

SELF-REGULATION AND HEART RATE VARIABILITY BIOFEEDBACK:
PROMOTING EMOTIONAL AND SPIRITUAL FITNESS IN ALCOHOL
ADDICTION TREATMENT.

A Dissertation

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Dedication

“Paradoxically, it is our rejection of limits that confines us to a life of relentless gratification-seeking. This results in lack of self-regulation. Our belief in limitlessness makes addicts of us.”

– Arnold Washton and Donna Boundy.

“The great advantage of the religious point of view is that it offers a way to achieve self-control. The end result of self-control from the religious point of view is a body under the control of the best part of the soul...Oddly enough, modern cognitive and physiological psychology, with all its scientific regalia, scarcely attempts to find practical methods of self-control.”

– Howard Rachlin.

“Religions are systems of healing for psychic illness... That is why patients force the psychotherapist into the role of a priest, and expect and demand of him that he shall free them from their distress. This is why we psychotherapists must occupy ourselves with problems which, strictly speaking, belong to the theologian.”

– Carl G. Jung.

This dissertation is dedicated to all who strive to bring more Light into this world!

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Above all, my praise and gratefulness are due to my Higher Power, the God of my forefathers, Who brought me out of my “Egypt” with mercy, and Who continues to do so each day.

Abstract

Most forms of addiction, including alcohol-related disorders, are pervasive and are stubbornly difficult to treat. One of the variables accountable for such difficulties is related to deficits in executive functions, and tends to manifest as problems in self-regulation and self-control. These self-regulatory issues pose many challenges to individuals in recovery, as well as, to clinicians tasked with treatment. Despite recent shift in focus on providing holistic care, including spiritually-based interventions, there are very few programs that systemically strengthen emotional self-regulation and help individuals integrate spirituality into their lives for a more sustainable state of recovery. Recent research demonstrates the potential utility of training individuals to self-generate positive emotions, reduce frequency of internal conflicts, and increase overall psychophysiological coherence. This dissertation builds on this research and integrates three interventions into a comprehensive, holistic, and empirically-supported adjunct to standard drug and alcohol treatment.

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Chapter One: Introduction

“Every form of addiction is bad, no matter whether the narcotic be alcohol or morphine or idealism.” - Carl Jung

Background

From the dawn of the earliest human civilizations and all the way to our modern times, people have learned to engage in certain behaviors and ingest various substances to alter their states of mind and regulate their feelings (Foroud, Edenberg & Crabbe, 2010; Torr, 2000). While current perception of behaviors such as hyper-sexuality, gambling, video-gaming, excessive eating, excessive shopping, over-exercising, and misusing chemical substances as distinct and unrelated remains prevalent in our society, recent evidence is suggesting a new way of thinking. For example, Shaffer, LaPlante, LaBrie, and Kidman (2004) proposed to conceptualize addictive behaviors as distinctive expressions of the same underlying addiction syndrome. These authors stated that the traditional focus on specific objects of addiction maybe less central than the underlying shared neurobiological and psychosocial antecedent, and equally shared manifestations and consequences. Approaching addiction from the syndrome model, clinicians are urged to broaden the treatment protocols and to attend to the underlying vulnerabilities rather than keeping a limited focus on the “addictive” nature of certain chemicals (Shaffer et al., 2004, p. 367). The call by these authors towards a broader perspective is in a general agreement with the rest of this dissertation. However, the decision to focus on alcohol as one of the many “objects of addiction” was made due to the ubiquity of this substance and its paradoxical role across generations and cultures. Therefore, despite seemingly

narrow topic, the discussion here can and should be applicable to all other types of addictive behaviors regardless of their outward manifestations.

Alcohol has a long and colorful history as both a healer (as an antiseptic and analgesic agent) and a ruthless destroyer (as a carcinogenic, cirrhotic, and neuropathic agent). The destruction caused by misuse and abuse of alcohol to individual and family dynamics reverberates in the spheres of health, relationships, criminality, and financial security across multiple generations (CASA 2012; Rose & Cherpitel, 2011; Rehm, 2011; Jason, Davis, & Ferrari, 2007; Dowd & Rugle, 1999). Alcohol-related disorders have become so pervasive that the World Health Organization (WHO) ranked them as one of the most widespread mental disorders across the globe, accounting for 1.4 percent of the total world diseases (Grant et al., 2006; Monteiro, 2001).

What makes alcohol unique from other recreational drugs is that many people can enjoy drinking alcohol without harming themselves or others. On the other hand, about 15 percent of all people who consume even one drink are at risk of developing an addiction, otherwise known as alcohol dependence or alcoholism (Rose & Cherpitel, 2011; Becker, 2008). Characteristics of alcohol dependence include severe urges and cravings for alcohol that dominate all other needs for survival, along with the development of tolerance that requires increased consumption to achieve the desired effect (Kranzler & Li, 2008). Addicted individuals often experience severe withdrawal symptoms. In chronic users of alcohol, abstinence can be fatal unless supervised by trained medical staff (Becker, 2008). Furthermore, such individuals experience severe dysfunction in their personal and professional lives. Even while unsuccessfully

attempting to cut down their drinking, they find themselves unable to control the habit despite aversive consequences (Rose & Cherpitel, 2011; Miller & Carroll, 2006).

Alcohol-related problems cost our society billions of dollars annually (Adrian, 2001; Kassel & Wagner, 1993; Morgenstern, Lubouvie, McGrady, Kahler, & Frey, 1997). The United States spends more than \$2.9 billion per year for treatment and prevention, while the total economic cost from untreated alcohol problems were estimated to be in excess of \$184.6 billion in 1998 (Grant, Dawson, Stinson, Chou, Dufour, & Pickering, 2006). The National Center on Addiction and Substance Abuse (CASA) at Columbia University (CASA, 2012), estimates that the risk of substance use and addiction to be even more costly, with annual costs to the government reaching the \$470 billion mark. Moreover, 50,000 to 200,000 alcohol-related deaths unfortunately occur each year (Stimmel, 2002). Currently, as much as 10-13 percent of the American adult population (14 million) meets the diagnostic criteria for alcohol abuse and alcoholism. With so much effort and resources invested into controlling the problem, and the prevalence rate remaining steady over the years, all data is pointing to a national pandemic (Dowd & Ruge, 1999; Stimmel, 2002).

Throughout the long history of alcohol misuse, societies have implemented a wide variety of interventions to control, reduce, or eliminate the problem. The societal perspectives concerning alcohol abuse and dependence have also evolved over the years, from perceiving and treating individuals as immoral sinners, to criminal villains, and more recently to victims of a disease. Historically, problem drinkers were publicly stoned, incarcerated, assigned to mental asylums, treated in sanatoriums, medicated, and

more currently indoctrinated into spirituality-based aftercare programs (Rose & Cherpitel, 2011; Bliss, 2007; Miller & Carroll, 2006). The frustrating fact is that the problem seems to persist, despite the growing sophistication of research and clinical expertise in preventive efforts, stabilization of withdrawal symptoms through medication, psychological education, and coping skills training (Rehm, 2011; Adrian, 2001; Dowd & Rugle, 1999). One factor that keeps the prevalence of alcohol-related problems relatively high is recidivism. Despite modern scientific and technological advancements, the rates at which people relapse in their recovery, even after going through intense addiction treatment, remains relatively high. For example, some studies found that only 50 percent of individual who entered intensive outpatient treatment actually completed the full 4-week program. Furthermore, of those 50 percent who continued with treatment, another 50 percent dropped out of that program (CASA, 2012; McKay & Hiller-Sturmhöfel, 2011).

Regardless of an ongoing debate among addiction experts as to the way to best conceptualize alcohol-related problems, most would agree that it tends to be chronic and heterogeneous, requiring focus on holistic and long-term recovery (McKay & Hiller-Sturmhöfel, 2011; Miller & Carroll, 2006). What makes addiction such a persistent and often incurable problem is the fact that it is deeply complex and seems to be a multivariate phenomenon, with roots in various genetic, neurobiological, developmental, psychological, dietary, social, environmental, legal, economic, and lifestyle factors (Brown, et al., 2009; Miller & Carroll, 2006; Redish, Jensen, & Johnson, 2008; Walsh, 2011).

To be able to address any problem, especially one as complicated as alcohol dependence, it is important to have an accurate and informative conceptualization that can account for the processes and the multivariate elements involved in the formation of this problem. Foroud, Edenberg, and Crabbe (2010) conducted a review of current studies and concluded that, while it is clear that genes account for at least half of the risk, the critical interaction among psychological and environmental factors is indisputable. That seems to suggest that at least half of the other risk factors lie within the realm of one's control per se. The responsibility for planning, problem-solving, decision-making, and self-control is placed with the individual. People in this sense seem to have some choice in their intent and how they direct their actions. This applies to both the initial development of an addiction pattern, as well as one's choice to pursue treatment and recovery (Dreyfus, 2000; Miller & Carroll, 2006).

Related to this discussion is the influence of one's motivation. For example, according to Miller (2006), addiction is "fundamentally a problem of motivation" and involves influences of intrapersonal and interpersonal processes on the individual's impetus (p.134). Therefore, to become motivated towards change, one needs to have hope and trust that the change will work, and that the consequence of such efforts would be more rewarding than keeping the maladaptive behavior unchanged. While some rewards such as peace of mind, length of time without relapse, feeling healthy, and other positive states are enough for motivating some, they may not be as equally worthwhile for every alcohol-dependent person (Zimmerman, 2000). Therefore, understanding what stands in the way of becoming willing, ready, and able to own their recovery and removing those

obstacles will significantly increase both engagement in treatment and adherence to the prescribed process (Miller & Rollnick, 2002).

Individuals with histories of substance misuse may be represented by a broad spectrum of variability in their vulnerabilities, which form challenges to the individual's natural tendency to maintain health (Bickel & Potenza, 2006). Furthermore, as DiClemente and Prochaska (1998), and later DiClemente (2006) noted, that movement towards health and recovery varies markedly, which can be attributed to individual factors or circumstances. For example, even among individuals who found themselves deep in the addiction cycle, there are those who are able to recover successfully without any formal interventions. Research indicates that for such individuals using a single, brief intervention may be adequately enough to motivate them to change their substance misuse patterns and to adopt better self-care and healthier lifestyles (Jacobson & Greenley, 2001; Walsh, 2011). However, on the opposite side of that spectrum are people who present with severe co-occurring deficits. Such individuals naturally require more intensive, broad-based, and long-term support from various types of professionals. In such cases, when the entire biochemical system is in a state of flux, it is not uncommon to provide a combination of psychopharmacological and psychosocial interventions. Therefore, the determinants for success in recovery will include the degree of one's willingness, ability, and readiness to engage in the long-term process of healing.

Over the years, multiple models of etiology of addiction in general, and alcohol-dependence specifically, were put forth to inform treatment of this phenomenon. Whereas most of them seem to have merit in their conceptualization of addiction, the exact

physiopathology remains unclear (Torr, 2000; Skipper, 2000). Notably, there is still an ongoing debate as to what constitutes effective treatment, particularly because treatment and recovery might represent two different processes (Miller & Carroll, 2006; Dowd, Millas & Rugle, 1999). One way to conceptualize treatment is to see it as a way to stabilize or redirect the course of a disease. Recovery, on the other hand, refers to the process and the subjective experience of moving out of illness towards wholeness (White, Boyle & Loveland, 2003). Substance Abuse and Mental Health Services Administration's (SAMHSA, 2011) working definition of recovery expects it to be holistic. In other words, recovery is to be considered as a dynamic interplay among one's mind, body, spirit, and community. Moreover, this definition sees recovery as a continuum of improved health and wellness. It is also presented as a self-directed process of change through which a person can become engaged to improve his or her own health and well-being. Similarly, Ciaramicoli (1997) recommended for individuals in recovery from addictions to strive towards a holistic level of health (physical, emotional, and spiritual balance) to enter a learning process of recovery through developing patience and tolerance for gradual gains. The individual in treatment needs to engage in recovery along all life-sustaining areas. This may require achieving a certain homeostasis along the physiological, emotional, cognitive, interpersonal, and behavioral subsystems through "physical activity, healthy nutrition, alternative medicines, and spirituality, in addition to the traditional psychological and medical treatments" (Ciaramicoli, 1997, p. 139). It is presumed that only then those individuals are likely to have more strength in self-control, deal with

everyday stressors without relying on maladaptive behaviors, and become better equipped at resisting temptations for substance misuse (Padykula & Conklin, 2010).

Whereas treatment can be operationalized as a process that aims to reach a total absence of symptoms, the true process of recovery is likely to be a more dynamic progression, with small and gradual movement towards health and reduced number of relapses (Adrian, 2010; as cited in Sayette & Griffin, 2011). The process of recovery from substance abuse disorders is almost never a straight road of success, where relapses into the state of drug use are common, and should not automatically be interpreted as an overall failure (Torr, 2000). If a relapse does occur, it should be considered as a temporary setback, which offers the treatment team and the client an opportunity to re-evaluate steps already taken and approaches already tried, to find a workable mix of techniques and skills for the next push towards recovery. Moreover, due to this complicated process, no single, formal stand-alone treatment may be enough. Instead, any formal treatment in the context of recovery from addiction should be thought of as an adjunct or “scaffolding.” The roles of psychotherapists are then to provide their clients with the right information and supportive environment for the natural progression towards health. Employing a variety of techniques, therapists work to bolster their client’s levels of motivation, hope, self-efficacy, and self-regulatory abilities (Bickel & Potenza, 2006; DiClemente, 2006; Dowd, Millas & Rugle, 1999; Jacobson & Greenley, 2001; McCrady, 2008; Miller, 2006; Miller, Forcehimes, & Zweben, 2011).

Whereas many different treatment options are available in helping patients achieve abstinence, treatment noncompliance and relapse rates following treatment are

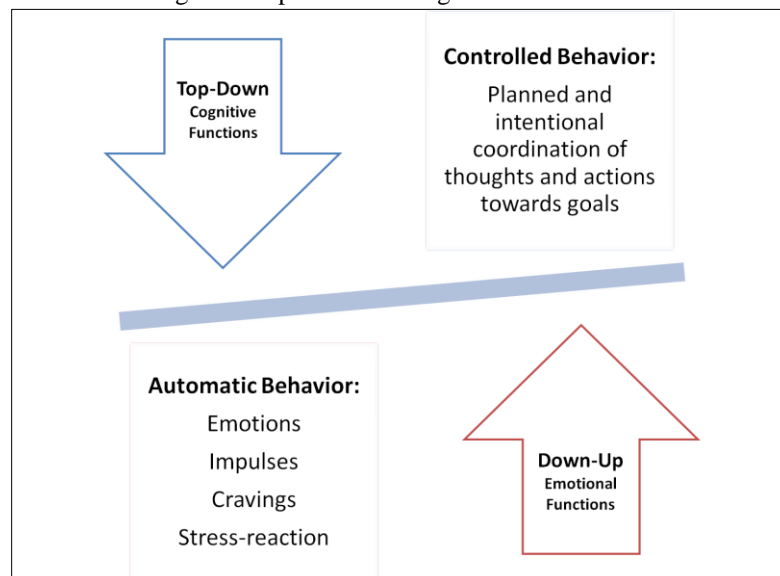
substantial (Hodge, 2011; Jason, Davis, & Ferrari, 2007; Putt, 1999). The levels of relapse reach as high as 70 percent for individuals relapsing after their first recovery attempt (Denzin, 1987). Witkiewitz and Marlatt (2004) found that, due to a large lapse-relapse learning curve, the likelihood of failing to change problematic behavior from a first attempt is as high as 90 percent. Fortunately, people who do relapse have a better chance of success during the next cycle (Miller & Rollnick, 2002).

There are many reasons for high relapse rates. Some of the failures are linked directly to complicating factors such as co-morbid psychological deficits that pose many difficulties in achieving treatment progress. For example, at the micro level, clinicians and neuroscientists alike have observed that as many as 50 to 80 percent of people with alcohol use disorders tend to show subtle cognitive deficits. These deficits manifest as problems in their working memory; attention; abstract reasoning; planning; problem-solving; judgment; sensitivity; inhibiting proponent responses; delaying gratification; regulation of one's emotions, thoughts, and behavior; the ability to grasp new and complex information; and lower tolerance of stress (Rose & Cherpitel, 2011; Wagner & Heatherton, 2011).

These brain functions, often called the executive functions are believed to reside in multiple, yet highly interrelated parts of the prefrontal cortex (PFC) of the brain (McCrary, 2008; Ivanov, Schulz, London, & Newcorn, 2008). Executive functions and their correlated self-regulatory abilities are considered fundamentally important for successful navigation and coexistence in the everyday life. Deficits in these areas are highly related to the formation of addictions. Fonagy and Target stated that, these

abilities that involve one's self-control over their reaction to stress, their ability to interpret mental states within themselves and others, and maintain focused attention, play a critical mediating function among the genetic predispositions, early life experiences, and adult functioning (as cited in Rueda, Posner, & Rothbart, 2011, p. 284). While a more detailed discussion on the importance of executive functions will follow in later chapters, it is important to introduce Blair and Ursache's (2011) conceptualization of the role of executive functions and self-regulation and self-control, as depicted in Figure 1. Specifically, they differentiated executive functions as being primarily related to the cognitive abilities and exemplifying the "top-down" aspects of rational thinking and planned behavior (organizing information, planning, problem solving, and coordinating thoughts and actions towards goals). On the other hand, they presented self-regulation and self-control as the "down-up" and more automatic aspects of behavior, including emotions, attention, and stress-reaction physiology (Blair & Ursache, 2011, p. 300).

Figure 1. Top-Down and Down-Up processes: This figure illustrates the relationship between the cognitive aspects of self-regulation and emotional self-control.



Other authors, like McCullough and Carter (2011) differentiated these further, presenting self-control as the process that overrides an automatic tendency, motivation, or craving (for example, craving for alcohol), by suppressing a goal of a lesser value, so that a goal with a higher value can be achieved. Although this differentiation among the top-down cognitive processes and down-up emotional reactions are extremely helpful and are related to the rehabilitation program to be presented in the later chapters, the terms of executive functions, self-regulation, and self-control will be used interchangeably, unless where they are differentiated for specific arguments.

Therefore, executive functions play an important role in stress response regulation (Williams & Thayer, 2009). Evidence shows that absence or inflexibility of such functions often seems to manifest as psychological and/or neurological disorders (ADHD, conduct disorders, mood disorders, and addictions). For example, Ivanov and colleagues (2008) have concluded that impaired inhibitory self-control (such as high degree of impulsivity), seen through neurobiological deficits in the PFC, represents an important indicator of risk for developing substance use disorders (SUDs). Williams and Thayer (2009) described a reciprocal relationship where deficits in executive functions pose as vulnerabilities towards developing poor self-regulation, and therefore having difficulties in managing substance use. In turn, excessive and chronic substance use may impair executive functions even further. While not always clear if the deficits in the brain structures and functions preexisted the substance abuse and dependence or occurred as the result of chronic use, this dysfunction appears linked to chronic alcohol use and/or

childhood traumatic experiences, and may even explain the highly frequent co-occurrence of other psychological disorders.

Strong and consistent epidemiological evidence highlights that alcohol use disorders often co-occur with other psychological problems (McCrary, 2008). In some cases, comorbidities reach as high as 75% to include polysubstance dependence, mood disorders, anxiety disorders, and neuropsychological deficits as some of the most commonly cited psychological and behavioral problems (Marlatt & Donovan, 2005). According to the 2010 National Survey on Drug Use and Health (NSDUH), there were approximately 45.9 million adults, from 18 years of age and older (20 percent of all adults in the U.S.), who were diagnosed with a some type of a mental illness in the past year. Among this group of adults, 11.4 million (5.0 percent) presented with serious mental illness, and about 25.2 percent of that segment of population struggled with drug and alcohol abuse or dependence (SAMHSA, 2012). Therefore, it is not surprising that with such high rate of co-occurrence, that the treatment of alcohol use disorders is an extremely complicated enterprise (Sterling, Chi & Hinman, 2011; Marlatt & Donovan, 2005).

As Miller, Forcehimes, and Zweben, (2011) pointed out, rapidly and often drastically shifting moods, coupled with the lack of self-soothing skills, might lead those individuals suffering from addiction to experience an internal and external turmoil. Williams and Thayer (2009) noted that individuals with deficits in the executive functions tend to struggle with adherence to complex behavioral change protocols and treatment regimens, especially when they find themselves in situations with insufficient

structure and social support. Such emotional, cognitive, and behavioral self-regulation difficulties, place the recovering alcoholic at the highest risk of relapse. Given these significant impairments in various components of self-regulation process, it seems feasible to provide clients with additional help to gain self-control (Miller, Forcehimes, & Zweben, 2011).

On the macro level, McNeece, DiNitto, and Raffoul (2005) present a grim view of the current state of substance abuse treatment in the United States, depicting most public programs that serve low-income individuals as inadequate and private programs as unapproachable to the majority of potential clients due to high cost. As Miller and Rollnick (2002), and Miller and Carroll (2006) point out, the sad reality of the current state of healthcare effected by the ongoing and drastic budgetary cuts, coupled with an increased emphasis by the third-party payers on the provision of empirically-supported treatments. The dwindling sources of funding and a higher pressure for increase in success rates of treatment are demanding changes in almost all aspects of the practice of psychotherapy. However, a greater concern for efficiency that has led both patients and third-party payers to seek treatments with shorter time-frame, lower costs, and demonstrable symptoms reductions, seems to result in a treatment package that may not be compatible with the holistic model of recovery (CASA, 2012; Carroll & Rounsaville, 2006; McLellan, 2006; Summers & Barber, 2010). For example, about 90 percent of all private health plans that provide insurance coverage, have instituted a limit that they cover only a 30-day inpatient stay and a 20-30 visits to outpatient clinics in one year (Stewart & Horgan, 2011). In terms of treatment of drug and alcohol addictions, many

inpatient institutions adapted a rehabilitation model that combined individual and group counseling, education, relapse-prevention, and self-help options in a supportive, yet highly structured environment. Traditionally, these programs included 5-7 days for detoxification and 3-6 weeks for rehabilitation. However, the current trend only allows for individuals in treatment to be kept for about 3-12 days, after which they are placed in halfway houses and are redirected to outpatient settings for continuation of their aftercare (Mack, Harrington, & Frances, 2010). Currently the insurance coverage varies broadly (CASA, 2012) with an average of stay covered by insurance being about 28 days (Mee-Lee, McLellan, & Miller, 2010).

In addition to economic pressures, another institutional challenge is related to an absence of national standards of care, and little evidence-based tailored solutions to address client's unique needs (CASA, 2012). The lack of systematic application of supported therapies is also related to the growing requirement for the treating clinicians in the drug and alcohol addiction clinics to have a higher level of education and more demands to demonstrate knowledge and competence in treating substance abuse disorders. The demand is not always met with the supply, as there is currently a lack of well-trained and experienced therapists with such specialization (CASA, 2012; Miller & Brown, 2009). Furthermore, most facilities tend to utilize clinicians employed on part-time basis, or those who are still in training, thus limiting the client's access to well-trained and available resources. Another, unfortunate limitation to providing treatment is related to the licensing and accreditation requirements for most of the drug and alcohol treatment facilities. Such regulations demand detailed treatment plans and progress notes

from the clinicians, which takes up from 40 to 60 percent of the time spent on documentation and other administrative tasks, rather than being in the direct contact with their patients (Mee-Lee, McLellan, & Miller, 2010). Therefore, it should not be surprising that many addiction treatment professionals would look for options that would augment recovery opportunities for their clients, yet with easier accessibility, affordability, and sustainability factors. One of the options gaining much popularity among both participants and clinicians involves incorporating spiritually based interventions.

To stay competitive and client-focused, many facilities are adopting a holistic model of recovery, and are beginning to address a broad spectrum of client's needs such as diet and nutrition; physical exercise; pharmacological, medical, and psychosocial therapies; and recently an increased emphasis on spirituality-based interventions (Rosmarin, Auerbach, Bigda-Peyton, Bjorgvinsson, & Levedursky, 2011; Nenn & Vaisberg, 2010; Lee & Newberg, 2005). In fact, Baetz and Toews (2009) outlined some of the clinical implications for including religiousness and spirituality into mental health, noting the multiple dimensions where they are likely to have an impact, including the biological, psychological, and social realms. Especially interesting seems to be the role of religious behaviors and spiritual practices in contributing to self-regulation and activation of a relaxing effect through contemplation, prayers, meditations, and religious services. Hill and Pargament (2008) define spirituality as "a search for the sacred, a process through which people seek to discover, hold on to, and when necessary, transform whatever they hold sacred in their lives" (p. 4). Religion, on the other hand, they define

as the larger social and institutional context, either traditional or not, where the “search for the sacred” (Hill & Pargament, 2008, p. 4) takes place. Religions, therefore aim to nourish the spiritual life (Underwood & Teresi, 2002). Currently, there is little research devoted to the self-regulatory benefits of spirituality and religiousness. Many current modes of spiritually-integrated interventions are in some modified form of cognitive-behavioral therapies or facilitating clients’ to engagement in the aftercare involving Twelve-steps programs (Ciarrocchi & Brelsford, 2009; Delaney, Forcehimes, Campbell, & Smith, 2009; Pargament, 2007; Rosmarin et al., 2011; Hodge, 2011; Delaney, Forcehimes, Campbell, & Smith, 2009).

The research on incorporating spirituality in addiction treatment and relapse prevention is relatively recent, yet evidence rapidly mounts to its benefits (Borras, Khazaal, Khan, Mohr, Kaufmann, Zullino, & Huguelet, 2010; Pargament, 2007; Project MATCH Research Group, 1997). Empirical findings continue to link intrinsic levels of spirituality and religiousness to lower incidences of delinquency and substance abuse; better mental and physical health; higher academic, professional, and social achievements, subjective well-being; and longevity (see McCullough & Willoughby, 2009; Unterrainer, Ladenhauf, Moazedi, Wallner-Liebmann, & Fink, 2010; Seeman, Dubin, & Seeman, 2003). Data also suggest that daily spiritual experiences such as awe, joy, and a sense of inner peace correlate significantly with an improved quality of life and positive psychosocial status. It also shows a general trend of a decreased total alcohol intake (Kaskutas, Turk, Bond, & Weisner, 2003; Underwood & Teresi, 2002). Emrick, Tonigan, Montgomery, and Little found additional supporting evidence that increasing

one's spirituality tends to promote a general state of sobriety. Meanwhile, findings from the large-scale longitudinal efforts such as the Project MATCH (1997), also suggest that spirituality can be a key component in the process of recovery (Borras, et al, 2010; Project MATCH Research Group, 1997). The importance of spirituality and religiousness in the lives of people is reflected in the significant move by the Joint Commission to make the inclusion of spirituality in the provision of addiction recovery and other health-care services to be a required component of providing holistic care (Hodge, 2011). Hence, Lee, and Newberg (2005) recommend that health-care providers take it upon themselves to become knowledgeable about the role of spirituality and religious involvement and the impact they have on patients' quality of life, symptom manifestation, and motivation to engage in treatment. Understanding such interactions promises new perspectives and additional options for increasing overall effectiveness of treatment and client's adherence to it.

Furthermore, Carrico, Gifford, and Moos (2007) found that spirituality and religiousness indirectly contributes to a sustained Twelve-step involvement by promoting an increased use of self-regulation skills. These authors found increase in self-regulatory abilities and strength to be sustainable long after the conclusion of the formal treatment. In their study, Carrico and colleagues (2007) found that people's self-regulation in the way of being able to override an automated, reflexive response to various drug-related cues and cravings was related to (a) arriving at more aware/acceptance of their internal emotional states; (b) developing a degree of mastery in making flexible and control reactions, and (c) applying a wider range of cognitive and behavioral skills to override

their reflexive reactions in highly emotionally-charged situations. These researchers reasoned that, the active mechanisms may be related to the spiritual/religious values and practices that encouraged a deeper self-awareness during moments of temptation, and offer individuals both a learning opportunity and numerous occasions during which they can practice adaptive coping responses. Having access to these self-regulatory resources and re-gradually gaining a sense of self-efficacy would allow addicted individuals to be able to better tolerate stressful situation and override their reflexive responses to internal and external triggers. Such quality would directly and indirectly lead to a sustained involvement in the Twelve-step groups, as well as translate to more successful drug and alcohol treatment outcomes in general (Carrico, Gifford, & Moos, 2007). Blume and Marlatt (2009) also considered the relation of self-regulation and the Twelve-step facilitation therapy (TSF). They conceptualized this relationship in terms of the Alcoholics Anonymous steps 1-3, where the focuses is on psycho-education about the disease model, acceptance of powerlessness over addiction, learning to trust in a Higher Power to restore harmony in one's life, engaging in support groups and other social networks. It may be interpreted from the comments of these authors, that individuals undergoing TSF may experience processes that enhance their self-awareness, provide multiple opportunities to practice better decision-making and self-regulation of behavior, and self-correct from the feedback given by their family and peers. Further, according to Kelly, Kahler, and Humphreys (2010), participation in the Twelve-step groups, such as Alcoholics Anonymous (AA) or Narcotics Anonymous (NA) was correlated with reduction in substance use disorders occurrences as well as in the psychological

functioning improvements. The decreased in health care costs, such that patients' reliance on professional services were lowered was attributed to the higher participation in the AA/NA groups. Therefore, research confirms that these fellowships are an attractive, effective, and beneficial option to a wide range of individuals; therefore, professionals in the mental health and substance abuse fields increasingly refer their clients to these organizations as a part of their process of recovery (Kelly, Kahler, and Humphreys, 2010).

In the contemporary substance abuse treatment arena, Alcoholics Anonymous (AA) has become a primary aftercare option (McLellan, 2006). Alcoholics Anonymous (AA) or Narcotics Anonymous (NA) are an abstinence-based, mutual-help fellowship that includes spiritual growth, personal responsibility, moral code, and altruistic participation in the context of nonjudgmental social support (Rose & Cherpitel, 2011). As a freely available resource, AA offer twelve steps that integrate spiritual and psychosocial methods to help their members maintain sobriety. Like all such programs, AA/NA views addiction as a disease made up of physical, emotional, mental, and spiritual factors (Narcotics Anonymous, 2008; Kassel & Wagner, 1993; Finlay, 2000). Miller and Carroll (2006) state that, based on literature review AA may be "the most effective ambulatory intervention for alcoholism... (yet) alone is not as effective as inpatient treatment combined with AA" (p.269). The reductions in the rates of relapse of as low as 37 percent are due to the participation in the Twelve-step programs (Denzin, 1987).

Brown and colleagues (2007) developed a seven-week behavioral intervention to facilitate Twelve-step involvement and found that the relapse rate dropped to 36%;

interestingly, about 90% of the participants in that study believed in God. In their 2007 study, Ouimette, Finney and Moos compared the Twelve-step program to cognitive-behavioral models of substance abuse treatments and found that, although both showed significant improvements, the Twelve-steps participants tend to be more likely to remain abstinent one year post treatment. Similarly, Morgenstern and colleagues (1997) and more recently Moos and Moos (2004) found that increased affiliation and involvement in AA predicted better outcomes, with participants showing higher levels of self-efficacy, motivation, and coping skills.

Twelve-step groups may offer many advantages over traditional treatment. For example, AA is long-term, free, and easily accessible. These fellowships also offer participants the chance to work on their recovery in a nonjudgmental and adaptively flexible way, where they get a chance to self-regulate the “dosage” of the intervention through the degree of involvement, frequency of their attendance, and steps accomplished (Kelly & Yeterian, 2011). Another important benefit of attending the AA/NA meetings is the cost benefits that such programs provide, both to the consumer and to the provider of drug addiction treatment. For example, Kelly and Yeterian (2011) found a consistent pattern across a number of studies of reduced cost associated with the provision of drug and alcohol addiction treatment. For example, while therapeutic comes were similar for both groups, those individuals who chose to attend only Alcoholics Anonymous and not outpatient treatment services had 45 percent lower treatment cost when compared to people who chose to attend outpatient treatment. Other studies demonstrated similar cost-savings across a matched sample of patients who received

either cognitive-behavioral treatment (CBT) or professional Twelve-step treatment (TSF). Those who were included in the Twelve-step facilitation programs had significantly higher rates of abstinence at a follow-up (46 percent), and demonstrated a substantially higher AA and NA participation in meetings. Meanwhile those treated using CBT showed a lower rate of abstinence (36 percent), utilized significantly more professional mental health services that accounted for annual costs at about 64 percent higher than for Twelve-step patients, which amounts to an additional \$4,729 per patient. Therefore, as Rose and Cherpitel (2011) have point out that, in addition to the cost effectiveness, the potential therapeutic benefits that seems to be aligned with the holistic model has convinced many researchers and clinicians that AA/NA is an attractive aftercare options for maintaining people's sobriety. Priester and colleagues (2009) found from their survey that 91 percent of treatment centers include some type of orientation and preparation for engagement with the AA/NA twelve-step programs. Therefore, current "focus of research has shifted in part to find ways to increase the attendance and the retention of new members at AA," and "the challenge for the clinical professionals focusing on getting these patients engaged and committed to AA participation after treatment" (p.173).

However, despite the benefits of such organizations in maintaining long-term sobriety, one of the well-documented problems is high dropout rates among AA members. This drop-out rate is especially high in the early stages of recovery, and has been linked to feelings of incompatibility and discomfort with the spiritual/religious emphasis incorporated into the philosophy and almost every step (Kelly, Kahler &

Humphreys, 2010). The paradox is that the treatment itself is not immune to the problem it aims to solve. As is true of general trends in formal addiction treatment services, where less than half of admitted clients complete treatment (CASA, 2012), the Twelve-step programs are also notoriously vulnerable to high drop-out rates. Many patients who were referred to AA/NA programs do not attend at all, quickly dropout from attending meetings, or are reluctant to fully engage in the “steps work” (McKay & Hiller-Sturmhöfel, 2011; Kelly, Kahler, & Humphreys, 2010). Findings indicate that only about 25 percent of newly referred clients ever come back for the next AA meeting, making the drop-out rates high enough to be considered a major concern (Rose & Cherpitel, 2011). While empirical investigations to explain what accounts for this behavior are relatively recent and often are based on anecdotal evidence, some of the most frequently cited reasons for discontinuation include inability to self-regulate emotional reactions and explicit opposition to the spiritual emphasis that is embedded in these program (McKay & Hiller-Sturmhöfel, 2011; Kelly, Kahler, & Humphreys, 2010).

Whereas some individuals with higher levels of religiosity and experience with various spiritual practices may be more open to the philosophies of the AA and the spiritual steps that they offer as the primary intervention, those with lesser exposure or openness to the spiritual content, and those who hold distinctly secular worldviews may feel excluded and be prone to disengage from the fellowships (Borras, et al., 2010; Kassel & Wagner, 1993). Furthermore, Pargament (2007) warns that the concept of spirituality should not be confused as being uniformly beneficial. He found that among those individual who may even identify as being religious or spiritual, yet experience a

spiritual-conflict, this internal struggle predicts a general decline in psychological well-being over time and disintegration leading to increased depression, anxiety, paranoid ideation and lower independent functioning (Pargament, Koenig, Tarakeshwar, & Hahn, 2004). If an individual perceives God as wrathful and punitive, the levels of neuroticism, negative affect (Beck & McDonald, 2004; Kirkpatrick, & Shaver, 1990), and the risk for future substance use and problems from addictions are increased (Miller, 1998).

Additionally, Saunders, Lucas, and Kuras (2007) found evidence that alcohol misuse is closely linked with having spiritual and religious problems. Participants studied reported much greater internal spiritual conflicts. For example, in their study they developed a self-report measure that helped in evaluating discrepancies in subjective perception of spiritual or religious functioning among alcohol abusing participants. This study found that those who abuse alcohol also tend to have significantly higher discrepancies between the current and ideal view of their religious well-being, existential well-being, connectedness to God, connectedness to others, and spiritual/religious-related practices. Authors suggested using specific motivational interviewing and other therapeutic techniques to increase the awareness of these discrepancies in people with substance use disorders. The expected positive results through the reduction of internal conflicts would be seen in greater engagement in treatment and enhanced therapeutic outcomes. It seems that, just as spirituality has the potential to facilitate recovery and post-traumatic growth, it holds the same potential to impede or even reverse it (Pargament, Desai, & McConnell, 2006). Therefore, ignoring the opportunity to help people explore the many explicit or implicit spiritual conflicts they carry is also a missed opportunity for a therapeutic

intervention to increase their overall well-being, and enhance compliance with the plans for current and aftercare treatments.

Saarnio and Knuutila (2003) concluded that, “the reason for dropping out of treatment is by far not a monolithic phenomenon” (p.37). In addition to these reasons including spiritual concerns, they found that drop-out rates can also be explained broadly by two types of problems. The first group is due to impulsivity, and the second group is due to projecting one’s own uncomfortable feelings onto others, which can rapidly escalate into an unmanageable and emotionally charged situation that these individuals are unable to control and therefore prematurely leave the treatment. As these researchers highlighted, having positive attitudes towards AA/NA are strongly correlated with both active participation and lower relapse, yet change in attitudes requires lengthy socialization. Although, AA/NA fellowships seem to be effective in helping their members learn to live without abusing alcohol and tolerate the aversive symptoms of alcohol withdrawal, those who present with inherent difficulties to evoke positive emotions, tolerate anxiety and stress, and stay focused on the content of the meetings are at a big disadvantage from the start. In fact, one’s abilities to regulate mood (Chiarrocchi & Brelsford, 2009), emotions, thoughts, behaviors (Padykula & Conkin, 2010) and having a healthy sense of self-efficacy (Witkiewitz & Marlatt, 2011) seem to be significantly correlated to successful relapse prevention. Therefore, it is not surprising that there is an overwhelming evidence demonstrating a link between higher emotional self-regulation, self-control over cravings, and a higher sense of self-efficacy and lower substance abuse, lower rates of crime and delinquency, and significantly improved

healthy behaviors (see Baumeister & Vohs, 2004 for a comprehensive discussion on such studies).

In consideration of the numerous external and internal challenges that individuals face on the path of overcoming their alcohol abuse and dependence, clinicians have a valuable opportunity to provide the right environment and skills that promise to significantly enhance the ultimate recovery. Even in the context of short-term addiction treatment facilities, clients can be helped to strengthen their self-regulation abilities, especially in ways to evoke positive emotions, and to remove any obstacles that may trigger negative emotions. These efforts are likely to help clients in their recovery regardless of their decision to attend Twelve-step programs or pursue other means of sustaining their sobriety. Therefore, as Miller, Forcehimes, and Zweben (2011) recommended, the goals of alcohol treatment and relapse prevention should be focused on training clients to activate their own self-regulation process by learning to self-monitor and to learn relaxation skills and/or breathing exercises to better manage their mood fluctuations, stress tolerance, and enhanced sense of self-efficacy and hope. Since these self-regulatory abilities play such critical role in general functioning, Williams and Thayer (2009) suggested that clinicians should consider including some type of neurobiological assessment, and placing more emphasis in their interventions on activating and strengthening client's self-regulation through "mind-body" modalities. For example, some of these approaches such as the cognitive-behavioral therapies, mindfulness meditation, and Heart Rate Variability (HRV) biofeedback have been gaining much of empirical support and positive reactions for clinicians and clients alike.

Over the past 30 years, increasing numbers of clients and therapists have actively sought alternatives to traditional therapies, with the practice of meditation especially popular (Pruett, Nishimura, & Priest, 2007). Kaplan (1985) described a number of goals shared by those who practice meditation, including efforts to gain control over their subconscious parts of the mind and emotions, enhance awareness and perception, attune to certain truths such as knowledge of self, and gain awareness of the spiritual and connection with the Higher Power. Of the various types of meditation available, the most studied in terms of their applicability in the field of addiction are Buddhist meditation, Transcendental Meditation (TM), and mindfulness-based meditation (Dakwar & Lewin, 2009). For example, the practice of mindfulness meditation, which was originally derived from Eastern spiritual practices, offers many potential benefits for individuals struggling with substance use disorders (Brefczynski-Lewis, Lutz, Schaefer, Levinson, & Davidson, 2007), and general psychological ailments (Lykins & Baer, 2009). Priester and colleagues (2009) randomly surveyed over 240 substance abuse treatment centers in the United States and found that about 58 percent of those who responded use meditation in their treatment services, which probably indicates the current growing openness among clinicians and clients alike to practice this ancient method of training one's mind to become better and self-regulating its focus, and controlling thoughts, emotion, and impulses. Although evidence is still inconclusive, some of the preliminary studies suggest that long-term and regular practice hold many benefits for people's mental and physical health, as it tends to help people achieve states of self-actualization, reduced anxiety, depression, and irritability and improved learning abilities, creativity, and emotional self-

regulation (Lykins & Baer, 2009; Dakwar & Levin, 2009; Wisner, Jones, & Gwin, 2010; Priester et al., 2009; Wachholtz & Pargament, 2008; Lee & Newberg, 2005; Compton & Becker, 1983).

Other benefits of some types of meditation practice may relate to fewer stigmas than those attached to “spiritual” and/or “religious” terms, making these practices more palpable to a wider group of individuals in recovery. For example, mindfulness-based meditation may be less threatening to clients because of its almost non-religious foundation. On the other hand, some clients, especially those who adhere to a religious tradition that advocates against following “other” religious practices may find themselves struggling to accept this approach, due to the religious backgrounds of Buddhist meditation and the quasi-religious aspects of TM. Due to the perceived incompatibility of the client’s pre-existing religious beliefs, or their agnostic/atheistic nature, this may dissuade some clients from practicing meditation (Dakwar & Levin, 2009). Clinicians can choose to work with individual clients in helping them dispel some of the misperceptions and fears associated with meditation, especially by pointing out the presence of mindfulness practices found in almost all of the world’s religious practices (Plante, 2008). On the other hand, despite many potential benefits from these meditative practices, therapists should recognize that there may also be aversive effects, especially for clients who may be too ill to commit and fully engage in a traditional meditation regiment.

Clients with severe addictions and/or a co-occurring psychiatric disorder may lack the necessary motivation, social support and discipline needed for regular practice

(Dakwar & Levin, 2009). In addition to the general prerequisite of having at least minimally intact cognitive functions, the ability to learn and master these techniques often requires adequate time, safe and peaceful space, and a well-trained instructor to impart clients with the needed guidance. However, the typically chaotic nature of most drug and alcohol rehabilitation centers or the aftercare settings where individual continue with their recovery may preclude such amenities. Most meditation trainings were originally designed for healthy adults with sufficient coping skills, and many empirical studies on meditation also included similarly well-functioning subjects (such as those with higher motivation, education and social economic status). As with many types of coping skills training, learning to meditate may require individuals to be willing, ready and able to take upon themselves the responsibility (Miller & Rollnick, 2002) to practice regularly, consistently, and diligently. However, these prerequisites may be more difficult to comply with for individuals with chronic alcohol addiction (Lykins & Baer, 2009; Wisner, Jones & Gwin, 2010).

Although by diligently practicing meditation individuals can learn to self-regulate, the co-occurring emotional, cognitive, and behavioral dysfunctions may prove to be a challenge and thus lead to similarly disenchanting, and at times even traumatized individuals. For example, in their review of using different types of meditations as a source for strengthening self-regulation, emotional coping and self-esteem, Wisner, Jones, and Gwin (2010) caution that some people who have experienced losses and grief may be hypersensitive and may feel overwhelmed by these emotions during meditation. Similarly, this caution applied to clients with severe psychiatric problems, including

psychosis, depression, and anxiety. Compton and Becker (1983) also warn that, despite strong empirical support for meditation being able to decrease anxiety and enhance relaxation, during the necessary earlier periods of training practitioners commonly experience intense emotional states of conflict and anxiety. Furthermore, in addition to the prerequisite learning period, in their study of experienced Zen mediators, Compton and Becker (1983) found that participation must be voluntary, under the tutelage of an experienced Zen master, and last at least 12 months before any positive effects can be observed. Even more importantly, because some individuals are at high risk for regression into psychotic states were reported to experience depersonalization and derealization during meditation, Dakwar and Levin (2009) presumably advise against practicing it by anyone who would be vulnerable for psychological instability.

Therefore, despite the availability of a wide variety of effective interventions (CASA, 2012), including mindfulness meditation and spirituality and/or religiousness, clinical professionals face numerous challenges in integrating these approaches successfully into treatments, as well as impacting the client's ability for active membership in the aftercare programs. As discussed, such obstacles may deter many individuals from initiating their involvement or deriving a full benefit due to their co-morbid psychological dysfunctions, and/or due to their pre-existing negative attitudes towards spirituality and religious practices. While existing pharmacological and psychosocial methods are effective in addressing cravings for alcohol and other drugs, echoing Carroll and Rounsaville's (2006) call for an alternative strategy, by identifying and implementing techniques that rely on the fundamental process shared by most

individuals with substance use disorders the existing interventions can be enhanced further. Therefore, by strengthening of one's ability to self-regulate own emotional, cognitive and behavioral systems, individuals can be positioned to engage in and maintain their involvement in traditional and spiritually-based interventions, with lower drop-out and relapse rates.

It is clear that an intervention is needed that offers all of the above benefits of providing an opportunity to achieve states of reduced anxiety, depression, and irritability, and develop a sense of self-efficacy, especially in one's ability to cope with stress and enhance positive emotions, while lessening negative emotions and increasing motivation. More as an adjunct, rather than a stand-alone solution, this intervention would be a practical bridge for the traditional approaches used in alcohol addiction treatment. Furthermore, this intervention would provide the client with immediate feedback and help maintain focus. To reference back to the previously introduced differentiation proposed by Blair and Ursache (2011), where the executive functions represent the "top-down" cognitive regulatory influences on the behavior, and the "down-up" represent emotional processes, by incorporating HRV into the current therapeutic mix, the expected benefit is reaching the proverbial harmony between the thinking and the feeling aspects of human experience. It seems that by offering the clients a "right-brain" and "down-up" stimulation to the brain, would complement and balance-out the traditional "left-brain" and "top-down," language-oriented psychotherapy. This intervention would honor the holistic, mind-body-spirit approach, aiming to augment and balance, rather than replace, the existing protocols. It would also avoid many clinical and ethical challenges, allowing

it to be implemented rapidly and efficiently, thus providing the individual with a sense of self-determination for their own recovery without straining existing deficits in executive functions.

One possible area of exploration for such intervention would be the use of Heart Rate Variability (HRV) biofeedback. HRV, the key marker found in the natural fluctuations in heart rate, “is a product of the dynamic interplay of many of the body’s systems” (McCraty, 2009, p. 20). Evidence shows a link between HRV and executive functioning (Segerstrom & Nes, 2007). One of the newest and increasingly explored physiological parameters, HRV can serve as an implicit measure of emotional states and general physical health (Thayer, Hansen, Saus-Rose, & Johnsen, 2009), as well as stress vulnerability and reactivity (Bradley et al., 2010; Porges, 1992). It has been equally effective as a biofeedback training tool, used to help individuals learn to evoke positive emotional states (often equated to transcendent states and spiritual connectedness), manage stress reactions, and develop a sense of self-efficacy (Wheat & Larkin, 2010; McCraty, 2009).

The Institute of HeartMath is one of the leading research institutions dedicated to studying the effects of positive emotions on health and well-being. Researchers at this institute have been able to provide empirical support for the positive effects of engaging in a self-regulatory technique they called the “Quick Coherence®,” which was designed for self-generation of positive emotional states and creation of a cardiac coherence (Childre & Rozman, 2005). The technique involves intentional evocation of a positive, positive thinking and regulating one’s breathing patterns (McCraty, Atkinson, Tomasino,

& Bradley, 2006; Moss, 2004). McCraty and colleagues have shown that using this technique enhances the effects even further when individuals receive information on the process and their efforts in real time, through biofeedback (see McCraty, Atkinson, Tomasino, & Bradley, 2009). Developing this technique for use in facilitating the process of recovery in individuals with alcohol use disorders offers the potential to increase the clients' abilities to self-regulate their emotional states, learning to focus their attention and cognition, override their impulses, and generate positively reinforcing emotions. Using the HRV feedback-training will likely benefit individuals who tend to be impatient and need immediate feedback on their efforts, may become quickly overwhelmed and self-conscious when present in groups, may lack the ability to describe their feelings, and therefore need an alternative to the traditional language-based therapeutic interventions.

Purpose

This dissertation will evaluate the growing body of research regarding the effect of self-regulation and self-control on the individual; additionally, it will consider their potential in facilitating the process of recovery and prevention of relapse through holistic, spirituality-based approaches among people with alcohol use disorders. In the context of addressing individuals' deficits in emotional self-regulation and resolving obstacles towards a more sustainable progression towards recovery, this dissertation will briefly consider some of the common curative factors and limitations of traditional treatment options. Furthermore, by combining the most promising and empirically-supported elements, a comprehensive program will be proposed, which will join the emotional regulation and sustained attention training, with spiritually-focused therapy. The scope of

the analysis will be limited to the interventions that are readily available, or easily modifiable, to make the program implementation both rapid and affordable. The ultimate goal for the program is to provide participants with information, skills, experience, and resources to continue developing their natural healing abilities in secular or spiritually oriented aftercare programs.

Method

First, I will review literature that broadly discusses theories of addiction. Particular interest would be in findings from neuroscience and psychophysiological research delineating different neuropsychological factors that are important to take into consideration when treating population with alcohol addiction. One important characteristic to consider is the neurological and psychological impairments that lead to addictive behaviors and/or result from chronic alcohol consumption, and are relevant to prevention of future relapse. For example Ivanov, Schulz, London, and Newcorn (2008) conclude that there may be underlying deficits in inhibitory control, which is central to substance use disorders. I will also examine characteristics of relapse and variables that increase such risks.

I will introduce the concepts of spirituality and religiousness and describe their roles in recovery from alcohol use disorders. Specific focus will be on providing theories and evidence on how spirituality enhances regulation of emotion, cognition, and behavior and shares common curative mechanisms with traditional psychotherapeutic interventions. I will also include a discussion on some of the practical, clinical and ethical

concerns in integration of religiousness and spirituality, and ways that successful implementation in alcohol recovery settings maybe hindered.

Next, I will research spiritually based interventions that have already been successfully incorporated into treatment, for example looking at mindfulness-based meditation, the Twelve-step programs and Heart Rate Variability (HRV) feedback to identify what elements in these methods are related to the strengthening and induction of self-regulation, positive emotions and a sense of self-efficacy. I will contrast HRV to another popular form of biofeedback equally empirically-supported method of addressing the dysregulation of affect and attention. The possible benefits of using HRV as an implicit assessment of emotional states will also be included (McCraty et al., 2009). I will review available literature to evaluate the effectiveness of these modalities and practical challenges they may address or pose.

Chapters Overview

Chapter One provides an overview and an introduction. First, I will discuss broadly the concept of alcohol addiction, and the emerging trend in using religious and spiritual treatment options. I will highlight some of the individual and systemic challenges involved in addiction treatments, especially related to the dysregulation of executive functions, the co-occurring psychological disorders, and the role of stress. I will discuss the evolution towards holistic recovery, and the beneficial role of spirituality in addiction treatments. Here I will briefly introduce and discuss some of the most popular options such as the Twelve-step programs and meditation practices. Benefits and limitations of these approaches will be presented, especially as they may relate to high

dropout rates. Finally, I conclude with an introduction to the use of Heart Rate Variability (HRV) biofeedback as a way to bridge and bolster the existing treatment options for the purposes of offering clients and additional opportunity to learn and strengthen their ability to self-regulate their emotions, thoughts and behaviors in a stigma-free, enjoyable, and easily accessible way. The chapter concludes with an overview of remaining chapters.

Chapter Two will begin with defining the state of wellness, and discuss this as a potential destination for all creatures. It will acknowledge the need for a holistic approach to life, as well as recovery from disease. The chapter will review the link between the failures of self-regulation and formation of addiction. Additionally, this chapter will present alcohol misuse in its “adaptive” role as an artificial method for self-regulation. The emphasis in this chapter will be on presenting the theoretical and empirical foundations to understand self-regulatory functions, and its neurological correlates in the prefrontal cortex (PFC). Furthermore, through presenting some theories on the developmental paths and potential vulnerabilities, this chapter will outline variables like chronic alcohol use, stress, cognitive impairment, and comorbid disorders as detractors from successful treatment adherence. The chapter will conclude with a brief overview of some theories explaining the formation of addiction.

Chapter Three will present the current state of drug and alcohol treatment, and outline its limitations and challenges for providing a holistic and life-long support. Then a few traditional models of treatment will be presented, in a way that parallels the models of addiction formation discussed in chapter two. The focus will return on discussing

spirituality (in general, in the form of Twelve-step program, and as meditation practices). However, this time these approaches will be analyzed in terms of possible curative and limiting mechanisms, and related to their self-regulatory roles that develop sustained attention, generate positive emotions, and inhibit impulses.

Chapter Four will begin with an overview of the earlier chapters to set the stage for the treatment package solution. The focus will turn to presenting two methods of addressing the issues and limitations of alcohol addiction and current treatment options. The solution will be presented as one that reflects Blair's and Ursache's (2011) conceptualization of two interacting systems, with the top-down responding to the cognitive and motivational modes of therapy, and the bottom-up responding to the training of the emotional, attentional, and stress-coping abilities. The theoretical roots for the two parallel modules of the program are in the Comprehensive Soldier Fitness program designed specifically for the U.S. Army. However, due to having their foundation in traditional therapeutic approaches, here they are being proposed as equally adaptable for addiction treatment protocols. Therefore, this program will be presented as a two-pronged approach for addressing Emotional Fitness and then Spiritual Fitness, with the connecting element being the biofeedback. While both of these programs will approach from the psycho-educational and experiential approaches, the HRV will be suggested as the ideal proxy that provides immediate feedback and control to the practitioners. With this benefit, it will be argued that individuals undergoing this training will not only be guided through overcoming some of the spiritual and religious struggles, but will also learn to use their emotions in healthier ways. The context of the treatment facility and planned

aftercare such as the Twelve-step programs will provide the opportunity to apply these skills. The rest of the chapter will present research on Heart Rate Variability (in contrast to the EEG neurofeedback, which poses some practical limitation) as a way to self-generate positive emotions and a state of physiological equilibrium, and a technique to self-generate positive emotional states, which are not unlike those achieved by seasoned mediators and spiritual practitioners. This chapter will also discuss HRV as a psychophysiological marker for stress vulnerability, resilience, and a general well-being. It will highlight the evidence that HRV provides an accurate, implicit measure of one's executive, limbic system and autonomic nervous system functions.

The final Chapter Five will begin by a brief overview of the integration of technology-based interventions into clinical settings. This chapter will provide some general guidelines for project planning and management. While some recommendations for the HRV biofeedback equipment will be offered, this chapter will encourage project leadership to conduct thorough analysis of organizational technological needs and evaluations of HRV biofeedback equipment vendors to ensure selection of the most compatible and capable technology. Further, this chapter will discuss the general course of treatment, and present some guidelines and recommendations for implementing the emotional and spiritual fitness training components, including the HRV protocol. The chapter will conclude with a discussion of the possible limitations and suggest directions for future research.

Chapter Two: Foundations of Self-Regulation

For the biological systems, of which a human being is one of the most complex examples, at its most basic level the primary goal is survival. Therefore, the ability to respond quickly and accurately to internal and external needs has a clear survival advantage. Continuously shaped by the reciprocal relationships of nature and nurture the organism learns to move towards achieving its goals or away to avoid harm and danger. According to the self-regulation perspective, the movement towards a goal involves the interaction of “negative or discrepancy-reducing feedback loop” (Carver & Scheier, 2011, p.4) that is essential for maintaining functional stability and survival, and include the processes of self-monitoring and self-corrections (Guo & Zakhari, 2008; Miller, Forcehimes, & Zweben, 2011). Additional insight is gained from the field of cybernetics, which stated a basic principle placing feedback as the primary variable responsible for any learning. Based on this principle, “one cannot control a variable unless information about the variable is available to the controller” (Schwartz & Olson, 2003, p. 10) and this information is referred to as the “feedback” (Schwartz & Olson, 2003, p. 10).

The feedback cycle, starts with the organism perceiving incoming information and using it for self-evaluation in reference to its current state. The organism then identifies any discrepancies observed between its current and desired states. If the two states are identical then there is no need to take action. However, if the organism perceives a gap between the two states, then action process is initiated. Such process involves organism to search and evaluate available options for action, followed by

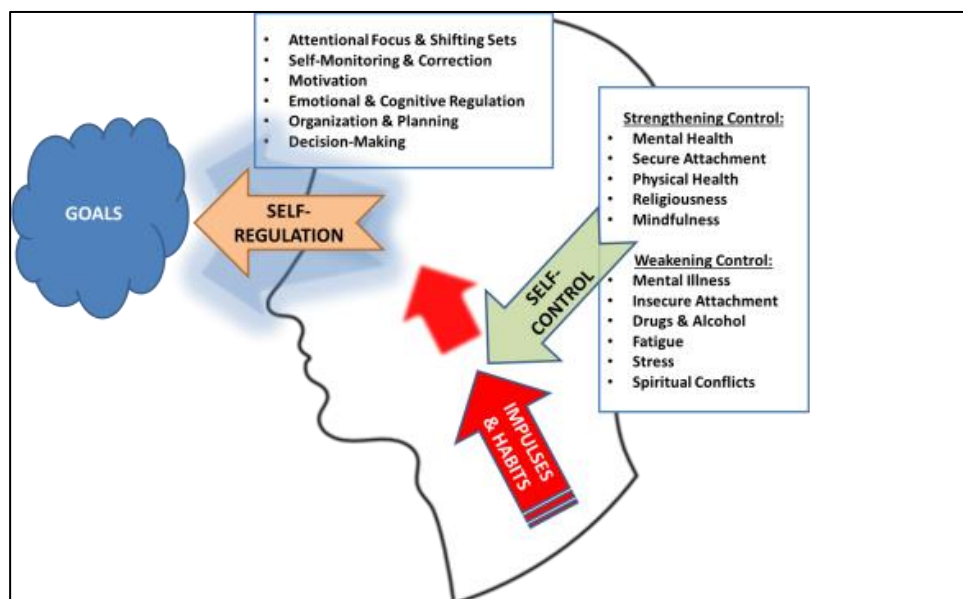
forming a certain decision for an action, which is subsequently followed by its implementation through action (Carver & Scheier, 2011).

Just as the body self-regulates the functions of its various organs on the micro level, so does the entire organism on the macro level relies on the feedback of information to achieve its goals (Carver & Scheier, 2011). While the body and its organs communicate through a variety of complex biochemical pathways, organisms utilize affect as a direct and automatic communication system that enables them to determine which element in the environment will facilitate survival and which will detract from it (Panksepp, 2010). The affective systems that reside in the most ancient part of animal and human brain, and mediates “social urges, social rewards, and social bonding” (Panksepp, 2010, p.158), all of which guide toward achieving appropriate life-sustaining activities. The affective systems are designed to act quickly to help the organism to also react rapidly through either activating the approach or avoidance systems. Either a positive or negative subjective experience indicates to the organism if it is closer or further from the goal. Positive affect activates the approach system, negative affect activates the avoidance system, and a neutral affect results in no changes to the behavior (Carver & Scheier, 2011). Just as the affect has a direct influence on action, the behavioral responses in turn also reduce the intensity of affects, thus exemplifying an endogenous, homeostatic, self-regulatory system.

While the term self-regulation and self-control have been used in the literature sometimes interchangeably, Carver and Scheier (2011) prefer to use self-regulation in a broader sense to describe a purposive processes, which activates self-corrective

adjustments using a feedback loop, and thus moves the organism towards (or away from) the certain goal. Self-control refers to the self-inhibiting efforts imposed to override many competing goals, wishes, needs, urges, and desires that pose as powerful detractors from the original goal (Baumeister & Vohs, 2004; Baumeister, Heatherton, & Tice, 1994).

Figure 2. Self-regulation and self-control: This figure illustrates the goal-directed processes and influences that either strengthen or weaken the ability to inhibit automated and reflexive responses.



Baumeister and Heatherton (1996) summarized the three key ingredients to self-regulation. The first component involves acquiring and establishing “standards,” goals, or values towards which all actions are to be directed. When such goals, values, or standards are absent, unclear, or in conflict, the ability for self-regulation is drastically reduced. The second required ingredient involves self-monitoring and comparing the perceived actual self, and the here-and-now state, to the “ideal self,” preset standards, and goals. If the

ability to attend to monitoring tasks of the self and the ideal-self goals, or ability to make accurate decisions are disrupted or dysfunctional, then the ability in self-regulation are also reduced. The third and the final ingredient of this feedback loop, requires the corrective action that adjusts any perceived deviations from the set goals (or the state of ideal). When the second phase identifies that the current state has not reached intended goals and had fallen short of the predetermined standards, the self-corrective process is set into motion to change the current state that would match more closely the “ideal” future state. Any failures to take action, or bring about a misguided change drastically reduce any successful self-regulation and chances of achieving those goals.

An important differentiation exists in defining the construct of self-regulation, which separates the reasons for failures in self-regulation either into under-regulation or misregulation categories. Under-regulation results from a failure to exercise control over one’s self, which is frequently due to having multiple, conflicting or inadequate standards. This is thought to lead to a breakdown in one’s ability to self-monitor, self-evaluate, and exert adequate self-regulatory strength (willpower) to override the reflexive/impulsive tendencies (Baumeister, et al., 1994; Saytte & Griffin, 2011). Alternatively, the *misregulation* refers to being able to exert control, yet in a way that fails to bring about the desired result. These misdirected control efforts are thought to involve some deficiency in knowledge, overgeneralizations, or having false or distorted beliefs (Baumeister, et al., 1994; Saytte & Griffin, 2011).

Self-regulation variables can be perceived as existing along two domains: in the behavioral domain, good self-control involves the interrelated capabilities for planning

into the future, considering and selecting among alternatives before acting, and linking actions to consequences. In the emotional domain, the ability for good emotional self-control involves the ability to reduce excessive arousal, and an enhanced ability to deal with negative emotions, such as sadness and anger. In fact, since people differ widely in their temperamental sensitivities and reactivity, they will regulate their activity in order to increase or decrease the degree of stimulation they receive (Rothbart, Ellis, & Posner, 2011). The concept of emotional self-control has been empirically correlated with behavioral self-control, because it involves activating cognitive strategies such as focusing and shifting attention, monitoring one's own levels of arousal, and using efforts to minimize unpleasant stimuli. Furthermore, based on the broaden-and build theory of emotions developed by Fredrickson and colleagues, the ability to self-generate, sustain, and increase in frequency of positive emotional experiences is significantly correlated with resilience, ability for more flexible responding to stress, better problem-solving skills, greater empathic accuracy, more satisfying interpersonal relationships, decreased mental illness and a global increase in mental and physical health (Algoe & Fredrickson, 2011). Whereas negative emotions act as a signal that prepares the body and mind for specific actions, positive emotions counteract these effects and promote recovery and healing (Garland, Fredrickson, King, Johnson, Meyer, & Penn, 2010).

The constructs of good behavioral and emotional self-control tend to be related to protective, buffering factors (Wills, Pokhrel, Morehouse, & Fenster, 2011). Therefore, in human behavior an automatically activated desire that is instantly translated into action, characterized as an "impulse" (Carver & Scheier, 2011, p.15-16), can be controlled

provided there is enough resources and effort. This ability is a limited resource, as one cannot regulate everything at once or sustain self-control without becoming easily depleted (Baumeister, et al., 1994). When this self-regulation strength is depleted or breakdowns due to over-expenditure, especially during the times of stress, people become less capable in handling their functioning and become especially vulnerable to relapse to previous patterns of behavior. “Fatigue or overexertion will deplete the person’s strength and hence undermine some patterns of self-control” (Carver & Scheier, 2011, p.3). In addition, the authors suggest that an “effortful control” system engages the executive, planful, organizing functions to manage one’s attention and inhibitory control to suppress and override certain inappropriate behaviors (Carver & Scheier, 2011, p.15). Rothbart, Ellis, and Posner (2011) hypothesized that attentional focusing, attentional shifting, and inhibitory control that comprise the bulk of effortful control in self-regulation are related to the executive functions of the prefrontal lobe in the brain (PFC).

Successful functioning in the world requires self-regulation (in relation to one’s progression towards or away from their goals) and self-control (in relation to one’s ability to override distracting impulses), and this appears to be across most of life’s domains (McCullough & Willoughby, 2009). Self-control predicts lower criminal and violent behavior, better self-assessed health (Baumeister & Vohs, 2004) , and even functions as a much more accurate predictor of academic performance than even intelligence (Duckworth & Saligman, 2006). Ability in children to delay gratification has been shown to be correlated with their higher academic achievements and social adjustments as they grow into adulthood (Mischel, Shoda, & Rodriguez, 1989). Naturally, the question of

how self-regulatory functions develop brings to the focus the interactions of early temperamental dispositions with the environmental context where the child develops. Self-regulation, as a manifestation of executive functions, may also be reflected in individual's personality traits, which confer risk or resilience for adverse stress-related outcomes. For example, using the five-factor model of personality, characteristics of neuroticism were associated with poorer decision making and stress regulation, while conscientiousness was linked to the better ability in overriding of dominant emotional tendencies and successful engagement in goal-directed behaviors (Williams & Thayer, 2009). A brief review of current theorizing in the area of attachment and emotional self-regulation suggests that caregiver affects infant's emerging self-regulatory abilities at multiple levels (Calkins & Leerkes, 2011).

The capacity for self-control over impulses, and the ability to regulate emotions, particularly negative emotions, develops over the first years of life. Researchers consider the acquisition of emotion regulation as early childhood's most critical developmental achievement (Calkins & Leerkes, 2011). Because the role of parental caregiving is a powerful force that shapes such development of emotional self-regulation, Calkins and Leerkes (2011) hypothesize that the emerging attachment relationship that develops in the child-parent dyad over the course of infancy and childhood activates and solidifies a certain "repertoire of self-regulated emotional skills" (p.356). During the developmental progress, as the infant maintains a connection to the object of attachment, they are also experimenting and practicing the skills to regulate their own internal state, and by expanding the breadth and the flexibility of coping adaptation to the external

environment, the infants enhance their own levels of functioning. For example, an infant's attentiveness towards a distractor presented to them by the caregiver is considered to be an example of one of child's earliest kinds of regulation of subjective experience of distress (Rothbard, Ellis, & Posner, 2011). Various natural biological maturational processes are at work that help the infant progress from a full dependence on the caregiver for comfort, to gaining their own capacity for self-soothing. It is through the multitudes of these interpersonal interactions of the child and the parent that self-regulation abilities are formed and strengthened.

According to attachment theory, humans are instinctually driven to engage in behaviors that strengthen the caregiver-child bond; therefore, infants develop certain relational patterns that ensure the provision of proximity, security, comfort, and nourishment critical to their survival specifically, and the survival of the species in general (Shorey, Snyder, Xiangdong-Yang, & Lewin, 2003). While early efforts (prior to 3 months of age) are theorized to be primarily instinctually-driven, within a few months of life the infant begins to develop the abilities to voluntarily control arousal levels, attention, and simple motor skills. The infants gradually develop from a "relatively passive and reactive neonate" (Calkins & Leerkes, 2011, p.356) to using "a rich behavioral repertoire of strategies in the service of reducing, inhibiting, amplifying, and balancing different affective responses" (p.357), as they communicate and evoke a response from their immediate environment. In addition to becoming more active and purposeful in the attempts to control affective arousal, they become more socially engaged as they recognize that caregivers may assist them in the regulation of affective

states. Furthermore, following the developmental pathways, as the infant continues to be supported and positively reinforced to use regulatory strategies independent of the caregiver, leading to the development of more habitual use of these self-regulatory abilities in the future, as well as, gaining a sense of self-efficacy (Calkins & Leerkes, 2011).

Under normal circumstances when the caregiver has been readily available and supportive throughout early experiences, “[t]he mother seems to provide a secure base from which these excursions can be made without anxiety” (Ainsworth as cited in Karen, 1994, p.136), and thus the learning of the self and the world progresses. However, any previous hurtful experiences, such as a prolonged parental absence, poor communication, emotional and physical negligence, rejection, abandonment, or physical abuse, threaten the child’s sense of security and disrupt many homeostatic mechanisms. The experience of negative affect interferes, and dramatically disrupts vital developmental experiences, as it keeps the child’s need for individuation through exploration, and the need for safety through closer physical and perceived proximity to caretaker unfulfilled (Calkins & Leerkes, 2011; Shorey, Snyder, Xiangdong-Yang, & Lewin, 2003). These attachment patterns are thought to persist throughout life and to be activated by any close relationship, including the therapeutic relationship, and even one’s relationship with God. As the infant matures, the positive and negative experiences of their caregiver’s availability and responsiveness are accumulated in the form of implicit and explicit memories, congealing into mental representations. These working models are adaptive in ways that they allow the individual to form predictions of what can be expected from the

responses of others, based on the available cues, and ameliorate anxiety. Furthermore, these working models are carried forward into adulthood, and aid the child to self-regulate their own behavior to ensure caregiver's continued support. Therefore, the attachment patterns that result significantly impact regulatory processes of affect, cognition, and behavior, and are further implicated in adult healthy relationship, or psychopathology. As Calkins and Leerkes (2011) highlighted, there is strong evidence in support of the idea that interactive experiences of the infant and the caregiver also affect the development of the prefrontal cortex (PFC), particularly the right hemisphere known for its role in regulation of emotion and coping skills. Neuroplastic changes have been shown empirically to be directly linked to various types and quality of experiences, and are equally malleable through a diverse range of mental and physical forms of training (Garland et al., 2010). A person's ultimate well-being, or the ability to live a full, satisfying, healthy, and productive life, is inextricable from being physically, emotionally, mentally, and spiritually healthy (Purdy & Dupey, 2005). Moreover, the concept of health is not monolithic, and is related to the ability to achieve certain life tasks (Healthy People 2020, 2013; Walsh, 2011). For example, while physical health includes the need for regular exercise, healthy nutrition, and rest, emotional health relies on the ability to identify, regulate, and express emotions appropriately. Similarly, intellectual health is achievable through successful development of cognitive capacity to analyze, to evaluate, to make rational and creative decisions. Social health depends on one's ability to establish genuine and lasting relationships. Finally, spiritual health typically includes the concept of spirit as the life-sustaining force, and it is similarly

achieved through strengthening one's spiritual beliefs and practices (Purdy & Dupey, 2005). One's spiritual sense of self creates one's mindset, defines values, determines action and predicts behavior. The spiritual self is a significant motivator and a vital resource for growth, especially in the time of life crises. Conversely, it can also lead towards a decline and psychological disintegration (Pargament & Sweeney, 2011). All of these life tasks are highly interdependent, and share at least one critical factor in common. Recently, the role that self-regulation and self-control play in ensuring success in all spheres of human endeavors has gained particular appreciation among researchers. Furthermore, success and failures in these capacities have long been the focus of philosophical, religious and spiritual traditions throughout the world. In fact, the extent to which people can influence, modify, or control their own behavior is what many experts believe sets them apart from other organisms (Baumeister & Heatherton, 1996; Vohs & Baumeister, 2011), and as Howard Rachlin (2000) succinctly stated, "...human happiness is inseparable from self-control" (p.8). If successful self-regulation is a prerequisite for achieving a holistic health, then failures in development of self-regulation and self-control are leading causes of many, if not most, of problems in living. Alcohol addiction is a multivariable and a highly complex phenomenon, therefore every aspect of it cannot be adequately reviewed within the limitation of a single dissertation. However, through the introduction of alcohol as a self-regulatory mechanism, as it will be presented in the following sections of the chapter, will serve as a segue into a discussions of potential interventions .

Substance Use and Co-occurring Disorders

According to research findings, it seems that people of all types and ages who are living with untreated mental illnesses, are at higher risk for many unhealthy, impulsive, self-destructive behaviors, including alcohol or drug abuse (CASA 2012, Krueger et al., 2006). For example, from a national sample of 68,487 adults 18 years and older, the National Survey on Drug Use and Health (NSDUH) survey conducted from January through December 2010 estimated that about 57.3 million of adults (representing approximately 25 percent of the general population) had either a mild or serious mental illness. Further, about 20.6 million (45.2 percent) of that group also met criteria for at least one type of substance dependence or abuse disorder in the past year. This statistic is stark when it is compared with 6.1 percent of adults who did not have any mental illness (SAMSHA, 2012). Even a much larger degree of co-occurrence was found from the data gathered from a large comorbidity study that used the NESARC data-set. This investigation found that in 2001–2002 about 70 percent of the young adults (19 million people) surveyed showed comorbidity with conditions such as antisocial personality disorder, pathological gambling, agoraphobia, panic, and bipolar I disorders (Dawson, 2011). Other authors also list research linking chronic substance use with co-occurring psychiatric disorders, such as mood disorders (depression and anxiety), and many childhood disruptive behaviors (e.g. CD, ODD, and ADHD) (Grant et al., 2006; Ivanov, Schulz, London, & Newcorn, 2008; Mueser, Drake, Turner, & McGovern, 2006; Rose & Cherpitel, 2011).

Mueser, Drake, Turner, and McGovern (2006) summarized a number of models explaining the co-occurrence. For example, according to the secondary psychopathology models they discussed, the chemical effects of the substances may trigger the development of psychiatric symptoms in particularly vulnerable individuals. Besides the disinhibiting properties of some of the chemical substances on the brain function, the use of drugs and alcohol disorganize behaviors, as they take the focus away from other aspects of one's life and constrict it to the drug acquisition, use, and coping with the negative consequences. Another set of models, explains co-occurrence through the presence of premorbid mental disorders that cause substance use disorders in those who are particularly vulnerable. These models propose that individuals engage in substance use as a way to temporarily self-medicate their difficulties arising from psychiatric illnesses, or "general dysphoria" (Mueser, Drake, Turner, & McGovern; 2006, p. 119) of suffering from unhappiness, loneliness, boredom, insomnia, physical or emotional trauma. While the direction of the causality points to a highly reciprocal relationship, evidence suggests that some inherent and developed psychological vulnerability are more likely to lead to the development of addictions, and addicted individuals are at a higher risk for developing externalizing and affective disorders (Kassel, 2010; Sokhadze, Connon, & Trudeau, 2008). Even if the relationship between psychopathology and substance use disorder remains for the most part inconclusive, leaving the "chicken-or-the egg" debate unsettled, extensive clinical and longitudinal studies indicate that emotional distress and behavioral dysregulation tend to predate the development of substance use disorder, often extending back to early childhood experiences (Khantzian,

2003). Nonetheless, understanding these co-occurrences may help to identify common factors involved, and presumably this would in turn help inform the design of more holistic and tailored prevention and treatment options (Mueser, Drake, Turner, & McGovern, 2006).

Shared link to PFC.

Researchers often note that the construct of inhibition is at the core of impulsivity (Ivanov, Schulz, London, & Newcorn, 2008) and *disinhibition*, or failures in self-regulation, is a common factor among highly impulsive behaviors that characterize some of the most frequently co-occurring disorders (Baumeister & Vohs, 2004). Neuroimaging findings link inhibitory control as a part of self-regulation to the prefrontal cortex of the brain (PFC), basal-ganglia, the subthalamic nucleus, and primary motor regions, thereby encompassing cognitive, affective, and behavioral processes (Davidson, 1998; Ivanov, Schulz, London, & Newcorn, 2008; Mezzich et al., 2007; Thayer et al., 2009). The PFC covers most of the frontal lobes of the brain, and is known to play an integral part in organizing and regulating behavior that recruits processes, such as working memory, attention control, inhibiting **prepotent** responses, and planning – all of which fall under the umbrella term executive function (Wagner & Heatherton, 2011). Executive functions can be considered an individual difference factor, as people vary in its functionality, capacity, and strength (Williams & Thayer, 2009). Among people with addiction problems, these types of failures manifest in various self-regulatory deficits, such as neurocognitive impairments, emotional difficulties, and interpersonal problems (Sokhadze, Cannon, & Trudeau, 2008). Additionally, any disruption to the normal

functioning of the PFC resulting in a breakdown of self-control and self-restraint, are especially evident in failures to obey social norms, having difficulties in regulating primary physiological drives (e.g. overeating, extreme sexual exhibitionism, and aggression), and thereby are linked in the progression of addictive disorders (Johnson, 2004; Miller, Forcehimes, & Zweben, 2011).

Ivanov and colleagues (2008) reviewed a number of studies seeking possible relationships between inhibitory dysregulation (an element of impulsivity that constitutes difficulty in withholding inappropriate or premature responses) in children, and the potential risk for developing substance use disorders in adolescence and adulthood. They found ample evidence for such a link in children with a variety of disruptive behavioral disorders and other maladaptive behavioral traits, such as Attention Deficit/Hyperactivity Disorder (ADHD), Conduct Disorder (CD), Oppositional Defiant Disorder (ODD), Bipolar Disorder (BD), Obsessive Compulsive Disorders (OCD), Tourette's disorders, Borderline Personality Disorder (BPD), and Antisocial Personality Disorder (APD). These disorders were similarly associated with a dysfunction of the prefrontal part of the brain (PFC) linked to the formation and development of executive functions that provide abilities for self-regulation and control (Ivanov et al., 2008). Overwhelming support for the high degree of co-occurring disorders was just recently contributed by one of the most comprehensive studies conducted by the National Center on Addiction and Substance Abuse (CASA) at Columbia University (CASA, 2012). This group of researchers used a multitude of methods for gathering their data, among which included a review of more than 7,000 scientific articles, reports, books and other reference materials related to the

science of addiction, analysis of five national data sets, interviews with 176 leading experts in a broad range of fields, focus groups, online surveys, and a case study of addiction treatment in New York State and New York City. The report confirmed that an addiction can be chronic and frequently co-occurs with other health conditions.

Furthermore, addiction frequently contributes to or causes a wide range of medical conditions. For example, risky substance abuse was directly linked to more than 70 conditions that require medical care (e.g. heart disease, cancer, depression, anxiety, posttraumatic stress disorder, bipolar disorder, attention deficit/hyperactivity disorder, conduct disorder, eating disorders, schizophrenia and other neuropsychiatric disorders) (CASA, 2012). The association between addiction and co-occurring health conditions can result from several factors.

In their 2007 study, Mezzich and colleagues evaluated the psychometric properties of the disinhibition of behavioral control, emotion modulation, and executive cognitive capacity in 278 boys ranging in ages from 10 to 12. The investigators found that dysregulated executive functions significantly predicted substance use disorders and other commonly co-occurring problems related to self-control (e.g. head trauma, violence, arrests, and crimes committed while intoxicated) when reassessed at the ages of 16 and 19 years. Using fMRI, these researchers showed that scores on neurobiological disinhibition correlated more strongly with frontal cortex activation (than other regions of the brain), and in conjunction with history of substance use were able to predict addiction disorders 3 years later with 85% accuracy (Mezzich et al., 2007). Furthermore, Mezzich and her colleagues (2007) have shown that the link between internalizing problems and

amplified risk of addiction is better explained by poor emotional regulation of mood (e.g. emotionality, emotional control, difficult temperament, and irritability).

Another study, demonstrated that any dysregulation of the PFC results in specific problems in maintaining control over impulses, emotions, and behavior. Quinn and Fromme (2010) found that higher ability for self-regulation was inversely predictive of heavy episodic drinking, alcohol-related problems, high risk-taking, and sensation-seeking behaviors. Similarly, neurological findings have linked impairments in the prefrontal cortex (i.e., dysregulation of the executive functions) to various addictive behaviors, and dysfunctions of emotional and inhibitory regulation (Lubman, Yucel, & Pantelis, 2003; Sokhadze, Cannon, & Trudeau, 2008; Williams & Thayer, 2009). Furthermore, noting the similarities of compulsive nature in the clinical, phenomenological, and neurobiological presentations among individuals with substance use disorders and other compulsive conditions, Lubman, Yucel, and Pantelis (2004) went on to propose that a shared neurobiological circuitry within the PFC fails in the role to inhibit reward-related behaviors.

Sokhadze and colleagues (2008) reviewed evidence from the psychophysiological perspective, and found that based on research conducted using Electroencephalographic (EEG) biofeedback, there are unique neural activities among individuals with chronic drug and alcohol use histories. Reports indicate that, when alcohol-dependent subjects were measuring using qEEG, there were consistent findings of substantial difference in the functional brain activity. Particularly notable were alterations mainly in the beta and alpha bands, which indicate hyper-excitability in the frontal regions of the brain.

Therefore, the accumulation of evidence converges on the conclusion that there exists a predisposition for an externalizing psychopathology associated with the dysregulation of PFC and the executive functions. Furthermore, the inhibitory deficits that are useful to explain the high relapse rates and maladaptive behaviors so commonly found among addicts may have etiology in specific neurophysiological regions, which are altered during early life development (Sokhadze, Cannon, & Trudeau, 2008).

Alcohol-to-Alcoholism: Models of Addiction

“We were drinking to live and living to drink.”– Alcoholics Anonymous

As already discussed earlier, alcohol use and misuse is paradoxical in many ways. Perplexing is the way that a relatively innocuous or even potentially salubrious substance can metamorphose into a relentless destructive force, as it can turn a relatively well-functioning moderate drinkers into life-long addicted individuals, who are willing to give up on everything they ever held sacred, just to have another drink (Dackis & O’Brien, 2005; Redish, Jensen, & Johnson, 2008). For many people who struggle with alcohol addiction, “drinking becomes the primary medium through which they can deal with people, work and live” (Torr, 2000). The Oxford English Dictionary defines addiction as the “formal giving over..., a dedication of a person to a master” (Brown, 1993). This definition, seems to capture well, what many addicts experience as enslavement to the drug, as their entire lives and all of their thinking becomes consumed by a single focus on ways of getting, using, and obsessing over the need to get more alcohol.

While addiction itself often refers to all mood-changing, mind-altering substances and behaviors, alcoholism specifically refers to dependence on or addiction to alcohol.

Many experts have conceptualized alcoholism as a chronic, progressive, and often fatal disease (McNeece & DiNitto, 2005b; Miller & Carroll, 2006) that “progresses from impulsivity to compulsivity” (Koob, 2006, p.25). Alcohol problems are only one part of continuum of alcohol use, on which individuals range from abstinence, to problem-free use, to different degrees of alcohol misuse and dependence (McCrary, 2008). An important feature of alcohol addiction has been identified as a “cluster of cognitive, behavioral, and physiological symptoms” (APA, 2000, p.192) responsible for individuals’ continuing to use substances despite severely aversive consequences (Kranzler & Li, 2008). As a prerequisite for diagnosing problems of alcohol abuse and dependence, this cluster of symptoms consists of cravings for alcohol; preoccupations with drinking; engagement in sneaking and concealing the use of alcohol; loss of ability to control drinking; and continued drinking despite physical, psychological, social, occupational, and legal consequences (APA, 2000, p.192). While the severity of the physical withdrawal symptoms resulting from an abrupt decrease of levels of alcohol consumption leads many individuals to relapse, these symptoms alone are usually not enough to diagnose alcohol addiction, because they may not be the most powerful motivator for seeking alcohol (Rose & Cherpitel, 2011).

As Becker (2008) reiterates, development of alcohol addiction is both a complex and dynamic process. The motivating factors for alcohol consumption cannot be understood by simply reducing the observations of a single molecule, or a single behavior, and instead should be viewed more globally as an active network (Panksepp, 2010), taking into consideration the many internal and external factors acting all as

integrated, complex, self-organizing, highly robust, and harmonious systems (Guo & Zakhari, 2008). For example, in their effort to offer a unified framework for addiction, Redish, Jensen, & Johnson (2008) identified key systemic vulnerabilities and grouped the most acknowledged theories of addiction into categories. Accordingly, multiple interacting learning and reward systems are responsible for a given organism's adaptive decision-making processes that go on to develop certain vulnerabilities during the addiction formation. The key systemic vulnerabilities result in the organism's chronic maladaptive choices. While the focus of scientific inquiry has shifted towards understanding of the pathophysiology of the brain, at the heart of the debate, the main question about the individual's responsibility for developing this disorder still remain (Skipper, 2000).

Addiction is multifaceted, but many contemporary conceptualizations include factors such as Sinha's (2008) a) developmental/individual-level that include temperamentally-based negative emotionality, impulsivity, difficulties in behavioral/self-control and other poorly regulated executive functions; b) stress-related factors related to childhood adversity such as neglect, abandonment, and chronic trauma; and c) genetic influences and family history of psychopathology. As Sinha (2008) concluded, these factors are interrelated and significantly influence each (e.g. neurobiological pathways and cognitive and behavioral self-control involved in reaction to stress). When exposed to stress or a challenging situation, the system with such pre-existing vulnerabilities become hypersensitive and highly dysregulated, resulting in decreased behavioral and emotional control and debilitated decision-making, as well as in increased experiences of

psychological distress and cravings. The following is a brief overview of some of the most commonly considered addiction models.

Genetic models of addiction.

While the dynamic interactions of internal and external factors in formation and maintenance of addiction is widely accepted, the debate among the subject matter experts is on the degree of their influence. For example, research consistently provides evidence for the critical role of one's genetic predisposition as it relates to developing addictions, biophysiological or psychological illnesses, affective response style, self-regulation abilities, and general susceptibility to stress (Cohen & Lichtenstein, 1990; Davidson, 1998; Muraven & Baumeister, 2000; Oscar-Berman & Marinkovic, 2003; Sinha, 2008).

Research conducted using animal models, particularly "genetically enriched" rats, consistently shows the strong influence of genetic effects. For example, investigators found that genetically predisposed animals are more sensitive and relapse more frequently than control groups when they were exposed to stressor and/or cues, despite previously extinguished drinking patterns (Foroud, Edenberg, & Crabbe, 2010). While animal studies are critical in our scientific exploration, they also have limitations. The richness and variability of social environmental factors most human experiences are impossible to simulate through animal studies (Foroud, Edenberg and Crabbe, 2010). As Guo and Zakhari (2008) point out, it is the dynamic interaction among genetic and epigenetic mechanisms which is responsible for susceptibility, initiation, progression, and pathogenesis of substance use disorders. Internal factors are constantly impacted and molded by many external variables, such as one's childhood parenting experiences;

religious and social environments; family's history of alcoholism; mother's drinking patterns during pregnancy; the individual's diet; level of education; the age when one first drinks; the duration of drinking, and the amount of alcohol consumed (Hesselbrock & Hesselbrock, 2006). As many emotional and environmental factors converge to manifest as influence the final outcome, what may be inherited by an individual is only the potential for developing an addiction (Skipper, 2000). Therefore, studies exploring the role of genes demonstrate that genetic predispositions, despite having strong influence, do not have the power to predict development of addiction in exclusion from environmental factors (Foroud, Edenberg, & Crabbe, 2010).

Positive reinforcement models.

The recent technological advances expanded scientific exploration to include neurophysiology. The brain's reward system, as an integral part of an organism's self-organizing systems (Bickel & Potenza, 2006), which aims to maintain an internal equilibrium for the most optimal functioning and it accomplishes this by engaging the organism in physiological, cognitive and behavioral activities to reach this homeostasis. While endogenous opioids are involved in the processing of various natural states and drives such as appetite, sexual function, pleasure, and pain, when activated by addictive drugs, especially in individuals who are genetically sensitive, the process becomes quickly dysregulated (Redish, Jensen, & Johnson, 2008). From more neurological perspective, Koob (2006) described a potential process of how addiction develops, placing the initial drug intake in the role of a catalyst that directly activates neuronal circuits in the brain's reward (hedonic) system, which otherwise would have been

stimulated by more “conventional reinforcers” (p.27) such as food, water, sex, and social interaction (Bickel & Potenza, 2006; De Wit & Phan, 2010), all vital for the survival of the organism and the species. Addictive drugs, such as alcohol, produce euphoria by activating brain pleasure centers that ensure the organism makes appropriate behavioral choices towards specific goals, which would ensure and not compromise its survival (Dackis & O’Brien, 2005). More specifically, the activation of the mesolimbic dopaminergic pathways, the neural circuits of orbitofrontal cortex, nucleus accumbens, ventral pallidum, and amygdala have been identified as the neural basis in the brain involved in positive, hedonic, and pleasurable experiences and linked to the mechanisms of learning and behaviors of addiction (Davidson, 1998; Gilpin & Koob, 2008; Panksepp, 2010).

The power of the addictive substances is that their chemistry overwhelms, subjugates, and eventually dysregulates the endogenous pleasure centers to such degree that the attention, thoughts, motivation, and behaviors often contradict the rational thought (and survival instincts) and lead to progressive loss of control, despite direct threat to the organism’s survival (Dackis & O’Brien, 2005). Because each organism is a system that is designed to self-regulate, the metabolic effects of alcohol and its reinforcing properties raises the threshold of what this organism naturally reacts to, and this in turn manifests as a requirement for incrementally larger doses of the drug to produce the same effects experienced previously, yet at a much lower dosage (Gilpin & Koob, 2008). While under most natural circumstances, the hedonic balance is maintained through a built-in feedback loop which signals an organism to disengage upon reaching

of certain internal thresholds; however, in those organisms with the control to directly stimulate their own reward system (as in having the option to self-administer the drug), such balance is disrupted (Koob, 2006; Koob & Le Moal, 1997). For example, Koob and Le Moal (1997) exemplified the drastic increase in the level of satisfaction “hedonic set point” (p. 55) with findings derived from animal studies, where experimental animals were permitted to self-administer a drug for a prolonged duration and resulted in doubling the amount of the drug being consumed. Repeated exposure to the drug sets the threshold for experiencing reward much higher, thus causing significant dysregulation in the hedonic (reward) system on an individual (Koob, 2006). As a natural consequence of these processes, the organism’s physiology reacts preemptively to counteract the effects of the substance and interprets any cues in the environment associated with alcohol in a manner that attempts to offset the anticipated aversive physiological experiences, therefore resulting often in either sensitization (craving) and counter-adaptation. The dysregulation of internal mechanisms manifest as a compulsion and the loss of control over drinking, and sets the ground for further failures in self-regulation, including emotional dysfunctions and intolerance of stress.

The reinforcing effects of alcohol have been largely accepted as an essential motivator, especially in the earlier stages of developing alcohol use disorder. Therefore it is not surprising that such pleasure-producing substances become so attractive to many individuals (as well as animals) (Gilpin & Koob, 2008). While the hedonic value of alcohol is understandable, the phenomena of the “transition from occasional drug use to drug addiction” (Koob, 2006, p.25), and from the “impulsivity to compulsivity” (p.29)

seems to require an additional reinforcing value, such as the experience of reduced negative emotional states. The neurobiological models of addiction that only emphasizes the positive reinforcement model, cannot account for all aspect of addiction. Particularly the model fails to fully account for the aversive taste and experience that initial alcohol intake imparts on most first-time users (Kassel, 2010), and even more poignantly the fact that individuals are unable to control their drinking, despite facing many harmful, painful, and distressful consequences (Lubman, Yucel, & Pantelis, 2004). The opponent-process theory of addiction, posits that initial highly rewarding with positive affect experience of drug-taking, followed by negative affective consequences due to the withdrawal of the drug from the system which the organism aims to avoid, set into motion the cycle of addictive behaviors (Panksepp, 2010). Eventually, the individual experiences a “spiraling distress” of addiction (Koob & Le Moal, 1997, p.52).

Negative reinforcement model.

The central role in explaining reasons for craving and using drugs is the negative reinforcement learning that occurs as an individual (or an animal) engages in behaviors to escape various forms of pain and distress (McCarthy, Curtin, Piper, & Baker, 2010). As in operant conditioning, any behavior that is reinforced by the removal of an aversive stimulus is likely to recur, when similar aversive stimulus is present in the future (McCarthy, Curtin, Piper, & Baker, 2010, p.16). On the neurochemical level, when alcohol exits the system, the result is a dramatic imbalance in the neurotransmitters, and that seems to increase the negative emotions such as commonly observed dysphoria, anxiety and panic attacks, as well as general systemic increase in the organism’s

sensitivity towards experience of stress (Dackis & O'Brien, 2005). Therefore, in order to escape the aversive, distressful experience usually associated with the withdrawal of the chemical substance from the system, the organism seeks to reinstate the chemical balance by relapsing. However, the negative reinforcement mechanism may also react to any sort of affective distress, even if it is not due to the withdrawal symptoms, by cueing the individual to engage in activities to seek immediate relief of negative affect (McCarthy, Curtin, Piper, & Baker, 2010).

In their reformulated negative reinforcement model, McCarthy, Curtin, Piper, and Baker (2010) propose that, while affective distress is not the only forerunner of cravings, the attempt to avoid distress is said to be a primary motive for turning to the use of drugs and alcohol. The authors argued that in research and in clinical studies, relapse has been observed in individuals long after the system has gone through a detoxification process, therefore suggesting that the primary reason for relapse cannot be due to distress caused by the substance withdrawal and chemical imbalance. Additionally, these authors presented empirical evidence that showed the activation of the psychophysiological and emotional symptoms of withdrawal resulting from sole exposure to conditioned stimuli, similar to associative learning involved in classical conditioning. The affective distress potentially changes the motivational value of alcohol by overinflating the influence of cues beyond the neurochemical effects of alcohol (McCarthy, Curtin, Piper, and Baker, 2010).

The incentive-sensitization theory posits, an organism learns to link environmental stimuli associated with the drugs and the effects experienced from the

activation of the neurological reward systems. These elements present in the organism's environment become as secondary "reinforcers" capable of activating the neurochemical and psychological states (e.g. reduction of distress) in anticipation of similar reaction in the future (Panksepp, 2010). As such, the learning is attributed to either the positive reinforcement related to the enhanced value of the incentive cues, or to negative reinforcement related to the enhanced incentive value related to the aversive withdrawal reactions. After an individual experiences repeatedly successful cycles of distress associated with withdrawal symptoms, and "self-regulated" reduction of this distress from alcohol intake, an automated (unconscious to the individual) response sequence is formed (McCarthy, Curtin, Piper, and Baker, 2010). The nature of automated, habitual behavior patterns is that once triggered (by the environmental cues) they are activated instantly and unconsciously. In fact, McCarthy, Curtin, Piper, and Baker (2010), pointed out that although individuals can be aware of the fact that they are engaging in addictive behavior, they are unlikely to be aware of the types of environmental triggers, their motivational influences, and decision-making processes that preceded their behavior. These processes occur outside of one's awareness and outside of one's conscious self-control.

According to Redish, Jensen, and Johnson (2008), all behaviors engaged in the earlier stages of learning begin with a conscious, flexible planning system involved in the functions of recognition of situations and contexts, identification and prediction of possible consequences of various actions, and the calculation of the value of achievable outcomes. The behavioral control transitions to the habit system after repetitive

experiences. The planning and the habit systems are hypothesized to be the functions of different anatomical substrates. Growing literature points to the prefrontal cortex (PFC) to be involved in the process of changing a habit, entailing the activation of the planning system in an effort to override/inhibit the automated execution of action (Redish, Jensen, & Johnson, 2008). As Panksepp (2010) stated, “without frontal lobes humans would be at the mercy of their basic animal urges” (p. 152) and thus the role of the prefrontal cortex, and area of the brain that mediates a variety of executive functions responsible for ensuring that long-term goals and opportunities are not subjugated by the basic bodily and emotional urges.

Cognitive models of addiction.

Kassel, Wardle, Heinz, and Greenstein (2009) discussed an important role that cognition plays in the formation of addictive behaviors, and although a thorough discussion of these theories is also outside of the scope for this work, because many interventions used in addiction treatment protocols rely heavily on tapping these capacities, it is important to gain a general perspective on some of these theories. For example, according to the Kassel and colleagues’ (2009) definition of cognition, it is “any process that transforms input” and involves “representation” (p. 63). It is generally accepted that cognition is a dual-process that involves both automatic - unconscious, rapid and low-effort, and controlled, or conscious - slow, and effortful processing (Kassel, Wardle, Heinz, & Greenstein, 2009). Therefore, there are hypothesized to be two routes that input is processed by the brain. Route one directly connects to amygdala and elicits a fear response (emotional communication to activate the avoidance system), but

does not pass through the sensory cortex and is not processed at the semantic level. The second path passes through the sensory cortex and only elicits the emotional signal to the amygdala after evaluating the stimuli to be threatening.

In general, the cognitive theories place the emphasis on how certain substances might dysregulate one or the other paths, and thus disrupt the decision making and judgment, leading to alcohol misuse. Some theories suggest that alcohol hampers the appraisals of the situations, and thus distorting the moods. Another group of cognitive theories assumes that alcohol may reduce psychological distress not by any direct influence on the emotional systems, but rather through a general disruption of cognitive functions, as it reduces the cognitive information processing capacity and restricts attention to cues. These groups of attention-allocation theories, referred to as “alcohol myopia” (Kassel, Wardle, Heinz, & Greenstein, 2009, p. 66) model, and claim that alcohol causes “a state of shortsightedness,” that leads to the disproportionate emotional and behavioral responses. Another important area, where Kassel and colleagues (2009) emphasize the role of cognition, is in the effects of expectancies of drug-use outcomes. For example, they draw on a number of classic theories, including the social-learning and conditioning theories, and conclude that in addition to the learning from the environment on what to expect from using alcohol, the reinforcing actions that consistently are paired with emotionally-rewarding consequences, may form certain cognitive schemas for future expectations.

Since appraisal involves “the evaluation of the personal relevance of a situation and the implications of that situation for the person’s well-being” (Kassel, Wardle, Heinz,

& Greenstein, 2009, p. 69), therefore any disruption in the process is perceived to be highly relevant to the self-regulation mechanism, especially the first and second stages where assessment of the gap between the ideal and the current state is involved. Although these cognitive processes also do not explain fully the formation of addictive behaviors, they clearly play an active role.

Attachment systems and stress factors.

Vaillant (1995) associated those who can drink in moderation to “a warm childhood and good premorbid ego functions” (p. 134), while noting that, those who struggle with addiction as children, on the one hand showed exceedingly worse emotional and physical health, while on another hand, had fewer family supports and lower emotional strengths than moderate social drinkers. Vaillant (2005) linked these childhood differences among individuals with vulnerabilities towards developing an addiction to alcohol, with “the disrupting effect of an alcoholic parent within the home” (p. 136). Furthermore, the frequently reported problematic behaviors exhibit poor regulatory abilities as they manifest as significant impatience, distractibility, difficulties in delaying gratification, and a lower threshold for frustration tolerance.

In their self-regulation model (SRM), Padykula and Conklin (2010), linked all abilities for self-regulation to be the products of the dyadic exchanges and intersubjective experiences which infants experience with their caregivers during the formative early infancy relationships. As these authors discussed, increased vulnerabilities are frequently observed among individuals with histories of interpersonal trauma dating back to early childhood. More specifically, the authors noted that many individuals with substance

abuse disorders share an etiology of having a dysfunctional attachment system due to trauma. Chronic exposure to stress, as often experienced by those exposed to prolonged life events that are perceived as traumatic. One of the definitions of stress is the “processes involving perception, appraisal, and response to harmful, threatening, or challenging events or stimuli,” which can be “emotionally or psychologically challenging” that “activate stress responses and adaptive processes to regain homeostasis” (Sinha, 2008, p.2). For example, when humans (or other mammals) experience a loss (of a beloved caregiver or other social support), they begin to exhibit “psychic pain” that is characterized by elevated levels of corticotropin-releasing factor (CRF) stress hormone production, and within the mesolimbic systems, increased levels of dynorphin activity (Panksepp, 2010).

When attachment is compromised due to interpersonal deficits and trauma, the individual is likely to experience difficulties in calibrating the regulatory response leading with either under- or over-regulate in response to internal or external stimuli. Evidence has shown that the experience of high emotional distress is correlated with the “loss of control over impulses and inability to inhibit inappropriate behaviors and delay gratification” in that it “impairs catecholamine modulation of prefrontal circuits, which in turn impairs executive functions like working memory and self-control” (Sinha, 2008, p. 7). More specifically, neuroimaging findings have shown that separation from the caregiver (in neonatal rats) adversely alters the development and functioning of the central CRF pathways and the prefrontal cortex (Sinha, 2008), thus impairing the

functioning in the same prefrontal regions of the brain that activate self-regulation and inhibition (Calkins & Leerkes, 2011).

In their 1999 study, Dawes, Clark, Moss, Kirisci, and Tarter demonstrated that consistent failures in controlling one's own behavior and modulating reactivity to environmental stimuli were frequently found among children who experienced negative interpersonal perceptions and coercive interpersonal exchanges within their families. The reverse pattern was also observed, in a study conducted by Wills, Pokhrel, Morehouse, and Fenster (2011), which demonstrated the resilience factors offered by strong self-regulation abilities. For example, in their study among 1,116 public school students who were in 10th and 11th grades, self-regulation moderated effects of negative life events and peer affiliation on the level of substance use and substance-related behavioral problems as those who measured high on good self-control also showed less negative life events and substance use.

Furthermore, in addition to the attachment quality with caregivers, there are other maturational and developmental factors that play role in development of executive functions. For example, different parts of the brain (PFC) continue to mature throughout adolescence and even into late adulthood (Brown et al. 2009; Mezzich et al., 2007). During the developmental stage of adolescence, individuals have to contend with ongoing neurobiological maturation in combination with the neurohormonal changes associated with the progression of the puberty stage, and the increased environmental stressors associated with changes in roles and responsibilities, all enforcing certain demands on the individual (Colder, Chassin, Lee & Villanta, 2010). As Johnson (2004) summarized this

process of growing up as “the slow subjugation of emotional centers - such as amygdala...-by the more recently evolved regions of the brain located in the prefrontal cortex that control voluntary actions...and other higher functions” (p.29). In terms of emotional functioning, with the growing maturation of PFC, adolescents also begin to form their sense of self into a multidimensional, organized stable view (Colder, Chassin, Lee, & Villanta, 2010). Unfortunately, it is also during this period that many adolescents begin to experiment with alcohol and drug use (Colder, Chassin, Lee, & Villanta, 2010). Initially, substances are used as an alternative means of self-regulation, however, the chronic use weakens each module, and the entire system, therefore making the individual inherently vulnerable to dysregulation and problems in overall functioning (Padykula & Conklin, 2010).

As Brown and colleagues (2009) highlight, it is during this sensitive period that many psychiatric and health problems become activated and flourish. During this developmental stage, the central nervous system is especially vulnerable towards any neurotoxins, including substances like alcohol. For example, as noted earlier, the risks for alcohol and drug use are especially high among adolescents with conduct disorders, attention-deficits, and mood disorders, which by definition implicate dysregulation of one or more executive functions. Evidence has shown that the prefrontal cortex is especially sensitive to alcohol-related damage (Oscar-Berman and Marinkovic, 2003). Brown and her colleagues (2009) described a relatively well-established characteristic found among late adolescents (between 16 and 20 years of age), who are particularly at risk for developing alcohol and other substance-abuse problems. Epidemiological studies found

that, individuals that begin drinking at a younger age are (a) more likely to develop dependence by age 25, and (b) to have more chronic and a relapsing form of such chemical dependence (Grant, 1998; Hingson, 2006). Furthermore, kids who began drinking by age 13 (compared with those who started at age 21 or older) were as much as five times more likely to develop alcohol dependence later in life (Masten et al., 2009, Grant & Dawson, 1997). Another pattern observed through research indicates that the heaviest drinking occurs in people in their late teenage years and/or in their early twenties, with the peak of both binge and heavy drinking occurring at the age of 21 (McNeece & Barbanell, 2005). Furthermore, research findings from the NESARC study showed that age was inversely associated with risk: close to 45 percent of the respondents who began to drink when they were younger than 14 years of age were at a much higher risk for developing an addiction within 10 years of starting to drink. They were also at risk for becoming addicted before the age of 15. Rose and Cherpitel (2011) highlight some of the patterns visible from a survey conducted in 2006, analyzing various demographic subgroups. The findings suggest a pattern that the highest percentage of alcohol use disorders, tends to be among males who never got married or became divorced/separated and were mostly within 18-25 years of age, and that the frequency of these occurrences drastically tapers off, as people get older. These findings show that such increased risk seems to be at least partially related to the short- and long-term consequences resulting from the alcohol-induced disruptions to the structural and functional development during a highly sensitive development stage for neurobiological, cognitive, behavioral, and social maturation (Brown et al., 2009).

Substance Use as Synthetic Self-regulation

“Those who lack the ability to moderate their drinking, lack the same “ego strengths” required to master any instinctual drive” - Vaillant

The cursory presentation of various conceptualizations above highlights the multidimensionality of addiction, and while each emphasized unique attributes, together they seem to share the function of self-regulation (and its neurological correlate) as a common factor in terms of vulnerability as well as potential source of resilience. Therefore, any factors that destabilize such functionality, be they rooted in the genetic predispositions, any disruptions during pre- or postnatal development, or the parental and environmental influences, will dramatically increase the risk for future difficulties in coping with stress, self-control, and self-regulation (Williams & Thayer, 2009). Although the scope limitation does not allow a thorough description, it is also important to consider the harmful impact of the chemical substances on the PFC development and function. For example, as often seen among chronic drinkers, there is a higher risk of acquiring severe brain damage from heavy alcohol consumption, which seems to be especially prevalent in the right hemisphere (but may also include abnormalities in the limbic systems) (Oscar-Berman and Marinkovic, 2003). These areas of the brain, when disrupted cause dysfunctions in navigation, creativity, and emotional sympathy. New evidence documents people with alcoholism being particularly impaired in their abilities for emotional processing, interpretation, and recognition of nonverbal emotional cues and facial expressions. Recovery of these functions is complicated and may not occur even after 4 months of abstinence from drugs and alcohol (Julien, Advokat, & Comaty, 2011). In

addition to permanent memory loss, failures of executive functions, and self-regulation abilities, damage to the frontal lobes also causes dramatic changes in the personality of the individual (Rose & Cherpitel, 2011; Sayette, & Griffin, 2011). There is strong evidence for the hypothesis that beside the destabilization of the reward system, alcohol also dysregulates the stress-response systems (Gilpin & Koob, 2008). Additionally, both acute and chronic alcohol abuse are “powerful activators of the stress systems” as an attempt of the neurochemical systems to overcome the destabilizing presence of the chemical. The activation of the stress-response systems contributes to the formation of a negative motivational state associated with the withdrawal symptoms. In the long-run, the chronically activated stress-response system becomes a broader vulnerability, as it becomes less resistant to other stressors (Koob, 2006, p.37-38). It may not be surprising, that as addiction progresses, normal functioning continues to diminish, and the individual becomes more physiologically and psychologically reliant on alcohol to deal with (or not deal with, as a form of denial and withdrawal from) everyday problems, these often manifest through delinquency and criminal activity (Oscar-Berman & Marinkovic, 2003). In chronic alcohol and drug users, the negative affects experienced during substance-withdrawal continue to increase, last longer, and become more difficult to extinguish with repeated exposures (Koob, 2006). Longitudinal studies confirm that dealing with stress and negative affect among recovering alcoholics and heroin addicts, triggers lapse-activated causal patterns, which then result in a large-scale breakdown in self-regulation, therefore initiating the addiction cycle (Muraven, Collins, & Nienhaus, 2002; Koob & Le Moal, 1997). On the other hand, those who can evoke positive emotions tend to have

better mental health, strong trust, resilience to stress, and increase connectedness to others (Kok & Fredrickson, 2010).

Therefore, self-regulation can be conceptualized as an adaptive effort to override a well-established habit (involving drug use in the context of an addiction), in order to increase the likelihood for positive long-term outcomes (Sayette & Griffin, 2011). Just as pushing an overworked muscle beyond its natural ability can cause a breakdown in the muscle tissue, so can many internal and external factors (e.g. inner conflicts, emotional distress, or external stressors) lead to a breakdown in self-control and compromise one's ability to resist or override habitual problematic behavior (Muraven & Baumeister, 2000; Cohen & Lichtenstein, 1990). Therefore, pre-existing or acquired failures in self-regulation not only increase risks for developing addiction, but may also keep an individual from altering the over-learned behavioral patterns, and instead leading to a cycle of relapse (Baumeister & Vohs, 2004; Baumeister et al., 1994; Williams & Thayer, 2009).

In summary, health and well-being are related to accomplish many life-tasks that depend upon one's self-control to override impulsive drives, and self-regulation functions to move an organism towards desired goals while avoiding the undesirable ones. In contrast, psychopathology, and more specifically addiction is ultimately a disorder of self-regulation of emotions, self-care, self-esteem, and relationships (Khantzian, 2003). The deficits self-regulation, among many factors, can be traced to the failures in the early childhood to establish and maintain adequate connections to and dependence upon caregivers, as well as other stressful and traumatic experiences, that have the capacity to

disrupt the functions of the PFC. Because of alcohol's effectiveness in stimulating the endogenous social reward processes, it rapidly becomes as a "pharmacological surrogate for real-life emotional interactions" (Panksepp, 2010, p. 148). The homeostatic functions in the organism work hard to establish an inner neurochemical and physiological balance, that results in aversive reactions and leads to an increase in drug craving and pain avoidant behaviors. Avoidance of negative and distressful emotional states rapidly becomes self-reinforcing, as it manifests through a cycle of compulsive behaviors and incrementally lowers the threshold for future stress. Consequently, chronic substance use also deteriorates any existing self-regulatory strength, and keeps the individuals from developing any alternative abilities, which results in impulsive, antisocial, and self-harming behaviors. Because of these complicated interactions, individuals become dependent both physiologically and psychologically on the chemical substances, and this makes their recovery extremely difficult. When preexisting or acquired psychological, neurological, and behavioral problems are present, the rate of relapse is proportionally increased (Blume & Marlatt, 2009; Marlatt & Donovan, 2005).

Therefore, in the context of drug and alcohol treatment interventions need to (a) decrease the reward value of the drug; (b) increase values of natural reinforcement; (c) change conditioned drug-seeking behaviors; and (d) strengthen self-regulatory and self-control abilities (Volkow, Fowler, & Wang, 2004). The best hope is in the provision of certain social and interpersonal environments, as well as, proven techniques and activities with the potential to provide an "emotional homeostasis" (Panksepp, 2010, p. 157), and a facilitation of PFC inhibitory functions. In the following chapters, both traditional and

more recent interventions known for their abilities in activation of the PFC and resulting in improvement of executive functions will be introduced. For example, some of the techniques used in cognitive behavioral therapy are known for their neurocognitive processes involving the executive function through the enhancement of self-monitoring and cognitive restructuring. Mindful meditation and HRV biofeedback have also been found to be effective in improving executive attention and stress regulation (Williams & Thayer, 2009).

Chapter Three: Treatment and Recovery

“Emotion regulation transcend single goals and seek to forge a union between passion and reason; mind and body, and other dualities that may divide the human psyche” -

Koole, Van Vellen, and Sheppes

Previous chapters already introduced the idea that, holistic well-being is related to a healthy functioning in the biological, psychological, social, environmental, institutional, and even spiritual areas. Conversely, when something disrupts the balance and obstructs the direction of natural development in these spheres various problems arise. Addictions are clearly related to those variables that significantly disrupt functioning. Therefore, it is not surprising that in treatment of addictions McCrady (2008) recommended for a multidimensional approach. The path to recovery needs to include ways of addressing vulnerabilities in each of those spheres of functioning (Beauregard, 2007; Carroll & Rounsaville, 2006). Furthermore, since individuals with addiction have also demonstrated difficulties in regulating their “rapid and drastic mood shifts as well as the lack of self-soothing skills” (p. 191), the goal of recovery should focus on strengthening their self-control, coping abilities, resistance of temptations to counteract the societal emphasis on quick-fix solutions and immediate need gratification (Padykula & Conklin, 2010; Miller, Forcehimes, & Zweben, 2011; Washton & Boundy, 1989).

This chapter will briefly highlight some of the benefits and limitations of well-established and empirically supported interventions, which are now the hallmark of most drug and alcohol recovery programs. The ultimate goal here is to present an additional solution that promises to build on the strengths of the existing interventions, yet offers an

effective, sustainable, and affordable solution to engage the individual's own self-regulation processes in the context of a holistic therapeutic enterprise (Dowd, Millas, & Rugle, 1999; Jacobson & Greenley, 2001; Miller, Forcehimes, & Zweben, 2011).

Fortunately, the world of alcohol addiction treatment has enjoyed a growth in the number of legitimate and empirically supported options. According to the 2009 National Survey of Substance Abuse Treatment Services (NSSATS, 2010), in the effort to provide a comprehensive and tailored treatment, many variables are considered, including the type of the substance used, severity of substance-related issues, the setting in which the treatment is offered, time and funding limitations, presence of co-occurring physical or mental disorders, client's preferences or other unique needs. Most facilities offer a wide range of inpatient and outpatient, short- or long-term treatment services, depending on the stage of recovery and severity of their addiction (McNeece & DiNitto, 2005a). For example, many individuals begin their treatment in the detoxification programs. Those with less severe impairments may begin their treatment in outpatient settings, while those with severe dependence and life-threatening physiological withdrawal symptoms may require inpatient treatment. Eventually, individuals continue their recovery at residential programs, coupled with participation in post-treatment care programs (McNeece & DiNitto, 2005c). Similarly, treatment delivery can also range from a day, to a few weeks, or to months (CSAT, 2004). Various modalities of delivering the psychological treatment are also available, and include brief motivational interventions, individual therapy or addiction counseling, group therapy, conjoint therapy, and family therapy.

For example, among the most commonly researched and applied approaches are brief and Motivationally-focused interventions (MI), cognitive-behavioral treatment (CBT), twelve-step facilitation focused treatment (TSF), and more recently mindfulness mediation (McCrary, 2008). These therapies are now a golden standard for addiction treatment, especially in facilities that follow the Minnesota treatment model (MM) (McNeece & DiNitto, 2005c). Minnesota Model (MM) has become one of the most influential and widely-adapted, integrative strategies for addiction treatment worldwide (Sterling, Chi, & Hinman, 2011; Mrojele & Stephenson, 1992). With its roots in the philosophy of Alcohol Anonymous Fellowship (AA) and the view of addiction as a chronic “disease,” MM’s major focus is on engaging clients in a long-term outpatient care (Handmaker, Packard, & Conforti, 2002). From this perspective, the process of treatment has shifted its focus toward first achieving abstinence from all forms of mood-altering substances, and then followed by the preparation of client’s entry in the AA’s twelve-step programs. While co-occurring psychopathology is addressed through stabilization of symptoms, less effort is given towards its treatment. In sum, each approach has roots in a variety of conceptualizations of addiction’s etiology, progression, and treatment objectives (McNeece & DiNitto, 2005a). While no single solution seems to adequately cure alcoholism (Miller & Carroll, 2006), it is important to appreciate each one’s unique emphasis as well as a set of common factors.

Pharmacological therapy

It has been established that effective treatment should be able to attend to multiple needs of the individual, which also involves the restoration of neurochemical balance

disrupted by the substance use. Medication use is an important element of treatment for many individuals, especially when it is combined with psychotherapy and aims to stabilize and/or treat many co-occurring mental and medical disorders. In addiction treatment, pharmacological agents have been used to manage acute withdrawal and to prevent relapse (Mack, Harrington, Frances 2010; O'Malle & Kosten, 2006). For example, Disulfiram (Antabuse) is a medication designed to inhibit the natural metabolic processing of alcohol, thus leading to a buildup of toxicity and thus resulting in a painful physiological reaction such as nausea, vomiting, cramps, flushing, and vasomotor collapse (McNeece & DiNitto, 2005b). The purpose of evoking this reaction is to help individuals enhance their motivation for continued abstinence and therefore avoid the aversive experience. A more recent medication is Acamprosate, which is designed to chemically mimic the natural amino acid neurotransmitters to reduce the painful acute withdrawal symptoms, which frequently lead individuals to relapse to alleviate their distress. There are some limitations to these approaches, with the most prevalent one is compliance and adherence to the treatment by the individuals, who may refuse or be unable to take that medication, thus nullifying its purpose. Other problems are related to negative neurological and physiological side-effects. For example, these medications may have dangerous results from interaction with other types of medications. In short-term they may cause discomfort such as diarrhea and headaches, and if taken longer than one year, they may lead to peripheral neuropath and liver problems (Mack, Harrington, Frances 2010). Studies evaluating the effectiveness suggest, that while there are some benefits from using pharmacological approaches (especially in conjunction with

psychotherapy), the application of aversion approaches has shown relatively modest results, in that they may reduce drinking frequency after a relapse, but do not sustain continuous abstinence (McNeece & DiNitto, 2005c).

Cognitive-Behavioral Therapy

The underlying assumption of substance misuse from the behavioral perspective is that it is a learned behavior and it results from multiple, repeated pairing of alcohol use with social, environmental, emotional, and physiological cues. Therefore in their purist form, behavioral approaches aim to train people in new patterns of behavior through adapting changes on the levels of operant and associative conditioning (Gabbard, 2005). The cognitive therapies usually involve techniques aimed at correcting negative and disruptive cognition and teaching patients to focus on, recognize and voluntarily change illogical cognition (Gabbard, 2005). The treatment modified for addressing addictions addresses individual's maladaptive thoughts, confronting dysfunctional beliefs where alcohol is considered to be the best available solution (Mack, Harrington, & Frances, 2010). The use of cognitive techniques increases one's awareness of the interconnectedness of thoughts, feelings, and behaviors. The emphasis is often placed on increasing the individual's ability to cope with stress and dealing with high-risk situations (intrapersonal and interpersonal) without their reliance on alcohol, thus increasing one's sense of self-efficacy.

Motivational Interviewing

While cognitive-behavioral therapies represent a broad class of theoretical basis and specific interventions, Carroll and Rounsaville (2006) suggested that they also share several common change factors. For example, they involve behavioral control and self-regulation and motivation (Carroll & Rounsaville, 2006). Motivation involves the process of problem recognition, evaluation of goals and consequences, desire for change, a sense of readiness and self-efficacy (Miller & Rollnick, 2002). In fact, Miller (2006) considers addiction to be “fundamentally a problem of motivation” (p. 134). Therefore, motivational techniques (usually in the form of Motivational Interviewing) are frequently used to enlist executive functions and increase individual’s own momentum towards a change, while various internal and external factors are recruited as reinforcers for sustaining that progression towards change (Carroll & Rounsaville, 2006; McNeece & DiNitto, 2005c). Miller and Rollnick (2002) defined MI as “a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence” (p. 25). Therefore, the goal of MI is not necessarily to teach new coping skills, gain insight, reshape cognitions, or explore the depths of one’s past; instead, it explores any discrepancies in person’s present experiences, concerns, values, and goals. MI helps the patients to identify something of intrinsic value to them, and then prioritizes goals. MI also purposefully augments the discrepancy between patient’s ideal and current states, and helps infuse the patient with confidence to initiate the change process.

In review of a number of studies, CBT has been shown to be helpful, especially in relapse prevention and for individuals with co-occurring psychopathologies, but generally

better for individuals with less severe or less chronic substance use (Carroll & Rounsaville, 2006; Mack, Harrington, & Frances, 2010). Behavioral therapies appear to be effective in helping individuals achieve better behavioral control and affective regulation, to interrupt the habitual patterns of behavior, change the reinforcing value of substances, and to strengthen the use of alternative sources of reinforcement (Carroll & Rounsaville, 2006; Williams & Thayer, 2009; Witkiewitz & Marlatt, 2011). In terms of effectiveness and efficacy of MI, several general conclusions can also be drawn from growing literature collected over the past three decades in support of using it in AOD treatment (Arkowitz & Miller, 2008). However, it is important to note that majority of the empirical studies published tend to deal with an adapted version of MI sometimes called Motivational Enhancement Therapy (MET). In this version the client is given feedback in motivational interviewing “style” based on some form of addiction evaluation (Burke, Arkowitz, & Dunn, 2002). Next, as evidence reviewed by Burke, Arkowitz, and Dunn (2002), in general this “adapted” version of MI in the form of relatively brief (one to four sessions) applications seems to have yielded moderate to large effects and good long-term maintenance. Nonetheless, MI is not to be considered as a panacea, and its large effects seem to be similar to other evidence-based treatment options such as Cognitive Behavioral Therapy (CBT).

The same results were derived from one of the largest randomized clinical trial (RCT) comparing treatments for alcohol use disorders. Findings from this research also found little difference in drinking outcomes among individuals who were randomly assigned to participate in Motivational Enhancement Therapy (MET), Twelve-Step

Facilitation (TSF), and Relapse Prevention (RP) (Project MATCH Research Group, 1997). CBT emphasized building coping skills and dealing with high-risk relapse-prone situations. TSF is grounded in AA concepts and attempts to promote abstinence through working the traditional twelve steps to recovery. At follow-ups conducted from 3 months to 3 years after the first therapy session, participants in all treatment groups (both in inpatient and outpatient samples) showed significant reduction in drinks per day and increase in percentage of days abstinent. In terms of the long-term success rate, about 24% of CBT clients and 27% of Motivational Enhancement Therapy (MET) clients were found to maintain abstinence three years after treatment (Project MATCH Research Group, 1997). Therefore, while the results of this study showed equal effectiveness of MI/MET, the difference may have been in that MI achieved effects in fewer sessions (Arkowitz & Miller, 2008; Chanut, Brown, & Dongier, 2005). This ability to have a faster impact is especially critical in population which is known to have notoriously high dropout rate in the early stages of treatment, with only 26% remaining past 6 months (Zweben & Zuckoff, 2002). Other findings also indicated that clients' ratings of the therapeutic relationship, rather than the type of therapy used, was what predicted best drinking patterns during and 12 months after treatment (Mee-Lee, McLellan, & Miller, 2010).

Still, there is very little evidence to suggest that any single one approach is more effective than another. For example, Imel, Wampold, Miller, and Fleming (2008) conducted a meta-analysis of 115 studies to examine whether there were any outcome differences between psychological treatments for alcohol use disorders (e.g. CBT,

psychodynamic therapy, Twelve-steps facilitation, etc.) and found no significant differences among treatments for alcohol use disorders. Another meta-analytic report, this time from Sweden (Berglund, 2005) showed that when specific therapies (twelve-step facilitation therapy, cognitive behavioral therapy, psychodynamic and family therapy) are compared, there was no statistical difference, which also suggests that all therapies may be equally effective. Therefore, as findings from decades of rigorous and sophisticated studies showed a relatively equal effectiveness among competing treatment approaches (CASA, 2012), Wampold (2010) concluded that this evidence works in support of common therapeutic factors, which apply across almost all theoretical approaches, targeted disorders and types of clients (Mee-Lee, McLellan, & Miller, 2010).

Despite growing empirical support for general effectiveness of traditional psychotherapeutic interventions to address addictions, there are certain shortcomings in the modern alcohol treatment. In their research Winters and colleagues (2000) found evidence in support of Minnesota treatment model (MM), and also highlighted that treatment retention is a powerful predictor for positive outcomes. When followed up one year after treatment, patients who completed the program (53%) showed significant reductions in their AOD use versus those who left prematurely (15%), and versus 27% for the waiting-list group (Winters et al., 2000). The difference between the early-drop-out group and the waiting-list group may indicate a presence of certain shared problems that hinder adherence to treatment and staying sober in general. Those individuals who were able to adhere to treatment for 18 months or longer also demonstrated significant

reductions in substance use and experienced an overall improvement in psychosocial functioning (Handmaker, Packard, & Conforti, 2002).

The problem becomes self-evident, in the fact that in the current healthcare environment, it is extremely rare that an individual is afforded an option for such lengthy treatment in a structured clinical setting. More specifically, as Rose and Cherpitel (2011) point out, a number of historical, cultural, and economic trends that may have contributed to the way in which current approaches treat addiction as if it were an acute disease rather than a chronic and recurrent one (White, Boyle, & Loveland, 2003). One of the current trends is that there are insurance requirements that significantly shortened inpatient and outpatient programs and substantially reduced accessibility and choice for those seeking addiction treatments (McKay & Hiller-Sturmhöfel, 2011). For example, in the current state of health-care, the length of patient's stay has become limited to about 28 days, in comparison to the recommended treatment duration of 6-12 weeks under the original Minnesota Model (MM) (Mee-Lee, McLellan, & Miller, 2010; Morojele & Stephenson, 1992; Sterling, Chi, & Hinman, 2011). The allocated length of treatment is by far lower than is needed for the natural recuperation of the lost functionality. To place this in the right context, it may require one at least 4 months of abstinence to recovery some of the neural functioning (especially in the prefrontal cortex), prior to gaining the capacity and self-regulatory strength to fully engage in the traditional treatment (Julien, Advokat, & Comaty, 2011). Therefore, it may not be surprising that both those seeking treatment and those providing it have been seeking alternative, affordable, sustainable, and holistic options. Alcoholics Anonymous and similar twelve-step programs provide a good

example of such option, as they offer a long-term, free, flexible, accessible, community-based and spiritually oriented alternative to standard treatment. Perhaps, it is not surprising that they have grown to a global scale of popularity among both clients and professionals alike (Kelly & Yeterian, 2011; Rose & Cherpitel, 2011).

Spiritually-Based Interventions

In addition to the practical reasons for an increased focus on spiritually-based models, there are also broad cultural shifts that seem to encourage the inclusion of religiousness and spirituality into mental health (Baetz & Toews, 2009; Pargament, 1997). Spirituality, discussed in the human rather than theological sense, can be a significant motivating force, a vital resource for growth and development, and builder of self-regulatory strength. However, when misused it can also be a source of struggle, emotional pain, social isolation, and decline (Ciarrocchi & Brelsford, 2009; Pargament & Sweeney, 2011). Due to the expansion of spiritually-based interventions as primary or adjunct therapies, it is important for clinicians to also understand some of the underlying mechanisms of change that may explain their effectiveness, or draw attention to signs of psycho-spiritual disintegration. Therefore, this section will briefly discuss some of the shared therapeutic factors and known limitations to using spiritually-oriented approaches.

In general, religiousness and spirituality are social and psychological forces with significant potential power that can have direct and indirect influences on the direction and outcome of people's lives (McCullough & Willoughby, 2009). For example, Vailant (2008) found that spirituality has deep psychobiological basis and therefore perceives it as a fusion of the positive emotions that also bind people to each other and to our

experience of “God.” Since emotional regulation, as an element of executive functions, seems to have an important effect in subjective positive feelings, decision making, as well as in social adjustment, it is important to understand the proposed psychological link of the spiritual experience (McCullough & Carter, 2011; Williams & Thayer, 2009). In fact, religion and spirituality have been topics of interest to philosophers, and theologians for generations. With recent advancement in scientific research psychologists may feel encouraged to seek fruitful ways for integration in service of mental health and general wellbeing. The interest is also evident among individuals seeking treatment, as studies evaluating such perspectives have shown a strong expressed desire for therapists to be able to discuss religious or spiritual issues in treatment (Arnold, Avants, Margolin, & Marcotte, 2002; Pargament, 2007; Weiss, 2000). For these many reasons, therapists should be prepared and empowered for such efforts.

While definitions continue to evolve, a contemporary and a unifying definition for these constructs is that spirituality is “a search for the sacred, a process through which people seek to discover, hold on to, and when necessary, transform whatever they hold sacred in their lives” (Hill & Pargament, 2008, p. 4), while religion is the social and institutional context where this ongoing process occurs (Pargament & Mahoney, 2002; Pargament, Desai, & McConnell, 2006; Hill & Pargament, 2008; Weiss, 2000). Like a candle wax and wick support and feed the flame, so does religion fosters and nourishes one’s spiritual life (Underwood & Teresi, 2002). It needs to be noted, that while spirituality as a construct, may be related to religiousness, however they are not equivalent. Thus one can be spiritual without being religious, or one can express

outwardly a high degree of religious worship and doctrine knowledge, yet inwardly lack a strong relationship to the spiritual transcendence (Pargament, 2007).

Space limitations allow only a glimpse at some of the growing literature. While there are some inconsistencies as to how some studies define and operationalize these constructs, higher and more intrinsic levels of religiousness and spirituality seem to be linked to better mental and physical health, higher academic, professional and social achievements, subjective well-being and longevity. For example, studies across different religious groups and throughout different countries seem to suggest that more religious individuals tend to have longer longevity, expressed as an average of 25-30% reduction in mortality (see McCullough & Willoughby, 2009; Unterrainer et al., 2010; Seeman, Dubin, & Seeman, 2003). Studies also found that daily spiritual experiences such as awe, joy and sense of deep inner peace seem to be related to a decreased total alcohol intake, improved quality of life and positive psychosocial status (Kaskutas et al., 2003; Underwood & Teresi, 2002). Similarly, religiousness and spiritual functioning were found to be inversely related to crime, delinquency, youth sexual behavior, and even more strongly with drug and alcohol misuse and gambling (Baier & Wright, 2001).

On the other hand, Ciarrocchi and Brelsford (2009) found that negative religious coping or spiritual struggles were linked to the experiences of emotional pain or psychological distress. More specifically, they found moderate correlations with positive emotions and well-being, and with emotional distress to suggest that, at an image of a punishing or abandoning God is associated with greater distress. The presence of religious images interpreted by individuals as negative, were more likely to contribute to

self-regulatory failures (Baumeister, Zell, & Tice, 2007). This seems to have direct implications for helping individuals in treatment to reconcile their relationships to the Higher Power prior to being able to engage in the twelve-step spiritual work. Moreover, this realization poses a challenge for clinicians to help clients in adopting a more positive image of God, while understanding and correcting the negative images and beliefs (Ciarrocchi & Brelsford, 2009). Therefore, more research in this direction promises an alternative and an attractive option for assessing and evaluating religion and spirituality. Religiousness and spirituality are inherently powerful and empirically-supported tools for predicting one's well-being (or psychological dis-integration). Therefore, having access to such information promises to augment diagnostic accuracy and recovery prognosis (Ciarrocchi & Brelsford, 2009).

While Rosmarin, Pargament, and Flannelly (2009) presented similar evidence in support of spiritual struggles being linked to physical and mental health in general. Interestingly, their findings showed a surprising correlation of higher spiritual struggles being linked to higher physical and mental well-being among a certain group of individual in their study. The findings from their study indicated that the experience of spiritual conflict differs significantly, not only to the degree of one's commitment to their religious and spiritual practices (non-Orthodox versus Orthodox), but also between Jewish and non-Jewish individuals. This differentiation is particularly interesting, as the authors pointed out, that a critical dimension of Orthodox Jewish life involves open discussions, critical analysis of various rabbinical arguments, and debates related to religious study. This type of religious practice is a central component of religious

education that encourages for the Orthodox members to openly explore many paradoxical concepts and conflict involving God. Furthermore, as Rosmarin and colleagues (2009) discussed, traditional Jewish lifestyle has integrated the idea that spiritual struggles are an opportunity for growth, and may be perceived as a unique chance for the individual to “remain steadfast to ethical and religious conduct while under stress” (p. 254-255). The authors concluded with a related treatment recommendation to normalize the process of conflict and highlight growth-potential of spiritual struggles, as well as to be aware of fundamental difference that exist among practitioners from different types of religions.

Researching religiousness and spirituality is a challenging endeavor, and to this day investigations on the effect of religious involvement focused primarily on explanations for (a) religion’s ability to prescribe health-promoting behaviors and/or prohibiting health-compromising ones; (b) religion’s ability to increase social support; (c) religion’s ability to socialize people to conformity with society’s norms; and (d) religion’s ability to provide people with effective stress coping skills. However, these explanations can account for only 35-50% of the relationship between religiousness and various measures of health and well-being (George, Larson, Koenig, & McCullough, 2000). Explanations for religious effectiveness based on the social support and directing behavior towards social approval and acceptance are not new, however, the notion that religion can also influence self-regulation and control of self is relatively new.

There are various implicit or explicit views on why the twelve-steps and other spiritually-oriented programs are thought to be popular, with some that perceive their ability to tap into the natural social-cohesion processes, provide the support for

individuals who wish to overcome their addictive behaviors, but lack certain self-regulatory abilities and social networks (Kelly & Yeterian, 2011; Panksepp, 2010; Saunders, Lucas, & Kuras, 2007). For example, from the AA's perspective, addicted individuals can only recover from their alcohol dependence through a spiritually-based awakening. To achieve this rare life-changing moment, AA professes a combination of tools, such as working the twelve spiritual steps, having a sponsor, believing in a power greater than the individual (Higher Power), and helping others (AA, 2001). According to the AA philosophy, to make any radical shifts in the personality, one is required to take a prescribed set of "spiritual actions" (Humphreys, 1993; Taub, 2011; Ouimette, Finney, & Moos, 1997). On the other hand, according to McCrady (1994), the twelve-step programs may share treatment factors with cognitive-behavioral therapy, specifically those that include initial identification and change of dysfunctional cognitions, behavioral change, and development of activities that are incompatible with drinking and drug use. Others understand the documented effectiveness of the Twelve-step programs through the role of group affiliation. Such social influences are perceived to effectively encourage emotional expression and self-control; development of cravings tolerance; maintenance of self-efficacy and motivation; and increase in coping skills and the use of social support networks (Meichenbaum, 2006; Morgentstern et al., 1997; Witkiewitz & Marlatt, 2004).

Meditation

"When a man comes out, [the Yogi practitioners] tell us that he remains "enlightened, a sage, a prophet, a saint, his whole character changed, his life changed, illumined. The first stage comes through concentration of the mind upon one point...." - William James.

Up to this point, the critical roles that meditation plays on effecting physiological regulatory processes and stress-reduction has been unfairly neglected. As an important component of common factors added by Kaplan & Berman (2010), there is a growing evidence that a wide range of psychological and neurological problems reflect the absence of the ability for directed and sustained attention as a common resource, especially so prominent in the variety practices of meditations. As mentioned earlier, attentional focusing, shifting sets, and inhibitory control comprise the bulk of effortful control in self-regulation, and are related to the executive functions of the prefrontal lobe in the brain (Garland et al., 2010; Rothbart, Ellis, & Posner, 2011).

Kaplan & Berman (2010) proposed that by training individuals to cultivate their abilities to sustain attention, as well as to help them resolve any problems that obstruct this practice, may be the solution many have been seeking, which offers an inexpensive, low on negative side effects, and widely available option. While all religious traditions offer techniques for meditation (Kaplan, 1985; Plante, 2008), there is very little research on Judeo-Christian religious practices and their linkage to beneficial or negative physiological impact. However, as evidenced by an increased interest over the past 30 years by researchers, therapists, and clients alike, more empirical research has been dedicated to evaluate the impact of eastern-based meditation (Zen, TM, Buddhist) on psychosocial and neurophysiological functioning (Newberg, & Waldman, 2009; Pruetz, Nishimura, & Priest, 2007). Meditation has become a key component of relapse prevention programs, and appears to aid clients in honing distress tolerance, emotion regulation, and attention skills, while also offering a spiritually-based alternative to the

twelve-step approaches that limit the overexposure to potentially emotionally overwhelming social interactions (Garland et al., 2010; Blume & Marlatt, 2009).

While the goals vary broadly, the practice of meditation includes efforts to enhance awareness and perception, to attune to certain truths such as knowledge of self, gain control over subconscious parts of the mind and emotions, and gain awareness of the spiritual connection with the Higher Power (Kaplan, 1985). In terms of their applicability to the field of addiction treatment, perhaps most empirical attention has been given to Buddhist meditation, Transcendental Meditation (TM), and mindfulness-based meditation which originally was also derived from Eastern spiritual practices (Dakwar & Lewin, 2009). Data from these studies suggested that the practice of mindfulness meditation offers many potential benefits for individuals struggling with psychological ailments and substance use disorders (Brefczynski-Lewis et al., 2007; Lykins & Baer, 2009; Newberg, & Waldman, 2009).

Seeman, Dubin, and Seeman (2003) evaluated studies analyzing the biological correlates of Judeo-Christian religious practices, lower blood pressure, lower hypertension, with better immune function (lower cortisol) and found only weak support for the hypothesized relationship. Next, the authors evaluated the considerably larger body of research on biological correlates of other religious practices such as meditation, as a mixture of Zen, Yoga, and Transcendental Meditation (TM), and in this review they found that subjects seem to exhibit significant decreases in blood pressure, lower cholesterol levels, and lower incidence of ischemia and cardiac events. Across numerous research findings, meditation practice is associated with lower stress hormones,

differential patterns of brain activity (e.g. increased alpha and theta waves). For example through practicing mindfulness meditation, individuals can generate an awareness and acceptance of sensation, be they positive or negative, as they unfold in the moment (Brefczynski-Lewis et al., 2007). Those who achieve a certain level of mastery, gain the abilities to relieve stress, soothe addictive cravings, improve attention, and regulate their emotional reactions to daily experience. Kumari (2006) also noted that brain changes were observed in healthy subjects who actively engaged in non-pharmacological interventions such as meditation. The changes seen in these groups such as increased levels of dopamine during meditation-induced changes of consciousness and increased left-frontal lobe activity are generally associated with positive emotions. The symptoms reduction in pharmacological and non-pharmacological interventions are thought to be two forms of treatment that produce equally effective changes, yet possibly following different mechanisms of action.

Preliminary studies suggest that long-term and regular practice hold many benefits for people's mental and physical health. For example, regular meditation practice helps in terms of reducing the states of anxiety, depression, and irritability, as well as enhancing learning abilities, creativity, and emotional self-regulation (Garland et al., 2010; Lykins & Baer, 2009; Dakwar & Levin, 2009; Wisner, Jones, & Gwin, 2010; Priester et al., 2009; Wachholtz & Pargament, 2008; Lee & Newberg, 2005; Compton & Becker, 1983). Other benefits of some types of meditation practice may relate to fewer stigmas than those attached to "spiritual" and/or "religious" terms, making these practices more palpable to a wider group of individuals in recovery. Although research evidence on

effectiveness of meditation, especially in relapse recovery is still relatively inconclusive (Lee & Newberg, 2005), Padykula and Conkin (2010) stated that, “[f]ostering the client’s capacity for mindfulness is a crucial component to enhancing regulatory functioning and recognizing patterns that lead to relapse” (p.355).

Common Therapeutic Factors

For our purposes, a short segue is needed to present a set of common factors as they were originally outlined by Saul Rosenzweig (as reprinted in Duncan, 2010), which was hypothesized to exist among all traditional psychotherapies and explains the universality of effectiveness as discussed above. These shared therapeutic mechanisms can be rephrased in the following categories: (a) the power of a relationship (as a force behind the implicit nonverbal learning, the self-corrective feedback, and “reconditioning” from perceived and actual social interactions); (b) the power of an object (as a force behind clinician’s personality and other unique factors that enable the experience of empathy, caring, and support); (c) the power of belief (as a force behind one’s allegiance to a specific ideology); (d) the power of meaning (as a force behind an alternative interpretation and formulation of psychological events). Relevant to our discussion is an additional common factor, (e) the power of self-regulation (as a force that gives the ability and strength to regulate one’s emotion, cognition, and action). Included in the power of self-regulation is the voluntary or directed attention that plays a broad range of roles in self-regulation activities and is central to executive functioning tasks (Kaplan & Berman, 2010). Additionally, it is important to keep in mind, that self-regulation, is a limited resources and is susceptible to depletion, therefore practices that

strengthen it should be favored and factors that weaken it need to be addressed (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Muraven & Baumeister, 2000). In the context of this set of Kaplan's, Berman's, and Rosenzweig's common factors, the next sections will explore some probable mechanisms of change that spirituality and religiousness may share with empirically-supported psychotherapies.

It has been long known that human beings are prewired for social content and are motivated for being included, as they may have historically developed reliance on group life for their safety, health, well-being, comfort, and other positive outcomes (Baumeister, DeWall, Ciarocco & Twenge, 2005; Fiske, 2010). Thus it should not be surprising that social interactions are one the most frequently cited therapeutic common factors, and an explicit component of religious gatherings and AA meetings. Social relationships are perceived to play variety of roles as they increase social networks that support abstinence among participants (Humphreys & Noke, 1997; Kaskutas, Bond, & Humphreys, 2002; Kelly, Kahler, & Humphreys, 2010). Yalom and Leszsz (2005), considered an implicit component of social relationships in AA to work through the instillation of hope, vicarious learning, social modeling, cohesiveness, universality, catharsis, and actively pursuing altruism, which are all similar to the therapeutic factors involved in group psychotherapy. To show the power of the social belonging and the debilitating effect of social isolation on self-regulation, Baumeister, DeWall, Ciarocco, and Twenge (2005) conducted six different experiments. These studies demonstrated how being excluded or rejected from a social group can cause dramatic reductions in one's ability for self-regulation. For example, in their studies those participants who were led to expect to live

a lonely future life, or were told that no one else in their group wanted to work with them, or were excluded from the group (arousing feelings of social rejection and isolation) showed significant impairment in their regulation of attention, impulse control, and other forms of self-regulation (Baumeister, DeWall, Ciarocco, & Twenge, 2005).

Gabbard (2005) also suggested that, some healing elements may be attributed to the development of an idealizing and/or mirroring transference alcoholic patients may be developing directly to the AA organization as a whole, which as a result can improve their self-care and heighten their self-esteem. It is also possible that certain transference may develop in the relationships with the Sponsor or an “expert” senior member to whom the initiates can turn for advice. However, in most world religions (especially in the Judeo-Christian tradition), God is often described as a father, a mother and or a lover, and it is during moments of stress and intolerable painful feelings of fear, anxiety, and loneliness, many people turn to God for safety and comfort (Beck & McDonald, 2004). Therefore, as Pargament, Desai, and McConnell (2006) hypothesized, spirituality may provide people an important source of support and encouragement, through a perceived relationship as they engage in private prayer and communications with God. Within the context of such perceived interpersonal relationship with a Deity, it has been suggested that God may function psychologically as an attachment figure (Kirkpatrick 1990, 1999). Rowatt and Kirkpatrick (2002) hypothesized, that by experiencing God, as they would a significant caregiver, to be near, warm, and responsive, the individuals adapt a hopeful and optimistic view of their own abilities in light of challenges. This perception of having

enough own resources to deal with problems in life buffers negative effects of stress on the immune system.

Research findings have shown that securely attached individuals tend to be more stable in socialization-based religiosity, in other words exhibiting gradual changes in their religious activities and belief (Beck & McDonald, 2004). However, insecurely attached individuals tend to compensate their anxiety and avoidance patterns by becoming more religious (Beck & McDonald, 2004). They seem to display emotion-based religiosity that is marked by sudden and drastic religious change, and have been found to engage in more petitionary prayer, as well as having more difficulties in finding meaning and purpose in life (Beck & McDonald, 2004). In adults with avoidant attachment style, there seems to be less frequent use of colloquial and meditative prayer (Beck & McDonald, 2004). Furthermore, in their 2002 study, Rowatt and Kirkpatrick examined how the dimensions of attachment to God correlated with some of the existing measure of affect, religiosity, and personality. From the results of their investigations, they found that individuals who tend to avoid relating to God also exhibit strong themes of unwillingness to be emotionally intimate, a need for self-reliance, and a difficulty with depending upon others. In contrast, those who demonstrated anxiety, exhibited themes of abandonment fears, and engaged in angry protests showing resentment and frustration for the lack of perceived affection, jealousy over perceived intimacy in relationships among others, and demonstrated high anxiety over one's worth and likability (Beck & McDonald, 2004).

Findings by Kassel and Wagner (1993) also indicated that the strength of one's ideological beliefs about a group correlate positively with successful affiliation with that

group. Moreover, the power of belief, especially when shared by the patient and the treating clinician in the probability of recovery and the patient's ability to change, are critically important in the treatment outcomes. As Bohart and Tallman (2010) suggested, "...techniques in psychotherapy may be also viewed as active placebos that similarly initiate client self-healing" (p. 87). The power of the belief is especially interesting when viewed through the lens of neuroscience. Recent research on the effect of placebos is helping to uncover the powerful changes that occur based on one's conscious and unconscious expectations of positive (or negative) outcomes. The placebo effect was defined by Benedetti, Mayberg, Wager, Stohler, and Zubieta (2005) as "a psychobiological phenomenon that can be attributable to different mechanisms, including expectation of clinical improvement and Pavlovian Conditioning" (p.10390). Regardless of being either induced direct through chemical interventions (drug), or through psychosocial interventions (psychotherapy or placebo), studies demonstrate a predictable biochemical changes in the brain functions from pre- to post-treatment (Benedetti et al., 2005). Seidel (2005) pointed out, that there appears to be substantial placebo effects for mental disorders. This finding not only indicates placebo administration as an effective and sometimes an equivalent to the established psychopharmacological agents (e.g. prescribed medications), but also deepens scientific understanding of clinical changes in the brain's biochemistry, form, and function. Active pharmacological agents were found to be effective for about 40% to 60% of patients diagnosed with a variety of mental disorders, whereas placebos were effective for 20% to 65% of patients. Interestingly, the regions implicated in the placebo analgesic effect were part of those in which

prominent endogenous opioid receptors and neurotransmitters are present in humans, and are involved in pain and self-regulation (Beauregard, 2007). Benedetti and his team (2005), revealed that a set of frontal regions appear to consistently increase in their activation during diverse tasks in which negative affect must be suppressed. These regions include the activations around the rostral PFC and superior medial PFC, DLPFC, VLPFC, and midrostral dorsal anterior cingulate. Both dorsal and ventral PFC were found to consistently become activated in the voluntary positive reinterpretation of the meaning of aversive visual stimuli, and were and correlated with reduced amygdala activation and anxiety. Meanwhile, regulation of affective responses to pictures, found placebo induced activity in both DLPFC and VLPFC and the midrostral cingulate. Increases in activation in these areas and placebo-induced decreases in amygdala correlated with larger placebo effects in reported emotion. Furthermore, Benedetti and his team (2005) noted that the same region of cingulate may be modulated by hypnosis in efforts to reduce subjective experience of pain. The results suggested by these studies point to a general system for self-regulation that applies to both emotions and pain and to both voluntary strategies and the externally generated appraisals that produce placebo effects. Therefore, beliefs, expectations, and faith, be they in the power of the group or the twelve-step process, or the Higher Power, can be powerful allies that clinicians can harness and facilitate in their patients.

It is fair to assume that people who begin attending AA meetings do so as a consequence of being previously introduced to this option, and this occurring most likely during the process of their recovery from their addiction. Moreover, many individuals in

recovery are also likely to have experienced various degrees of traumatic experiences which predated the substance misuse. Interestingly, it is during such critical life events and painful consequences that many people become more spiritual, increase in their religiousness, and have described experience of a “greater closeness to God” (Pargament, Desai, & McConnell, 2006, p. 124). As Pargament, Desai, and McConnell (2006) suggested, it is during this traumatic time that is also the most appropriate time for the meaning-making process. They explain this as having a spiritual foundation that helps individuals to form a certain narrative about their circumstances and their life, which is ripe with personal and non-judgmental meaning. Vilchinsky and Kravetz (2005) explored three process models that attempt to explain the relationships among religious belief, behavior, and psychological well-being. From their analysis of data derived from a group of Israeli students, the researchers were able to identify a positive correlation between religious belief and psychological well-being, mediated by having a meaning in life. Their findings were highlighted in contrast to the frequently proposed relationship between religiousness and social support. Thus the authors concluded that the seeking a meaning in one’s life, religious belief is likely to serve as the link between religiousness and well-being. The process of motivation for this search for meaning seems to include a cognitive-affective network that is actively involved in planning, formation, and the struggle to achieve their goals enabled by the use of various environmental resources (Vilchinsky & Kravetz, 2005, p. 467). As goal-directed behaviors become habitual, what jolts individuals from the routine pursue of goals (including harmful ones) is some type of a life-crisis (Pargament, Desai, & McConnell, 2006). Life-transformative changes

begin through becoming aware of the priorities in their lives, and a decision to reorganize and re-prioritize goals, which frequently involves the inclusion of more altruistic goals and healthier behaviors. The process of re-evaluation and re-prioritization of goals and engagement in more prosocial activities may naturally result in experiencing of more frequent positive and rewarding consequences. These positive life experiences go on to reformulate one's self-perception and generates a new meaning to the person's existence (Pargament, Desai, & McConnell, 2006).

This final common factor is related to the dynamic relationship between self-regulation and self-control and spiritual-religious practices. While the empirical research on the link between religion and self-control is in its infancy, recently scientists have come to similar conclusions. Science seems to now echo most of the views and teachings of philosophers and religious leaders since ancient times, that human happiness is inseparable from self-control (Baumeister & Tierney, 2011; Rachlin, 2000; Koob & Le Moal, 1997). As Rachlin (2000) pointed out, people tend to exert more self-control when they are able and willing to follow rules (e.g. inhibit personal desires, delay self-gratification, and engage in prosocial activities). Moreover, acceptance and observance of specific rules is an inseparable part of most religious traditions (Rachlin, 2000). Specifically, McCullough and Willoughby (2009) propose that religion acts to promote self-control through (a) influencing goal selection, organization and motivation; (b) facilitating self-monitoring; (c) adjusting attitudes and behaviors to meet the ideal; (d) developing self-regulatory strength and promoting its mastery. These authors proposed, that the intensification in human religiosity (increase in focus on supernatural entities that

(a) monitor human behavior for moral probity and moral lapses,(b) possess well-formed preferences about desirable modes of human conduct, and (c) administer temporal or afterlife punishment and rewards) reflects increase in self-control, so that modern problems related to waiting, tolerating, and cooperating could be resolved without exclusive reliance on social monitoring and policing or even expensive institutional monitoring or policing. Accordingly, these survival skills are what religious beliefs and practices also aim to cultivate in the followers, with the presumed goals for self-preservation by establishing a self-sufficient and socially responsible community. The researchers hypothesized that the development of a belief of omniscient, omnipresent, and omnipotent deities, helped early humans to also develop the self-monitoring abilities, set ideal models of behavior against which to compare their own, use the social group as a motivator to adjust their reactions and control their impulses through constant feedback.

For example, one of the very few controlled experiments studying these topics was conducted by Shariff and Norenzayan (2007), where they examined the effects of God concepts on selfish and prosocial behavior by implicitly activating the concept of God and using the cooperative behavior as the measure. The data from their experiments showed that individuals who are primed with God concepts demonstrated more prosocial, altruistic behavior, observed for both theist and atheist participants. Interestingly, the authors hypothesized that supernatural God concepts may be linked semantically and dynamically to moral models of ideal behavior, and are associated with generous, prosocial, and cooperative behavior. It may also be that God concepts may be activating the inherent self-monitoring mechanisms that trigger a tendency to infer the presence of

an “intentional watcher” or a “moralizing agent” and thus impose control over one’s selfish and impulsive nature (Shariff & Norenzayan, 2007, p. 808). Because being accepted by a social group may require certain prosocial attitudes and behaviors, even at a cost to self, the authors suggested that the concept of God functions as an external auxiliary superego, which facilitates societal cooperative behaviors (Shariff & Norenzayan, 2007).

Additionally, religious practices and rituals, including regular prayer, study, meditation, holiday, and dietary laws observances all may provide a way that individuals strengthen their tolerance, a sense of self-efficacy, and increase the strength of the self-regulatory strength and stamina (Baumeister & Tierney, 2011; McCullough & Carter, 2011; McNamara, 2002; Brefczynski-Lewis, et. al., 2007). Both the Western and the Eastern ancient spiritual traditions seem to emphasize a specific disciplined approach to life in general and specifically a path towards the attainment a spiritual union with the Creator, or a spiritual enlightenment (Miller, 1998). This life-long spiritual path, according to the wisdom of the sages, is achievable only through maintaining a sober, focused disciplined mind and body, and includes self-monitoring and self-regulatory abilities; work on the personal character strengths and values; altruistic attitudes and social engagement. Therefore, even from this perspective, the engagement in the Twelve-step programs can be understood as a constant practice and development of self-regulatory abilities, especially since they involve the desire to belong to the group and participate in various forms of interactions that require self-control.

Failures of Spirituality and Religiosity

While recent literature has become replete with examples of how higher spirituality and religious involvement is associated with various health and social benefits, and lower likelihood of engaging in self-harming behaviors, Pargament (2007) warns that spirituality should not be used as a synonym for “goodness.” In fact, a body of empirical evidence reports that spiritual problems can be used to predict a general decline in psychological well-being over time, as spiritual-struggles and disintegration may lead to increased depression, anxiety, paranoid ideation and lower independent functioning (Pargament, Koenig, Tarakeshuar, & Hahn, 2004). The risk for future substance use and problems from addictions is increased if one’s concept of God is that of a wrathful and a punitive one (Miller, 1998). Even if in terms of attachment styles, having an anxious attachment to God consistently and significantly predicts, neuroticism, negative affect (Beck & McDonald, 2004; Rowatt & Kirkpatrick, 2002). As discussed in chapter two, experiencing inner conflicts and anxieties, manifests in different ways, but commonly seen as self-defeating behaviors, resistance to treatment, and relapse (Khantzian, 2003). Therefore, just as engaging in some type of spiritual pursuits can facilitate many positive developments such as increase resilience and encourage post-traumatic growth, aid in development of secure attachments, increase cooperative and altruistic behavior, and strengthen self-regulatory functions, however, other types of spiritual paths can also do the opposite and be harmful (Pargament, Desai & McConnell, 2006). It is seems that when spirituality lacks flexibility, it is likely to become inadequate in its salubrious capacities, and even be debilitating in the times of stress and uncontrollable change,

especially when in use by individuals who are already struggling with basic decision-making, information-processing, attention and memory functions and impulse control. For example, McCann and Webb (2012) conducted a study that found cognitive flexibility mediates the relationship between traumatic symptoms and struggling with God. Individuals who tend to struggle in their conceptualization and their relationship with God that is they are unable to accept the paradox of God being loving, powerful, and giving, yet still experience negative traumatic events, exemplify cognitive inflexibility and thus are less capable of utilizing cognitive coping strategies.

In addition to the inability to flexibly resolve spiritual struggles, equally problematic seems to be the inability to sustain a spiritual approach to life, by random, inconsistent and undisciplined trying out various methods (Pargament, 2007; Pargament, Desai & McConnell, 2006), that may be a result of underlying difficulties psychological distress and/or failures in executive functions such as poor planning, sustained attention and short-term memory, poor commitment, difficulties in delaying gratification, and other types of self-dysregulations. In summary, spirituality offers opportunities for emotionally corrective experiences, resilience and growth factors, and through consistent practice of rituals, and other religious observances that reinforce delayed gratification and self-control help develop stronger self-regulatory capabilities. However, individuals who enter drug and alcohol treatment do so with many cognitive deficits and failures in executive functions. These debilitating variables interfere with basic information processing, decision-making, conflict-resolution, emotional regulation, directed attention, abstract thinking, and other functions that are needed for healthy integration of

spirituality. With renewed interest in the topic and accessibility to neuroimaging technologies, there is a growing resurgence in studies investigating the role of meditation as a potential method for development of self-regulation and other spiritual and secular goals. Due to the empirical support for its effectiveness, many researchers and clinicians have been advocating the use of meditative practices in drug and alcohol treatment programs (Blume & Marlatt, 2009).

While traditional recovery programs' treatment goals are gradually shifting to preparing individuals to enter self-help and mutual-help organizations like AA, these organizations like any other professional or facilitated treatment are prone to problems of adherence, recidivism, and effort. Adherence to treatment refers to the extent people follow through with what was agreed with or prescribed by therapists. There is now growing evidence that demonstrates a strong correlation between treatment retention, symptomatic improvements, and well-being of patients (Zweben & Zuckoff, 2002). The Twelve-step programs are known to be highly vulnerable to high drop-out rates, as many patients either do not attend at all, quickly dropout from attending meetings, or are reluctant to fully engage in the "steps work" (McKay & Hiller-Sturmhöfel, 2011; Kelly, Kahler, and Humphreys, 2010), with only about 25 percent of new clients ever come back for the next AA meeting (Rose & Cherpitel, 2011). As mentioned in chapter one, the most frequently cited reasons for resistance to enter, or discontinuation of attendance may be due to personal spiritual struggles that lead to opposition of the spiritual emphasis in these programs, and general difficulties in self-regulation of negative affect in those highly complex and anxiety-provoking social interactions (McKay & Hiller-Sturmhöfel,

2011; Kelly, Kahler, and Humphreys, 2010). These spiritual struggles combined with cognitive inflexibility and highly strained self-regulatory resources leave individuals very little opportunity for taking advantage of so much potential in these interventions. While certain counselors may provide general guidance using the Twelve Step Facilitation techniques for the individuals in following the Twelve-steps towards the goal of spiritual attainment, no one in the addiction treatment facilities, regardless of their leadership position, power, or experience, has the privilege or ethical right to answer the ontological questions about God's existence, which leaves individuals to struggle with the big questions on their own (Pargament & Sweeney, 2011). Furthermore, many individuals in drug and alcohol treatment programs are also struggling with general executive functioning deficits that pose a challenge for transmitting psycho-educational information, helping with decision-making, motivating for change in individuals where basic cognitive functions and ability to sustain attention are compromised. While many models seem to place larger emphasis on modifying existing cognitive-behavioral therapies or facilitating and preparing clients to engage in the aftercare Twelve-steps programs (see Pargament, 2007; Rosmarin et al., 2011; Hodge, 2011; Delaney, Forcehimes, Campbell, & Smith, 2009), less research has been devoted to developing interventions based on the self-regulation aspect of spirituality (Ciarrocchi & Brelsford, 2009; Kelly & Yeterian, 2011).

Therefore, this may be an opportune time to develop interventions that help grow internal and external factors that serve to initiate, sustain and expand recovery in general, and adherence to treatment more specifically (White, Boyle, & Loveland, 2003).

Additionally, despite such growing empirical support for spiritually-based self-regulation, there have not been many interventions that capitalize on its effectiveness in enhancing relapse prevention of addiction (Ciarrocchi & Brelsford, 2009; Baumeister & Vohs, 2004). Since the Twelve-steps programs have empirical support for being effective, cost efficient, and generally popular, it is important for clinicians who work with dually-diagnosed individuals to become more familiar with ways to help those who most likely to benefit from joining these organizations but face many difficulties in participation. Therefore, it seems that the role of psychotherapists need to be expanded even beyond treatment of psychopathology and addiction, to deepen their understanding and utilization of psychospiritual domains, and find methods that would help individuals overcome the environmental, organizational, economic, and psychobiosocial limitation as they work to be integrated into more sustainable healing practices. As Pargament and Sweeney (2011) suggested, therapists can help their clients by facilitating this search for “truth, self-knowledge, purpose, and direction in life” (p. 58).

In regards to the use of meditation as a clinical intervention, Dakwar and Levin highlighted in their (2009) article, that this treatment method is equally vulnerable to similar challenges of implementing spirituality as already discussed. For example, the religious backgrounds of Buddhist meditation and the quasi-religious aspects of TM may still dissuade some clients from practicing them, due to the perceived incompatibility of the client’s pre-existing religious beliefs, or their agnostic/atheistic nature. While the third type of meditation, the mindfulness-based meditation, is less threatening to such clients, due to its almost non-religious foundation, it too may have potential aversive

effects, especially for clients who may be too ill to commit and fully engage in a traditional meditation regimen.

Moreover, those clients with severe addictions and/or a co-occurring psychiatric disorder may lack the necessary motivation, social support and discipline needed for regular practice (Dakwar & Levin, 2009). Engaging in self-regulation taps into limited resources, and sustaining attention while also trying to resolve cognitive conflict, suppress emotions and other impulses, seems to lead to self-regulatory failures, leading these individuals to give in to their cravings (Wagner & Heatherton, 2011). In addition to the general prerequisite of having at least minimally intact cognitive functions and resources, the ability to learn and master these techniques often requires adequate time, safe and peaceful space, and a well-trained instructor to impart clients with the needed guidance. However, the typically chaotic nature of most drug and alcohol rehabilitation centers or the aftercare settings where individuals continue with their recovery often precludes such amenities. Most meditation trainings were originally designed for healthy adults with sufficient coping skills, and many empirical studies on meditation also included similarly well-functioning subjects (such as those with higher motivation, education and social economic status). As many types of coping skills training, learning to meditate may require for individuals to be willing, ready and able to take upon themselves the responsibility (Miller & Rollnick, 2002) to practice regularly, consistently, and diligently. However, these prerequisites may be more difficult to comply with for individuals with chronic alcohol addiction (Lykins & Baer, 2009; Wisner, Jones & Gwin, 2010).

Although by diligently practicing meditation individuals can learn to self-regulate, the co-occurring emotional, cognitive, and behavioral dysfunctions may prove to be a challenge and thus lead to similarly disenchanted, and at times even traumatized individuals. For example, in their review of using different types of meditations as a source for strengthening one's self-regulation, emotional coping, and increasing self-esteem, Wisner, Jones and Gwin (2010) caution that some people who have experienced losses and grief may be hypersensitive and may feel overwhelmed by these emotions during meditation. Similarly, this caution applies to clients with severe psychiatric problems, including psychosis, depression, and anxiety. Compton and Becker (1983) also warn that, despite strong empirical support for meditation being able to decrease anxiety and enhance relaxation, during the necessary earlier periods of training practitioners commonly experience intense emotional states of conflict and anxiety. Furthermore, in addition to the prerequisite learning period, in their study of experienced Zen mediators Compton and Becker (1983) found that participation must be voluntary, under the tutelage of an experienced Zen master, and last at least 12 months before any positive effects can be observed. Even more importantly, because some individuals are at high risk for regression into psychotic states were reported to experience depersonalization and derealization during meditation, Dakwar and Levin (2009) presumably advise against practicing it by anyone who share some of the psychological stability.

To summarize, while there are now many viable and empirically supported treatment options for substance abuse disorders, clinical and administrative limitations as well as a growing openness towards spiritually-based psychotherapeutic interventions

creates an opportunity for more creative solutions. Evidence is growing in favor of spiritually-informed self-help programs like the AA/NA and mindfulness meditation as adjuncts to traditional therapy due to their potential for positive treatment impact and reduction in healthcare cost. Yet despite the potential benefits of these options, those struggling with addiction are vulnerable for relapse due to difficulties in adherence to treatment and prematurely treatment termination as they are towards traditional approaches. This may be related to the same underlying mechanisms that include the presence of comorbid psychiatric disorders. Therefore, in addition to the fact that in such difficult cases, spirituality alone should not be used to address deepest psychological problems and traumas, clinicians should consider additional options to bolster self-regulatory abilities and strength during the inpatient treatment. Since as Beauregard (2007) stated that “the ability to self-regulate negative emotion is essential to a healthy psyche” and that this ability “constitutes one of the cornerstones of socialization and moral development” (p.220), clinicians with backgrounds in psychotherapeutic models and techniques are best positioned to teach and train their clients on how to use emotional self-regulatory strategies more effectively. As Gross (1998) pointed out, attempts to change individual’s ineffective patterns of physiological and experiential aspects of emotional regulation are already a staple of various psychotherapeutic interventions. For example, various individual, couples, and family modalities, as well as, psychopharmacological treatments, biofeedback, anger and anxiety management, and progressive relaxation therapy are used to decrease physiological and experiential aspects of negative emotions and are now an integral component of standard treatment packages.

Clinicians also utilize interventions, that “target emotion regulatory patterns ranging from those that influence the situation or the way the situation is construed to those that alter the emotional response itself” (Gross, 1998, p.280). These efforts may be especially challenging among individuals diagnosed with alcohol misuse problems, as they are consistently found to have deficits in their executive functions that limit their task-shifting, inhibition, decision-making abilities, and failure to effectively predict negative consequences from their impulsive and pleasure-focused actions (Lubman, Yucel & Pantelis, 2003; Quinn & Fromme, 2010; Wagner & Heatherton, 2011). While as Blume and Marlatt (2009) previously noted that self-regulation training may already be an integral component of traditional therapies (e.g. TSF, and CBT) many addiction treatment professionals and common interventions have not advanced in their abilities to recognize and harness such mechanisms.

Chapter Four: Training for Self-Regulation

In earlier chapters, alcohol and other drug addictions were presented as a chronically relapsing disorder where individuals turn to these substances as a self-medicating action in efforts to increase positive and decrease negative emotional experiences, especially in the times of stress and in the presence of co-occurring psychiatric disorders. A recent recognition of a need for a comprehensive, holistic model that would account for the complex and interrelated role that each of these factors have on the health and disease was also introduced. Various treatment options were also briefly discussed, as ways to provide the individual with an opportunity to regain balance and control over their chemical, physiological, emotional, social, and even spiritual functioning. Some evidence was presented to demonstrate their relatively equal effectiveness in treatment, and some of the inherent limitations. Some focus was given to the deficits that arise in the areas of prefrontal cortex and the performance of executive functions in relation to the chronic and compulsive alcohol use, both as a possible premorbid condition and the aversive consequences caused by chemical trauma to the brain. Additionally, these findings were discussed as indications of shared etiology and explanations for some shared curative mechanisms.

The problems in self-regulation of emotions were also briefly contrasted with the salubrious ability to generate and sustain positive emotions such as admiration, gratitude, love, amusement, and pride, which are hypothesized to build one's adaptability and resilience in the time of stress (Garland et al., 2010). The discussion on the frequent co-occurring disorders with roots in dysregulated executive functions and disruptions in the

prefrontal cortex of the brain also presented as challenges in treatment and recovery. Furthermore, the unfortunate reality of increasing current environmental pressures that tend to limit, shorten, and outsource alcohol recovery to free organizations like Alcoholics Anonymous, and this perceived incompatibility with the chronic nature of addiction was mentioned. General conclusions were also drawn, as best outlined by Volkow and colleagues (2004), which proposed for successful alcohol addiction interventions to decrease the incentive of the drug, increase values of endogenous reward, and strengthen the executive functions for increased inhibitory control.

As the challenges inherent in the addiction treatment fields are outlined, it seems that the general agreement is in a call for a self-regulation-focused training solution, which would not be a replacement for currently applied treatments per se, but rather as a sustainable, accessible, and affordably adjunct. In addition to the findings that identified religiousness and spirituality to be highly correlated with increased self-regulation abilities, a broader movement towards providing more holistic, integrated and spiritually-oriented interventions placed the Twelve-step programs and meditations in the forefront. However, when individuals lack the spiritual motivation or face many spiritual struggles, coupled with the presence of psychiatric disorders and disruptions in the executive attentive abilities, they fail to take the advantage of these practices, lack in their treatment engagement and drop-out prematurely. Therefore, by building on the strengths and commonalities of various approaches, this chapter will present a program to help overcome some of those limitations. This program will be based on the best-practices and common curative factors of interventions discussed previously, and thus prepare the

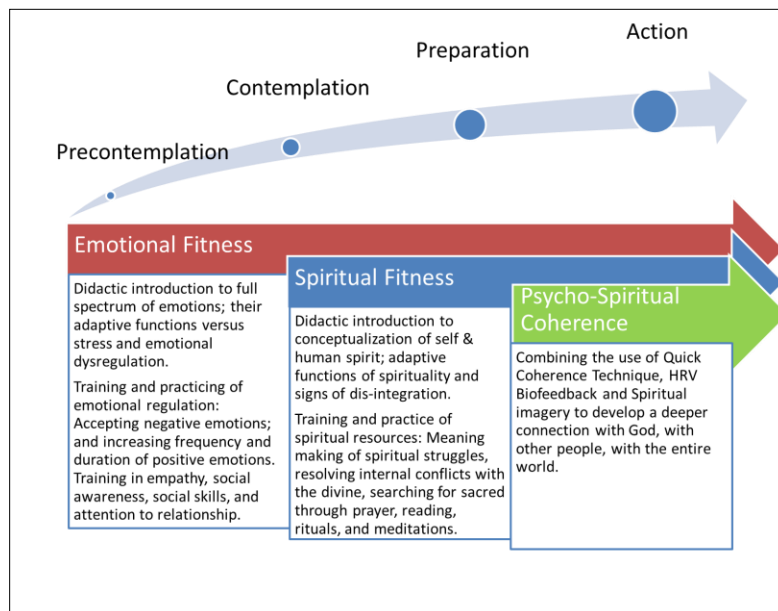
participants with skills and experiences that provide them with a firmer foundation for continued progress towards holistic recovery. Moreover, again referencing Blair and Ursache's (2011) representation of self-regulation in terms of a dynamic interaction of the "top-down" cognitive processes and the "down-up" emotional processes, the intervention proposed here would honor the holistic, mind-body-spirit integration.

Joining of Mind, of Heart, and of Action

"You shall love God your Lord with all your heart, with all your soul, and with all your resource...Bind them as a sign upon your arm and let them be an emblem in the center of your head". –Deuteronomy 6:5-8

There is deep and mystical wisdom in the quote above, that hints at the need for the joint efforts through the functions of the heart (emotions), soul (rational thought), and resources (action), and these need to become a regular practice of mindfulness (see Kaplan, 1975). Therefore, the proposed approach here, as summarized in the Figure 3 below, in the context of Prochaska's and DiClemente's (1982) Transtheoretical Model of stages of readiness, intends to engage the individuals in treatment on all of these levels. For example, the first part of this program will represent the building of emotional self-regulation and strengthening sustained attention skills, while the second part will re-introduce participants to their spiritual resources. Meanwhile, both of these components will be strengthened through the use of biofeedback. It is possible to assume, that as one's self-regulatory abilities and stamina increase, so will the sense of self-efficacy, and thereby a willingness to change (i.e., adhere to treatment).

Figure 3. Intervention: Building of self-regulation skills through emotional and spiritual fitness.



Emotional Fitness Training

Self-regulation and self-control, especially as they relate to emotions, were presented as the foundation upon which wellness is sustained. From decades of research, data has shown that an ongoing neuroplasticity produces real neurological changes through exposure to experiences, and either weakens or strengthens one's overall cognitive, behavioral, and emotional functioning. Therefore, the ability to self-generate and regulate positive emotions can be trained (Algoe & Fredrickson, 2011). The following model is based on the Comprehensive Soldier Fitness program that Sara Algoe and Barbara Fredrickson (2011) developed for the use in military, but discussed as potentially applicable in other areas. Based on the broaden-and-build theory of positive emotions advanced by Fredrickson and colleagues (see Garland et al., 2010), positive

emotions help broaden people's cognitive and perceptual capacities, increase awareness, reduce vulnerability for PTSD, and decrease symptoms of depression and anxiety.

Therefore, in order to cultivate this emotional resilience, clients are expected to undergo a combination of didactic training and practice to achieve an "emotional fitness," which is similar to the way regular physical exercises promote physical fitness. According to Algoe and Fredrickson (2011), this training needs to consist of three separate, but interdependent phases.

Phase 1 provides the critical building-blocks in the form of psycho-education, aimed to solidify the foundation and build basic skills. Individuals in training learn about emotions' role and its influences on the body, mind, and social relationships. They are trained to differentiate between feelings of stress and relaxation, and between positive and negative emotions. They are taught that although more positive emotions are needed for emotional resilience and mental wellness, both negative and positive emotions are adaptive and constitute a full spectrum of potentially informative mechanisms. In this phase, individuals are taught to troubleshoot their emotional abilities and are encouraged to be courageous in exploring the range of their emotional experience (Algoe & Fredrickson, 2011). For example, Smith (2005) provided guidelines and a set of tools for this type of work. He organized various states of relaxation, depicting them in a shape of a pyramid, and related each level to a cycle of healing and growth. Using this guide offers both therapists and participants a visual roadmap for identifying where the client is in terms of his/her relaxation state and skills, and suggests the next stages to strive towards. Smith (2005) observed, those individuals who tend to have psychopathology and higher

levels of distress, tend to have relatively limited range of coping skills and to also experience problems in sustaining effortless focus. He said that, frequently used defense mechanisms of withdrawal, reduction in awareness, minimization, and detachment may be a temporarily normal and adaptive, especially during the early stages of healing. The down-side here, Smith (2005) noted, was that at this level individuals are unlikely to be able to effectively differentiate the subtle levels of higher relaxed states. Therefore, in the earlier phases of training, Smith (2005) instructed to maintain clinical focus on first achieving a relief from stress, then help clients to learn to evoke positive feelings of pleasure and joy. Once ready, at more advanced states, he hypothesized that clinicians can include for the clients the feelings of selflessness, spirituality, and transcendence as legitimate goals of treatment. Therefore, by the completion of this first phase of emotional fitness treatment, clients can be expected to have some basic understanding of the dynamic role of emotion in the context of their body, mind, spiritual strivings, and social relationships, as well as identify some of the states of emotional fitness that they hope to achieve in the near future.

The goal of *Phase 2* of the emotional fitness training is to provide clients with opportunities to learn and practice adaptive skills for up-regulation of positive emotions and down-regulation of negative emotions (Algoe & Fredrickson, 2011). The objective here is to provide clients with multiple positive emotional states, as well as with the experience of being able to effectively control their reactions. Having access to these coping skills is hoped to offer an alternative option, with a self-reinforcing effect to be used automatically in place of the client's habitual reliance on addictive substances.

Therefore, individuals need to be given tools that quiet and focus their mind (Smith, 2005). For example, there are a number of helpful and effective techniques that were designed to help individuals relax both physically and mentally, and evoke positive emotions. These techniques range from progressive muscle relaxation, to autogenic training, to visualization, to mindfulness and Loving Kindness meditations, to various forms of biofeedback (see Garland et al., 2010). According to Smith (2005), like learning most new skills, to effectively learn relaxation skills and ways to self-generate positive emotions may take at minimum a full month. As discussed previously, since many individuals in addiction treatment have very limited days to achieve these objectives, the use of HRV biofeedback presents a unique, yet powerful adjunct to the training in cultivation of positive emotions, stress management, and self-awareness (Moss, 2004). Therefore, HRV biofeedback and related techniques are intended to be learned in parallel with receiving education on the roles of emotions and stress. The transformational potential of technology-based interventions, and more specifically the use of HRV biofeedback, will be discussed in further detail below.

Lastly, in the *Phase 3* of training, individuals will be motivated and given the opportunity to practice the skills and techniques learned in the previous phase (Algoe & Fredrickson, 2011). Here, individuals will try different interventions for best fit with their personalities, and create their individual action plans to optimize their practice in everyday life. During the final steps during this phase, the primary focus will be on extending the consideration for others, through developing empathic accuracy, setting up

optimal emotional environments for other, and communication of emotion (Algoe & Fredrickson, 2011).

Spiritual Fitness

According to the research of Ciarrocchi and Breslford (2009), the real power of religion and spirituality may be attributed to their ability to regulate emotional and psychological well-being through enhancement of positive emotions, rather than through reduction of negative emotions or diminishment of pain and suffering. Specific methods of spiritual coping appear to be especially well-suited for individuals struggling with addiction and co-occurring psychological disorders, which increase one's experience of distress (Ciarrocchi & Breslford, 2009). While these life stressors tend to create critical moments of conflicts about matters of deepest existential significance within oneself and with the relation to others (including with the Higher Power), the outcome that may lead to either growth or decline seems to depend on individual's ability and preparedness to resolve these struggles (Pargament, Koenig, Tarakeshwar, & Hahn, 2004; Rosmarin, Pargament, & Flannelly, 2009). The consequence of similar struggles and conflicts may result in growth, provided that the individual is able to accept the reality of the current situation, engage in positive problem-solving, access social network for support, draw on spiritually-based resources, and make meaning out of the experience (Pargament & Sweeney, 2011; Pargament, Desai, & McConnell, 2006).

Pargament (2007) defined spirituality as a cyclical and transformative process of discovery that evolves over one's lifespan, and is geared towards searching for the sacred in one's life. As some evidence suggests, clients may have a variety of explicit and

implicit degrees of identification with spiritual and religious beliefs and practices (Hill & Pargament, 2008). In helping the clients to better integrate spirituality into their everyday lives, therapists need to remember that people may already have inherent spiritual resources. The role of the therapist then simply shifts to help them reconnect with those resources, to become more self-aware, to have the direction of their spiritual strivings clarified, and to help resolve any internal and external conflicts (Pargament, 2007).

Despite the seeming inappropriateness of the “spiritual” intervention for some groups of clients, especially those who present with strong agnostic or as atheists views, or simply feel uncomfortable with the idea spiritual exploration, it is still possible to engage them in this therapeutic work. For example, this approach is presented in terms of Pargament’s (2007) definition, which explains spirituality as a process of searching for the sacred, and this sacredness to be present universally in all people, even in the secular domains (e.g. one’s relationship with parents, children, community, and engagement in uplifting practices such as music, dance, martial arts, etc.), then it is possible to help clients feel more comfortable and engage in this process.

The following program is adapted from the spiritual component of the Army’s Comprehensive Soldier Fitness (CSF) program designed by Kenneth Pargament and Patrick Sweeney (2011). This program consists of building awareness in three domains: a) of self and spiritual-self, where individuals in treatment are assisted with identifying their core values, beliefs, passions, skills and strengths in contrast to weaknesses. They determine what motivates them and gives them meaningful and purposeful life, and a plan to develop their human spirit; b) of resources that cultivate the spiritual-self, where

they are provided with access to spiritual tools (e.g. meaning-making, ritual, prayer, spiritual reading, charity work, meditation, contemplation, and HRV biofeedback). Also with realization of how stress can impact their psychological, physiological, and spiritual functioning, and ways to anticipate, react and overcome struggles of the human spirit; and c) of the relationships with the spiritual-other, where individuals are encouraged to build deeper connections with other people and the world, as they encounter diverse people and find commonalities in their experiences (Pargament & Sweeney, 2011).

At this time, there are only a few protocols that were developed for the purposes of guiding psycho-spiritual integration that is applicable to the current intervention. For example, Rosmarin and colleagues (2011) presented a 50-minute, stand-alone spiritually integrated group psychotherapy, as a pilot they conducted in an acute psychiatric setting, where an average length-of-stay was 7.2 days. As the initial step in this intervention, and similar to the general format discussed above for the spiritual fitness, these researchers provided psycho-education on the relevance of spirituality to psychiatric symptoms. In the next stage, they helped the participants to integrate spiritual beliefs into cognitive restructuring, and concluded by instructing them with the use of spiritual exercises involving behavioral-activation and self-care. Although the authors of this study noted their decision to exclude individuals who were not interested in religious or spiritually-oriented therapy, or had significant reports of delusions or hallucinations, they provided research indicating low risk of harm and potentially positive effects of such therapies even with nonreligious participants with severe mental illnesses (for citation of this literature see Rosmarin et al., 2011).

In the introductory segment of each group session, Rosmarin and colleagues (2011) spent 12-15 minutes with introduction of spirituality and its integration into treatment, yet with respect to each participant's unique spiritual beliefs and religious practices. In this segment, participants were encouraged to discuss within the group, how spirituality may have been relevant in their lives, and to their own symptoms. Following this open discussion, the group leader presented participants with research on spirituality's effectiveness, possible mechanisms, and areas where spiritual struggles may obstruct any progress or turn people away from spiritual strivings. For example, in the overview of possible spiritual struggles, participants were introduced to three main groups, that included interpersonal struggles with clergy or congregation members, intrapersonal struggles involving fundamental spiritual/religious doubts or existential crises, and divine struggles that reflected a sense of mistrust or anger towards God (Pargament, 2007; Rosmarin et al., 2011). The participants were also educated on how these struggles and other types of psychosocially-bound symptoms are related to mental health, and stood in contrast to healthy spiritual growth.

In the next 15-20 minute segment of the group therapy session, Rosmarin and colleagues (2011) gave their participants a handout that listed statements, which reflected commonly held spiritual beliefs. Participants were instructed to compare their emotional responses to each of the statement, and then to identify at least one that they found to be most meaningful and comforting. They were then instructed to discuss these with the rest of the group. The group leader reviewed with the group some common cognitive strategies and cognitive distortion, as well as alternative ways of interpreting events using

spiritual terms. The leaders encouraged participants to continue using comforting statements and positive interpretations as a reaction to stress and negative emotions (Rosmarin et al., 2011).

In the final 15-20 minutes of the group, participants were presented with an overview of self-care strategies (e.g. medication compliance, regular physical exercise, nutrition, and sleep hygiene). In addition to self-care strategies, participants were encouraged to use at least one spiritual practice regularly, and monitoring their response to it each day, during the length of the two weeks in treatment. In this segment, the group discussion also included the role of motivation and how to increase it through becoming more active and less avoidant. In the final part of the session, participants were led through a series of spiritual exercises. They were asked to count their blessings, and to remember open miracles that they may have observed or experienced. The participants were also introduced to five types of prayer, to spiritual study, and ways for contemplative meditation. The leader provided participants with a list of various options for free or affordable resources (Rosmarin et al., 2011).

As mentioned earlier, spirituality and religiousness are some of the most sublime aspects of one's self-concept, and this creates a context where therapists need to tread carefully. Several ethical precautions need to be considered, particularly in the areas of one's scope of practice, unforeseen dual relationships, potential to hold strong positive or negative beliefs and stereotypes about religion in general or any specific kind, and being in the position of influence that can become exploitive (Plante, 2008).

Moreover, although CBT is one of the most adapted approaches, spirituality should not be reduced to simple cognitive or behavioral techniques, and instead its relational component can be explored by therapists skilled in applying object relations theory, where they can engage their clients in exploration of how their perceived relationship with the Higher Power relates to their psychological symptoms and alcohol use (Hodge, 2011). These sessions may be particularly helpful to those individuals, who expressed having spiritual struggles as the primary reasons for dropping out of AA or other spiritual approaches. Therefore, other psychotherapeutic approaches may be more appropriate. For example, Shafranske (2009) discussed the potentially valuable application of psychodynamic approaches in addressing many spiritual concerns in psychotherapy. He highlighted that appreciation of the unconscious representations of God and other religious objects, beliefs, narratives and experiences on the individual's symptoms, self-perception, and relationship with others is the hallmark of psychodynamic psychotherapy. It is important to note, that this process can be especially valuable for individuals working through the twelve-steps of the Alcoholic Anonymous Fellowship. The eleventh step of the twelve steps, which are intended to lead up to the spiritual awakening, requires that individuals "improve contact with God" through prayer and meditation to achieve "God-consciousness" (Taub, 2011, p.46). Therefore, working through spiritual conflict, is as critical as achieving the goals of each step. Therefore, helping their client explore their spiritual narratives, schemas, fears and anxieties, and perceived relationship to the transcendent, Higher Power, may be as second nature to

willing psycho-dynamically oriented therapists. Consequently, the type of psychotherapy practiced should not be a limiting factor in this program.

Further, it is also important to keep in mind that development of spirituality and deriving benefits from it are not guaranteed, and other factors need to be considered. For example, Miller, Forcehimes, O'Leary, and LaNoue (2008) conducted two clinical studies on integrating a "spiritual guidance" treatment (SG), a manual-guided form of spiritual direction, along with Motivational Interviewing, and found very little evidence that spiritual practices had any effect on lowering alcohol use outcome measures. Following an initial exploration session, the researchers offered participants in the experimental group a menu of 13 spiritual disciplines to choose a method for spiritual exploration. This was followed by an opportunity to practice and eventually discuss their experiences in group sessions. These methods were based on Judeo-Christian disciplines and as Forcehimes, O'Leary, and LaNoue (2008) described also included the widely used practices of acceptance, celebration, fasting, gratitude, guidance, meditation, prayer, reconciliation, reflection, service to others, solitude, worship, and self-care. However, in contrast to the original hypothesis, after administering 12 sessions of spiritual guidance the researchers reported participants showed and significantly less improvement on depression and anxiety, in contrast to indicators from the treatment as usual control group. The investigators related these findings to the possibility that offering this intervention too early in the recovery process, when patients were still relatively recently out of the detoxification, and therefore still dealing with many crises during and after treatment which were likely to be incompatible to their basic needs (Miller, Forcehimes,

O'Leary, & LaNoue, 2008). Hence, as these authors hypothesized, the optimal time for fostering spiritual growth may be later in recovery. Another explanation considered was that, similar to the Twelve-step programs, most of the world religions tend to emphasize lifelong regular practice and growth rather than short-term fixes. Even according to the philosophy of the Alcoholics Anonymous, sobriety is commonly understood as an evolving process of character, which involves physical, psychological, and spiritual changes and requires a long period of time for development (Miller, Forcehimes, O'Leary, & LaNoue, 2008).

As discussed in earlier chapter, most substance abuse programs adapted an approach of treating the acute symptoms of addiction within limited to a 28-day inpatient or intensive outpatient treatment. These trends offer relatively meager windows of opportunity in the larger context of recovery. Therefore, as it can be surmised from the above discussed studies, although spirituality is promising to become a significant source for resilience and positive emotions in the future, it may not be sustainable prior to having some of the most fundamental needs addressed. Therefore, as discussed previously, training individuals in ways of self-regulation may pave the way for future engagement in spiritual practices. The final section of the chapter will discuss the benefits of including biofeedback as a way to begin training the executive functions and increase the abilities in sustaining attention, self-control, and motivation by providing them with immediate feedback, and a sense of self-efficacy by using this technology.

Biofeedback

Although, as depicted in the Figure 3 above with a third arrow titled Psycho-Spiritual Coherence, this is not meant to be thought of as a separate phase. Instead, it represents a natural culmination of the two efforts described above and the underlying support provided by biofeedback training. In this treatment package, the use of HRV biofeedback technology plays a critical role, as it serves to provide participants an enhanced and highly powerful method for learning to self-regulate emotions, as well as to manage stress. In fact, retraining executive cognitive and emotional functions to achieve the physiological changes and self-regulation growth among addicts has a long history that may be traced back to the ancient spiritual practices but revived as contemporary viable adjuncts to treatment (Schwartz & Andrasik, 2003; Williams & Thayer, 2009).

More specifically, while there are now multiple modes of biofeedback (i.e., Electroencephalography (EEG), the one that will be recommended here is the Heart Rate Variability (HRV). When combined with the support of technology, biofeedback provides the best venue for effective, practical, and accessible intervention, especially when applied with individuals who already present with difficulties in sustaining attention and controlling their impulses, therefore, it is proposed here as both the connector and as a critical component for the entire program.

The use of HRV biofeedback is also connected to more “spiritual endeavors.” For example, as will be discussed in more detailed in the following sections, HRV biofeedback training provides practitioners with a subjective experience of and skills for sustaining attention, inward focus, self-awareness, feelings of connectedness and peace.

Therefore, the inclusion of biofeedback serves as a metaphorical bridge for connecting the cognitive, emotional, and spiritual realms of functioning. That is, after individuals become familiar with their emotional and spiritual selves, as they gain mastery in their practice of self-monitoring, self-generation, and self-modulation of positive emotions, and with the help of the therapist they find some resolutions to their internal conflicts and struggles, they can then move on to experiencing the transcendence of self. As Smith (2005) described the transcendent goals as those that involve one moving beyond their both positive and negative everyday wants and needs. While different relaxation states Smith (2005) reviewed repair, replenish, and prepare clients in different ways, once the individual progresses to the higher levels, they are more likely to feel the spiritual. For example, he stated that, anything in client's life that retains the focus on him or herself, is not only distracting, but can also become as antispiritual. From this perspective, for people to feel stronger and closer in their relationship with the sacred, with their Higher Power, or God, (as they understand it), they need to experience a selfless expression of gratitude and compassion towards each other. These exercises in empathy development are likely to be included in the emotional fitness as well as in the spiritual fitness, however, in this final phase, the use of the Heart Rate Variability biofeedback can provide the practitioners a direct visual feedback as they put all of their new skills into practice, and direct this positive emotion as if to flow through them and towards humanity. The pairing of these two powerful visual and experiential states is intended to be evoked on cue by the individuals outside of training session, and to become more generalized in their day-to-day lives.

History and empirical support for EEG.

As discussed throughout the earlier chapters, the ability to exhibit self-control and the self-regulatory strength to inhibit impulsivity, engage in healthy decision-making processes, and regulate emotional reactivity involve numerous brain regions. Of particular interest are those, which have shown to be engaged in the executive functions, and are clustered, in the prefrontal cortex (PFC). Relatedly, each and every brain region is known to produce certain electric brainwaves that also vary according to their healthy functioning. For example, research has shown that individuals with histories of substance abuse have elevated beta activity. Individuals with alcohol dependence show lower frontal alpha and slow beta coherence, which indicate dysregulation in brain activity in the prefrontal areas of the brain (Sokhadze, Cannon, & Trudeau, 2008).

Electroencephalography (EEG) is a form of neurofeedback. As it is used to measure voltage fluctuations within the neurons of the brain, and by feeding back this as information to the client, has been successfully used as an operant conditioning (or cognitive) technique to train the individual to either inhibit or reinforce certain forms of electrical activity along the scalp. This ability to control some of the neurological functioning, among other benefits, has shown to enhance stress tolerance and reduces anxiety (Schwartz & Andrasik, 2003; Scott, Kaiser, Othmer, & Sideroff, 2005). Since anticipation of and reaction to anxiety-producing situations is critical in relapse, gaining abilities to self-regulate would be especially beneficial during the initial phases of recovery.

Sokhadze, Cannon, and Trudeau (2008) provided a brief overview of the progression of research in the use of Electroencephalography (EEG) in treatment of various disorders, including alcohol addiction. Findings of biofeedback and its applicability in treatment were historically inspired by the studies of beneficial outcomes among practitioners of yoga and meditation, and such investigations goes back at least to the research conducted at the Menninger Clinic in the 1970s (Schwartz & Olson, 2003). One area where researchers and clinicians have found EEG to be particularly applicable is in assessment of the degrees of chronicity and deficits, as these may have resulted from the neural damage due to the chronic substance use. For example, Winterer and colleagues (1998) have successfully predicted the relapse among chronic alcoholics, with the rate of 83-85%. The strength of these predictions significantly outperformed other clinical variable and subjective tests used traditionally. Bauer (2001) was also able to demonstrate that relapse-prone individuals were characterized by the presence of increased beta (19.5-39.8 Hz) brainwaves.

In addition to its diagnostic and predictive utility, EEG has shown to have more direct uses in the treatment of addiction. For example, in some non-controlled studies, researchers were findings that by training individuals to control their alpha-theta (8-12 Hz and 4-8 Hz) brain waves, increased their awareness, sensitivity and suggestibility and helped them achieve certain spiritual-like states that were in-line with the goals and philosophy of Alcoholics Anonymous (Sokhadze, Cannon, & Trudeau, 2008). Various combination of protocols were tried, with Peniston and Kulkosky conducting a first, randomized study of alcoholics where they achieved positive results from combining

relaxation exercises using temperature biofeedback and alpha-theta brainwave biofeedback. Even after 4-year follow up, subjects in the study showed 80% positive outcome in comparison to 20% seen in the traditional control condition, with reduced scores in the Beck Depression Inventory, a more sustained prevention of relapse, sustained changes in personality tests (Millon Clinical Multiaxial Inventory and 16-PF) (Sokhadze, Cannon, & Trudeau, 2008).

Other protocols seemed to be better suited for individuals where substance use was correlated with preexisting psychiatric problems with impulse control problems (i.e. ADHD, conduct disorder, and bipolar disorders). Scott and colleagues (2005) conducted a study where they evaluated the effectiveness of EEG biofeedback protocol on improving variables of attention, retention in treatment, and abstinence rates after year post-treatment. In this study, they used randomly-assigned 121 subjects undergoing an inpatient substance abuse program. In addition to the traditional treatment they received based on the Minnesota Model (including individual, group, and family therapies), the subjects in the experimental group received EEG biofeedback, with each session lasting 45 minutes, two daily sessions, over the course of 5 working days and lasting about 5 weeks. In this experiment they used the Beta and SMR followed by an alpha-theta protocol. During the first phase, subjects underwent EEG biofeedback as operant conditioning to increase subject's ability to increase either 15-18 Hz (Beta) or 12-15 Hz (SMR) EEG activity. In the second phase, subjects were trained on the Alpha (8-11Hz)-Theta (5-8Hz) protocol. This also included the technician guiding participants in mental exercises dealing with cue extinction and rejection of relapse, and reading a guided

imagery script about essential elements of maintaining abstinence, attending AA/NA's Twelve-step meetings regularly, expanding identified comfort zones. Results of 40-50 sessions have demonstrated support for the efficacy of EEG, specifically showing that participants in the experimental group averaged 136 days in their adherence to treatment, when compared to only 98 days for the control group. Furthermore, experimental group subjects also were found to be more cooperative and more attentive as EEG biofeedback training progressed. Despite the facts that 8 of the experimental group participants lapsed back to using drugs (yet stopping after less than 4 weeks), they also self-reported feelings of dysphoria when they used the substance and were able to maintain positive changes on the five of the MMPI scales. The authors of the research concluded that these positive results were a strong indicator of neurophysiological changes taking place due to the EEG biofeedback intervention.

Other studies have achieved similar results incorporating EEG biofeedback into treatment protocol, showing substantial improvements in measures of attention and personality (Scott, Kaiser, Othmer, & Sideroff, 2005; Sokhadze, Cannon, & Trudeau, 2008). While this overview of research on the effectiveness of biofeedback is limited to the above presented examples, as Sokhadze, Cannon, and Trudeau (2008) summarized the evidence of its effectiveness in accordance to the Guidelines for Evaluation of Clinical Efficacy of Psychophysiological Interventions adapted by AAPB and ISNR organizations places it in the range of "probably efficacious." Using the outlined criteria these treatment approaches have shown to produce beneficial effects in multiple studies, especially when combined with residential rehabilitation modalities.

Despite such promising outcomes, there are also some well-recognized limitations to the use of EEG. At the current state of technology EEG provides relatively poor quality determinants of neural activity that occurs below the upper layers of the brain (the cortex). The preparation and client set-up also takes a long time and effort, especially since clients are required to be connected by electrodes from the EEG equipment and in precise placement of dozens of electrodes around the head. This procedure requires the use of various gels, saline solutions, and/or pastes to keep electrodes in place, and this creates an additional discomfort to the participants. Costs are also prohibitive, as the better equipment can range in tens of thousands of dollars, not including the constant supply of gels and replacement electrodes. Furthermore, the use of EEG requires well-trained individual that have strong educational and experiential backgrounds in the neurofeedback.

History and empirical support for HRV.

Enter Heart Rate Variability! Over the past decades, the decrease in the HRV has received increased attention as a prognostic tool for indicating increased risk for various types of chronic diseases, behavioral disorders, aging, and even mortality. Dardik (1997) defines Heart Rate Variability (HRV) as “a simple measure of the beat-to-beat evenness of consecutive heartbeats” (p. 18). Here, any decrease in the HRV corresponds to interbeat intervals, and paradoxically, the more uneven the intervals, the greater the HRV. In fact, no other single risk factors have been implicated with such consistent and strong empirical support for a surprisingly wide spectrum of disorders than HRV (Dardik, 1997). While all the mechanisms behind this single risk factor are not fully understood, it

does point to the high degree of interconnectedness of psychological and physiological systems.

It seems that the earliest time that decreased HRV was identified as a risk factor and an early indicator, linked to infant mortality and Sudden Infant Death Syndrome was in 1965 by Drs. Hon and Lee. It followed soon after, that other researchers began to discover its associations with cardiovascular diseases, insulin dependence, cancers, autoimmune diseases, and neurological disorders (Dardik, 1997). Carney and colleagues (2001) also cited studies conducted by Garfinkel, Raetz, and Harper (1992) that found significantly lower HRV rates among chronic cocaine users. Individuals diagnosed with a clinical depression also showed significantly lower heart rate variability, which was found to increase their risk for coronary artery disease (as cited in Carney, et al., 2001). In addition to other empirical evidence they reviewed, Segerstrom and Nes (2007) conducted an experiment, which also showed the applicability of HRV as a measure of self-regulatory strength. As the authors discussed, self-regulation being analogous to muscle strength is a limited resource, and when drained this self-regulatory fatigue leads to lapses in self-regulation and self-control (Muraven & Baumeister, 2000). Since neural connections in the brain structures that are involved in the autonomic nervous system regulation and the prefrontal cortex overlap, HRV was hypothesized to be a good index for self-regulatory capacity and activity. In their experiment, they randomly assigned 168 subjects to two conditions of either high or low self-regulation, and asked to first engage in a task of resisting or indulging in desirable foods. The second part involved measuring their performance on a number of moderately difficult to impossible anagrams in terms of

their persistence and time taken to solve puzzles. Thirdly, the subjects were also exposed to high-stress conditions of public-speaking. During the entire process they were also being continuously monitored using various biofeedback tools, including HRV. The results from this experiment were in line with findings of other investigators, that showed that a) higher HRV measures were obtained during high self-regulation efforts, while low HRV was seen during low self-regulation effort; b) high resting HRV measures also predicted higher self-regulatory strength and capacity, including better performance on executive functions test, less negative emotion during stress, better effective coping and impulse control; and d) and finally, measures of self-regulation strength and capacity using HRV was far more accurate than subjective reports. The authors concluded that, for people who are facing more serious consequences of self-regulatory failures as those who are in alcohol addiction recovery, HRV feedback could be a helpful non-subjective tool to aid in diagnostics and measurements of progress. For example, increased HRV in response to relevant alcohol-related cues can be used as a marker for capacity to resist temptation. Similarly, lowered HRV measures may indicate self-regulatory fatigue and signal a good opportunity for a timely boost in motivation (perhaps using motivational interviewing) (Segerstrom & Nes, 2007).

Since the human heart is a kind of a bioelectric pump, for the purposes of adaptation it beats at a variable rate in terms of the interval between each heartbeat (Moss, 2004). Dardik (1997) explained that in nature, heartbeat exists as a cycle of systolic contraction and diastolic relaxation, therefore forming a wave continuum of energy expenditure and recovery. The measurement of HRV, according to him involves a

combination of heartbeats as a continuum of systole/diastole wave, and the elevations and decrease along the body's behavioral waves of energy expenditure and recovery.

Therefore, in nature HRV "is a wave within a wave" (p.22). Moreover, he noted that what is inherent in this wave continuum is the unification of the two, seemingly different structures - the heart and the whole organism. Taking this a step further, he stated that common to all of our behaviors, including emotional reactions, is the wave of energy expenditure and energy recovery, and this he said is what helps explain the phenomenon of mind-body connection. This connection appears to be clearer in the identical ways that stress-response manifests in both the "mind" and the "body." For example, since body's autonomic nervous system (ANS) is the chief coordinator of most of the body's internal functions, one of the key mechanisms that it accomplishes this is through indicating to the heart the rate at which it should beat, which sets the heart rhythm. The ANS consists of two systems, the sympathetic branch, which it serves as a throttle to increase activities of the internal organs in the anticipation of the fight/flight survival response, which includes the heart's action. The second branch is the parasympathetic, which acts as a brake system to decrease internal activity including the heart's rate (Moss, 2004).

Interestingly, the body's mechanisms function in the same way in their response to either emotional stress or stress to the physical body. For example, during the relaxation (parasympathetic phase), as physiological changes are seen in the decreases in breathing rates, heart-rate, blood pressure, stress-hormones, oxygen consumption, and muscle relaxation. During both mental and physical arousal (sympathetic phase), similarly identical physiological stress responses increase the heart-rate, breathing, blood pressure,

muscle tension, stress hormone and oxygen consumption, as the organism activates its natural survival mode in preparation for fight/flight/freeze activity. The higher the wave range, the greater the capacity of the heart rate to vary responsively within its range. The balance between the sympathetic and parasympathetic system's activities produces an ongoing increase and decrease in heart-rate, best depicted as a wave. While all system activities produce certain output that can be measured and represented through individually waves, due to the interconnectedness and the continuous communication of various systems, the heart appears to represent the "collective simultaneity of all the behavioral waves waving within one another," which are combined into the "master wave" of the heart that HRV seems to represent (p. 25). Since the heart rate variability is the result of the overlay of multiple biological rhythms, it is a great maker for healthy functioning among the physical, emotional, mental and even spiritual dimensions (Moss, 2004; Chidlre & McCraty, 2001).

Besides its predictive uses for cardiac and other health outcomes, recent technological advances and research also identified HRV's powerful potential in the area of biofeedback training. Gevirtz (2003) reviewed HRV's application as an emerging modality to be used in clinical settings. For example, among rapidly growing literature, Thayer, Hansen, Saus-Rose, and Jonsen (2009) have provided strong evidence from the pharmacological, neuroimaging, and psychophysiological perspective that have linked the central nervous to HRV in humans, and further linking HRV to the performance of cognitive executive functions (i.e., working memory, attentional set-shifting, inhibitory control) and affective executive functions (i.e., emotional regulation, affective set-

shifting, extinction, and response inhibition) identified with prefrontal cortical activity. More specifically, they have shown that HRV is neutrally-linked to a set of structures in the prefrontal cortex (PFC), which are involved in cognitive, emotional, and autonomic regulation. Moreover, they identified a common reciprocal inhibitory cortico-subcortical neural circuit that allows the organisms to respond to demands from changes in the environment, and effectively adapt by organizing their behavior. In some of their experiments, they have successfully shown that high HRV also had superior performance on executive function tasks, including better reaction time and accuracy in responses to correctly identified stimuli, and fewer false-positive responses compared to the low-HRV group. When an aversive stimulus was added for the second experiment, to stimulate the negative effects of stress, individuals with high HRV had better performance than low HRV. Furthermore, this experiment showed that high-HRV group performed better independent of the pressures from the environmental, while the low-HRV group showed an improved performance on reaction time during increasingly threatening and stressful moments. In addition to strengthening the proposed relation of HRV and susceptibility to stress, these findings also suggested that experience of fear facilitates an increase in attention. In those individuals who are generally low in HRV, it seems that in order to perform they require additional environmental stimulation. Conversely, high HRV provides the foundation for greater behavioral flexibility, self-regulation, and adaptability that is independent of the changes in the environment.

Additional studies reviewed by Thayer, Hansen, Saus-Rose, and Jonsen (2009) also provided evidence that HRV could be altered by behavioral programs (i.e., aerobic

exercise), and this in turn affects executive and cognitive functions. For example, in experiments that used Go-NoGo tasks, results showed that individuals with high HRV are significantly better in executive tasks such as planning and decision making, as well as in overriding prepotent tendencies, such as processing of inhibition or disinhibition, and excitation. In another previously conducted study, these authors evaluated if HRV is related to psychopathology. The research was based on using Hare's four-facet model, where the first "facet" is represented by interpersonal style. The characteristic core of this style are patterns of behavior that manifest as superficial charm, grandiose sense of self-worth, manipulation of others, and pathological lying. Regression analysis by the investigators showed a positive relationship with HRV and accounted for 15-29% of total variance. This also demonstrated that individuals with high scores in interpersonal facet also exhibited better performance on tasks that taxed executive functions (Thayer, Hansen, Saus-Rose, & Jonsen, 2009). Additional research seems to indicate that individuals with higher HRV tend to be cheerful, kind, deal well with stress, express trust, prosocial behavior, while engaging in very little instances of maladaptive coping (Kok & Fredrickson, 2010).

Similarly, individuals with high HRV seem to be good predictors of the ability to make adequate decisions and actions in critical situation, and being high in situational awareness. Interestingly, high HRV seems to be highly correlated with personality factors of neuroticism, extraversion, and conscientiousness, which have also been linked to individuals with high religiousness (Ciarrocchi & Brelsford, 2009; Thayer, Hansen, Saus-Rose, & Jonsen, 2009). Briefly, McCullough and Willoughby (2009) reviewed literature

on this subject and found strong positive correlations of religion and traits of agreeableness, conscientiousness, and low neuroticism, as well as abilities in self-control. These personality traits have been considered to be the basic personality ingredient of self-control. This connection has been attributed to one's ability to adapt own behavior to the wishes and feelings of others, as well as to task demands (McCullough & Willoughby, 2009).

Since substance use was previously described as a misguided strategy for coping with one's emotional and psychological distress, and one that consequently adds to the dysregulation of affect and cognitive. Positive emotional and cognitive well-being and purpose in life are highly correlated to spirituality and religiousness, while also being negatively related to substance coping. Whereas substance coping is positively related to negative affect (Ciarrocchi & Brelsford, 2009). Therefore, as already discussed in previous chapters religious and spirituality variables are potential motivators for psychological and emotional well-being. In terms of HRV, Childre and McCraty (2002) have also found that genuine positive emotions, such as love, appreciation, compassion, care, inner harmony, and greater sense of connectedness, which are so frequently associated with "spiritual" experiences, are also something that can be evoked through increasing heart-brain synchronization (state of coherence) through the use of HRV biofeedback. In their work, they have investigated the role of positive emotion in enhancement of physical, cognitive, and psychosocial functioning that serves as resilience to stress and increase in the abilities for self-control and self-regulation. They point out that people in general struggle with successful engagement, building, and

sustaining positive perceptions and emotions and frequently fall into a habit to respond with negative attitudes and emotional reactions. They also stated that, when unrecognized and unmanaged, emotional activity can drain vital resources, further disrupt neural processes needed for clear perception, rational thought, effective decision-making and self-regulation.

For the past few decades, Childre and McCraty (2002) have continuously researched how to tap the rhythms of heart rate variability (HRV), and proposed a model of emotion that includes the heart, the brain, nervous and hormonal systems, all functioning in a dynamic and interactive ways. They have developed techniques that combine intentional focus on the area of the heart, with intentional evocation of positive emotion, which results in a parasympathetic state of psychophysiological “coherence.” This state has been linked to improved cognitive, emotional, performance, health related, and increased subjective experience of spiritual outcomes. Moreover, people using these techniques have also been reporting greater feelings of connectedness to other people and to God (regardless of their particular belief system), and a greater sense of intuition (connection to their intuitive intelligence. Therefore, this biofeedback training technique promises to help people develop emotional self-regulation skills that will increase the capacity to sustain positive emotions and greater “spiritual connectedness” which can be entered spontaneously and automatically (Childre & McCraty, 2002, p. 16).

Although, HRV biofeedback is a relatively new technique, it has been proven to be effective in training people to change the variability and dominant rhythms in their heart activity (Wheat & Larking, 2010). While HRV’s initial discovery was tied to its

diagnostic abilities, more current uses have extended to applying HRV biofeedback in treatment of medical and psychiatric conditions, including management of symptoms of anxiety, anger, depression, panic attacks, chronic fatigue, fibromyalgia, chronic pain, asthma, irritable bowel syndrome, and various cardiovascular conditions (McCraty, Atkinson, & Tomasino, 2001; Moss, 2004;). Among individuals studied post the HRV biofeedback training significant improvements were seen in self-efficacy, increased positive emotion, and a sense of connectedness. Wheat and Larking (2010) conducted a thorough review of available evidence and have concluded that there is ample and overwhelming evidence that biofeedback using HRV showed significant improvements in clinical outcomes, with notable changes across several diseases, namely asthma, cardiovascular disease, COPD, heart failure, fibromyalgia, Major Depressive Disorder (MDD) and Post-traumatic Disorder (PTSD). For example, they described experiments utilizing a manualized approach with duration of 10 sessions, where psychometric assessments showed a significant decrease in depressive symptoms. Initially the physiological improvements co-occurred with the decreases in depressive symptoms. However, improvements in symptoms of depression continued to accumulate, while physiological changes plateau after seventh session.

Another related study discussed involved subjects enrolled in a residential clinic for substance use disorders (Gevirtz, 2003). Participants in this study abstained from alcohol for at least two weeks prior to the experiment, but all displayed elevated PTSD symptoms. Randomly assigned participants to two groups were instructed to either practice progressive muscle relaxation (PMR) or use a HRV biofeedback (and six-breath

technique) for 20 minutes each day for 4 weeks. The results showed that while both groups significantly reduced PTSD symptoms, only the HRV group showed a change in the total variability. Therefore, the conclusion from these findings was to suggest that HRV is to a viable solution to be used as a supplement to traditional treatments (Gevirtz, 2003).

Particularly notable are phasic relationships between the respiratory activity and heart rate changes, as each breath intake is accompanied by an increase in heart rate, and each expiration leads to its decrease (Gevirtz, 2003). Research seems to have established that, regular practice in increasing the amplitude of variation in heart rate (as measured by HRV), can strengthen homeostatic reflexes in the autonomic nervous system (ANS). According to the underlying psychophysiological understanding, each individual has a unique natural frequency at which respiration and HRV are in a synchrony and result in the most optimal autonomic self-regulation. On average, for most individuals this frequency involves breathing at a rate of six times per minute, and with the heart rate variation of about six cycles within the same time period. While initially the individual is guided by the use of biofeedback for the purposes of skill training, when this optimal level of coherence is reached, this model predicts that the organisms functions at its most optimal level, with the highest level of resilience and self-control (Gevirtz, 2003).

As the momentum of holistic health that emphasizes self-regulation and self-control increases, and more individuals take more active role in their recovery, biofeedback therapies will offer a unique and easily adaptable option to facilitate such efforts towards growth and wellness (Schwartz & Andrasik, 2003). Sokhadze, Cannon,

and Trudeau (2008) proposed an integrated approach that combines biofeedback and traditional psychotherapies for the purposes of assessment and treatment of substance abuse disorders that are comorbid with psychological disorders. The assessment aspect of biofeedback allows the provision of the needed baseline of pretreatment functioning and some indication of the degree of neurocognitive deficits, which also goes beyond the limitations of the subjective tests used. By providing the psychophysiological markers, therapists gain useful information for planning and measuring progress of their interventions. For example, researchers used a combination of motivational interviewing (MI) and biofeedback in a randomized study measuring the deficiencies in selective attention among addicts. The control group consisted of general educational drug counseling, while the experimental group received two sessions of MI and biofeedback. Research found that the MI group showed significantly (62.6%) less positive substance use than the control group (84.9%) (see Sokhadze, Cannon, & Trudeau, 2008).

In sum, biofeedback may be used to normalize the hyperarousal pattern commonly observed in addicts and provide addicts with healthier ways to achieve the same physiological effects of positive emotions, which they attempt to achieve through self-medication. Individuals who maintain high HRV levels tend to adapt well in various situations and show superior performance on numerous indices of cognitive functioning and directive attention, as well as be able to override their impulses, and show greater self-regulatory capacity (Kok & Fredrickson, 2010). However, the relationship is likely to have a reciprocal causality, as Kok and Fredrickson (2010) suggested that an increase in positive consequences from supportive social and emotional exposures, leads to the

development of higher HRV. Consequently, as these abilities accumulate and compound over time, the individual is left with more durable, flexible, and efficient resources. These authors concluded that HRV is a “gateway personal resource” (Kok & Fredrickson, 2010, p. 435) as it moderates the degree to which people experience positive emotions and social relationships.

Despite many promising benefits, many challenges present themselves as difficulties in quieting and focus the mind, overriding the disruptive impact of worrisome thoughts, which tend to activate the sympathetic nervous system and disrupt self-regulation and relaxation (Moss, 2004). Lastly, as mentioned in previous chapters, similar limitation and even warnings of potentially harmful outcomes apply to HRV as with meditation, with individuals who may present with severe psychiatric disorders in addition the general challenges to overcome the distracting internal and external stimuli, struggle with major psychological difficulties, may be experiencing failures in reality testing and other ego functions, or are still under the influence of the chemical substances. Nonetheless, when HRV biofeedback is coupled with interventions like cognitive behavioral therapy individual can be expected to have an enhancement in the ability to manage stress, and prevent the development of relapse following sobriety. The next chapter will offer general guidance in terms of the overall project preparation and deployment, as well as suggest some sources for the psychoeducational content and exercises that comprise the intervention.

Chapter Five: Treatment Package

This dissertation focused on the treatment of alcohol addiction. However, as introduced in the first chapter, conceptualizing addiction as a syndrome with shared neurobiological and psychosocial antecedents also calls for broader treatment protocols that would treat the underlying vulnerabilities rather than remain limited by the focus on the “specific objects of addiction” (Shaffer et al., 2004, p. 367) and its various manifestations. Earlier chapters suggested different ways to think about addiction, and presented compelling evidence, effective psychotherapeutic modalities, and approaches. Conversely, a number of internal and external challenges existing in the contemporary addiction treatment milieu were also discussed. One of the unifying themes in this dissertation was unifying agreement among the experts to include self-regulatory training opportunities as a way to counter the vulnerabilities in the area of executive functions. Effective emotional self-regulation can be thought of as the first line of prevention against the disruptive effects of distress (Shaffer, 2013). The dilemma of the current cultural and economic trends was also discussed as an increased shift in emphasis towards the provision of holistic care is counteracted by the increasingly limiting environment and access to resources. From the brief overview of some of the recent empirical and anecdotal evidence, the rapidly growing interest in integrating spirituality and religiousness into health care had become apparent. Nonetheless, unique practical, clinical, and ethical concerns pose challenges to such integration, especially, within the time-limited substance abuse treatment settings. Throughout this dissertation, I emphasized the importance of a two-pronged approach. The up-down part of the

treatment provides the cognitively-based interventions, while the down-up interventions would train individuals experientially in ways to strengthen the automaticity of self-generation of positive emotion. Since this process is inherently difficult and time consuming, I have proposed to include biofeedback technology as a practical, nonthreatening, affordable, intuitive, and an effective way to train the emotional self-regulation.

In this chapter, I will present a treatment protocol that in combination with the emotional, spiritual, and HRV biofeedback components may provide a holistic improvement to traditional drug and alcohol treatment programs. The intent here is also to build upon the existing infrastructure and utilize the available resources, to minimize the unnecessary disruptions and costs to the organizations, clinical staff, and clients. For example, since majority of AOD addiction treatment facilities rely on some combination of group and individual psychotherapy, this protocol was also designed to follow the same format. The Emotional and Spiritual Fitness didactic sessions and exercises, coupled with the HRV biofeedback training are optimally delivered in the group format. Meanwhile, the follow-up sessions that help address issues related to motivation, cognitive distortions, emotional and spiritual conflicts, relational problems, and clients' difficulties in mastering certain relaxation techniques are best suited for individual psychotherapy.

Technology

In addition to the empirical evidence presented in this dissertation in support of potential effectiveness of the treatment package, it is also important to consider some of

the practical and cost-saving benefits. For example, while the delivery of the emotional and Spiritual Fitness components of this intervention are relatively “low-tech,” and can be easily implemented by the same staff already conducting psycho-educational and therapeutic interventions, the integration of HRV feedback requires the inclusion of technology that may not be present or adequately used at the majority of substance use treatment settings. For any diligent administrator responsible for balancing organizational resources, the clinical effectiveness may not be enough to make a convincing case for any additional expenditure, especially at the times of constrained budgets already discussed. Therefore, it is important to highlight some of the benefits that can be gained from this investment and outweigh the short-term costs.

Since this treatment package is at least partially based on a technology platform, it is important to briefly discuss the integration of Information Technology (IT) into the evidence-based psychotherapeutic practice. In general, the role of Information Technology in mental health service delivery has grown exponentially in the past few decades, partly due to the desire to make delivery of services more cost-effective for providers and more affordable for recipients. A number of recent investigators (Eonta et al., 2011; Barnett, 2011; Cucciare & Weingardt, 2007) contributed to the discussion by presenting the use of technological innovations as a way to enhance psychotherapy. For example, Cucciare & Weingardt (2007) reviewed randomized controlled studies published from 1998 through 2006, and concluded that technology-based delivery of psychological services is cost-effective, as the benefits tend to include a significant reduction in the cost and duration of treatment, higher accessibility, and satisfaction from

clients. Their review also found evidence for clients' tendencies to be more willing to disclose important details about their emotional problems when using a computer-based intervention, than when speaking face-to-face with a clinician. This was confirmed especially in the area of substance abuse (Cucciare & Weingardt, 2007). Similar conclusions were reached by Bikel, Christensen, and Marsch (2011), who evaluated the use of computer-based interventions in the assessment, treatment, and research of drug addictions, and found that in addition to being an effective and an accessible method for motivation and engagement of drug-addicted individuals, there were significant cost savings. They reviewed literature in support of using computer programs, which they found helpful in the areas that promote skill mastery, self-monitoring abilities, and increase in knowledge base. Individuals in studies reviewed showed higher degree of motivation for abstinence, significantly more learned information about pathology, and higher enjoyment from computer interaction in comparison to therapist-based counseling. The authors highlighted benefits such as less time required for therapist intervention, and more cost-efficient ways to deliver common information. Furthermore, Bikel, Christensen, and Marsch (2011) also discussed some promising software applications that help to engage clients in rehabilitation of the executive functions and increase the frequency of healthy decision-making. The use of computer-based interventions allows a delivery of broad-based interventions, not limited to any particular entity of addiction or psychopathologies. The self-guided, self-paced, and on-demand applications can be an appropriate way for the delivery of common didactic components to a relatively large and diverse group of clients, yet without the use of valuable clinical time. Barnett (2011) and

Eonta et al., (2011) also discussed some promising evidence for the successful use of information technology as a personalized way to address psychiatric illnesses such as generalized anxiety disorders, depression, posttraumatic stress disorders, and panic disorders.

In their summary of research on the integration of emerging technologies into alcohol addiction treatment, Cunningham, Kypri, and McCambridge (2011) also outlined certain advantages. For example, similar to research findings discussed above, they also identified benefits such as an increased outreach to a larger number of people who may never pursue face-to-face treatment due to problems in accessing treatment, feelings of stigma, shame, and denial of problems. Moreover, these researchers found that using technology for the purposes of screening client's severity of problematic substance use patterns, and provision of personalized feedback summaries with direct illustration of risks of aversive consequences, was especially effective among this population. In their 2011 article, these authors also reviewed some of the most commonly used web-based applications that were developed with a wide range of cognitive behavioral tools. These CBT-based online tools incorporated similar techniques already used in face-to-face interventions (e.g. drinking diaries, goals setting exercises, and relapse-prevention techniques), and reportedly have been found to be promising as an adjunct to traditional methods. The key theme identified by Cunningham, Kypri, and McCambridge (2011), is that while the trend of using computer-based and/or web-based tools in delivery of mental health services appears to be gaining momentum, the manner and degree of integration are likely to remain a challenge for future explorations.

Additionally, the reader of this dissertation may find the applicability of the HRV biofeedback as a potentially reliable index for self-regulatory strength and ability described in experimental research conducted by Segerstrom and Nes (2007) to be particularly interesting. What makes these research findings so significant is the fact that reliable assessment of self-regulatory strength and fatigue are difficult in naturalistic settings (e.g. inpatient and outpatient addiction treatment facility). As the authors discussed, among alcoholics with significantly higher self-control abilities and strength to resist a temptation to drink, there was also significantly higher HRV patterns during experimental exposures to cues. Their investigation also found the reverse, where those more prone to relapse had lower HRV indicators. These findings suggest that using HRV biofeedback technology as a diagnostic and assessment tool can be an effective way to efficiently gauge the severity of presenting problems, and use this information for formulation of treatment goals, evaluation of treatment response, and review of progress. Segerstrom and Ness (2007) also hypothesized that the feedback may be helpful for clients, as seeing lower HRV scores may signal to the individual his or her fatigues in self-regulatory strength. The authors reasoned that this immediate feedback may serve as a learning opportunity and a source of motivation. For example, clients may increase in their self-awareness, as well as become more motivated to adhere to treatment so as to minimize risks for relapse.

Therefore, extending the use of technology to deliver timely and individualized psycho-education, assessment, and training components also promises to enhance intervention effectiveness, and lower resources utilization and burnout rate. Furthermore,

based on the Silverman's (2013) prediction of future trends, the use of technology in the provision of mental health services will grow exponentially, especially due to the recent emphasis on rewarding more efficient health care service delivery outlined by President Obama's Affordable Health Care Act of 2010. Therefore, the ability to save both financial and human resources in the long-term, as well as demonstrate the organizational ability to provide cutting-edge, evidence-based, more efficient solutions should be attractive to the organizational leadership.

Project Planning and Implementation

There are many new and exciting possibilities that are arising from trends in the integration of IT into mental health services delivery. Nonetheless, a comprehensive review is outside the scope for this dissertation and therefore the remaining sections will only provide some general highlights related to the process of integration of technology required for the use of Heart Rate Variability Biofeedback equipment. Although, it may appear a rather simple technological solution, as Legris and Collette (2006) pointed out, regardless of the size and complexity of a project, there are always risks for failed deployment. According to these authors, problems may arise if the project experienced weak implementation management, had uninvolved stakeholders, and held a certain disregard for social factors.. Therefore, to ensure successful integration of HRV biofeedback into addiction treatment, it is important to utilize the change management and project management best practices (Legris & Collette, 2006).

Project and change management are critical processes to be considered when an organization is in the process of planning for change in terms of types and methods of

services it delivers, and its resources. Alternatively, it is important to remind the implementation leadership to pay attention to some areas. For example, any project that aims to achieve its goals needs a champion: a person who will act as a leader and collaborate with all project stakeholders. Without a champion, and a buy-in from all stakeholders, projects may stagnate, run into many problems, or completely fail.

Therefore, after the inception of the project, the project manager becomes the responsible resource for planning, organizing, negotiating, coordinating project resources, and reporting on the overall status. A project plan is one tool, that a project manager may find helpful for scheduling tasks and updating and communicating progress (see a sample in Appendix A). Additionally, having a project outline can serve as a starting point for the project leadership, especially in the early stages of planning and coordination. For the project to be successful, Legris and Collette (2006) also recommend analysis of business requirements through conversations with all impacted stakeholders. These business requirements need to be gathered from all impacted stakeholders, such as those of senior management, IT and clinical staff, and clients. Once the scope of the project is negotiated and agreed upon, final deliverables are prioritized and divided into smaller, manageable tasks. To have an accurate estimate of the overall project, each tasks owner needs to provide an estimated time, effort, and dependencies for completion of their assignments. For example, although each project is unique, in technology-related deployments, some high-level tasks may involve an analysis of the existing system, a definition of requirements for future systems, presentation of viable options, and coordination of the purchasing decisions for new hardware and software (Legris &

Collerette, 2006). Once the equipment is acquired, the project can move on to installation and testing phases. Therefore, successful integration of technology into day-to-day functioning of organizations is a serious effort that requires committed leadership, detailed planning, appropriate resources, and a buy-in from all stakeholders.

Hardware and Software Options

As discussed above, each organization will differ in terms of its business needs, existing IT systems, technology readiness, and resources. Moreover, the larger technological trends prohibit one from making any practical and specific technology-based recommendations. The increasing rate of technological development would likely make any recommendation prematurely obsolete. Furthermore, there is an ethical and a professional dilemma of making recommendations, and unintentionally marketing one type of equipment over another. The intervention being proposed here took into consideration some of the deciding factors, such as the adaptability, affordability, accessibility, ease-of-use, and user-interface qualities. Based on the informal review of literature discussing the application of HRV biofeedback, and personal experience using this equipment, it appears that the Institute of HeartMath's patented system fits the basic requirements for this computer-based part of the intervention. Nonetheless, due to the unique needs of each organization and the rapidly evolving technological options, senior management is highly encouraged to conduct independent evaluations of vendors for HRV biofeedback, and compare their findings to the clinical, business, and technological requirements of their stakeholders.

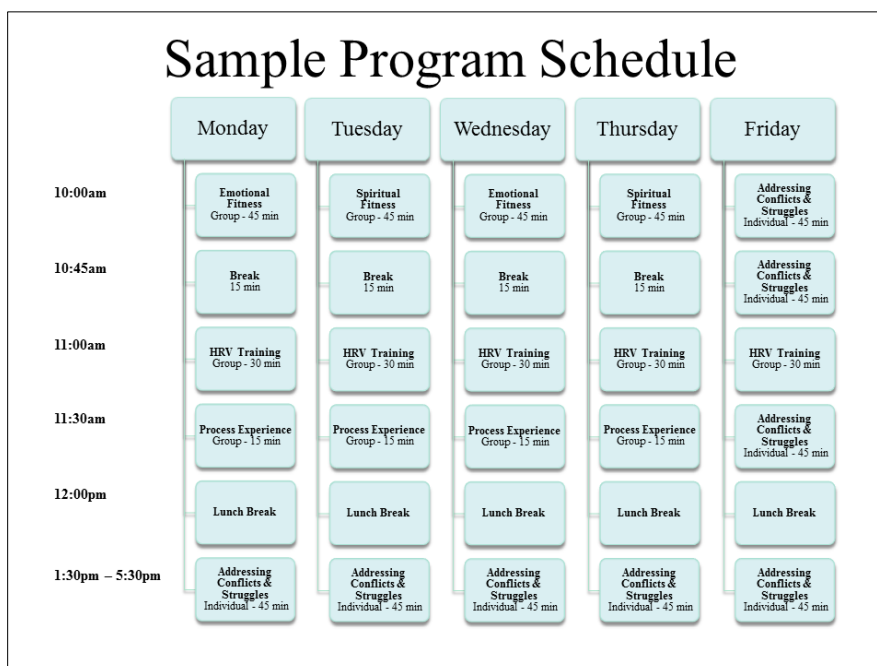
In conclusion, the Heart Rate Variability technology that includes the emWave® software plus the HRV pulse sensor (Heartmath, LLC, Boulder Creek, California) discussed here plays a major part in this proposed treatment package. With growing recognition of the potential benefits from IT integration into the clinical setting, addiction treatment facilities with plans to foray into technology-based interventions may approach this package as a positive step into an exciting, empirically-supported, and potentially cost-saving arena. Nonetheless, there are unique ethical considerations related to the use of technology in mental health, and these will be discussed later in the chapter. Meanwhile, the following sections will present some recommended for deployment of the Emotional and Spiritual Fitness components, including a sample Heart Rate Variability biofeedback protocol.

General Course of Treatment

The entire course of treatment proposed here, is expected to vary in length depending upon the need of the patient, severity of presenting problems, and duration of approved treatment. As discussed in earlier chapters, the limitations of time duration in treatment covered by the third party payers and the limitations inherent in client's high drop-out rates, there seems to be a rather small window of opportunity for clinicians to make their therapeutic impact. Therefore, the sequence and the intensity of treatment protocol described here takes into consideration these confines. Moreover, it is also acknowledged here that depending on the individual factors related to client's severity and chronicity of problems, some people will require a longer course of treatment (Gevirtz, 2003; Sokhadze, Cannon, & Trudeau, 2008). The three part intervention as

detailed below was designed to be delivered daily, and for five days of the week. It is important to highlight that delivery of the Emotional and Spiritual Fitness training alternate throughout the week. Meanwhile, to solidify all the didactic and experiential material learned earlier the HRV biofeedback training is designed to be delivered each day during the five-day week. The individual psychotherapy sessions, with their focus on addressing the psycho-spiritual struggles and internal conflicts are suggested to follow the group sessions. This is recommended so to help clients have time to process the information, as well as to give the clinician an opportunity to identify individuals who may require this type of follow-up during group interventions

Figure 4. Sample Program Schedule: This is a sample sequence of sessions scheduled throughout the week.



Promoting emotional fitness.

The Emotional Fitness component described here is based on the program developed by Algoe and Fredrickson (2011). This includes an educational component geared towards helping clients gain a better perspective on the nature of emotional reactions (e.g. the adaptive and maladaptive functions, the role of stress, and forms of self-regulation including the substances use.) This component of the overall treatment package consists of two weekly group therapy sessions, each lasting 45 minutes in duration. The first phase of the Emotional Fitness would consist of a brief introduction to the overall program objectives and is geared towards preparing clients by providing a general rationale behind emotional self-regulation and the use of adjunct stress-management and emotional self-regulation techniques. During this phase, clients would participate in didactic sessions with topics that would inform participants on the influential role of emotion in human psychophysiology and general well-being. The instructor would help clients learn to differentiate between feeling positive and negative emotions. Clients would learn how positive and negative emotions impact differently the clarity of thought, decision-making, impulse control, and stress management. Additionally, clients would discuss the way emotions may influence interpersonal relationships. Clients would also learn to differentiate between feeling stress and being relaxed. Another topic would be related to the formation, maintenance, and recovery from addictions, with the focus on the automaticity of emotional reactions in response to cues, and general methods for dealing with these habitual activations.

Readers of this dissertation may find more specific detailed topic discussions and relevant exercises in the books of McKay, Wood, and Brantley's (2007) and McKay, Davis, and Fanning's (2011). These publications provide educational material that can be readily applied in group sessions and guide the instructor through topics on mindfulness, interpersonal effectiveness, emotion regulation, and tolerance. Clinicians conducting these sessions may find additional guidance on emotional skills training in the integrative approach presented by Douglas Mennin (2007). This Emotion Regulation Therapy (ERT) was designed to provide clients emotional knowledge, somatic awareness, and skills for adaptive emotion regulation. Mennin (2007) encouraged therapists to help clients explore the manner by which they approached their emotions and their physiological components. Similarly, in the current intervention clients are also encouraged to explore their emotions. For example, as Mennin (2007) suggested, clients can be instructed to maintain a focus on their body without disengaging or attempting to control the experience. From this inward perspective, and growing from this self-awareness, clients can be taught to identify, label, and differentiate among different emotional states, and expand their emotional vocabulary. Furthermore, Mennin (2007) recommended educating clients about the informational value that emotions serves, as the role of the primary emotional reactions (e.g. fear, joy, anger, and sadness) is to provide specific information about action tendencies, associated meanings, and motivation for behavior. More specifically, clients can learn that, emotions are automated reactions to the discrepancies between goals or physiological needs, and one's ability to achieve them. In this sense, positive

emotions signal that goals were accomplished or are within reach, while negative feelings communicate that one's efforts failed to reach the goals (Mennin, 2007).

In the second phase of the Emotional Fitness component, clients will have an opportunity to explore in further detail a full range of skills and abilities for emotional self-regulation. These individuals would be taught to use specific techniques to reduce the frequency and duration of experience of stress and negative emotions. In parallel, they would also be offered a range of options for increasing the frequency of positive feelings and extending the state of relaxation. For example, clients would learn that anxiety as one of the emotional reactions activates the sympathetic system, which by its nature, counteracts the more relaxed parasympathetic system. When all critical resources are directed towards maintaining a state of vigilance and preparedness, the other systems in the organism suffer especially from chronic depletion. This tends to result in less than optimal state for learning and recovery (Algoe & Fredrickson, 2011; Moss, 2004). Therefore, individuals need to be given tools that quiet and focus their minds (Smith, 2005). For example, Garland and colleagues (2010) discussed ways that people can evoke positive emotions as well as be able to relax both physically and mentally. These techniques range from progressive muscle relaxation, to autogenic training, visualization, mindfulness, Loving Kindness meditations, and various forms of biofeedback (see Garland et al., 2010). A universally accepted technique for successful self-regulation involves training clients to draw their attention to their own breathing patterns. Through exercises clients are trained to be more self-aware, so that they can recognize internal and external cues to shift their breath towards more effortless (diaphragmatic) breathing

pattern. In short, diaphragmatic breathing exercises the baroreceptor reflex, which activates the parasympathetic system, and is a critical component required for reaching the state of holistic coherence (Bradley, McCraty, Atkinson, Tomasino, Daugherty, & Arguelles, 2010; Moss, 2004).

According to McCraty, Atkinson, Tomasino, and Bradley (2006), an individual is thought to be in the state of coherence, when two or more of the body's oscillatory systems (e.g. respiration and heart rhythms) become synchronized. Working with colleagues at the Institute of HeartMath, Childre and Rozman (2005) developed a self-regulatory technique they called the "Quick Coherence®," which was designed for self-generation of positive emotional states and creation of a cardiac coherence. The technique involves intentional evocation of a positive emotion through shifting one's attention to the area of the heart. It also entails positive thinking and regulating one's breathing patterns to become diaphragmatic (McCraty, Atkinson, Tomasino, & Bradley, 2006; Moss, 2004). This technique can be used anywhere and anytime, requiring no external aids. It can be effective in less than a minute. It is useful when used at the onset of distressing feelings such as frustration, irritability, anger, anxiety and sadness, and helps to keep these negative emotions from escalation. It can also be a powerful way to bring one's emotional reaction into balance, after a period of a lost control. Furthermore, from the regular use of such techniques such as the Quick Coherence®, the individual enters a state of psychophysiological coherence, presenting as more calm, alert, and available for learning (McCraty et al., 2009), thus creating the most opportune time to address the problematic areas of one's life using more cognitive approaches. The Institute

of HeartMath outlined the following steps for their Quick Coherence® Technique, as originally described by Doc Childre and Deborah Rozman (2005, pp. 44-45). For example, their first step involves instructing the client to bring his or her attention on the area around his or her heart (i.e. area in the center of one's chest and behind the breastbone). The second step involves instructing the client to begin to breathe deeply and slowly, while still maintaining his or her focus on the area of the heart. The goal here is to help the client feel as if his or her breath is coming in and going out through the heart area. While continuing to breathe at an average rate of six breaths during inhalation and six breaths during exhalation, the therapist instructs his or her client to find a natural inner rhythm, which would create comfort. To achieve this ability, therapists can advise their clients to breathe abdominally, while exhaling through slightly pursed lips. If this is apparently bothersome to the client, one can advise them to return to normal breathing pattern for a while, so to avoid either hyperventilation or hypoventilation. The final part of this technique involves activation of a positive feeling. Therefore, the therapist would ask the client to maintain his or her focus on the area of the heart and to continue breathing deeply and slowly. Meanwhile, the client would be asked to recall and attempt to re-experience positive feeling, e.g., a time when he or she felt exceedingly good inside. According to Childre and Rozeman (2005) this is the most important step, and if the client is struggling with remembering a positive emotion, the therapists may need to suggest remembering a special place he or she has been to or the love felt for a close friend, family member, or even a beloved family pet (pp. 44-45). Since the practice of effortless breathing during commonplace activities in diverse settings is critical to overall

success, Shaffer (2013) recommended for clients to practice the Quick Coherence® technique at least 20 minutes daily. Furthermore, according to Smith (2005), learning relaxation and ways to self-generate positive emotions, like acquiring any other new skill, may take longer than one month. Since many individuals in addiction treatment have limited days for accomplishing these goals, using HRV biofeedback presents as a natural adjunct to help individuals to become more masterful in cultivating positive emotions in less time (Moss, 2004). Therefore, in the third phase of the Emotional Fitness program, individuals are encouraged to practice these skills, including the Quick Coherence® technique. What makes this intervention different from other emotion regulatory interventions is that it includes the HRV biofeedback.

A number of researchers (Bradley et al., 2010; Childre, & McCraty, 2001; McCraty, Atkinson, & Tomasino, 2001; McCraty & Tomasino, 2004) have successfully paired this process with the use of equipment that measures and feeds back one's progress. What enhances and solidifies the learning of the Quick Coherence®, or any other relaxation training technique, is the provision of real-time physiological data regarding one's self-regulation, and the achievement of overall systemic coherence. This is made possible by the latest advances in biofeedback technology, which was designed and developed through a close collaboration with Quantum Intech, Inc. (Boulder Creek, California). A new HRV feedback patented systems called emWave® system (Heartmath, LLC, boulder Creek, California) replaced the older Freeze-Framer technology (Childre, 1994; McCraty & Tomasino, 2004). The unique feature of this product is that it uses a photoplethysmograph sensor (PPG) to detect the pattern of the

variations in the beat-to-beat of the heart by a simple, single point of attachment to a finger or an earlobe. The recording of the beat-to-beat variations is then translated through the patented software application and displayed on the computer screen as a colorful, analog or graphic that plots them like sine waves, as well as a recording of the cumulative ratio of time spent in either Low, Medium, or High coherence (McCraty, Atkinson, & Tomasino, 2001).

When the Quick Coherence® technique (Childre & Rozman, 2005) is practiced in combination with the HRV biofeedback, the trainee sees the results of his or her own efforts on the computer screen and is able to experiment to find the most personally appropriate approach. This procedure is relatively simple, non-invasive, nonverbal, and provides immediate feedback (Tiller, McCraty, & Atkinson, 1996). Another advantage of this software is that it can be adapted to each individual's personal preference and abilities. The skills for self-regulation are further honed through a variety of included games. The opportunity to "play" is visually engaging and less threatening to the trainee, and thus increases self-motivation. Ongoing empirical studies have demonstrated that as the individuals continue to use the Quick Coherence® technique in combination with the emWave® biofeedback (Heartmath, LLC, boulder Creek, California), they begin to exhibit a significant increase in parasympathetic activity and smoother and less irregular heart rhythm patterns, in as few as four 30-minute HRV training sessions (Shaffer, 2013).

During the time of practices, trainees observe their own effectiveness increases in impacting the state of coherence, in addition to the emergence of the state of relaxation. Individuals also benefit from the increased sense of self-efficacy. The state of increased

self-confidence should be a welcomed change especially for those individuals with chronic addiction, who may have attended years of “treatment,” and yet have seen little progress. The use of technology in general and computer games specifically may be also attractive to some individuals who grew up in the generation of video and computer games. On the other hand, some individuals may find technology intimidating, and therapists may need to approach such individuals with care and patience. Moreover, it should be noted, that the use of HRV is intended only as a temporary supportive feature until self-regulatory skills have been mastered, after which the reliance on the external tools would be phased out. Since self-regulation and stress resilience have such broad implications in health, well-being, and overall functioning, it is hoped that the ripple effect of recovery resulting in this area will carry over to activate recovery in another areas of human experience. Hence, this process would become truly holistic in its nature.

Promoting HRV coherence.

The protocol recommended here is based on a combination of steps outlined by Peper, Tylova, Gibney, Harvey, & Combatalade (2008), and described by Shaffer (2013). This protocol involves daily, 30-minute HRV training sessions. Each session includes (a) 3-minutes of instruction on the use of equipment; (b) 3-minutes of baseline assessment; (c) 3-minutes of using the self-directed coaching session (becomes optional after mastering basic skills); followed by (d) a set of six 3-minute training segments; finally concluding with (e) 3-minutes of post-baseline assessment (Peper et al., 2008, pp. 283-320; Shaffer, 2013). It is also important to mention, that while the emWave® technology (Heartmath, LLC, boulder Creek, California) was designed to have an intuitive computer-

human interface, and its use may not require any extensive training, it is highly recommended that therapists new to the biofeedback technology become familiar with some of the theoretical and technological background prior to their initial use (see Peper et al., 2008, pages 283-320; Moss, 2004).

Shaffer (2013) reminded clinicians to be attentive to any client(s) who either verbally or non-verbally demonstrate significant difficulties in applying the Quick Coherence® technique and achieving any success in self-regulation. This may become evidenced through a higher ratio of time in the low coherence and depicted by a rugged and irregular wave throughout all of the training segments. In such instances, the clinician may be required to dedicate time to work with these individual clients and address the areas of need. As Shaffer (2013) found, some of the common areas of difficulties may require clinicians to adjust expectations for clients by lowering the goal (i.e. instead of striving to breathe at 6 breaths per minute, clients may need to start out by breathing at higher rates).

Promoting spiritual fitness.

The next major component of this overall program is Spiritual Fitness training, based on the proposed program by Pargament and Sweeney (2011), and a pilot integration study conducted by Rosmarin and colleagues (2011). As described in chapter four, this program consists of three main domains, which include: (a) becoming aware of spiritual-self and spiritual strivings; (b) learning about a broad range of resources for cultivation of the spiritual-self and planning for spiritual destination; and (c) developing a relationships with the spiritual-other (Pargament & Sweeney, 2011). However, there is

another implicit goal of the Spiritual Fitness training. This was also discussed in earlier chapters and is related to the ability of religious practices to set the stage for the future increases in the abilities and strengths for self-regulation and self-control (McCullough & Carter, 2011).

The training proposed here differs only slightly from the one outlined by Rosmarin and colleagues (2011). For example, in the length of the session depicted in their pilot stand-alone group psychotherapy was about 50 minutes. In contrast, in the current protocol the duration is shortened to be delivered within 45 minutes. Another notable difference is that the original pilot included individuals who were preselected to be open to spiritual interventions, while the program suggested here requires more flexibility to be open to a broader group of clients.

During the initial phase, which is geared towards increasing clients' awareness of their spiritual-selves and investigating unique spiritual strivings, clinicians would begin by providing psycho-education on the relevance of spirituality to psychiatric symptoms. Similar to the group format presented by Rosmarin and colleagues (2011), the introductory segment would consist of 12-15 minutes of discussions about the roles of spirituality in people's lives. Here, participants would be asked to reflect on their unique spiritual beliefs and religious practices. They would be engaged in a discussion and encouraged to share personal experiences about ways that spirituality may have been relevant to their own symptoms. During the next segment, the clinicians would share with the members of the group summaries of relevant research, in a format that is written to be highly relatable to individual's lives and easy to follow. The use of vignettes and short

stories would likely prove to be highly effective (see Pargament, 2007). Topics covered here may include research and stories about the way spirituality has long been linked to better health, general well-being, and life satisfaction. Clinicians may also include findings about the roles of spirituality and religiousness in terms of prevention and recovery in addiction. Next, clinicians would contrast these findings with ways that spirituality and religiousness may also lead to disintegration.

Clinicians would highlight areas where spiritual struggles may impede any progress or turn participants away. For example, as Rosmarin and colleagues (2011) have done in their session, clinicians would discuss the three main groupings for spiritual struggles: (a) interpersonal struggles with clergy or congregation members; (b) intrapersonal struggles involving fundamental spiritual/religious doubts or existential crises; and (c) divine struggles that reflected a sense of detachment, mistrust, or even anger towards God. The participants would be educated concerning these struggles and the way that other types of psychosocially-bound symptoms are related to mental health. They would be invited to explore these areas in individual sessions with their therapists.

According to Pargament (2007) the process of spiritually integrated psychotherapy should begin with some general, yet informal assessment of client's baseline spirituality. A variety of instruments are now available (see list of options in Pargament, 2007, p. 234). However, using a self-report measure in the setting of drug and alcohol treatment facilities may be challenging. Instead, he suggested engaging clients in a natural therapeutic conversation, by asking them to tell their spiritual story. This approach is likely to be already familiar to some, especially for those individuals who

experienced a similar exercise that involves sharing of one's life-story in the context of traditional Twelve-step meetings. Pargament (2007) compiled a list of some open-ended questions that clinicians can adopt as ways to initiate the conversation, and seek to identify patterns in the responses from clients. These may indicate the direction and the quality of client's spiritual integration. The clinicians should also aim to understand how their clients tend to organize the meaning of the sacred in their lives, and not only learn about the facts of their spiritual beliefs and practices (Delaney, Forcehimes, Campbell, & Smith, 2009). Therefore, in the following 15-20 minute segment of the Spiritual Fitness training, clients would be instructed to identify the types of spiritual beliefs and notions they tend to hold from a list of statements. Clients would also be likely to be instructed to gauge their emotional responses to each statement and identify at least one that they felt to be the most personally meaningful and comforting. They would then discuss these reactions in their individual sessions and/or in the context of the group.

Pargament (2007) urged clinicians to be particularly alert to any signs of a spiritual struggle that have features of internal conflict and emotional distress. He warned clinicians about the subtle nature of these conflicts, as many clients are either unaware of them, or feel a need to actively avoid their exploration. As this concept was already touched upon in earlier chapters, experiencing an undercurrent of negative emotions, especially related to fears and anxieties of social disapproval and interpersonal rejection, create an internal tension among different goals and impulses (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Rawn & Vohs, 2011). Such internal conflicts, including those with spiritual and religious content, drastically deplete the limited self-regulatory

and self-control resources, and in the process increase risks for relapse to all sorts of problematic behaviors (Rawn & Vohs, 2011; Wagner & Heatherton, 2011; Sayette & Griffin, 2011). Pargament (2007) outlined some of the most frequently reported spiritual struggles that place them at much greater risk for psychological and physical problems. These include greater risk of mortality as well as signs of spiritual resilience that appear to counterbalance the impact of internal and external vulnerabilities. For example, in the current intervention and according to Pargament's (2007) recommendations, during the early phase of the Spiritual Fitness group sessions, and during the individual sessions clinicians would pay attention to themes such as client's perceived relationship to God, the clergy, religious community, and spiritual-self that would indicate signs of disintegrations. Clients may depict their view of God as a punishing, hateful, resentful, neglectful, and absent. They may doubt God's love, and wonder about the "evil forces" having more influence on the events and life circumstances. They may present with themes exemplifying existential doubts, fears, and anxieties. Similarly, clients with poorly integrated spirituality may describe their doubts about their own faith, and a belief in religious leaders. They might also speak about the sincerity of their religious peers.

Meanwhile, more healthy signs of spiritual integration would likely present as clients' feelings of connection to something larger than themselves. They may describe this process as engaging in prayers and meditations that would indicate a desire to feel closer to God, or looking for ways to learn lessons from problems. This may also manifest as seeking forgiveness, and finding other ways to build a stronger relationship with their Higher Power. Clinicians may find such clients to be likely to show more

appreciation for the sacredness of life's moments, and to frequently exhibit patterns of living consistently and in accordance to the higher ethical and moral standards.

Moreover, these clients would likely discuss their connection to other people (e.g. family members, friends, community members, and with their religious leaders) more positively, and speak about their desires to be an active agent in making the world a better place (Pargement, 2007).

The next 10 minutes of the group are geared towards helping clients learn about a broad range of resources for cultivation of the spiritual-self and to aid in planning for spiritual destination. For example, clinicians may engage members of the group (or individual clients) in series of spiritual exercises, such as "Counting Your Blessings" and "Remembering Miracles" (Rosmarin et al., 2011, pp. 295-296) and introduce them to different types of prayer (Newberg & Waldman, 2009). In this segment, participants would also be presented with an overview of self-care strategies (e.g. medication compliance, regular physical exercise, nutrition, and sleep hygiene). Clients would learn that regular spiritual and religious practices are "an important part of many people's self-care regiment and that "particularly in the times of stress, it can be important to attend to both physical and spiritual self-care" (Rosmarin et al., 2011, p.293). Among a number of techniques and exercises, clinicians would also work with clients to help them recognize some of the common cognitive distortion, and help them challenge their own misperceptions, replace these distortions with healthier alternative ways of thinking, and regularly use more positive declarations (Rosmarin et al., 2011). One of the key messages of the program involves clinicians' strong encouragement of a regular use of these

practices for sustaining currently observed benefits, as well as increasing overall effectiveness over time. Clinicians would likely help clients to understand the importance of this message if they describe the need for consistent and regular practice in terms of building and strengthening the “spiritual and emotional muscles.”

A vital component of this overall program and the Spiritual Fitness training is the ability to address some of the spiritual and emotional struggles in individual psychotherapy. While the context of a group provides valuable opportunities, there are also some limitations that can be minimized by giving the chance to discuss such personal issues one-on-one with a clinician. Within 45 minutes allotted to meeting individually with clients, clinicians would find a special advantage to addressing observed patterns of spiritual dis-integration or emotional difficulties. The intent of using individual psychotherapy sessions is also in line with a standard drug and alcohol treatment options, and therefore would not require any major organizational changes. Furthermore, since helping clients resolve any intrapsychic conflicts and relational difficulties are the mainstay of psychotherapy, it seems that almost any type of psychotherapeutic approach (e.g. cognitive-behavioral, psychodynamic, or dialectical) would be perfectly applicable.

Since working with spiritual and religious content may pose many ethical risks, it is advisable to tread carefully, and consult with other professionals (Plante, 2008). Therefore, as was recommended by Smith (2005) this segment of the intervention would likely begin by some variation of the following introduction for their clients of the intent of using psycho-spiritual intervention:

“Secular psychologists (social workers, counselors, psychiatrists) are not qualified to consider matters of the supernatural and paranormal. However, we recognize that many spiritual activities can be profoundly meaningful and contribute to relaxation, regardless of one’s religious orientation. Similarly, music, dance, and poetry are not the exclusive property of any one’s religion, but can be profoundly meaningful in any religion as well as in the secular world. The techniques we can explore are like music, dance, and poetry. They can work for both faithful and nonfaithful alike. Are you interested in exploring some of these techniques?”(p .335).

During this component of the treatment package, clinicians would point out to the clients the likelihood of having limited and a naïve understanding of the spiritual concepts. As Pargament (2007) observed, that “one of the oddest things about religious education is that it often ends just when it should be beginning” (p. 137). This means that even among those individuals who grew up familiar with spiritual and religious concepts, due to their developmental level at the time they only learned information that was accessible at that cognitive level. Therefore, clients as adults with more mature capacity to “tolerate, integrate, and learn from paradox,” (Vaillant, 2008, p. 206), may be ready to replace their child-like conceptions of what is divine and what they considered as sacred with more sophisticated spiritual concepts (Pargament, 2007). Therefore, the clinician and the client would collaboratively look at how the client may perceive his or her relationship with the divine. For example, clients would be encouraged to engage in a two-way conversation with God, and imagine God’s response. If the client would respond with signs of disintegration (i.e., a distant, uninvolved, uncaring, or even angry God) the therapist would challenge such dysfunctional perceptions and explore their maladaptive nature. Clinicians can also help their clients to identify and diminish the influence of the “false gods” (Pargament, 2007, p.279). As described by Pargament (2007), these false

gods are inadequate substitutes for genuine spiritual strivings that tend to manifest in people's lives as addictions (e.g. addiction to drugs, alcohol, sex, anger, power, and relationships), as obsessions with oneself, other people, or acquisition of material objects. Similarly, therapists would also be alerted to any discussions of a devil or demonic forces, especially if the client is engaging in demonization of him or herself, or of others, as this may be a strong sign of spiritual dis-integration. As Pargament (2007) indicated, these internal conflicts with the sacred should be made explicit. This exploration should be pursued despite being at risk of causing distress to a client. The clinician would also help clients normalize the conflicts, so that the feelings of shame, fear, and embarrassment are alleviated.

As discussed previously, negative emotions (e.g. anger, fears, shame, guilt, sadness, and anxiety), can be destructive cognitively, emotionally, relationally, and spiritually. These feelings can interfere and lower the effectiveness of psychotherapeutic and spiritual interventions. On the other hand, positive emotions (e.g. hope, joy, kindness, forgiveness, compassion, and love) have the potential to heal emotional wounds, improve physical well-being, and improve relationships (Newberg & Waldman, 2009; Vaillant, 2008). Furthermore, along the long and arduous path of going through all steps of the AA Fellowship, individuals are acquiring the ability for empathy and compassion and to reach the final twelfth step of being in service to their Higher Power (Taub, 2011). Therefore, the final component of this Spiritual Fitness training is intended to build on the skills learned and insight gained throughout this "emotional and spiritual boot-camp," and to use the Heart Rate Variability biofeedback to practice sending gratitude, love, and

compassion outward. The hope here is that the visual and the psychophysiological experience will strengthen the given client's ability to evoke this sensation on demand, as he or she continues to work spiritually after completing the program.

As the Emotional Fitness training progresses, the ability and the sense of self-efficacy to generate positive emotions and to reduce stress would likely increase with each session, especially since the use of HRV biofeedback is an integrated component. The Spiritual Fitness training is geared towards broadening and deepening clients' conceptualizations of the sacred, increasing access to spiritual resources, and for removing any spiritually-related internal conflicts. The final stage of this program would join the emotional know-how with the spiritual know-how, and from this combination utilizing the HRV biofeedback, help clients experience a state of spiritual coherence. The following segment is based on the modified version of Newberg and Waldman's (2009) exercise called "Sending kindness and forgiveness to others" (p.206-209), and is combined with the Institute of HeartMath's Quick Coherence® technique as developed by Doc Childre and Deborah Rozman (2005, p.44-45).

The clinician would use a version of the following exercise, which would require connecting the client to the HRV biofeedback equipment (i.e. the pulse sensor), and starting-up the emWave® software (Heartmath, LLC, Boulder Creek, California). The client would be instructed to sit comfortably and quietly, and to begin following the three steps of the Quick Coherence® technique (Childre & Rozman, 2005, pp. 44-45). Once the state of high coherence is achieved, the clinician would instruct the client to use the visualizer screen of the emWave® software (Heartmath, LLC, Boulder Creek,

California), an interactive way to imagine that the increase in flow of the “energy” (as depicted on the screen as the flow of heart or stars) is God’s love and compassion. This energy would be imagined by the client as being radiating towards the client from the sacred source of all. The client would be then instructed to begin accepting this “Godly love” to him or herself, by repeating the following prayer 10 times: “God loves me. God’s love is filled with warmth, kindness, forgiveness, and peace. God intends for me to be happy, and I receive this blessing with an open heart.” The clinician would then direct the client notice gently, without judgment, the way that this may have changed client’s feelings. The client would be encouraged to continue to visualize the warmth around the heart area, and feel the positive energy coming from the Higher Power warming, healing, and protecting him or her. The client would be reminded to smile gently as he or she visualizes this flow of energy, and to breathe diaphragmatically.

The next step would involve directing the client to repeat the same process, and alter the prayer to send the energy and love towards someone whom the client loves (i.e. a close friend or family member, or even treasured pet). The clinician would encourage the client to keep repeating this process, until the client feels a warm, compassionate attitude toward that person. The clinician would suggest to the client to smile gently, as he or she visualizes this flow of energy. The clinician may decide to use a different “visualize” screen, if this would enhance client’s ability to imagine him or herself becoming the channel for God’s energy. As the client’s HRV coherence increases, including the positive feelings, he or she would also see the increase in flow of the “energy,” as it would be depicted as an increase in the flow of the hearts or stars on the

screen. The clinician would instruct the client to imagine that the imagery on the screen is representative of God's healing energy, love, and compassion and that being radiated through the client towards that person. The client would be gently instructed to repeat the following prayer 10 times, and ask the client to imagine sending the energy towards first the person he or she loves, then the person he or she likes, and finally a person he or she may not like: "God's love is filled with warmth, kindness, forgiveness, and peace. God's energy and love are endless. God sends his love, healing, and compassion through me and I am God's channel for his energy. May you now be filled with this warmth, kindness, forgiveness, and peace." The clinician would gently remind the client to continue to visualize the warmth around his or her heart area, and feel the positive energy coming from the Higher Power, which is also warming the person who the client chose to direct the flow towards. The client would be instructed to imagine this person being healed, and protected in a warm glow. As these exercises continue, (always gauging the client's progress), the clinician would instruct the client to keep enlarging the circle by generating love to as many different people as possible (e.g. members of the treatment group, AA/NA, neighbors, colleagues). The client would again be reminded to take a nonjudgmental view of how his or her feelings may have shifted, as his or her state of coherence also increases. The client would be guided to observe any changes in his or her mood, posture, and muscle tone. The client would be given a recommendation, to decide to keep this positive feeling for the rest of the day, and to use the Quick Coherence® technique (Childre & Rozman, 2005, pp. 44-45) at any stressful moment (Newberg & Waldman, 2009).

The techniques provided here are powerful ways to improve the client's mental, emotional, physical, and spiritual well-being. They are designed to evoke and sustain positive emotional states, such as sincere appreciation, connectedness, and compassion. However, they are only as good as the amount of time and effort clients are willing to invest into using them. Therefore, when practiced daily, they hold the potential to eventually teach clients to automatically respond with self-compassion to the challenges of life and to enhance their compassionate response toward others. Similarly, they would help clients to increase energy in the moment and enhance resilience for future challenges. Therefore, clients should be instructed to use these practical tools immediately at the first signs of feeling overwhelmed by stressors, facing a difficult decision, or experiencing an internal struggle.

Limitations

The treatment proposed here was never intended to replace the traditional interventions used in substance misuse treatment. However, even as an adjunct, there are a number of potential challenges to the success of these interventions. Chronically substance-abusing populations tend to be difficult to treat, due to many factors discussed, including the high frequency of co-occurring mental health problems (Shaffer, 2013). Therefore, therapists are encouraged to use their clinical sense in order to select individuals for whom some or all components of this treatment package may be counter-therapeutic. For example, individuals not yet detoxified from chemical substances, or those who have recently been treated with a certain pharmacological agents, may not demonstrate any substantial increase in their HRV coherence. For example, Shaffer

(2013) discussed some of the known effects of certain prescribed and illicit drugs in the system that may pose difficulties for people's ability to up- or down-regulate their heart-rates, resonance frequency breathing, and mindfulness. Conversely, as traditional treatment of addiction in general and the inclusion of biofeedback training have shown, individuals with a wide range of comorbid psychological illnesses can benefit from this intervention. For example, recent experiments by Kim and colleagues (2013) demonstrated that even individuals with severe, chronic brain injury can modify HRV through biofeedback. Additionally, as discussed in terms of common treatment factors, the importance of therapists' attitudes and belief in the effectiveness of treatment are as critically important as the active ingredient of the treatment itself. As Bohart and Tallman, (2010), Beauregard (2007), Benedetti et al., (2005), and others have discussed, adapting a hopeful attitude towards the potentiality of these interventions will initiate client self-healing processes. Therefore, despite some possible counter-indications, therapists should attempt to engage as many clients in treatment as possible.

At this point, it is also important to impart some words of warning. As Smith (2005) and Shaffer (2013) noted, before beginning the breathing exercises, it is important to identify clients who may be suffering from a severe respiratory disorder, abdominal pain, chest injury, or weakness. For such clients, excessive use of breathing or diaphragmatic breathing can cause hyperventilation, and lead to exacerbation of their symptoms or even harm to their health. Therefore, close consultation with a qualified specialist is critical before they can be included in Quick Coherence® (Childre & Rozman, 2005, pp. 44-45) plus the HRV training.

Additionally, another set of limitations may arise from the technological challenges involved in the deployment of the HRV biofeedback intervention. The organization's ability to invest resources in the technology may be limited, and this would compromise the intervention's intended experiential benefits. Although, the emWave ® HRV technology (Heartmath, LLC, Boulder Creek, California) is relatively intuitive to use and does not require any specialized training, some fundamental educational and hands-on experience is required. Therapists that are unfamiliar with the theoretical and practical aspects of this technology are likely to lack the ability to properly assess, train, evaluate, and address any issues.

Lastly, since the intervention discussed here encourages the therapists to enter the realm of the spiritual, this may bring up a number of serious ethical and moral concerns. First of all, as per Pargament's (2007) reminder, the therapists should keep in mind that spiritual resources are meant to facilitate the client's relationship with the sacred, and therefore need to be recognized and treated with respect. The content of this treatment is not focused on any one type of spiritual belief, but rather encourages a spiritually-conscious, holistic view of human existence. The individual therapists are not required to be religious, nor specialists in one or many world traditions; however, they do need to be genuinely open and comfortable to explore these topics with their clients and most importantly within themselves.

Regardless of their own spiritual acumen and experience, therapists need to be authentic in their beliefs and practice within these personal and professional boundaries. They should take care not to impose their own beliefs or disbeliefs on their clients, but

rather help their clients in clarifying and overcoming barriers for the use of their spiritual resources. In those circumstances, where the therapists bring with them a specific set of beliefs and practices, it is important that he or she tread carefully so as not to overstep the ethical and moral values (Plante, 2008). For example Tan (2003) provided a review of some of the major potential pitfalls inherent in integration of spirituality into psychotherapy. To highlight some of the areas that greatly increase the risk for ethical violations, Tan (2003) and (Plante, 2008) have outlined recommendations for therapists to be mindful of being drawn into potential dual relationships (religious and professional). They also highlighted risks of becoming the idealized version that may displace or assume religious authority for clients. More frequently, the authors said that risks may include therapists willingly or unknowingly imposing religious values on clients and or misusing spiritual resources like prayer and the Sacred Scriptures. Some therapists may also be at higher ethical risks for misapplication of religious interventions in situations and with problems that require medical or psychological treatments. As any other professionals, psycho-spiritually oriented therapists may also be at risk for violating work setting boundaries, practicing outside the boundaries of professional competence, and also becoming embroiled in superstition or trivializing what their client's consider as sacred (Pargament, 2007; Plante, 2008; Tan, 2003). Since it is one's professional obligation to stay current with the developments in his or her field of practice, the above stated authors urge clinicians to adapt a regular practice of reviewing the given ethical code of conduct published by the appropriate regulating organization and read latest

scientific literature on the appropriate integration of spiritual interventions into addiction treatment.

Future Research

The application of emotionally and spiritually-based interventions are a rapidly growing area of research. Due to rapidly advancing modernization of technology, the Heart Rate Variability biofeedback is also becoming an area of interest. Future research should address the combination of these fundamentally different modalities, especially when they are integrated into addiction treatment. Researchers should investigate the optimal balance of HRV training with standard treatment. Although a case can clearly be made for the usefulness of HRV in training emotional self-regulation, investigators should consider whether this (a) can be accomplished within the limited time and space of AOD addiction treatment facilities; (b) results in statistically significant benefits or interferes with the standard evidence-based treatment; and (c) is acceptable to the clients and the therapists. Research should also investigate the appropriate balance and universally acceptable didactic material for the Spiritual Fitness training. While some researchers have stepped forward with a variety of modified treatments that now include a spiritual component, this area is still in its infancy. Going forward, researchers may design and evaluate the potential effectiveness of using Motivational Interviewing as a possible method for increasing motivation for spiritual exploration. Equally interesting would be to design and evaluate the effectiveness of using brief-therapy, such as Lester Luborsky's (1984) Core Conflictual Relationship Theme method, to address any spiritual conflicts.

Summary

All types of addictions are harmful to individuals and society. Due to alcohol's ubiquity and accessibility, its misuse continues to be a major global problem. While drinking alcohol poses little harm to many individuals, there are some individuals that appear to be at particularly high risk for developing an addiction. The most salient problem with the addictions is that, once developed, they are difficult to treat. This is especially true for substance use disorders, because the chemical in the substances consumed mimic the same reward circuits of the brain, giving the individual control over its consumption, therefore providing a powerful incentive to pursue the behavior. On the other hand, when the substance is withdrawn from the system, the psychophysiological reaction resulting from the organism's attempt to bring about homeostasis is experienced aversely by the individual. To avoid this experience of distress, most people in this situation relapse back to using the substance. Individuals tend to rely on alcohol, and/or other chemical substances, as a way to self-regulate emotions that they wish to either augment or diminish. Additionally, many individual with chronic substance misuse history tend to present with co-occurring disorders, including cognitive deficits and emotional dysregulation. Research has found some correlations relating to the prefrontal cortex, executive functions, self-regulation and self-control, and the problems of dysregulation associated with substance abuse. These deficits are hypothesized as either predating the long-term alcohol consumption, resulting from it, or most frequently, including them both. Such comorbidity seems to create a compounding degree of complexity in being able to treat alcoholism.

Many factors are involved in both relating to the internal states and traits of the individual entering treatment, and the external milieu. For example, one's willingness, ability, and readiness are critical components for success in treatment and ultimate recovery. Similarly, the type, intensity, and duration of treatment represent the three main legs upon which the treatment outcomes depend. However, in the contemporary world, the pressure is to lower the cost of doing treatment, which often translates into compromising the stability of one or all of those legs. Therefore, the focus is shifting to preparing clients for a life-long recovery process that takes place outside of the addiction treatment facilities. This usually takes the form of joining the Twelve-step programs of the AA Fellowship. Client's drop-out rates both from the addiction treatment and the AA is legendary. Therefore, the challenge discussed in this dissertation has been in isolating those critical shared curative factors that can be bolstered to help better prepare clients for self-directed recovery, increase their treatment compliance, and reduce drop-out rates.

What seems to be an important area for treatment is related to strengthening the given client's self-regulation and self-control abilities. I reviewed the few most common and empirically-supported therapeutic options as well as some of their salient limitations. I also presented evidence of the salubrious effects of spiritual and religious practices in general well-being and alcohol treatment specifically. It seems that there are ways to train self-regulation of emotion in a sustainable and holistic way. The treatment being recommended here was two-pronged, yet with a common critical component that promises to intensify and enhance these two interventions. The first side of the treatment was presented as the Emotional Fitness program that would reintroduce the clients to

their emotions through a series of didactic sessions, and experiential exercises using the latest biofeedback technology. This Heart Rate Variability (HRV) technology, found to measure the variations in the beat-to-beat patterns of the heart, is the optimal component that provides individuals with immediate and direct information on their own ability to evoke positive emotion. Therefore, while the “top-down” component of the Emotional Fitness would provide information through psycho-education, the “down-up” component would allow clients to put these ideas into practice. The second part of this protocol involves developing the client’s Spiritual Fitness. Similar to the emotional training, this series of sessions would introduce clients to the psycho-education on the topic of spirituality, helping them explore the areas of its well-integration or dis-integration in their own lives, and addressing any spiritual conflicts. Since internal conflicts, including those of spiritual nature, are known to predict broader psychological distress and pathology, I recommended for the therapist to target these and utilize the psychological skills to help their clients reach resolution. Since some clients identify themselves as non-spiritual or non-religious, the therapists are encouraged to present the idea of spirituality as “a search for the sacred” (Hill & Pargament, 2008, p.4), and thus may include all types of creative human endeavors that “raise their spirits.” The spiritual training would be also paired with the HRV training, and the exercises used would involve experimentation with various forms of prayer, meditation, and contemplation (Rosmarin et al., 2011). HRV biofeedback is also an optimal resource for exploring the spiritual and transcendental states, as it allows practicing the states of peace, joy, acceptance, forgiveness, connectedness, and compassion. The integrated use of the emotional and spiritual know-

how along with the HRV biofeedback have been hypothesized as the needed preparatory components for reducing individual's distress, and equipping them with a sense of self-efficacy to benefit best from the addiction treatment at the clinic as well as from their future attendance at AA.

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