).

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on Flourishing through Perceived Need Fulfillment of $\beta = .37$ ($SE = .18$) with 95% confidence that the indirect effect lies somewhere between .05 and .77. It can once again be concluded that Perceived Need Fulfillment significantly mediates the relationship between Perceived Need Support and Flourishing since 0 does not fall within the 95% confidence interval for the indirect effect.

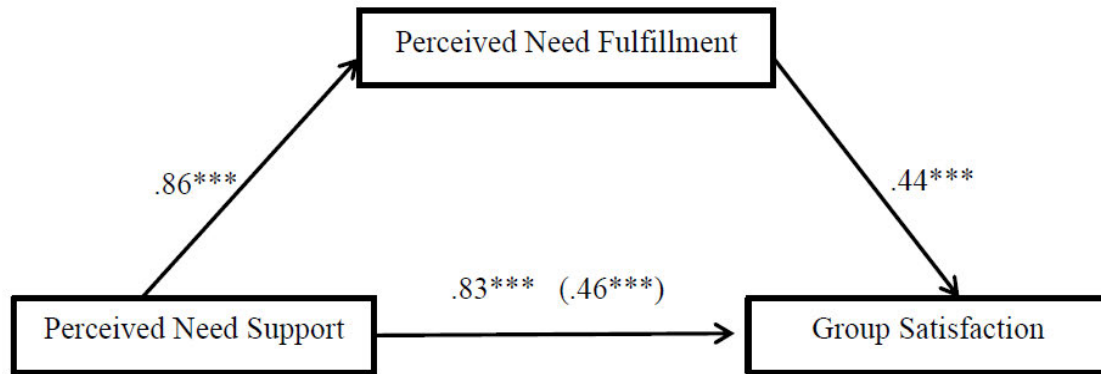


Note: ** $p < .01$; *** $p < .001$; Gender was included as a covariate in all regression analyses

Figure 4. A mediation analysis testing whether Perceived Need Fulfillment mediates the association between Perceived Need Support and Flourishing.

Testing whether or not Perceived Need Fulfillment mediates the relationship between Perceived Need Support and Group Satisfaction (H6): A mediational analysis was conducted to test the sixth and final hypothesis outlined in the main theoretical model. In Step 1 of the mediation analysis, the regression of Group Satisfaction onto Perceived Need Support, ignoring the mediator, was statistically significant ($\beta = .83, p < .001$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was also statistically significant ($\beta = .86, p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Fulfillment) was significantly related to Group Satisfaction after controlling for the effects of Perceived Need Support ($\beta = .44, p < .001$). The final stage of the mediation analysis revealed that after controlling for the mediator (Perceived Need Fulfillment), Perceived Need Support remained significantly related to Group Satisfaction ($\beta = .46, p < .001$). A follow-up Sobel Test was conducted to explore the significance of the indirect effect. Results indicated that the magnitude of the indirect effect was

statistically significant ($z = 3.55, p < .001$). However, since Perceived Need Support continued to make a significant unique contribution toward predicting Group Satisfaction after controlling for the mediator (Perceived Need Fulfillment), evidence was obtained for partial (rather than full) mediation. The results of this analysis are displayed visually in Figure 5.



Note: *** $p < .001$; Gender was included as a covariate in all regression analyses

Figure 5. A mediation analysis testing whether Perceived Need Fulfillment mediates the association between Perceived Need Support and Group Satisfaction.

When univariate outliers were deleted from the dataset, the mediation analysis yielded much different findings. In this instance, Step 1 of the mediation analysis showed that regression of Group Satisfaction onto Perceived Need Support, ignoring the mediator, was statistically significant ($\beta = .81, p < .001$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was also statistically significant ($\beta = .84, p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Fulfillment) was not significantly associated with Group Satisfaction after controlling for the effects of Perceived Need Support ($\beta = .17, p = .205$). The final stage of the mediation analysis showed that after controlling for the mediator (Perceived Need Fulfillment),

Perceived Need Support remained significantly related to Group Satisfaction ($\beta = .67, p < .001$). A follow-up Sobel Test was conducted to explore the significance of the indirect effect. Results indicated that the magnitude of the indirect effect was not statistically significant ($z = 1.48, p = .139$). Thus, when univariate outliers were deleted from the dataset, Perceived Need Fulfillment was no longer found to mediate the relationship between Perceived Need Support and Group Satisfaction.

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on SWB through Perceived Need Fulfillment of $\beta = .37$ ($SE = .16$) with 95% confidence that the indirect effect lies somewhere between .07 and .71. It can once again be concluded that Perceived Need Fulfillment significantly mediates the relationship between Perceived Need Support and Group Satisfaction since 0 did not fall within the 95% confidence interval for the indirect effect.

Supplementary (Post-Hoc) Analyses

Three post-hoc predictions were tested as a supplementary component to the initial findings reported above. These predictions were tested with the intent of building upon previously reported findings and creating a richer understanding of process mechanisms during peer-support meetings for problematic alcohol use. The following post-hoc hypotheses (PHH) were tested:

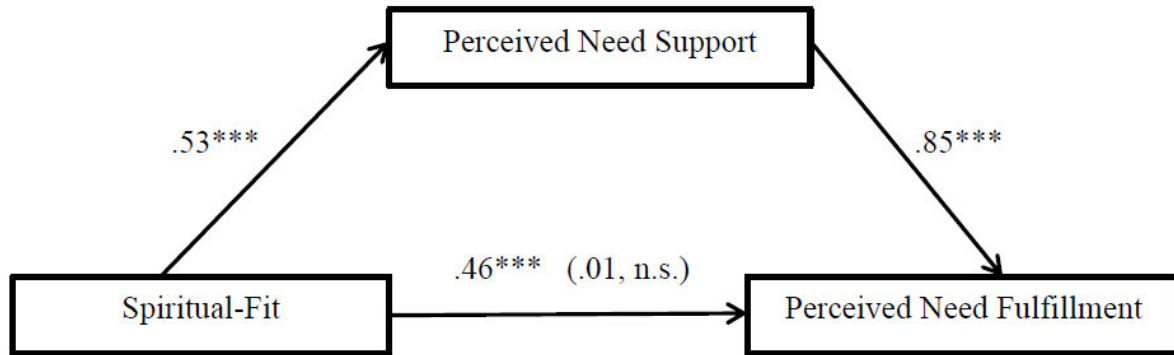
Post-Hoc Hypothesis 1 (PHH 1): Perceived Need Support will mediate the relationship between Spiritual-Fit and Perceived Need Fulfillment.

Post-Hoc Hypothesis 2 (PHH 2): Perceived Need Fulfillment will mediate the relationship between Perceived Need Support and Autonomous Regulation.

Post-Hoc Hypothesis 3 (PHH 3): Perceived Need Fulfillment will mediate the relationship between Perceived Need Support and Controlled Regulation.

Testing whether or not Perceived Need Support mediates the relationship between Spiritual-Fit and Perceived Need Fulfillment (PHH 1). In Step 1 of the mediation analysis, the regression of Perceived Need Fulfillment onto Spiritual-Fit, ignoring the mediator, was statistically significant ($\beta = .46, p < .001$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Support) onto Spiritual-Fit was also statistically significant ($\beta = .53, p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Support) was significantly associated with Perceived Need Fulfillment after controlling for the effects of Spiritual-Fit ($\beta = .85, p < .001$). The final stage of the mediation analysis showed that after controlling for the mediator (Perceived Need Support), Spiritual-Fit was no longer significantly related to Perceived Need Fulfillment ($\beta = .01, p = .894$). Results of a Sobel Test showed that Perceived Need Support significantly mediates the association between Spiritual-Fit and Perceived Need Fulfillment ($z = 4.16, p < .001$).

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Spiritual-Fit on Perceived Need Fulfillment through Perceived Need Support of $\beta = .41$ ($SE = .12$) with 95% confidence that the indirect effect lies somewhere between .20 and .67. It can once again be concluded that Perceived Need Support significantly mediates the relationship between Spiritual-Fit and Perceived Need Fulfillment since 0 did not fall within the 95% confidence interval for the indirect effect.



Note: *** $p < .001$; Gender was included as a covariate in all regression analyses

Figure 6. A mediation analysis testing whether Perceived Need Support mediates the association between Spiritual-Fit and Perceived Need Fulfillment.

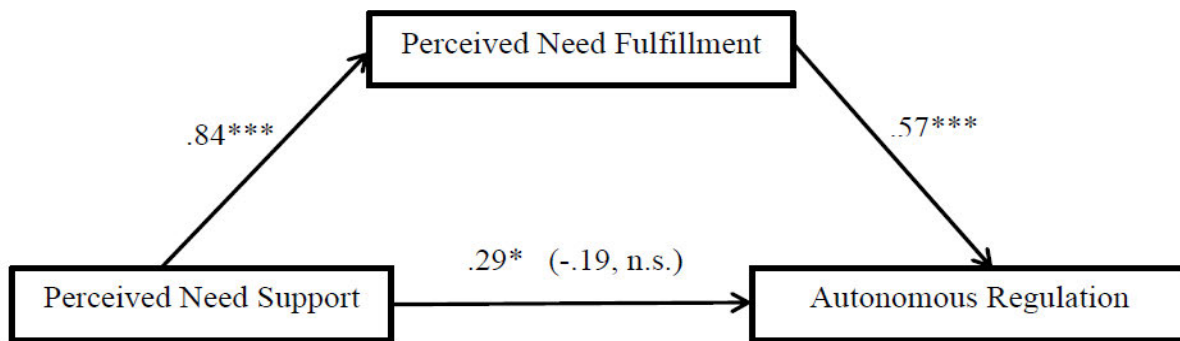
Testing whether or not Perceived Need Fulfillment mediates the relationship between Perceived Need Support and Autonomous Regulation (PHH 2). In Step 1 of the mediation analysis, the regression of Autonomous Regulation onto Perceived Need Support, ignoring the mediator, was statistically significant ($\beta = .33, p = .004$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was also statistically significant ($\beta = .86, p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Fulfillment) was not significantly associated with Autonomous Regulation after controlling for the effects of Perceived Need Support ($\beta = .17, p = .464$). The final stage of the mediation analysis showed that after controlling for the mediator (Perceived Need Fulfillment), Perceived Need-Support was no longer significantly related to Autonomous Regulation ($\beta = .19, p = .416$). Results of a Sobel Test did not show Perceived Need Fulfillment to be a significant mediator of the relationship between Perceived Need Support and Autonomous Regulation ($z = 1.20, p = .232$).

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on Autonomous Regulation through Perceived Need Fulfillment of $\beta = .22$ ($SE = .21$) with 95% confidence that the indirect effect lies somewhere between $-.20$ and $.62$. Once again, Perceived Need Fulfillment was not shown to be a significant mediator of the relationship between Perceived Need Support and Autonomous Regulation since the value of 0 was contained within the 95% confidence interval for the indirect effect.

When univariate outliers were deleted from the dataset, the mediation analysis yielded much different results. In this instance, Step 1 of the mediation analysis showed that regression of Autonomous Regulation onto Perceived Need Support, ignoring the mediator, was statistically significant ($\beta = .29, p = .015$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was also statistically significant ($\beta = .84, p < .001$). Step 3 of the mediation analysis showed that the mediator (Perceived Need Fulfillment) was significantly associated with Autonomous Regulation after controlling for the effects of Perceived Need Support ($\beta = .57, p = .009$). The final stage of the mediation analysis showed that after controlling for the mediator (Perceived Need Fulfillment), Perceived Need Support was no longer significantly related to Autonomous Regulation ($\beta = -.19, p = .365$). This time, results of a Sobel Test showed that Perceived Need Fulfillment significantly mediates the association between Perceived Need Support and Autonomous Regulation ($z = 2.05, p = .041$)

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on Autonomous Regulation through Perceived Need

Fulfillment of $\beta = .38$ (SE = .21) with 95% confidence that the indirect effect lies somewhere between .01 and .80. It can once again be concluded that Perceived Need Fulfillment significantly mediates the relationship between Perceived Need Support and Autonomous Regulation since 0 did not fall within the 95% confidence interval for the indirect effect. However, it is important to note that the significance of this indirect effect may depend heavily on bootstrap simulation variance since the lower end range of the confidence interval is close to 0.



Note: * $p < .05$; *** $p < .001$; Gender was included as a covariate in all regression analyses

Figure 7. A mediation analysis testing whether Perceived Need Fulfillment mediates the association between Perceived Need Support and Autonomous Regulation.

Testing whether or not Perceived Need Fulfillment mediates the relationship between Perceived Need Support and Controlled Regulation (PHH 3). In Step 1 of the mediation analysis, the regression of Controlled Regulation onto Perceived Need Support, ignoring the mediator, was not statistically significant ($\beta = .05$, $p = .644$). Step 2 of the mediation analysis showed that regression of the mediator (Perceived Need Fulfillment) onto Perceived Need Support was statistically significant ($\beta = .86$, $p < .001$). Step 3 of the mediation analysis showed the mediator (Perceived Need Fulfillment) to have a marginally significant relationship

with Controlled Regulation after controlling for the effects of Perceived Need Support ($\beta = -.45$, $p = .059$). The final stage of the mediation analysis showed that after controlling for the mediator (Perceived Need Fulfillment), the relationship between Perceived Need Support and Controlled Regulation was marginally significant ($\beta = .44$, $p = .065$). Results of a Sobel Test did not show Perceived Need Fulfillment to be a significant mediator of the relationship between Perceived Need Support and Controlled Regulation ($z = -.88$, $p = .379$).

A follow-up bootstrapping procedure was employed to further assess the magnitude and significance of the indirect effect. Bootstrapping results with 1000 samples yielded a mean indirect effect of Perceived Need Support on Controlled Regulation through Perceived Need Fulfillment of $\beta = -.29$ ($SE = .32$) with 95% confidence that the indirect effect lies somewhere between $-.87$ and $.34$. Once again, Perceived Need Fulfillment was not shown to be a significant mediator of the relationship between Perceived Need Support and Controlled Regulation since the value of 0 was contained within the 95% confidence interval for the indirect effect.

Discussion

The main objective of the current study was to explore how peer-support programs facilitate positive recovery outcomes among individuals with a history of problematic alcohol use. Specifically, an SDT-based model (Grouzet, 2012) was tested to explore peer-support processes of recovery. Recovery outcomes incorporated into the model did not include conventional drinking-related variables such as frequency and/or quantity of alcohol consumption. Instead, *process-oriented outcomes* such as well-being, group satisfaction, and autonomous regulation for limiting alcohol use were investigated from a SDT point of view. In general, the SDT-based model was supported. Results showed that well-being, group satisfaction, and autonomous regulation for limiting alcohol use were more likely to be attained when individuals perceived their group environment as need supportive. Findings also showed that perceived need fulfillment was a major pathway linking perceived need support to each positive recovery outcome. The following discussion will break down the model in greater detail and provide an interpretation of major themes revealed by the findings. To conclude, implications, limitations and directions for future research will be discussed.

Perceived Need Support and Need Fulfillment

Findings corresponding to the first hypothesis showed perceived need support to be associated with increased perceptions of need fulfillment. This finding is interesting to consider from a SDT frame of reference which, of course, acknowledges the social context as a major contributor to psychological health and well-being (Ryan & Deci, 2000). This basic assumption was substantiated by results showing a very strong association between perceiving peer-support groups as need supportive and benefiting from perceived fulfillment of psychological needs. Stated differently, peer-support attendees who experienced their group as need supportive also

felt close to other group members, competent to limit alcohol consumption, and free to choose their own recovery-related actions and behaviours.

This finding is consistent with previous research exploring the link between perceived need support and perceived need fulfillment across varying contexts. For example, Adie, Duda, and Ntoumanis (2008, 2012) found that male and female athletes who perceived their coach as autonomy supportive were more likely to perceive greater satisfaction of autonomy, relatedness, and competence needs. In an alternative health-care setting, perceived autonomy-support was found to be associated with greater perceptions of autonomy and competence for diabetes management (e.g., Williams, McGregor, Zeldman, Freedman & Deci, 2004). As a final example, researchers in the domain of education have found autonomy supportive teaching styles to significantly impact students' perceptions of autonomy and competence in the classroom (e.g., Hamm & Reeve, 2002).

The Role of Spiritual-Fit

Spiritual-fit was first hypothesized to moderate the relationship between perceived need support and perceived need fulfillment. Thus, it was predicted that only individuals with a high degree of spiritual-fit would experience psychological need fulfillment as a result of perceiving need support from the peer-support environment. Findings did not show evidence to support this prediction. Instead, group attendees were shown to experience psychological need fulfillment regardless of the level of spiritual-fit, as long as they also perceived their group as need supportive. These results prompted a follow-up post-hoc analysis to further explore how spiritual-fit might be related to perceptions of need support and need fulfillment. Results of this analysis showed that subjective appraisals of *spiritual-fit* were positively associated with perceptions of need support and need fulfillment. Moreover, perceived need support was shown

to fully mediate the association between spiritual-fit and perceived need fulfillment, suggesting that one reason why spiritual-fit is associated with perceived need fulfillment is through its relationship with perceived need support.

Theoretically, it is interesting to consider how a factor like spiritual-fit could possibly exert influence on perceptions of need support. Research and theory on the topic of close relationships and interpersonal attraction may provide a useful framework for understanding this relationship. Specifically, research in this area suggests that individuals tend to like people more when they perceive them as being more similar to themselves (i.e., in terms of attitudes, beliefs, physical appearance, etc; Byrne, 1971). This phenomenon has sometimes been referred to as the “similarity-attraction hypothesis” (e.g., Selfhout, Denissen, Branje, & Meeus, 2009).

In the current study, it appeared that a similar phenomenon may have been unfolding at the group level. Specifically, results showed a strong link between perceived spiritual similarity (i.e., spiritual-fit) and group satisfaction. Interestingly, it was also found that individuals who reported greater satisfaction with their peer-support group were increasingly likely to perceive their group as need supportive. It may have been the case that participants who expressed satisfaction with their group (in part, because of high perceived similarity) were more likely to perceive other group members as caring about them, providing choice, etc. Alternatively, it may have been the case that participants who disliked their group (in part, because of low perceived similarity) were less likely to perceive other group members as caring about them, providing choice, etc. The relationship between spiritual-fit and perceived need support may have, therefore, existed indirectly through group satisfaction. Interestingly, research in the area of close interpersonal relationships has also found perceived self-partner similarity to be related to relationship satisfaction (Murray, Holmes, Bellavia, Griffin, & Dolderman, 2005) and feelings of

being understood and validated by the partner (i.e., perceived need support; Murray, Holmes, & Griffin, 1996).

It is also important to note the correlational nature of the association between spiritual-fit and perceived need support. Causality cannot automatically be assumed to flow in a direction moving from spiritual-fit to perceived need support. It may, rather, be the case that perceiving a need supportive peer environment influences perceptions of a harmonious spiritual-fit. Once again, it is interesting to consider the possible theoretical underpinnings of this relationship. Relative to the similarity-attraction hypothesis referenced above, the attraction-similarity hypothesis predicts that being in a positive relationship may *precede* perceptions of similarity (Morry, 2005). Based on this assumption, perceptions of spiritual similarity may be intensified as one continues their involvement in a satisfying and need supportive peer group. Over time, any pre-existing gap between one's own spiritual (or non-spiritual) beliefs and the philosophy of the group may begin to converge if the group is first perceived as need supportive environment.

Mediated Pathways

Findings showed that perceived need support was related to a number of positive recovery outcomes including: well-being, group satisfaction, and autonomous regulation for limiting alcohol use. In a test of indirect effects models, perceived need fulfillment was identified as a mediating variable explaining *why* perceived need support was associated with each outcome. Thus, an important psychological process seemed to be unfolding for persons experiencing their peer-support group as need supportive. Specifically, perceived need support was associated with perceptions of need fulfillment, which was in turn, associated with (subjective and psychological) well-being, group satisfaction, and autonomous regulation for limiting alcohol use.

Notably, perceived need fulfillment was found only to mediate the relationship between perceived need support and *autonomous regulation* – not the relationship between perceived need support and *relative* autonomous regulation (see results corresponding to H4; PHH2). Upon looking at zero-order correlations between relative autonomous regulation, autonomous regulation, and controlled regulation, it became evident that relative autonomous regulation had much more in common with the absence of controlled regulation for limiting alcohol use than it did with the actual presence of autonomous regulation for limiting alcohol use. Accordingly, mediation findings were likely suggestive of the fact that, through its influence on perceived need fulfillment, perceived need support operates by *facilitating or enhancing* autonomous regulation rather than *reducing or diminishing* controlled regulation. This rationale may further explain why perceived need fulfillment did not mediate the relationship between perceived need support and controlled regulation (see PHH3). Instead, evidence was obtained to suggest that perceived need fulfillment mediates the relationship between perceived need support and autonomous regulation (see PHH2).

These findings provide support to a growing body of research that suggests need supportive environments increase autonomous regulation for performing behaviours in different contexts. For example, need supportive exercise programs have been found to increase autonomous types of regulation for physical activity (e.g., Edmunds, Ntoumanis, & Duda, 2008), whereas need supportive classroom environments have been found to facilitate autonomous types of regulation for academic-related behaviours (see Niemiec & Ryan, 2009). This phenomenon has also received support in the context of addictions treatment. For instance, Williams, Niemiec, Patrick, Ryan, and Deci (2009) found that a need supportive tobacco intervention increased autonomous regulation for limiting smoking behaviours.

Findings corresponding to the mediated pathway model are also consistent with previous research. For example, Amorose and Anderson-Butcher (2007) showed that athletes perceiving their coaches as autonomy-supportive were more likely to perceive psychological need fulfillment, and in turn, adopt greater autonomous regulation for exercise behaviours. While this evidence exists in abundance across varying contextual circumstances, the current study represents the first ever empirical evidence to suggest problem drinkers experiencing *peer-support programs* as need supportive are more likely to perceive psychological need fulfillment, and in turn, adopt greater autonomous regulation for limiting alcohol use.

Previous research is also consistent with findings corresponding to the mediation model involving well-being. Researchers have consistently found positive linkages between perceived need support, perceived need fulfillment, and well-being (e.g., Church et al., 2012; Gagné, Ryan, & Bargmann, 2003; Patrick, Knee, Canevello, & Lonsbary, 2007). Moreover, a substantial body of existing research has also shown perceived need fulfillment to mediate the association between perceived need support and well-being (e.g., Baard, Deci, & Ryan, 2000; Deci et al., 2001). In conjunction with these findings, results of the current study lend further support to a major theoretical tenant of SDT – specifically, that people must experience their environment as need supportive in order to satisfy psychological needs and experience well-being (Ryan & Deci, 2000).

Finally, previous research is consistent with findings showing a positive association between perceived need support and group satisfaction. This type of research has been very prominent in the area of organizational psychology whereby numerous studies have demonstrated a positive association between perceived autonomy support in the workplace and job satisfaction (e.g., Ilardi, Leone, Kasser, & Ryan, 1993; Vansteenkiste et al., 2007). In

primary health-care settings, Williams, McGregor, King, Nelson, and Glasgow (2005) have also shown that diabetic patients were more satisfied with the help they received for managing glycemic levels when physicians were perceived as autonomy supportive.

Clinical Implications

Overall, findings strongly suggest that peer-support attendees with a history of problematic alcohol use may benefit from contextual supports of group structure, autonomy-support, and interpersonal involvement. In this type of setting, group members may be more likely to perceive psychological needs as being supported and fulfilled, which in turn, may lead to widespread recovery benefits of group satisfaction, well-being, and autonomous regulation for limiting alcohol use. From an organizational standpoint, peer-support groups may develop a large following of affiliates simply by providing need supportive environments. Indeed, group members embedded within need supportive contexts may enjoy satisfying group experiences, which in turn, may lead to greater retention of program attendees. More importantly, however, providing need supportive peer environments may lead to a unique style of recovery that revitalizes and restores a lost sense of well-being among individuals with a history of problematic alcohol use.

Results also suggest that peer-support groups should view spiritual-fit as a supplementary contextual support in addition to elements of structure, autonomy-support and interpersonal involvement. Indeed, group members were shown to perceive their group as need supportive if they also perceived a harmonious spiritual-fit with their group. It seems that group members may benefit from a process in which peer-support groups divulge their spiritual (or non-spiritual) philosophy before each new meeting. In this instance, each new group member can privately assess the degree of spiritual-fit with the program at the onset of each meeting. It may also be

important for peer-support programs to educate group members about other available peer-support options including groups that hold different spiritual (or non-spiritual) philosophies about addictive behavior change. In turn, this may expose group members to a new realm of recovery options that may have otherwise remained dormant. Only under this circumstance will each attendee have a fair and equal opportunity to select the peer-support program(s) that they feel provides the best fit with their personally held spiritual beliefs and values.

Limitations and Directions for Future Research

The most obvious direction for future research is to test whether or not process-oriented outcomes incorporated into the current study model (i.e., autonomous regulation, well-being, and group satisfaction) are related to measures of actual alcohol consumption. Notably, the current study is part of a larger program of research that will carry out this initiative. It is predicted that in the future, longitudinal data will show each of these outcomes to be associated with sustainable and long-term remission from problematic alcohol use. Researchers might also consider developing an objective coding system of contextual supports in peer-support programs (i.e., elements of structure, autonomy-support, and interpersonal involvement). It would indeed, be interesting to examine whether or not objective and subjective measures of need support are related to one another. Perhaps other factors associated with perceived need-support would hold incremental predictive validity above and beyond objectively coded need support. For instance, it would be interesting to examine whether or not spiritual-fit predicts perceptions of need support after accounting for the effects of objectively coded need support.

One of the main limitations of the current study was its cross-sectional design. Although directionality was implied in the main theoretical model (see Figure 2), correlational results were not able to yield information about how variables were temporally related to one another. For

instance, being happy (i.e., scoring high on measures of subjective well-being) may have preceded positive perceptions of need-support rather than the other way around. Using longitudinal data, the larger program of research (from which the current data has been extracted) will seek to investigate the temporal relationship between key study variables by examining them across multiple time points.

There is also a chance that findings pertaining to the current study were limited to members of secular-based peer-support programs. This speculation originates from examining various organizations that agreed to distribute information about the web-survey to group affiliates. During the recruitment phase, no contact was achieved with representatives of spiritually-based peer-support groups, web-organizations, etc. Thus, it is possible that the study sample involved an underrepresentation of AA attendees. If this assertion is true, findings may lack generalizability to attendees of all peer-support programs.

In addition to this issue, there is also a possibility that the study sample is biased by involving only those participants with mid to high levels of perceived need support and spiritual-fit. It is entirely feasible that drop-out rates for peer-support groups are higher among individuals with low levels of perceived need support and spiritual-fit. As such, these individuals may not have received adequate representation in the study sample because of peer-support group drop-out. It should be noted that distributions corresponding to both perceived need support and spiritual-fit were slightly negatively skewed with most participants endorsing high levels of spiritual-fit and perceived need support. A much smaller percentage of participants endorsed having low levels of perceived need support and spiritual-fit. If sampling bias did exist in the current thesis project, some of the statistical effects may portray inaccurate representations of “true” underlying effects. For instance, relative to the effect that was observed in the current

thesis project, spiritual-fit may actually be a much stronger predictor of group satisfaction (Hypothesis 3). The reason for attenuation in the effect size may solely be an artifact of peer-support members' tendency to leave groups out of dissatisfaction (i.e., because of a poor spiritual-fit), thereby eliminating any chance of these individuals becoming involved in the study in the first place.

Finally, the present study was limited to current peer-support attendees since the vast majority of individuals responding to the online battery indicated that they were current (rather than former) attendees of at least one peer-support group. It has yet to be discovered whether or not perceived need support and perceived need fulfillment would have the same effect on recovery-related outcomes (e.g., well-being) for both current and former attendees. As part of the larger program of longitudinal research, it will be important to examine whether or not "active ingredients" of peer-support programs (i.e., perceived need-support and need-fulfillment) continue to have a lagged impact on well-being and motivation after people drop-out.

Conclusion

Individuals in recovery from problematic alcohol use may, unfortunately, have long histories of exposure to environments that undermine basic psychological needs. Peer-support programs, however, appear to be in the unique position of counteracting this deficit through offering safe and need supportive climates. Interestingly, the current study indicates that SDT *can* be applied to show how perceptions of need-support and need-fulfillment (occurring in the context of peer-support groups) facilitate positive recovery outcomes of psychological well-being, group satisfaction, and autonomous regulation for limiting alcohol use.

These findings have only begun to scratch the surface of research still needed to be conducted in this area. The larger program of research from which this thesis originates holds exciting implications that have yet to be discovered. For instance, underlying changes in psychological well-being and motivation (occurring as a result of peer-support attendance) may have lasting implications for addressing the age-old problem of self-regulatory failure and relapse. Perhaps peer-support programs are able to encourage *long-term* and *sustainable* remission from problematic alcohol use. Perhaps they are able to help individuals truly move beyond addiction and *flourish in life*. As part of a unique positive psychology perspective of health-care provision, investigation of these issues may provide new and important insights into the process of addictions recovery through peer-support attendance.

References

- Adie, J. W., Duda, J. L., & Ntoumanis, N. (2008). Autonomy support, basic need satisfaction and the optimal functioning of adult male and female sport participants: A test of basic needs theory. *Motivation and Emotion, 32*, 189-199.
- Adie, J. W., Duda, J. L., & Ntoumanis, N. (2012). Perceived coach-autonomy support, basic need satisfaction and the well-and ill-being of elite youth soccer players: A longitudinal investigation. *Psychology of Sport and Exercise, 13*, 51-59.
- Alcoholics Anonymous. (1939). *Alcoholics Anonymous*. New York: Alcoholics Anonymous World Services.
- Alcoholics Anonymous (2001). *Alcoholics Anonymous: The story of how thousands of men and women have recovered from alcoholism* (4th ed.). New York: Alcoholics Anonymous World Services.
- Alcoholics Anonymous World Services (2012). *Fact File*. Retrieved from http://www.aa.org/pdf/products/m-24_aafactfile.pdf
- Allen, J. (1989). Overview of alcoholism treatment: Settings and approaches. *Journal of Mental Health Administration, 16*, 15-82.
- Amorose, A. J., & Anderson-Butcher, D. (2007). Autonomy-supportive coaching and self-determined motivation in high school and college athletes: A test of self-determination theory. *Psychology of Sport and Exercise, 8*, 654-670.
- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic Need Satisfaction: A Motivational Basis of Performance and Well-Being in Two Work Settings. *Journal of Applied Social Psychology, 34*, 2045-2068.
- Baard, P. P, Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology, 34*, 2045-2068.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*, 1173.
- Baumeister, R., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.
- Belmont, M., Skinner, E., Wellborn, J., & Connell, J. (1988). *Teacher as social context: A measure of student perceptions of teacher provision of involvement, structure, and autonomy support* (Tech. Rep. No. 102). University of Rochester, Rochester, NY.
- Brandsma, J.M., Maultsby, M.D. & Welsh, R.J. (1980). *Outpatient treatment of alcoholism: A review and comprehensive study*. Baltimore, MD: University Park Press
- Brecht, M. L., Anglin, M. D., & Dylan, M. (2005). Coerced treatment for methamphetamine abuse: Differential patient characteristics and outcomes. *The American Journal of Drug and Alcohol Abuse, 31*, 337-356.
- Byrne, D. E. (1971). *The attraction paradigm* (Vol. 11). Academic Pr.

- Church, A. T., Katigbak, M. S., Locke, K. D., Zhang, H., Shen, J., Vargas-Flores, J. D., ...Ching, C. M. (2012). Need satisfaction and well-being: Testing self-determination theory in eight cultures. *Journal of Cross-Cultural Psychology, 43*, 507-534.
- Connell, J. P. (1990). Context, self, and action: A motivational analysis of self-system processes across the life-span. In D. Cicchetti (Ed.), *The self in transition: From infancy to childhood* (pp. 61-97). Chicago: University of Chicago Press.
- Connell, J. P., Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self-process in development: Minnesota Symposium on Child Psychology* (Vol. 23, pp. 167-216). Chicago: University of Chicago Press.
- Copeland, J., & Maxwell, J. C. (2007). Cannabis treatment outcomes among legally coerced and non-coerced adults. *BMC Public Health, 7*, 1-7.
- Coyhis, D. (1999). *The Wellbriety journey: Nine talks by Don Coyhis*. Colorado Springs, CO: White Bison, Inc.
- deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York: Academic Press.
- Deci, E. L. (1975). *Intrinsic motivation*. New York, NY Plenum.
- Deci, E. L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum
- Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology, 53*, 1024-1037.
- Deci, E. L., & Ryan, R. M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Eds.), *Nebraska symposium on motivation: Vol. 38. Perspectives on motivation* (pp. 237–288). Lincoln: University of Nebraska Press.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268
- Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies, 9*, 1-11.
- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), *Oxford handbook of motivation*. New York, NY: Oxford University Press.
- Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin, 27*, 930-942.
- Diener, E., Larsen, R. J., Levine, S., & Emmons, R. A. (1985). Frequency and intensity: Dimensions underlying positive and negative affect. *Journal of Personality and Social Psychology, 48*, 1253–1265.

- Diener, E., Sandvik E., & Pavot W. (1991). Happiness is the frequency, not the intensity of positive versus negative affect. In F. Strack and M. Argyle (Eds.), *Assessing Well-Being: The collected works of Ed Diener*, (pp. 213-231). Elmsford, NY: Pergamon Press, .
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*, 276–302.
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. W., Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, *97*, 143–156.
- Ditman, K. S., Crawford, G. G., Forgy, E. W., Moskowitz, H., & MacAndrew, C. (1967). A controlled experiment on the use of court probation for drunk arrests. *American Journal of Psychiatry*, *124*, 160-163.
- Emrick, C. (2004). Alcoholics Anonymous and other mutual aid groups. In N. Heather and T. Stockwell (Eds.), *The essential handbook of treatment and prevention of alcohol problems*, (pp. 177-192). Chichester: John Wiley & Sons, Inc.
- Emrick, C. D., Tonigan, J. S., Montgomery, H., & Little, L. (1993). Alcoholics Anonymous: What is currently known? In B. S. McCrady & W. R. Miller (Eds.), *Research on Alcoholics Anonymous* (pp. 41-76). New Brunswick, NJ: Rutgers Center of Alcohol Studies.
- Evelein, F., Korthagen, F., & Brekelmans, M. (2008). Fulfillment of the basic psychological needs of student teachers during their first teaching experiences. *Teaching and Teacher Education*, *24*, 1137-1148.
- Foote, J., DeLuca, A., Magura, S., Warner, A., Grand, A., Rosenblum, A., & Stahl, S. (1998). A group motivational treatment for chemical dependency. *Journal of Substance Abuse Treatment*, *17*, 181-192.
- Frankl, V. E. (1966). Self-transcendence as a human phenomenon. *Journal of Humanistic Psychology*, *6*, 97-106.
- Gagné, M. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology*, *15*, 372-390.
- Galanter, M., Dermatis, H., & Santucci, C. (2012). Young People in Alcoholics Anonymous: The Role of Spiritual Orientation and AA Member Affiliation. *Journal of Addictive Diseases*, *31*, 173-182.
- Gossop M., Harris J., Best D., Man L., Manning V., Marshall J., & Strang J. (2003). Is attendance at Alcoholics Anonymous meetings after inpatient treatment related to improved outcomes? A 6-month follow-up study. *Alcohol and Alcoholism*, *38*, 421–426.
- Grolnick, W. S., & Ryan, R. M. (1989). Parent style associated with children's self-regulation and competence in school. *Journal of Educational Psychology*, *81*, 143-154.
- Grouzet, F.M.E. (2011, June). *The Circumplexity of motivational self: New theoretical and empirical evidences*. Paper presented at the Sixth Self Biennial International Conference, Quebec, QC.

- Grouzet, F.M.E. (2012, July). Toward positive and sustainable sobriety: a discussion. Paper presented in K. Hart (Chair), *Positive psychology of resilience in addiction recovery*. Symposium presented at the 7th Biennial International Meaning Conference, Toronto, ON.
- Grouzet, F.M.E. (2013). *A two-dimensional measure of affect*. Unpublished instrument.
- Grouzet, F.M.E., Kasser, T., Ahuvia, A., Fernandez-Dols, J. M., Kim, Y., Lau, S., Ryan, R. M., Saunders, S., Schmuck, P., & Sheldon, K. (2005). The structure of goal contents across 15 cultures. *Journal of Personality and Social Psychology*, *89*, 800-816.
- Hamm, D., & Reeve, J. (2002). *Teachers as resources and obstacles to students' intrinsic motivation*. Unpublished manuscript, Michigan State University.
- Heider, E (1958). *The psychology of interpersonal relations*. New York: Wiley
- Hill, P. C., Pargament, K. I., Hood, R. W., Jr., McCullough, M. E., Swyers, J. P., Larson, D. B., & Zinnbauer, B. J. (2000). Conceptualizing religion and spirituality: Points of commonality, points of departure. *Journal for the Theory of Social Behaviour*, *30*, 51–77.
- Hodge, D. R. (2003). The Intrinsic Spirituality Scale: A new six-item instrument for assessing the salience of spirituality as a motivational construct. *Journal of Social Service Research*, *30*, 41-61.
- Humphreys, K. (2004). *Circles of Recovery: Self-Help Organizations for Addictions*. Cambridge: Cambridge University Press.
- Ilardi, B. C., Leone, D., Kasser, T., & Ryan, R. M. (1993). Employee and Supervisor Ratings of Motivation: Main Effects and Discrepancies Associated with Job Satisfaction and Adjustment in a Factory Setting. *Journal of Applied Social Psychology*, *23*, 1789-1805.
- James, W (1890). *The principles of psychology*. New York: Holt
- James, W. (1902). *The varieties of religious experience: A study of human nature*. New York: The Modern Library.
- Kaskutas, L. A. (2009). Alcoholics Anonymous effectiveness: Faith meets science. *Journal of Addictive Diseases*, *28*(2), 145-157.
- Kaskutas, L. A., Bond, J., & Humphreys, K. (2002). Social networks as mediators of the effects of Alcoholics Anonymous, *Addiction*, *97*(7), 891-900.
- Kelly, J. F., Myers, M. G., & Brown, S. A. (2000). A multivariate process model of adolescent 12-Step attendance and substance use outcome following inpatient treatment. *Psychology of Addictive Behaviors*, *14*, 376-389.
- Kessler, R. C., Mickelson, K. D., & Zhao, S. (1997). Patterns and correlates of self-help group membership in the United States. *Social Policy*, *27*(3), 27-46.
- Koestner, R., Losier, G. F., Vallerand, R. J., & Carducci, D. (1996). Identified and introjected forms of political internalization: Extending self-determination theory. *Journal of Personality and Social Psychology*, *70*, 1025–1036.
- Kownacki R. J. & Shadish W. R. (1999) Does Alcoholics Anonymous work? The results from a meta-analysis of controlled experiments. *Substance Use and Misuse*, *34*, 1897–1916.
- Kurtz, L. (1997). *Self-help and support groups*. Thousand Oaks, CA: Sage.

- Krentzman, A. R. (2012). Review of the Application of Positive Psychology to Substance Use, Addiction, and Recovery Research. *Psychology of Addictive Behaviors, 27*, 151-165.
- Larsen, D. L., Attkisson, C., Hargreaves, W. A., & Nguyen, T. D. (1979). Assessment of client/patient satisfaction: Development of a general scale. *Evaluation and Program Planning, 2*, 197-207.
- Laudet, A. B., Becker, J. B., & White, W. L. (2009). Don't wanna go through that madness no more: Quality of life satisfaction as predictor of sustained remission from illicit drug misuse. *Substance Use & Misuse, 44*, 227-252.
- Laudet, B. A., Cleland, C. M., Magura, S., Vogel, H. S., & Knight, E. L. (2004). Social support mediates the effects of dual-focus mutual-aid groups on abstinence from substance use. *American Journal of Community Psychology, 34*, 175-85.
- Laudet, A. B., & Stanick, V. (2010). Predictors of motivation for abstinence at the end of outpatient substance abuse treatment. *Journal of Substance Abuse Treatment, 38*, 317-327.
- Li, E., Feifer, C., & Strohm, M. (2000). A pilot study: Locus of control and spiritual beliefs in Alcoholics Anonymous and Smart Recovery members. *Addictive Behaviors, 25*(4), 633-640.
- Maddux, J. E., Snyder, C. R., & Lopez, S. J. (2004). Toward a positive clinical psychology: Deconstructing the illness ideology and constructing an ideology of human strengths and potential. In P. A. Linley & S. Joseph (Eds), *Positive psychology in practice* (pp. 320-334). Hoboken, NJ: Wiley.
- Matsunaga, M. (2010). How to Factor-Analyze Your Data Right: Do's, Don'ts, and How-To's. *International Journal of Psychological Research, 3*, 97-110.
- Moos, R. H. (2008). Active ingredients of substance use-focused self-help groups. *Addiction, 103*, 387-396.
- Moos, R. H., & Moos, B. S. (2006). Participation in treatment and Alcoholics Anonymous: A 16-year follow-up of initially untreated individuals. *Journal of Clinical Psychology, 62*(6), 735-750.
- Morgenstern, J., Labouvie, E., McCray, B. S., Kahler, C. W., & Frey, R. M. (1997). Affiliation with Alcoholics Anonymous after treatment: A study of its therapeutic effects and mechanisms of action. *Journal of Consulting and Clinical Psychology, 65*(5), 768-777.
- Morry, M. M. (2005). Relationship satisfaction as a predictor of similarity ratings: A test of the attraction-similarity hypothesis. *Journal of Social and Personal Relationships, 22*, 561-584.
- Murray, S. L., Holmes, J. G., Bellavia, G., Griffin, D. W., & Dolderman, D. (2005). Kindred spirits? The benefits of egocentrism in close relationships. *Journal of Personality and Social Psychology, 82*, 563-581.
- Murray, S. L., Holmes, J. G., & Griffin, D. W. (1996). The benefits of positive illusions: Idealization and the construction of satisfaction in close relationships. *Journal of Personality and Social Psychology, 70*, 79-98.

- Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., Bernstein, J., Deci, E. L., & Ryan, R. M. (2006). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescence*, *29*, 761–775.
- Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education*, *7*, 133-144.
- Nowinski, J., Baker, S., & Carroll, K. M. (1992). *Twelve step facilitation therapy manual: A clinical research guide for therapists treating individuals with alcohol abuse and dependence*. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.
- Osborne, J. W., & Overbay, A. (2004). The power of outliers (and why researchers should always check for them). *Practical Assessment, Research & Evaluation*, *9*, 1-12.
- Ouimette, P. C., Finney, J. W., & Moos, R. H. (1997). Twelve-step and cognitive-behavioral treatment for substance abuse: A comparison of treatment effectiveness. *Journal of Consulting and Clinical Psychology*, *65*, 230-240.
- Patrick, H., Knee, C. R., Canevello, A., & Lonsbary, C. (2007). The role of need fulfillment in relationship functioning and well-being: a self-determination theory perspective. *Journal of personality and social psychology*, *92*, 434.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, *36*, 717-731.
- Preacher, K. J., & Hayes, A. F. (2008a). Contemporary approaches to assessing mediation in communication research. In A. F. Hayes, M. D. Slater, & L. B. Snyder (Eds.), *The Sage sourcebook of advanced data analysis methods for communication research* (pp. 13-54). Thousand Oaks, CA: Sage.
- Preacher, K. J., & Hayes, A. F. (2008b). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, *40*, 879 – 891.
- Project MATCH Research Group. (1997). Matching alcoholism treatment to client heterogeneity: Project MATCH post-treatment outcomes. *Journal of Studies on Alcohol*, *58*, 7-28.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J. & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*, 419-435.
- Riley, D., Sawka, E., Conley, P., Hewitt, D., Mitic, W., Poulin, C., Room, R., Single, E., & Topp, J. (1999). Harm reduction: concepts and practice. A policy discussion paper *Substance Use and Misuse*, *34*, 9-24.
- Room, R., & Greenfield, T. (1993). Alcoholics Anonymous, other 12-Step movements, and psychotherapy in the U.S. population, 1990. *Addiction*, *88*, 555–562.
- Rudy, D., & Greil, A. (1989). Is Alcoholics Anonymous a Religious Organization? Meditations on Marginality. *Sociological Analysis*, *50*, 41–51.

- Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality, 63*, 397–427.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*, 141–166.
- Ryan, R. M., & Deci, E. L. (2002). An overview of self-determination theory: An organismic dialectical perspective. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of Self-Determination Research* (pp. 3-33). Rochester, NY: University of Rochester Press.
- Ryan, R. M., & Frederick, C. M. (1997). On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *Journal of Personality, 65*, 529–565.
- Ryan, R. M., Williams, G. C., Patrick, H., & Deci, E. L. (2009). Self-determination theory and physical activity: the dynamics of motivation in development and wellness. *Hellenic Journal of Psychology, 6*, 107-124.
- Selfhout, M., Denissen, J., Branje, S., & Meeus, W. (2009). In the eye of the beholder: perceived, actual, and peer-rated similarity in personality, communication, and friendship intensity during the acquaintanceship process. *Journal of personality and social psychology, 96*, 1152.
- Sharma, M., & Branscum, P. (2010). Is alcoholics anonymous effective. *Journal of Alcohol and Drug Education, 54*, 3-6.
- Silva M. N., Markland D., Minderico C. S., et al. (2008) A randomized controlled trial to evaluate self-determination theory for exercise adherence and weight control: rationale and intervention description. *BMC Public Health 8*: 234.
- Skinner, B. F. (1953). *Science and human behavior*. New York: Macmillan.
- SMART Recovery. (2010). *SMART Recovery Membership Survey*. Retrieved from smartrecovery.org
- Solberg, R.J. (1983). *The dry drunk syndrome*. Minnesota: Hazelden.
- Steindler, M. S. (1998). Addiction terminology. In A. W. Graham, T. K. Schultz, & B. B. Wilford (Eds.), *Principles of addiction medicine* (pp. 1301–1304), 2nd ed. Chevy Chase, MD: American Society of Addiction Medicine, Inc.
- Timko, C., Moos, R. H., Finney, J. W., & Lesar, M. D. (2000). Long-term outcomes of alcohol use disorders: comparing untreated individuals with those in Alcoholics Anonymous and formal treatment. *Journal of Studies on Alcohol and Drugs, 61*, 529-540.
- Tonigan, J. S. (2008). Alcoholics Anonymous outcomes and benefits. In M. Galanter, & L. A. Kaskutas (Eds.), *Recent developments in alcoholism* (Vol. 18, pp. 357-371). New York: Springer.
- Tonigan, J., Connors, G., & Miller, W. (2003). Participation and involvement in Alcoholics Anonymous. In T. F. Babor & F. K. Del Boca (Eds.), *Treatment matching in alcoholism* (pp. 184 –204). Cambridge, England: Cambridge University Press.

- Tonigan S., Miller W. R., & Schermer C. (2002). Atheists, Agnostics, and Alcoholics Anonymous. *Journal of Studies on Alcohol and Drugs*, 63, 534-541.
- Urbanoski, K. A. (2010) Coerced addiction treatment: Client perspectives and the implications of their neglect. *Harm Reduction Journal*, 7, 1-10.
- Vansteenkiste, M., Neyrinck, B., Niemiec, C., Soenens, B., & De Witte, H. (2007). Examining the relations among extrinsic versus intrinsic work value orientations, basic need satisfaction, and job experience: A self-determination theory approach. *Journal of Occupational and Organizational Psychology*, 80, 251–277
- Van Wormer, K., & Davis, R. (2003). *Addiction Treatment: A Strengths Perspective*. Toronto: Nelson Thomson Learning
- Verstuyf, J., Patrick, H., Vansteenkiste, M., Teixeira, P. J. (2012). Motivational dynamics of eating regulation: a self-determination theory perspective. *International Journal of Behavioral Nutrition and Physical Activity*, 9, 1-16.
- Walsh, D. C., Hingson, R. W., Merrigan, D. M., Levenson, S. M., Cupples, L. A., Heeren, T., ... & Kelly, C. A. (1991). A randomized trial of treatment options for alcohol-abusing workers. *New England Journal of Medicine*, 325, 775-782.
- Waterman, A. L. (2013). Introduction: Considering the nature of a life well lived – intersections of positive psychology and eudaemonist philosophy. In A. L. Waterman (Ed.), *The best within us: Positive psychology perspectives on eudaimonia* (pp. 3-18). Washington, DC: American Psychological Association.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063-1070.
- Whitford, J. L., Widner, S. C., Mellick, D., & Elkins, R. L. (2009). Self-report of drinking compared to objective markers of alcohol consumption. *The American Journal of Drug and Alcohol Abuse*, 35, 55–58.
- Williams, G., Grow, V., Freedman, Z., Ryan, R., & Deci, E. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology*, 70, 115-126
- Williams, G. C., McGregor, H. A., Zeldman, A., Freedman, Z. R., & Deci, E. L. (2005). Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychology*, 23, 58.
- Williams, G. C., Niemiec, C. P., Patrick, H., Ryan, R. M., & Deci, E. L. (2009). The importance of supporting autonomy and perceived competence in facilitating long-term tobacco abstinence. *Annals of Behavioral Medicine*, 37, 315–324.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.
- White, W. (2007). Addiction recovery: Its definition and conceptual boundaries. *Journal of Substance Abuse Treatment*, 33, 229–241.

- White, W. (2009). *Peer-based addiction recovery support: History, theory, practice, and scientific evaluation*. Chicago, IL: Great Lakes Addiction Technology Transfer Center and Philadelphia Department of Behavioral Health and Mental Retardation Services.
- White, W., & Kurtz, E. (2005). *The varieties of recovery experience*. Chicago, IL: Great Lakes Addiction Technology Transfer Center.
- White, W. & Nicolaus, M. (2005). Styles of secular recovery. *Counselor*, 6, 58-61.
- Worthington, E. & Aten, J. (2009). Psychotherapy with religious and spiritual clients: An introduction. *Journal of Clinical Psychology*, 65, 123-130.
- Zeldman, A., Ryan, R. M., & Fiscella, K. (2004). Motivation, autonomy support, and entity beliefs: Their role in methadone maintenance treatment. *Journal of Social and Clinical Psychology*, 23, 675– 696.

Appendix A

PERCEIVED NEED SUPPORT

Source: Teacher as a Social Context Questionnaire (Belmont, Skinner, Wellborn, & Connell, 1988)

Adaptation: Tyler Carey and Frederick Grouzet ©2013

Instruction: For the following questions, please think about the peer-support program that you attend most frequently. Please tell us about your experiences in this group. What are the other group members like, including the group leader (if there is one)?

Response Scale:

Very untrue	Untrue	Somewhat untrue	Neutral	Somewhat true	True	Very true
----------------	--------	--------------------	---------	------------------	------	-----------

Items:

- (1) I get the sense that the people in my group like me.
- (2) The people in my group seem to really care about me.
- (3) The people in my group seem to really know me well.
- (4) The people in my group just don't seem to understand me.
- (5) The people in my group spend a lot of time with me.
- (6) The people in my group talk with me quite a bit.
- (7) I can't seem to count on anyone in my group when I need them.
- (8) Every time I do or say something wrong, it seems like the people in my group act differently toward me.
- (9) The people in my group seem to keep changing how they act toward me.
- (10) My group doesn't tell me what they expect of me during meetings.
- (11) My group shows me how to solve problems for myself.
- (12) My group doesn't explain why the things we discuss during meetings are important.
- (13) People in my group seem to really try and make sure I understand each topic before moving on.
- (14) My group checks-in with me to see if I am ready before discussing a new topic.
- (15) My group seems to offer many choices about how I can overcome my problem.
- (16) My group explains how I can use the things we discuss during meetings in my own recovery.
- (17) It seems like my group is always getting on my case about how I should try to overcome my problem.
- (18) The people in my group always seem to be telling me what to do.
- (19) It doesn't seem like the other people in my group listen to my opinion.

Appendix B

PERCEIVED NEED FULFILLMENT

Source: Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012).

Adaptation: Frederick Grouzet and Tyler Carey ©2013

Instruction: For the following questions, please continue to think about the peer-support group that you attend most frequently. Please tell us about how you feel during a typical group meeting.

Response Scale:

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
----------------------	----------	----------------------	----------------------------------	-------------------	-------	-------------------

Items:

During a typical meeting at _____ ...

- (1) I feel a sense of contact with the other group members
- (2) I am successfully completing difficult tasks and I am contributing to group activities
- (3) I am free to do things my own way
- (4) I experience some kind of failure, or I am unable to do well.
- (5) I have to do things against my will.
- (6) I am lonely.
- (7) I have a lot of pressures I could do without.
- (8) I feel close and connected with other group members.
- (9) I take on and master hard challenges
- (10) I feel a strong sense of intimacy with the group members.
- (11) I do well even at the hard things.
- (12) There are other group members telling me what I have to do..
- (13) I struggle doing something I should be good at.
- (14) I am doing what really interests me.
- (15) I feel unappreciated by one or more group members.
- (16) I sometimes do or say something stupid that makes me feel incompetent.
- (17) My choices and/or actions express my “true self.”
- (18) I have disagreements or conflicts with the other group members.

Appendix C

GROUP SATISFACTION

Source: Client Satisfaction Questionnaire (CSQ; Larsen, Attkisson, Hargreaves, & Nguyen, 1979)

Adaptation: Tyler Carey and Frederick Grouzet ©2013

Instruction: For the following questions, please think about the peer-support program that you attend most frequently. Please rate the quality of this peer-support program.

Questions:

- (1) How would you rate the quality of this peer-support group?
 Excellent Good Fair Poor
- (2) Are you getting the kind of help that you want?
 No, definitely not No, not really, Yes, generally Yes, definitely
- (3) To what extent does this peer-support group meet your needs?
 Almost all of my needs were met Most of my needs were met Only a few of my needs were met None of my needs were met
- (4) If a friend were in need of similar help, would you recommend this peer-support group to him/her?
 No, definitely not No, I don't think so Yes, I think so Yes, definitely
- (5) How satisfied are you with the amount of help you are receiving?
 Very dissatisfied Mostly dissatisfied Indifferent, or mildly dissatisfied Mostly satisfied Very satisfied
- (6) Does the support you receive help you deal more effectively with your problem?
 Yes, it helped a great deal Yes, it helped somewhat No, it really didn't help No, it seemed to make things worse
- (7) In an overall general sense, how satisfied are you with the help you are currently receiving?
 Very dissatisfied Mostly dissatisfied Indifferent or mildly dissatisfied Mostly satisfied Very satisfied
- (8) If you were to seek help again, would you come back to the same peer-support group?
 No, definitely not No, I don't think so Yes, I think so Yes, definitely
- (9) Which of the following statements most clearly reflects your future as a person involved with this peer-support group?
 I will definitely continue attending this group I probably will continue attending this group I don't know I probably won't continue attending this group I definitely won't continue attending this group

Appendix D

SATISFACTION WITH LIFE SCALE

Source: Satisfaction with Life Scale (Diener, Emmons, Larson, and Griffin, 1985)

Instruction: Below are a number of statements that you may agree or disagree with. Please indicate your level of agreement with each item.

Response Scale:

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
----------------------	----------	----------------------	----------------------------------	-------------------	-------	-------------------

Items:

- (1) In most ways my life is close to ideal.
- (2) The conditions of my life are excellent.
- (3) So far I have gotten the important things I want in life.
- (4) If I could live my life over, I would change almost nothing.

Appendix E

FLOURISHING SCALE

Source: Flourishing Scale (FS; Diener, Wirtz, Tov, Kim-Prieto, Choi, Oishi, & Biswas-Diener, 2009)

Instruction: Below are statements with which you may agree or disagree. Please read each statement carefully and indicate your level of agreement.

Response Scale:

Strongly disagree	Disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Agree	Strongly agree
----------------------	----------	----------------------	----------------------------------	-------------------	-------	-------------------

Items:

- (1) I lead a purposeful and meaningful life.
- (2) My social relationships are supportive and rewarding.
- (3) I am engaged and interested in my daily activities.
- (4) I actively contribute to the happiness and well-being of others.
- (5) I am competent and capable in the activities that are important to me.
- (6) I am a good person and live a good life.
- (7) I am optimistic about my future.
- (8) People respect me.