

A Self-Regulation Model of Recovery from Psychiatric Disability

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The process of writing this dissertation has been a remarkable intellectual and personal journey, more satisfying than I either hoped or imagined when setting out, and marked by encounters with extraordinary ideas and the people behind them. The influence of my social worker mother, Eleyne, is clearly reflected in my choice of field, and Sunday lunches with my father, Joel, and his engineer/physicist colleagues are no doubt responsible for the initial analogy between human behavior and the perturbation of a physical system in dynamic equilibrium.

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Chapter I

INTRODUCTION

Background of the Problem

It is widely recognized that many people with serious mental illness experience severe distress and disruption of their goal and role functioning, and there is widespread and growing interest in personal recovery as a positive response to that distress and disruption. There is considerably less consensus as to what, precisely, constitutes “recovery” in this context, and what psychological mechanisms might underlie it. This thesis will briefly survey the thinking about recovery from psychiatric disability, then propose and test a self-regulation model of goal structures, skills, efficacy, and affect to improve our understanding of this important phenomenon.

The distress and disruption experienced by people with serious mental illness may be caused directly, by psychiatric symptoms, or indirectly, by psychosocial sequelae. In either case, these effects may involve both a decrease in positive activities and/or resources, and an increase in threats. Many types of symptom-based distress have been reported, including the trauma of psychotic symptoms (e.g., Frame & Morrison, 2001), the psychic pain of depression (Fan & Wu, 2007), and impaired

functioning in social (Chovil, 2005), work, and school settings (Driessens, 2007). Psychosocial sequelae may include traumatizing treatment (Centofanti, Smith, & Altieri, 2005) or exposure to traumatic events during treatment (Cusack, Frueh, Hiers, Suffoletta-Maierle, & Bennett, 2003), loss of community (Mezzina et al., 2006), loss of employment (Driessens, 2007), loss of child custody (Park, Solomon, & Mandell, 2006), school drop-out (Breslau, Lane, Sampson, & Kessler, 2008), imprisonment (Cloyes, Wong, Latimer, & Abarca, 2010), and homelessness (Greenberg & Rosenheck, 2008). Often, the lines between direct and indirect harm are blurred, and both aspects may contribute to some harms, such as excess mortality (Piatt, Munetz, & Ritter, 2010). The common disruption of identity and sense of self may also be attributable directly to the illness, or mediated by intervening losses, including those referenced above (Shea, 2010).

Given the painful consequences of serious mental illness and the limitations of existing treatments (Connolly & Thase, 2011; Falkai, 2008; Gonzalez-Isasi, Echeburua, Liminana, & Gonzalez-Pinto, 2011), it is not surprising that alternative conceptions of “recovery” have become increasingly important in public discourse on the topic. Contexts include national policy statements (*New horizons: A shared vision for mental health*, 2009; *SAMHSA's working definition of recovery updated*, 2012), endorsements by service provider organizations (e.g., Sharfstein, 2005), and advocacy from consumer and family support groups such as the National Alliance for Mental Illness (NAMI).

Numerous proposals have been put forth, from a variety of perspectives,

regarding the nature of recovery from psychiatric disability. Bussema and Bussema, among others, have explored the role of faith in recovery as a spiritual journey (2007; 2000). Other researchers, including Buckley-Walker, Crowe, and Caputi have investigated recovery as an ongoing process of constructing and recreating self and identity (2010). Davidson, among others, has addressed the theme of reestablishing personal agency (2007), and Matthias et al. are among those investigating the related constructs of self-determination and decision-making (2012). Chovil has framed recovery as improvements in general daily functioning (2005), where others including Mezzina et al. have focused more specifically on regaining normal social functioning (2006), and Dunn, Wewiorski, and Rogers have further narrowed that focus to the significance of attaining and maintaining employment (2008). Although a recovery orientation may sometimes be seen as at odds with an illness or symptom focus, symptom reduction has also been viewed as an integral part of recovery from psychiatric disability (e.g., Lysaker, Roe, & Buck, 2010). Overall, the diverse perspectives on recovery may be more complementary than conflicting, but they make for a bewildering conceptual landscape, and have led to constructs and measures that resemble collections of desirable states more than coherent theories (e.g., Corrigan, Salzer, Ralph, Sangster, & Keck, 2004; Jerrell, Cousins, & Roberts, 2006; Salyers, Godfrey, Mueser, & Labriola, 2007).

Many writers have focused on recovery as a process, rather than an outcome (e.g., Shea, 2010), and clearly recovery must involve some process component, unless one conceives of it as an instantaneous transition from an unrecovered to a recovered

state. There are dangers, however, in a simplistic conception of that process, particularly if such a conception precludes serious consideration of functional outcomes (Roe, Rudnick, & Gill, 2007).

Roe, Rudnick, and Gill raise five broad areas of concern in their 2007 article, three of which will be addressed here. First, they raise the possibility that a tight focus on recovery as “growth, transformation of the self and personal actualization,” may exclude people with serious mental illness who place greater importance on more concrete goals, “such as finding a safe place to live, securing helpful treatment and rehabilitation, and accessing opportunities to learn and work.” Second, the authors point out that an expectation of universal recovery could lead to dual stigmatization: “first, by society at large for having a mental illness, and second, by the mental health community, their peers, and possibly others because of their ‘failure’ to be in recovery or to realize their potential for recovery.” Most critically, they caution that conceiving of recovery as an undifferentiated process universal to all people with serious mental illness “makes it impossible to predict what brings about recovery, nor can ‘being in recovery’ be used to predict desirable outcomes. Consequently, no hypothesis related to ‘being in recovery’ can be tested or refuted.” Roe et al. suggest that this last issue may be addressed by modeling recovery as “a continuum with various points or a process with various stages” (Roe et al., 2007, p. 172), a point that will be developed further below.

Another way in which even theoretically rigorous models of psychiatric recovery may tend to reinforce or increase existing stigma is that the very act of

proposing a theory of recovery that is specific to people with psychiatric diagnoses would logically seem to imply that such people are fundamentally different from their fellow human beings and beyond the ken of more general psychological theory. In order to avoid this negative effect, it would be greatly preferable to model recovery from psychiatric disability as a particular case of a more generally applicable theory of human behavior.

Roe et al. summarize the conceptual landscape of recovery as follows:

“The concept of recovery, and particularly the notion of ‘being in recovery’ or recovery as a process, has generated much hope and positive change. At the same time, it faces some challenges”

The authors challenge their readers to

“explore such challenges and ways of systematically addressing them in depth, so as to protect the valuable concept of recovery from becoming meaningless through a carelessly loose and overly broad understanding of its meaning and implications” (Roe et al., 2007, p. 173).

It was against this background of diverse and sometimes confusing perspectives that Rudnick (2008, p. 277) proposed a philosophical framework of recovery from schizophrenia that he speculated could “be successfully applied to [other] serious mental illnesses (SMIs).” Rudnick characterized recovery as: “...a process of adaptive or compensatory self-organization of the person as a whole and in relation to the environment” (p. 267). From this perspective, recovery is seen

as *adaptive* self-organization, because self-organization can be maladaptive if it

goes off-track...and recovery addresses the person as a whole because it involves her goals as well as biopsychosocial processes that compensate for the impairments associated with the disorder (p. 276).

Recovery is accordingly:

characterized as self-organization processes that compensate for the impairments and deficits involved in schizophrenia and thus reduce the disability related to schizophrenia, whether or not the symptoms are alleviated.

Rudnick's proposal provides a conceptually coherent model of recovery as adaptive self-reorganization, but, as he acknowledges, "[the] proposal, as hopeful as it is, should be followed by hypothesizing and testing specific self-organization processes involved in recovery from schizophrenia, as well as interventions that facilitate these processes (p. 276).

Statement of the Problem

This thesis delineates just such a set of adaptive self-organization processes. It proposes a theory of recovery from psychiatric disability that will help us to explain what brings about recovery and enable us to use recovery to predict other desirable outcomes. The model will, within a single structure, address both the goals of personal growth and transformation emphasized by some people with serious mental illness, and more concrete goals prioritized by others. It will provide an understanding of recovery that supports its aspirational qualities for all people with serious mental illness, while explaining the necessary processes such that their evident difficulty may discourage stigma towards those who struggle to achieve them.

Finally, it will do these things by building upon a rigorous and dynamic body of psychological theory that reveals recovery from psychiatric disability to be a special case of complex adaptive processes that apply to much of human behavior, regardless of the presence or absence of mental illness.

Fifteen years before Rudnick proposed his conception of recovery as adaptive self-organization, Paul Karoly (1993) published a far-reaching overview of the nascent field of psychological self-regulation. In this review, Karoly described self-regulation as follows:

Self-regulation refers to those processes, internal and/or transactional, that enable an individual to guide his/her goal-directed activities over time and across changing circumstances (contexts). Regulation implies modulation of thought, affect, behavior, or attention via deliberate or automated use of specific mechanisms and supportive metaskills. The processes of self-regulation are initiated when routinized activity is impeded or when goal-directedness is otherwise made salient (e.g. the appearance of a challenge, the failure of habitual action patterns, etc.) (p. 25).

At the time, self-regulation was still a rather obscure subfield of psychology, and Karoly's article was one of only 21 publications indexed under the subject heading Self-Regulation in PsycINFO for that year. Research into self-regulation remained relatively moribund for another decade, but research activity increased sharply after 2000, and a dynamic new approach to understanding human behavior was launched. The area has been extraordinarily fecund, and a PsycINFO search of

materials published between 2000 and 2012 returned 4410 records for subject heading Self-Regulation, including 634 (14%) published in 2012, alone.

This chapter will describe a model of recovery from psychiatric disability grounded in the self-regulation literature and informed by developments in motivational neuroscience, a model in which recovery comprises development of “modulation of thought, affect, behavior, or attention” over time to compensate for “the appearance of [the] challenge” of serious mental illness and its debilitating sequelae, which embody Karoly’s “failure of habitual action patterns” including the disruption of previously successful patterns of “thought, affect, behavior, or attention” (1993, p.25).

Proposed solution

To fully appreciate the implications of a self-regulation model of recovery from psychiatric disability, it will be helpful to briefly sketch a self-regulatory perspective on general human development and functioning. The concepts below are developed in service of this goal, and are part of the value proposition for examining recovery, and the field of psychiatric rehabilitation, more broadly, from a self-regulation perspective. Once this broad context is established, the thesis will narrow its focus to a recovery model that incorporates a manageable subset of core self-regulation constructs.

Self-Regulatory Structure

The self-regulatory perspective begins with one pivotal shift in analytic focus “from what the self is to what it does” (Baumeister & Vohs, 2004, loc. 50). What the

self does is, in turn, best understood in terms of two anatomically and psychologically distinct neural super-systems: an approach system that motivates behaviors involving approach to desirable stimuli (goals), and an avoidance system that motivates behaviors involving avoidance of undesirable stimuli (aversions) (Young, 1936, p. 315).

Self-regulation involves a set of interacting components comprising a self-system, a surrounding environment, and a striving system that can be seen as mediating between the two. These constructs can be overlaid on Karoly's (2010, p. 149) overview of regulatory components, as follows (although Karoly presents the goal system as a component of the larger self-system, rather than a conceptually distinct structure, as it is treated here):

The self-structure includes two of Karoly's component groups: episodically modifiable personal factors and biological limiting or enabling conditions. The former comprises self-regulatory appraisals/strategies, cognitive schemata including self/other/world knowledge and belief systems, instrumental and expressive skills, memory, self-regulatory competencies (executive functions), arousal processes, and automaticity (habitual behaviors/responses). The latter is composed of temperament, central nervous system/autonomic nervous system/immune functioning, conditioning history, and genetic material.

The environment includes Karoly's norms, values, socioeconomic status, situational cues, contingencies, supports, and barriers, as well as biologically significant aspects of the physical environment.

The striving system includes both goal and aversion content and structure (Karoly, 2010, p. 151). The content, although it represents a tremendous range of individual variance, is fairly straightforward, but the structures comprise a number of distinct phenomena potentially relevant to psychiatric illness and recovery. Motivational competition reflects the fact that resources being used to regulate one goal/aversion at a particular moment are unavailable to simultaneously address other, unrelated goals/aversions (Cavallo & Fitzsimons, 2012). Identity (or striving) complexity refers to the number of goals or aversions (usually goals) present in a goal/aversion system (Luo & Watkins, 2008). Striving conflict is a situation in which desired movement relative to one goal or aversion impedes desired movement relative to another (Kleiman & Hassin, 2011). Striving facilitation is a condition in which desired movement relative to one goal or aversion enhances desired movement relative to another (Riediger, Freund, & Baltes, 2005). Identity differentiation/integration is the extent to which an individual perceives their strivings as many distinct units versus fewer, multi-faceted entities (Sheldon & Emmons, 1995). Goal-aversion balance occurs when a goal and an aversion in close alignment result in mutually reinforcing approach and avoidance motivation (Oyserman & Markus, 1990).

Two particularly important and closely related structural phenomena are striving hierarchy and striving meaning saturation. Hierarchy refers to the multi-layered structure of superior and subordinate goals and aversions, which is particularly important because, although top-level strivings (e.g., being smart) may

ultimately drive most motivated behavior, immediate attention is more often focused on subordinate strivings in the hierarchy (or sub-goals), such as doing well on a particular exam (Carver & Scheier, 1998). A particular striving is meaning-saturated (Karoly, 2010) when it is so critical to an individual's motivational hierarchy that any change in its status forces movement throughout the goal/aversion system, making it highly resistant to devaluation and/or disengagement and thus relatively inflexible in the face of behavioral inefficacy.

As Karoly quotes from Bandura, "the self-regulating system is both a 'product and producer of influences'" (2010, p. 148). From the moment of birth, each individual is embedded in a social and physical environment containing a unique set of potential goals and aversions, referred to collectively as environmental affordances (p. 152). Initially, the affordances accessible to the individual (those relevant to primitive, instinctual behavior) are relatively sparse and simple, as are the related environmental supports and obstacles. The simplicity of the newborn's self-system (its set of self-regulatory competencies, skills, habits, etc. available to manipulate its environment) is comparably simple, as is the internal structure of its mediating goal/aversion system.

As the individual develops, however, awareness of and access to environmental affordances evolve rapidly in constant interaction with the development of more sophisticated capacities, cognitions, skills, habits, and behaviors of the self-system. Mediating striving structures develop apace, from the simple and concrete (e.g., basic food likes and dislikes) to complex self-guides (e.g., social

values and identity structures), all in constant interaction with the self-system's various attributes and the whole of the individual's social and physical environment.

Over time, development of the individual's self-system and striving structure slows along with other developmental processes (Pujol, Vendrell, Junque, Marti-Vilalta, & et al., 1993) as they approach a dynamic equilibrium in early adulthood. This equilibrium comprises a self-system and striving system formed in reciprocal interaction with the environment, particularly during the early years of the developmental process. Not every individual's equilibrium will be equally (much less optimally) adaptive, and even elements adaptive in the individual's early environment may be less so later in life, but the fundamental nature of the process remains. The critical point in this account is that, because all elements of the individual's self-system and striving structure co-evolve in constant interaction with the environment, substantial perturbation of the self-system or the environment is likely to undermine the suitability of the striving structure and compromise the efficacy of the individual's approach and avoidance behavior.

Self-Regulatory Process

Thus far, we have focused on the structure of the self-system and striving system as they develop in reciprocal interaction with their environment. The primary emphasis of self-regulation theory, however, is on a constantly repeating set of *processes* at the core of that interaction. Broadly drawn, these are: allocating behavioral resources to specific goals and aversions (which sometimes extends to planning the use of those resources); using the informational content of feedback

signals to monitor and optimize approach and avoidance behavior; and dealing with the potentially disruptive affective impact of those same signals.

Allocating resources to specific goals and aversions, or target selection, involves the valuation (a function of subjective probability and magnitude) of the motivational object. Goals are selected for action via two processes: by comparison of valuations across all approach affordances under consideration, or without comparison when the valuation of a specific goal exceeds a preset threshold value (Glimcher, 2011, loc. 2219). The process for aversion “selection” has received far less research attention than has its goal equivalent, and is likely to rely heavily on threshold rather than comparative processes. Different detection and action processes also operate for active avoidance in the presence of immediate threats as opposed to increased vigilance in the presence of potential threats (Fiddick, 2011). When goal approach conflicts with aversion avoidance, resource allocation depends on individual trait and state differences in approach and avoidance sensitivity (Carver & White, 1994), with “ties” between approach and avoidance motivation resulting in avoidance behavior (Corr, 2008, loc. 228).

Where approach behavior is concerned, goal selection is frequently followed by implementation planning, which facilitates goal-directed behavior and results in improved goal outcomes (Gollwitzer & Oettingen, 2011). It is not clear to what extent this is or is not true of aversion avoidance, which tends to be more reactive and less directional (and arguably less amenable to planning) than approach behavior.

Control systems are iterative feedback structures that signal movement

relative to some goal or aversive state. The core elements of a simple control system are an input gathered from the environment, a reference value to which that input is compared, a signal that communicates the result of that comparison, and some action taken in response to that signal. This action influences the state of the environment, which is then reflected in a new input value, and the loop repeats until the difference between the input and the reference value is too small (or too large) to trigger a new action, or until some external force interrupts the loop's operation.

The signals generated by human control systems frequently include (or are associated with) an affective component, meaning that they convey not only pure information used to optimize behavior, but also a 'raw feel', the experience of which is, itself, either rewarding or aversive. Which specific affects are generated depends on the particular approach or avoidance subsystem involved and the direction of movement relative to the reference value. Movement towards and proximity to goal reference values may be signaled by liveliness and/or security (Gilbert et al., 2008), and movement away and distance from such values may be signaled by sadness (Panksepp, 2011a) and/or loneliness (Panksepp, 1998, loc. 9756). Movement towards and proximity to aversion reference values may be signaled by fear, anxiety (Fiddick, 2011), and/or disgust (Toronchuk & Ellis, 2007), movement away is signaled by relief (Carver, 2009), and distance from is signaled by quiescence (Gilbert et al., 2008). Positive movement relative to reference social value is signaled by pride (Gruenewald, Dickerson, & Kemeny, 2007), and negative movement is signaled by guilt/shame (de Hooze, Zeelenberg, & Breugelmans, 2010). Obstruction of

movement relative to either goals or aversions that is perceived as potentially reversible is signaled by frustration, and such obstructions when attributed to interference by other actors (whether real, imagined, or anthropomorphized) are signaled by anger (Kuppens, Van Mechelen, & Rijmen, 2008).

When the affective content associated with control signals is sufficiently intense, it often triggers a behavioral response to directly manage that affect, either in addition to or instead of a direct environmental modification response intended to improve the underlying approach/avoidance outcome (Koole, 2009). This direct management of control affect may include a range of reevaluative (Carver, Scheier, & Weintraub, 1989), accommodative, devaluative, avoidant, and cathartic (Brough, O'Driscoll, & Kalliath, 2005) coping mechanisms. These behaviors can be highly adaptive to the extent that they allow an individual to directly manage potentially disruptive affect while sustaining approach/avoidance effort when goals/aversions are slow to respond to direct manipulation, but they can be equally maladaptive when they divert resources from potentially effective goal/aversion-directed behavior, or delay appropriate goal disengagement when direct manipulation cannot reasonably succeed.

When both goal/aversion-directed behavior and direct affective coping are unsuccessful, particularly for extended periods of time, the individual is likely to experience a flood of negative affect(s) signaling the failure to bring their actual state into line with their goal/aversion reference values. The specific affect(s) involved will depend on the individual's attributions regarding this failure and their expectation of

future results. A perceived chance of future success will result in frustration, while such an expectation with attribution to agentic causality may result in chronic anger for both goals and aversions. Non-agentic attribution without the possibility of future success will tend to result in chronic sadness in the face of unobtainable goals (Hochman, Fritz, & Lewine, 2005), chronic anxiety in response to inescapable potential threats (Delgado et al., 2009), and despair in the presence of inescapable immediate threats (Tronson et al., 2008).

Application to psychiatric illness

It is proposed that people experiencing the onset of serious mental illness attempt to negotiate their goal/aversion structures using self-systems that are newly impaired by the illness. Adaptive habits are disrupted while newly maladaptive habits form and/or persist. The affected individual's behavior is generally less effective at approaching goals and avoiding aversions, and goals/aversions that had been mutually facilitating may become competitive or even conflicting. For example, prior to onset of a serious mental illness, a person might have high-level goals of self-sufficiency and academic accomplishment and a strong aversion to substance dependence, all of which might be mutually facilitating. Following onset, however, the same person might need substantial help from family members and service providers, while also relying on psychoactive medications, to achieve academic goals; his/her goals and aversions, once mutually reinforcing, are now in considerable conflict. Poor approach/avoidance outcomes result in a decline in affect and social emotions associated with effective self-regulation (liveliness, security, and pride) and

a rise in affects and social emotions associated with ineffective self-regulation (sadness, anger/frustration, fear, anxiety, loneliness, and guilt/shame). In the case of top-level and otherwise meaning-saturated goals and aversions, the goal/aversion structure is highly resistant to change, and the individual becomes vulnerable to chronic negative affect. The individual begins to disengage from more flexible goals, and will likely disengage over time from even the most meaning-saturated, leading to a less complex and therefore less rewarding and resilient goal structure (Luo & Watkins, 2008).

At the same time, new and inescapable aversions begin to accumulate, leading to an increasingly aversive environment, with more potential aversions and fewer potential goals. This shift increases sensitivity to aversive stimuli and reduces sensitivity to rewarding stimuli. The individual's recognition of their decreased ability to successfully manage either goals or aversions, together with environmental changes such as external stigma and related drops in social support and other resources, leads to reduced self-efficacy and lower striving expectations. The cumulative shift towards an avoidance-dominated motivational balance and an increasingly aversive environment initiate a general shift of activation from the approach to the avoidance super-system, favoring avoidance over approach behaviors, and a vicious spiral downward has begun. For some, and perhaps many, people with serious mental illness, their personal and environmental resources may suffice to arrest this downward spiral relatively quickly. In too many cases, however, the spiral continues until a grim new dynamic equilibrium is established: an almost complete

(though still unsuccessful) focus on aversion avoidance and general abandonment of goal pursuit, in an environment filled with potential threats and nearly devoid of potential rewards.

Application to recovery from psychiatric disability

Recovery from psychiatric disability, then, is proposed to be the reversal of this downward spiral. The individual encounters some new resource, or experiences some remediation of capacities compromised by the illness and/or development of compensatory skills of sufficient magnitude to disrupt the new, illness-dominated equilibrium of the impoverished self-system, goal/aversion structure, and environment. This change leads to better striving expectancies and more effective goal-directed and aversion-directed behaviors, resulting in approach and avoidance outcomes that outperform long-deflated reference values. For example, imagine a person with severe negative symptoms of schizophrenia and many years' experience failing to get positive social responses, to the point where this is no longer even attempted. Such a person might participate in a brief training on making introductions, leading to a number of unexpectedly positive social interactions. Those improved outcomes generate more control signals associated with positive affects and fewer of their negative affective counterparts, as well as an environment with a slightly improved ratio of potential goals to looming threats or other aversions. The self-regulatory illness process has reversed, and an upward spiral may begin, slowly driving the self-system, goal/aversion system (Clarke, Oades, and Crowe, 2012), environment, approach and avoidance outcomes, and affective balance towards pre-

onset levels. In some cases and in certain important respects, post-recovery functioning may even surpass pre-onset levels (McGrath & Linley, 2006).

Scope of thesis

If the proposed model of recovery from psychiatric disability is substantially accurate, it should be possible to predict and test numerous relationships between recovery, approach/avoidance functioning, and components of the environment, self-system, and goal/aversion system. Testing all of the relationships implied by the model lies well beyond the scope of a single dissertation, so the remainder of this thesis will focus on testing predicted relationships between a smaller subset of nine representative components of the proposed model [intra-striving conflict (striving ambivalence), approach focus, approach functioning, approach affect, avoidance focus, avoidance functioning, avoidance affect, self-regulatory skills (coping self-efficacy), and self-regulatory habits (coping frequency)], and a measure of recovery developed independently by Dr. Retta Andresen and her colleagues (Andresen, Caputi, & Oades, 2006) that differentiates between five stages of recovery from psychiatric disability (1: Moratorium, 2: Awareness, 3: Preparation, 4: Rebuilding, and 5: Growth), and is consistent with Roe, Rudnick, and Gill's (2007) proposal of "a continuum with various points or a process with various stages" (Roe et al., 2007, p. 172).

If support is found for the relationships hypothesized below, it should provide a sufficient proof-of-concept for the proposed self-regulatory model and will hopefully justify more comprehensive testing and further development. Inter-

relationships between self-system capacities, skills, cognitive schemata, and habits, environmental affordances, supports, and obstacles, approach/avoidance functioning, and/or control affect, will not be addressed further, except as may be required to lay a foundation for the study's hypotheses.

Need for the Study

Recovery from psychiatric disability is an increasingly important concept in public discourse about serious mental illness, but the construct's theoretical and empirical foundations lag behind public and personal investment. The present study will attempt to help rectify this situation by drawing from the robust and dynamic body of self-regulation research to explain some aspects of recovery. In so doing, it will also reframe recovery from psychiatric disability as one subtype of normal human adaptation, rather than an essentially alien experience separating people with serious mental illness from their fellow human beings. By focusing on universal motivational systems and structures operating in reference to individually defined goals and threats, the study will integrate the idiographic nature of recovery with a nomological core. Finally, the study will generate preliminary data on several refinements or extensions of self-regulation theory that underlie the design of its measures and hypotheses.

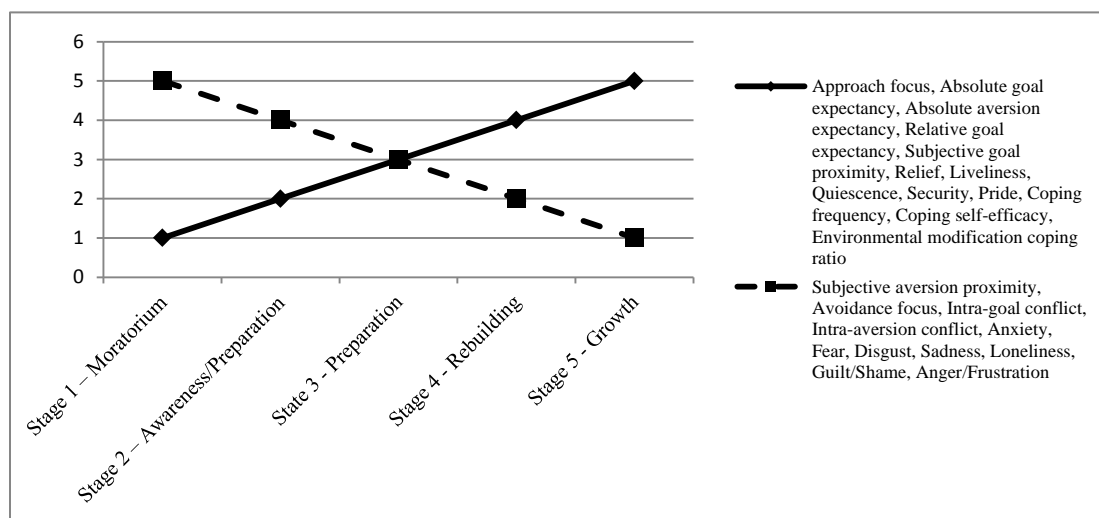
Hypotheses

The study's hypotheses are as follows, and are visually approximated in

Figure 1, below.

Figure 1

Hypothesized Relationships



Intra-striving conflict

Stage of recovery will be negatively related to Intra-Goal Conflict (degree to which goal approach conflicts with aversion avoidance, as reflected in the anticipated intensity of *negative* affect if/when goals are attained), and Intra-Goal Conflict will be significantly lower for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Stage of recovery will be negatively related to Intra-Aversion Conflict (degree to which aversion avoidance conflicts with goal approach, as reflected in the anticipated intensity of *negative* affect if/when aversions are avoided), and Intra-Aversion Conflict will be significantly lower for respondents in higher than lower

stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Approach focus

Stage of recovery will be positively related to Approach Focus (self-reported focus on reaching goals), and Approach Focus will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Approach functioning

Stage of recovery will be positively related to Absolute Goal Expectancy (self-reported likelihood of reaching goals), and Absolute Goal Expectancy will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Stage of recovery will be positively related to Relative Goal Expectancy (self-reported goal proximity, goal efficacy, and likelihood of reaching goals relative to expectations for same), and Relative Goal Expectancy will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Stage of recovery will be positively related to Subjective Goal Proximity (self-reported proximity to goals), and Subjective Goal Proximity will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

*Approach affect**Positive*

Stage of recovery will be positively related to positive approach affects (affects generated by successful goal approach: Liveliness, Pride, and Security), and positive approach affects will be significantly greater for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$.

Negative

Stage of recovery will be negatively related to negative approach affects (affects generated by unsuccessful goal approach: Anger/Frustration, Loneliness, and Sadness), and negative approach affects will be significantly greater for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$.

Avoidance focus

Stage of recovery will negatively related to Avoidance Focus (self-reported focus on avoiding aversions), and Avoidance Focus will be significantly lower for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$.

Avoidance functioning

Stage of recovery will be positively related to Absolute Aversion Expectancy (self-reported likelihood of avoiding aversions), and Absolute Aversion Expectancy will be significantly lower for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$.

Stage of recovery will be negatively related to Subjective Aversion Proximity (self-reported proximity to aversions), and Subjective Aversion Proximity will be significantly lower for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Avoidance affect

Positive

Stage of recovery will be positively related to positive avoidance affects (affects generated by successful aversion avoidance: Quiescence and Relief), will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Negative

Stage of recovery will be negatively related to negative avoidance affects (affects generated by unsuccessful aversion avoidance: Anxiety, Disgust, Fear, and Guilt/Shame), and negative avoidance affects will be significantly lower for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Self-regulatory skills

Stage of recovery will be positively related to Coping Self-Efficacy (self-reported ability to utilize specific coping behaviors), and Coping Self-Efficacy will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5.

Self-regulatory habits

Stage of recovery will be positively related to Coping Frequency (self-reported frequency of utilizing any coping behaviors), and Coping Frequency will be significantly greater for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$.

Stage of recovery will be positively related to Environmental Modification Coping Ratio (self-reported frequency of coping with problems by acting to modify the problematic environment, divided by self-reported frequency of coping with problems by other means), and Environmental Modification Coping Ratio will be significantly greater for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$.

Chapter II

RELATED LITERATURE

Recovery

Recovery Measures

In 2011, Burgess and colleagues published a review of self-report recovery measures suitable for routine use in the context of mental health services. The review evaluated self-report measures of recovery from psychiatric disability according to eight criteria: explicit measurement of personal recovery domains, brief and easy to use, takes consumer perspective, quantitative, subjected to scrutiny of peer review, sound psychometrics, applicable to Australian context (no instruments were eliminated by this criteria), and acceptable to consumers. Using these eight criteria, the authors narrowed a field of 22 instruments to four recommended options: the Illness Management and Recovery Scales (IMRS), the Recovery Assessment Scale (RAS), the Recovery Process Inventory (RPI), and the Stages of Recovery Instrument (STORI) (Burgess, Pirkis, Coombs, & Rosen, 2011).

Two of the four recommended measures were quickly eliminated from consideration. For reasons developed in later sections of this thesis, a self-regulation perspective suggests that both positive (recovery) and negative (“anti-recovery”) dimensions may be important to understanding the recovery process. Since the RAS

contains no negative dimension, and indeed no negative items of any sort, it is not an appropriate measure for use in this context (Corrigan, Giffort, Rashid, Leary, & Okeke, 1999). The IMRS incorporates some negative items, but the instrument was, as its name implies, designed as a measure of both recovery and illness management, and also contains items concerning alcohol and drug use (Salyers et al., 2007). A large psychometric study (Sklar, Sarkin, Gilmer, & Groessler, 2012) has confirmed that the 15 items of the IMRS comprise three distinct factors (recovery, management, and substance use). Only one of these appears to measure recovery, as such. As with the RAS, the IMRS is not an appropriate instrument for the present study.

Both the RPI and the STORI include negative recovery dimensions/items (the RPI's "anguish" subscale and the STORI's "moratorium" stage) and both scales were designed to measure recovery as such (Andresen et al., 2006; Jerrell et al., 2006). The RPI's six subscales, however, range from two subscales with two items each to one subscale with eight items (Jerrell et al., 2006), as opposed to the STORI's more balanced structure, with five stages of 10 items per stage (Andresen et al., 2006). This structural consideration, taken together with the STORI's explicit treatment of recovery as change over time (Andresen et al., 2006), and the validation of a brief, derivative instrument in a non-Western population (Chiba, Kawakami, Miyamoto, & Andresen, 2010), led to selection of the STORI over the RPI for use in the present study.

Stages of Recovery Instrument

In 2003, Andresen, Caputi, and Oades proposed a stage account of the

subjective experience of recovery from schizophrenia. Their model comprised five stages and four processes of recovery derived from a systematic review of 28 published, first-person, experiential accounts of recovery from serious mental illness, 14 consumer-authored articles on recovery, eight qualitative studies of consumer experiences of recovery, and other published papers on recovery that incorporated first-person accounts. The items were drafted by the study authors, then piloted by 10 consumer-researchers, and finally refined based on feedback from the pilot. Unlike Prochaska and DiClemente's classic stages of change theory (Prochaska & Norcross, 2002), Andresen et al.'s model does not associate specific processes and stages, but proposes a "whole of experience model" in which the same core processes progress across all five stages of recovery (Andresen, Oades, & Caputi, 2011, p.171).

The proposed stages of recovery are based on a perceived pattern in five reviewed studies, three of which proposed four phases or dimensions of recovery and two of which proposed three such phases. The stages are: Moratorium...characterized by denial, confusion, hopelessness, identity confusion and self-protective withdrawal;" "Awareness, [in which] the person has a first glimmer of hope of a better life, and that recovery is possible;" "Preparation, [in which] the person resolves to start working on recovering;" "Rebuilding...[in which] stage the hard work of recovery takes place;" and "Growth...[the] final stage of recovery [that] could be considered the outcome of the recovery process" (Andresen et al., 2003, p.591). The four recovery processes identified are: "redefining identity", present in 42 of 46 sources; "finding meaning in life", in 42 sources; "taking responsibility for recovery",

in 38 sources; and “finding hope”, in 36 sources (p. 589). Constructs subsumed by the four recovery processes are represented in Table 1, below (Andresen et al., 2011, p.35).

Table 1
Processes of Recovery

Hope	Responsibility	Self and identity	Meaning and purpose
Optimism	Responsibility for recovery	Restructured sense of self	Purpose in life
Hopefulness	Empowerment	Self-redefinition	Meaningful work
Hope of others	Self-determination	Acceptance of illness	Spirituality
Inspiration	Attitude	Self-acceptance	Change in values
Role models	Self-management of illness	Meaning of illness	Change in attitudes
Others' belief in self	Willingness to take risks	Overcoming stigma	Change in goals
Personal agency	Building independence	Integrated sense of self	Intrinsic values
Hope for the future	Discard patient role	Taking stock of self	Self-worth
		Internal inventory	Meaning in the illness
		Self-knowledge	
		Relationship with illness	

The stages of recovery model has spurred development and testing of three assessment instruments designed to identify a respondent's stage of recovery within the model. The Stages of Recovery Instrument (STORI) is a 50-item, self-report instrument (Andresen et al., 2006) that has been selected as a promising candidate for use in the Australian mental health service system (Burgess et al., 2011); an abbreviated, 30-item version of the instrument was under development at the time of design of this study. The Self-Identified Stage of Recovery (SISR) is a brief, two-part, self-report instrument comprising five total items (Andresen et al., 2006). The Short Interview to Assess Stages of Recovery (SIST-R) is a structured interview of five narrative questions with interviewer probes (Wolstencroft, Oades, Caputi, & Andresen, 2010).

Published studies using the SIST-R (Wolstencroft et al., 2010) and SISR (Andresen et al., 2006; Andresen, Caputi, & Oades, 2010; Chiba, Kawakami, &

Miyamoto, 2011; Chiba et al., 2010) consistently support the stages of recovery model. Of particular interest in the present context is Chiba et al.'s (2011) finding of a positive relationship between stage of recovery and benefit-finding. Factor analyses of data in the two published STORI psychometric studies (Andresen et al., 2006; Weeks, Slade, & Hayward, 2011) identified partially overlapping three-factor structures, rather than the expected five factors, but the sample size in both studies ($N = 94$ and 50 , respectively) was insufficient to draw any conclusions regarding the factorial structure of a 50-item instrument. In all other respects, both studies supported the stages of recovery model (Andresen et al., 2006).

The STORI was selected for the present study based on several of the above factors. These included the measure's clear and explicit targeting of recovery without conflation of related constructs; its inclusion of both positive and negative subscales; its balanced distribution of items across subscales; generally strong psychometrics; and the structural suitability of a stage-based measure for capturing adaptive, self-regulatory processes as they unfold over extended periods of time.

Quantitative Recovery Research

A considerable amount of quantitative research into recovery has been conducted using the instruments described above, among others. Most of this work has utilized some form of the RAS to represent the recovery construct. Other constructs that have been explored in relation to recovery include: approach vs. avoidance goal content, benefit finding, leisure motivation, objective vs. subjective dimensions, and social support.

Clarke, Oades, and Crowe investigated the relationship between recovery and goal content, using the SISR-A to measure stage of psychological recovery, and the 24-item RAS as a continuous recovery measure. The authors found that the frequency of avoidance goals remained relatively stable across SISR stage of recovery, while the frequency of approach goals increased. In the lowest SISR recovery stage (moratorium), health goals were significantly more common than other goal types. Health goals were also significantly and negatively related to RAS recovery score, and relationship goals were significantly and positively related to the same measure (Clarke, Oades, & Crowe, 2012).

Chiba, Kawakami, and Miyamoto tested the relationship between recovery and benefit-finding, using the SISR-A to measure stage of recovery with the SISR-B and 24-item RAS as continuous recovery measures. Benefit-finding was found to have a nearly linear positive relationship with SISR-A stage of recovery, and to be strongly and positively correlated with both SISR-B and RAS recovery scores (Chiba et al., 2011).

Chris Lloyd and colleagues studied the relationship between clubhouse members' recovery and leisure motivation, using the 24-item RAS to measure recovery. As expected, leisure motivation was found to be significantly and positively related to recovery (Lloyd, King, McCarthy, & Scanlan, 2007).

Several research teams have investigated relationships between objective/observer-report and subjective/self-report recovery dimensions. Lloyd, King, and Moore examined the relationship between self-reported subjective recovery

(consumer empowerment and the 24-item RAS) and self-reported objective recovery (paid employment, community participation, and needs being fully met). The authors reported that RAS score was positively correlated with community participation, but the relationship was fully mediated by empowerment. RAS score was also positively related to paid employment, but the relationship was confounded by employment differences across diagnoses (Lloyd, King, & Moore, 2010). Connell, King, and Crowe, on the other hand, found no significant difference on 41-item RAS scores between employed and non-employed respondents. Furthermore, employed respondents actually scored significantly lower on the RAS “reliance on others” subscale, and trended lower in their scores on the RAS subscale “willingness to ask for help” (Connell, King, & Crowe, 2011). Roe, Mashiach-Eizenberg, and Lysaker examined relationships between subjective self-reported recovery domains (41-item RAS, quality of life, perceived social support, and emotional loneliness) and objective observer-reported domains (symptom severity and global functioning). The authors found no direct relationship between 41-item RAS total score and total symptom severity, but RAS score was negatively related to animation symptom score, and RAS personal confidence and hope subscale score was negatively related to mood symptom severity. RAS score was also positively related to social support and negatively related to loneliness, although these relationships were mediated by quality of life (Roe, Mashiach-Eizenberg, & Lysaker, 2011).

The relationship between recovery and social support has been another focus of multiple researchers. As described above, Roe et al. found that RAS score was

positively related to perceived social support, mediated by quality of life (Roe et al., 2011). Corrigan and Phelan reported that 41-item RAS score was positively related to social network size and network satisfaction (Corrigan & Phelan, 2004). Hendryx, Green, and Perrin also found that RAS scores were positively associated with perceived social support and social network size, as well as engagement in all types of activities (Hendryx, Green, & Perrin, 2009). Webb and colleagues further reported that 41-item RAS score was positively related to perceived religious social support, and that a negative relationship between RAS score and experiencing a struggle with faith was mediated by perceived religious social support (Webb, Charbonneau, McCann, & Gayle, 2011).

Self-Regulation

Approach and Avoidance

As was stated in the first chapter, at the conceptual core of self-regulation theory is a shift in focus “from what the self is to what it does” (Baumeister & Vohs, 2004, loc. 50), and what the self does originates with a set of complex and inter-related motivational systems. These motivational systems, stimulated by the environment, spur the individual to draw from a repertoire of cognitive schemata, competencies, and habits potentially appropriate to that environment in order to generate approach and avoidance behaviors. Those behaviors interact with the environment to produce more or less satisfactory outcomes that, in turn, generate a range of positive or negative affective states. Those states differentially impact the activation/sensitivity of the motivational systems and drive reinforcement learning, all

of which influence the next behavioral sequence. Although this simplified description may suggest a cycle of rigidly sequenced events, real-life self-regulation involves an extraordinarily complex, dynamical system of simultaneous interactions.

At the most basic level of motivational organization is the long-recognized split between two “super-systems” governing approach and avoidance behaviors, respectively (Young, 1936, p. 315). The approach super-system motivates behaviors involving approach to rewarding and challenging stimuli, while the avoidance super-system motivates behaviors involving avoidance of aversive stimuli. These two motivational super-systems involve different neural pathways, such that the trait sensitivity of each is largely independent of the other (Corr, 2008, loc. 267). The approach and avoidance super-systems are, however, mutually inhibitory: approach activation tends to reduce avoidance activation, and vice versa (Corr, 2008, loc. 266), although avoidance activation appears to inhibit approach activation much more strongly than the reverse (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). For example, the constant fear of involuntary hospitalization would be likely to seriously undermine effort devoted towards positive life goals, while even a strong desire for meaningful work would be relatively unlikely to defuse fear of coercion.

Individual differences in approach and avoidance sensitivity have been found not only in complex mammals like chimpanzees and other primates, but in relatively simple mammals and birds, fish, and even invertebrates (Jones & Gosling, 2008). Fundamental approach and avoidance motivation are present in organisms as primitive as amoeba (Elliot, 2008) and paramecium (Buzsaki, 2006, p. 30).

Subsystems

The approach super-system includes two generalized component systems. These are an approach-to-reward system that motivates the pursuit of novel stimulus and rewards (Panksepp, 2011b, loc. 1334) and an approach-to-challenge system that appears to increase approach activation and motivate aggression in response to blocked approach behavior (Lewis & Ramsay, 2005), such as limitation on access to personal funds. The same system responds to imposed exposure to or blockage of escape from aversive stimuli (Berkowitz, 2010), such as involuntary medication. The approach-to-reward system includes a number of specialized subsystems. One subsystem, dedicated to separation distress/attachment (Panksepp & Watt, 2011) involved in establishing and maintaining key interpersonal relationships, will be included here. One additional approach subsystem (de Hooge, Zeelenberg, & Breugelmans, 2011) that specializes in promoting social value (Gruenewald et al., 2007) underlying social acceptance, inclusion, and prestige, will also be included in the proposed model. This last function relies on managing others' social perceptions of oneself and necessarily integrates higher cognitive functions such as perspective-taking, involving areas of the social cortex that are not involved in more primitive approach or avoidance behavior (Takahashi, 2004).

The avoidance super-system also comprises two distinct systems. The first, threat-avoidance, was again established by Panksepp (2011a). This first system is further divided into two subsystems, one that motivates active avoidance of immediate threats, such as a physical attack, and a second that motivates avoidance-

related vigilance (McNaughton & Corr, 2004) for the monitoring of potential threats, such as a frequently confrontational family member or service provider not presently engaged in hostilities. The second avoidance system motivates avoidance of contaminants/toxins, such as another's feces or spat saliva, and was proposed and supported by Toronchuk and Ellis (2007).

There is considerable intra-species and individual variation in approach and avoidance sensitivity and reactivity that is largely determined by genetic (Goldsmith & Lemery-Chalfant, 2008) and developmental (Fox & Reeb, 2008) factors. These differences have profound effects on attention (Derryberry & Reed, 2008), learning (Pizzagalli, Dillon, Bogdan, & Holmes, 2011), and strategic and tactical aspects of emotion regulation (Scholer & Higgins, 2011). They have also been proposed, with considerable supporting evidence, as the core dimensions of human personality (Larsen & Augustine, 2008).

Theoretical work on approach and avoidance motivation has sometimes assumed or implied that the two systems are roughly symmetric analogues of each other, each operating in a different motivational direction. More recent work, particularly arising from an evolutionary perspective (e.g., Kenrick & Shiota, 2008), shows clearly that this is not the case. There are profound differences between the approach and avoidance systems (Corr, 2008), and even among closely related subsystems of each (e.g., (Pappens et al., 2010) vs. (Carskadon & Herz, 2004)), presumably due to natural selection in the face of domain-specific evolutionary pressures (Catania, 2004).

One fundamental distinction between approach and avoidance motivation lies in their differing directionality. Approach motivation and behavior are inherently directional. Although there may be a range of different approach subgoals capable of satisfying a higher-level goal, and even multiple behavioral paths toward any one subgoal, those paths will generally share a behavioral “space” and each subgoal is associated with a specific final “location”. One such example might be the desire for an entry-level job in television production at CBS. Avoidance motivation, on the other hand, is inherently *non*-directional. There are, in most circumstances, any number of paths away from an aversive stimulus, and an infinite number of endpoints that do not coincide with it. One example in this case would be the desire to escape poverty. This duality suggests that avoidance motivation, alone, is not a sufficient guide for sustained behavior, and it may at least partially explain Oyserman’s (1990) emphasis on the importance of balance between desired/expected and feared future states in successful goal pursuit.

Simple Control Theory

To describe these units as “motivational systems” begs the question of precisely how the systems operate to motivate behavior. A proposed set of answers to this question, with a growing body of supporting evidence, can be found in the field of control systems, or “cybernetics”, initially developed to improve the control of mechanical systems during the Second World War (Wiener, 1961). Control theory was first systematically applied to human psychology and behavior by William Powers (1973), whose work was later refined, extended, and popularized by Carver

and Scheier (1998).

Both general and psychological control theory deal primarily with closed-loop systems. To understand what this means, it's best to start by looking at a very simple example of an *open-loop* system, one in which the output is fully determined by external inputs. One such example is the predatory behavior of a common water bug, *Ranatra Dispar*. This predatory bug sits and waits for a smaller insect to venture near (the stimulus input), at which point it makes a lunge toward the intended prey (the output). Once the lunge is initiated, the water bug exerts a pre-determined amount of effort in a pre-determined direction. It has no ability to modify its behavior in response to changes in the current, prey's location, etc. Because the lunge is very fast, the distance is very short, and the time elapsed is correspondingly very brief, this is not a serious handicap. Typically, not much happens while the lunge is executed, investment of resources in monitoring and adjustment would be inefficient, the open-loop control is highly adaptive, and the water bug captures its prey with adequate frequency to survive and reproduce (Bailey, 1986).

Now consider a hunting lion attempting an open-loop procedure analogous to that of the water bug. This lion would detect a gazelle several hundred yards away, close its eyes, disengage its senses of smell and hearing, and start running in the appropriate direction for a predetermined time at a predetermined speed. At the end of the run, many seconds or even minutes later, it would leap with its fangs bared and claws extended. By this time, of course, the gazelle would be nowhere to be found (even assuming the lion didn't simply run into a tree en route) and the lion would

have expended a great deal of energy without obtaining new resources. Clearly, the open-loop system is maladaptive in this context and will result first in a hungry lion, and then a dead one. When a complex series of behaviors must be executed over an extended period of time in a dynamic environment, the ongoing feedback of closed-loop control is a prerequisite for success.

Closed-loop systems are described by Jagacinski and Flach (2003, loc. 365) as systems “that monitor [their] own behavior (output) and respond not to the input, *per se*, but to the relation between the reference input and the output,” a capacity referred to as “feedback control”. Closed-loop control systems have a number of common elements: a sensor that gathers an input value for the controlled variable from the environment; a reference or goal value of that same controlled variable; a comparator that compares the actual value to the reference value; and an output generator that takes some action to narrow the gap between the two. The action or output generated, together with any external disturbance of the controlled variable, determines the new state of the environment, which is then resampled by the sensor. This feedback loop repeats until the input value equals the reference value, or until some external force interferes with the system’s operation.

Figure 2
Simple Control System

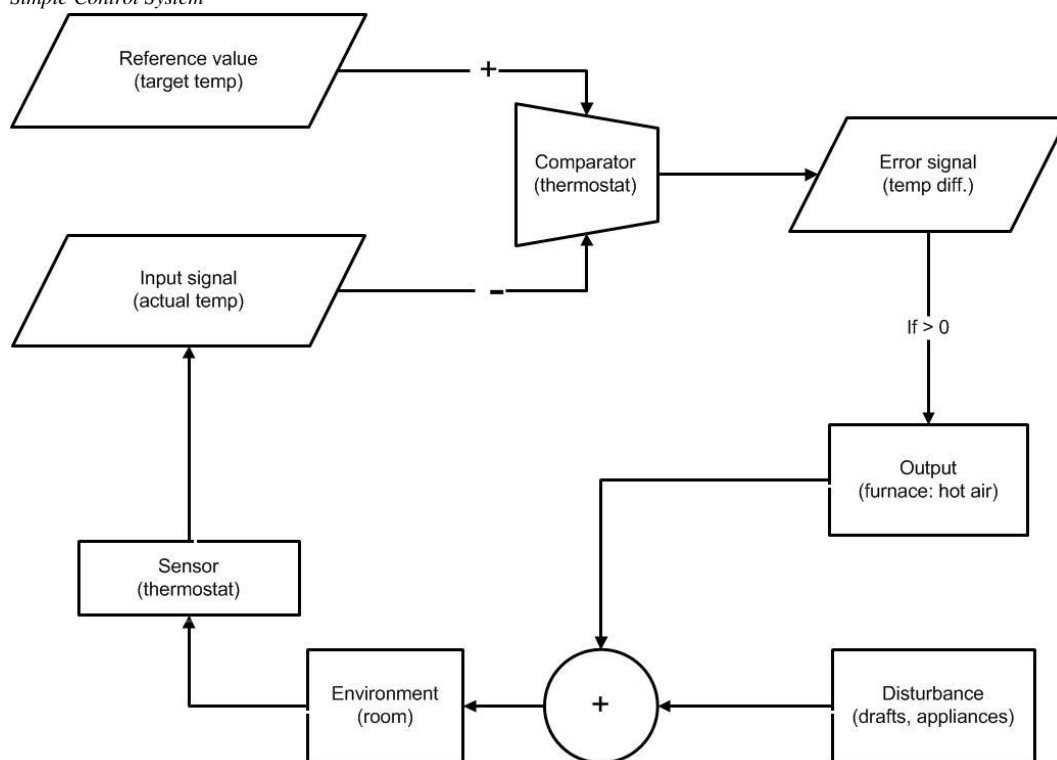


Figure 2, above, is a classic example of a very simple, closed-loop control system: a digital thermostat and furnace (adapted from Carver & Scheier, 1998)). In this system, a thermometer (the sensor) detects the temperature of a room and passes that information to a microcircuit that subtracts the actual room temperature from the thermostat's reference temperature. If the actual temperature is less than the thermostat setting, the comparator sends a signal of that difference to the furnace (the output generator), which starts blowing hot air (the output) into the room. The hot air generated by the furnace combines with cold air coming from a drafty window (the external disturbance) to determine the new room temperature. The thermometer detects the new temperature and passes it to the comparator, beginning the next iteration of the feedback loop, which keeps repeating until the actual room

temperature is the same as the thermostat's reference temperature.

Let us revisit our lion and see if it fares any better with this approach. The lion sees a gazelle and starts moving towards it, belly low to the ground. As it proceeds it continuously monitors the difference between its own position (the output of its behavior) and the position of the gazelle (the reference input). At some point, that difference becomes sufficiently small to trigger a change in behavior, and the lion charges towards the hapless gazelle, still monitoring the difference between their positions. As the gazelle attempts to flee this way or that, the difference in relative position momentarily increases, and the lion alters its own trajectory to compensate. In the end, the lion may or may not capture the gazelle, but its chances have certainly improved, and that the closed-loop control succeeds with adequate frequency is witnessed by the species' survival. Many human behavioral sequences are, obviously, much more complex than a lion's hunting behavior, in which cases effective closed-loop feedback is even more critical to success.

This thermostat-and-furnace is an example of a negative feedback loop, in which the system's behavior tends to reduce its output, and is therefore self-limiting (Jagacinski & Flach, 2003). Positive feedback loops, such as the crescendo of noise produced by feedback between a powered speaker and a microphone, tend to increase their output, are therefore not self-limiting, and tend to result in behavior of escalating (and ultimately unsustainable) intensity. Because of this, positive feedback loops only occur in living organisms when "incorporated into complex systems with built-in checks" that constrain this tendency (McFarland, 1971, p. 21). An example of this

might be a cocaine craving that continually increases with physical proximity of the drug up to the very moment of consumption, at which point the craving is satisfied and the feedback loop is abruptly terminated.

It is important to note that the thermostat-furnace system actually manages its *perception* of the environment, rather the environment itself, of which it can have no direct knowledge (Powers, 1973). Because of this, control can fail due to malfunction in any element of the input as well as the output subsystem. If the sensory apparatus (thermometer) malfunctions, the control process will fail to initiate or will operate on bad data. If the signal processor fails, the input value from the environment will be garbled or absent. If the reference value (target temperature) is set inappropriately, the goal state will be undesirable or unattainable. If the comparator malfunctions, the error signal will be inaccurate. If the response behavior (furnace) malfunctions, the impact on the environment will be inadequate. If the external disturbance (cold draft) is excessive relative to the maximum output, the goal state will remain out of reach.

There are several important characteristics, however, that render the thermostat-furnace control system both highly resistant to malfunction or distortion, and largely incapable of adaptive change. First, it acts on only a single environmental variable, or motivational target: the temperature of a particular room; second, it has only a single “motivation” to act, governed by the temperature setting on the thermostat; third, it has only one behavioral response in its environmental modification repertoire; fourth, and most important for the purposes of this thesis, it has no capacity to directly manipulate the controlled values, but must act on them

indirectly by modifying the environment. If the goal state (target temperature) cannot be reached, a single behavior (furnace output) will simply continue to operate on the same environmental variable unless and until interrupted by some force external to the control system. As we will see, this is a fundamental difference between digital or mechanical control systems and their psychological counterparts, with profound implications for psychological control.

Psychological Control

Figure 3
Psychological Control System

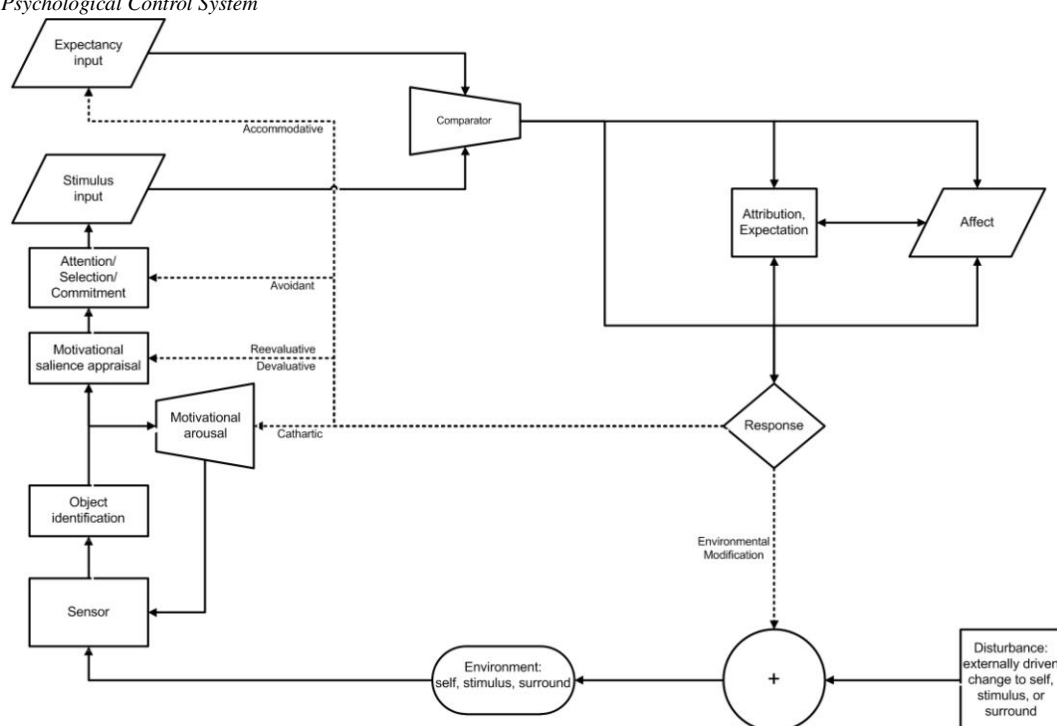


Figure 3, above, is an abstraction of a human psychological control system, several components of which will be examined in greater detail below. In brief, the individual's sensory faculties receive stimuli that are identified (or treated as novel), and are appraised for motivational salience. If appraised as motivationally salient, a

stimulus input is forwarded to the comparator, which compares that input to a pre-existing motivational reference value. The comparator generates a signal of the magnitude of difference (if any) between the input and reference values. That signal triggers inter-related cognitive processes and affective experience, which determine the initiation of some response behavior or set of behaviors. These response behavior(s), together with any external disturbances, act on the environment and/or directly on some targeted component(s) of the control system. Finally, the sensor(s) encounter new stimuli from the (presumably) altered environment, and the cycle repeats.

There are two important limitations or distortions of this account that are worth bearing in mind while engaging with the following material. The first point is that the rigidly sequential operation suggested by Figure 3, while a useful heuristic extrapolated from mechanical control systems, is a gross over-simplification of the massively interconnected, parallel processing characteristic of complex neural systems (Bargh & Williams, 2007). Nothing in psychological control is as simple as it appears in the figure above, and very little of the phenomenon's true complexity is currently understood.

The second point is that many, if not most, components of psychological control systems appear to be executable via either conscious or nonconscious processes (Papies & Aarts, 2011), the implications of which remain unclear (Berry, Shanks, Speekenbrink, & Henson, 2012). This is particularly common in the domain of social functioning, where effective self-regulation is both critical to survival (under

the conditions in which humans evolved) and requires ongoing integration of complex feedback from multiple sources (Bargh & Williams, 2006). One simple example in this domain is the integration of emotional faces with the context in which they appear, which is done quickly, effortlessly, and outside of conscious control (Aviezer, Bentin, Dudarev, & Hassin, 2011). For instance, one might unconsciously detect a psychiatrist's disapproval or discomfort when broaching sexual behavior, and alter or drop the topic without ever being aware of either the doctor's disapproval or of one's response to it. Unfortunately, even the precise meaning and nature of "conscious" and "nonconscious" as used in this context are still unclear, as are their relationships to recently proposed dual-process and dual-system models of cognition and emotion (Frankish, 2010). It will probably be impossible to formulate a fully coherent account of self-regulation/psychological control until these issues are much better understood, and readers familiar with the topic will doubtless recognize gaps left by unanswered questions at various points in the following discussion.

There are two other important differences between psychological and mechanical control systems that influence whether psychological systems will succeed in effectively guiding approach/avoidance behavior. The first of these is the presence of affect. Unlike the thermometer-furnace system, psychological control systems are typically associated with emotions with positive or negative valences. That is, the subjective experience associated with the control signal is *itself* rewarding or aversive. Because of this, any actual or expected full or partial failure of primary control in the form of environmental modification will generate a secondary coping

process to avoid the resulting negative affect, separate from the primary motivation of approaching or avoiding the underlying stimulus. This issue will be addressed at greater length in the section on affect, below.

The second factor, which interacts powerfully with the first, is individuals' ability to manipulate the input side of their own control systems. If a person can effectively change their situation relative to rewarding or aversive stimuli, they presumably will. If they cannot, however, or believe that they cannot, or attempt to do so and fail, they have a repertoire of responses not available to the thermostat-furnace. In many cases, the individual's secondary motivation to regulate affect may become dominant over the primary motivation to regulate motivationally salient stimuli. The problem, of course, is that the individual's exposure to the stimulus remains unaddressed, and sometimes the behavior used to control the secondary motivation may actually worsen the situation relative to the primary goal/aversion. For instance, a person with no work history, flooded with performance anxiety related to an approaching job interview, might effectively manage the affect by having a few drinks, but this would be unlikely to improve their interview performance. Of course, these responses are not mutually exclusive, and it is possible to engage in environmental modification while at the same time more directly regulating (primarily) negative affect. An example of this approach might be repeatedly role-playing one's job interview while also using breathing exercises to directly manage anxiety.

Sensor

Sensory apparatus, and motivationally salient stimuli, involve both exteroceptive and interoceptive systems. Exteroceptive stimuli are those generated outside the body, and include the common “five senses” of sight, smell, sound, taste, and (skin-based) touch. Interoceptive stimuli are handled by a separate system and include pain, temperature, sensual touch, hunger, thirst, etc. (Craig, 2003).

Motivational stimuli can also be either currently present, or re-experienced / remembered. Mentally re-experiencing any approach or avoidance stimulus or process will recreate, in whatever degree, the affective states associated with that experience. Although a single instance of re-experienced process or affect is likely to have less impact than its immediately experienced counterpart, all will significantly influence both immediate affective state and general mood (Lyubomirsky, Sousa, & Dickerhoof, 2006). One example might be the vivid memory of recent, persecutory hallucinations, which could be almost as distressing as the immediate experience. Rumination is essentially the frequent/intrusive re-experiencing of easily accessible, memory-based stimuli (Martin & Tesser, 2006).

Object identification

Efficacy of object identification varies by domain. Animals are detected more quickly than any tested class of inanimate objects, even after controlling for likely confounding variables (New, Cosmides, & Tooby, 2007). Detection of human faces is even more rapid than recognition of potential predators and prey (Crouzet, Kirchner, & Thorpe, 2010), reflecting the extreme importance of social functioning in human

evolution.

Motivational arousal

Motivational arousal is a function of trait motivational sensitivity that is influenced by genetic and early environmental factors (e.g., Fox & Reeb, 2008), diurnal (Stone et al., 2006) and probably seasonal (Ennis & McConville, 2004) cycles, and transient activation, which is influenced by recent experience and the presence of motivationally salient stimuli (Papies & Aarts, 2011).

Motivational salience appraisal

Influenced by general motivational arousal, living organisms must determine the motivational salience of specific stimuli. Salience, in this case, is essentially a vector including both valence (good-bad/approach-avoid) and magnitude. Given that stimulus valence is essentially an evolved proxy for reproductive advantage, and is thus, by its nature, critical to survival (Kenrick & Shiota, 2008), it is unsurprising that humans automatically and unconsciously assess the valence of most, or even all, stimuli they encounter (Elliot, 2008). This does not mean, however, that determinations of motivational salience are precise or consistent. In fact, all such valuations involve stochastic signal-detection processes with a degree of variance and associated error rate or “noise” in the appraised magnitude (Glimcher, 2011, loc. 1020).

The likelihood that a particular stimulus will be assessed as rewarding or aversive and the speed with which this occurs are influenced by an organism’s trait-based motivational sensitivity/reactivity, largely determined by genetic (Goldsmith &

Lemery-Chalfant, 2008) and developmental (Fox & Reeb, 2008) factors, and its state-based motivational arousal, driven by more recent and transient experience (priming). A person who is generally sensitive to, and/or is transiently primed to respond to, aversive stimuli, will detect such stimuli more reliably and more rapidly than he/she will approach stimuli, and will be more likely to identify neutral or novel stimuli as aversive. A person who is sensitive to or primed for rewarding stimuli, on the other hand, will demonstrate the opposite tendencies (Scholer & Higgins, 2011). One example of this appears to be hallucinations involving white noise or other neutral stimuli, in which a person in a negative affective state is likely to project threatening content onto the stimuli, while a person in a positive affective state is likely to project pleasurable content onto the same neutral field.

Many active avoidance processes are primarily responsive to aversive stimuli that are external to the individual, or exteroceptive, such as predators and contaminants. Given this, it may be that arousal of the active avoidance subsystem is largely driven by proximity, with high-arousal control processes dominating in the presence of immediate threats or contaminants. This is, however, unlikely to apply to arousal of the threat vigilance subsystem, which is primarily responsive to stimuli that are only *potentially* threatening, and thus less cognitively “close”. Active avoidance, therefore, is likely to increase with absolute (albeit subjective) proximity of aversive stimuli (Smith, Berridge, & Aldridge, 2011), while vigilance is likely to vary primarily as a function of *relative* threat expectancy. Many approach processes are, similar to threat vigilance, primarily responsive to internal states (interoceptive

stimuli), such as hunger and thirst (Bevins & Murray, 2007). Because of this, absolute proximity to potentially rewarding stimuli will have less impact on control processes, and low-arousal processes involving relative reward expectancy are likely to dominate approach behavior. Neither avoidance nor approach arousal will be directly measured in this study, but variables intended to capture both expectancy and proximity of threat will be included.

One conception of psychotic disorders, with their characteristic positive symptoms of hallucinations and delusions, holds that they are in large part disorders of salience, in which objectively neutral stimuli are erroneously appraised as having significant motivational salience (Kapur, 2003). The reverse situation may apply to negative symptoms, in which motivationally salient stimuli fail to be recognized as such (Galdos et al., 2011).

Attention/Selection/Commitment

Attention has been defined as “any cognitive process that results in the selection of some information over other information” (Taylor & Amir, 2010, p. 381). Attention can generate emotions via automatic bottom-up or automatic processes, but it can also be used to regulate emotions via top-down or strategic processes (Taylor & Amir, 2010, pp. 381-382). Basic attentional “looking” manipulation is one of the most fundamental mechanisms of self-regulation, developing in human infants between five and ten months of age (Morasch & Bell, 2012).

Perhaps the most fundamental difference between the self-regulation of approach and avoidance behavior is the evolved difference in strategies as they relate

to potentially rewarding and aversive stimuli. In the relatively simple example of predation, an organism can, and indeed must, select which reward to pursue from among a large number of potential prey animals (C. N. DeWall, Baumeister, Schurtz, & Gailliot, 2010). Also, although there is a cost in expended resources for failed predatory or other resource-seeking attempts, the resource-seeking organism must only succeed periodically to survive. Predator-avoidance, however, presents the opposite problem. All predatory threats must be successfully avoided for the intended prey to survive and reproduce; it does little good to evade three out of four predators. This may explain why the negative affect associated with threat-avoidant behavior is linked to a narrow focus on threatening stimuli, while positive affect associated with approach to reward is linked to a broader focus and more diffuse attention, which is itself correlated with increased creativity (De Dreu, Nijstad, & Baas, 2011). It may also be the reason why the selection between multiple threats takes longer than selection between alternative goals (Boyd, Robinson, & Fetterman, 2011).

Social self-regulation appears to occupy a middle ground: a person need not succeed socially with all other individuals, and can to some degree and in some contexts choose which to pursue. On the other hand, other individuals are also social agents pursuing their own interests, which are likely to constrain our own. Also, once relationships have been established (such as with attachment figures), failure with individual-specific social goals may be very costly. Social choice involves more freedom than surviving a savannah full of predators, but considerably less than selecting foods from a lunch buffet!

Reference Input/Comparator

A full understanding of approach and avoidance processing has yet to emerge, and may be many years away, but recent research suggests that Sutton's temporal difference learning model (Sutton, 1988) can account for much of what has been observed regarding reward-driven learning (O'Doherty, 2011). Reward learning is better understood than its avoidance-driven counterpart, largely due to generous government funding of addiction-related neuroscience research, but there is also at least some support for aversion-driven temporal difference learning (Wood, Ver Hoef, & Knight, 2012).

Temporal difference algorithms are so named because the predicted value of a reward for an earlier action is retroactively modified by some fraction of the difference between the expected and actual reward at a later time. A simple, real-world example will make this easier to understand. Imagine a person who is deciding whether to enroll in a supported employment program and expects that, if they enroll, they are guaranteed to get a great-paying job in three months. This is a very large expected reward (100% probability of a big paycheck in one quarter) and the person does enroll. Two months later, the person is still unemployed and is much less confident that they will get a job in three months, or that it will pay very well if they do. Their expected reward at three months is much lower than it was at enrollment, and their *expected value of the behavior of enrolling* is retrospectively reduced. Because their initial expected reward was informed by some earlier experience or belief system, however, the expected reward of enrollment only drops by some

fraction of the difference between what they expected and what they now expect, rather than by the entire difference. It is this learning process that determines the reference value that will be in effect the next time this person is faced with a decision about enrolling in supported employment.

Two key variables in this process are the number of future time points that retrospectively impact an earlier expected reward, and the relative magnitude of that impact (i.e., what fraction of the difference between earlier and later expected rewards comprises the retroactive adjustment). The individual's discount rate (the rate of decrease in subjective value relative to anticipated time before reward) is also an important factor, but will not be addressed in this thesis. These factors, interacting with an individual's approach/avoidance behaviors, determine the reference values of the control systems for the next iteration.

As Carver and Scheier (1998, p.150) observe, control system reference values must generally change less rapidly than the stimulus values (and hence the environment) for control systems to function effectively as a guide to behavior. If, however, the reference values are *too* inflexible, even impossible goal/aversion reference values will fail to adjust, and will again fail as behavioral guides. Where the impact ration is high, the look-back time is low, and environmental shift is slow, control systems will over-adapt to minor environmental fluctuations. Where the impact ration is low, look-back time is high, and environmental shift is rapid, control systems will fail to adapt to long-term environmental shifts.

Attribution/Expectation

There are numerous cognitive processes that may influence the operation of psychological control systems, both broadly speaking, and in specific instances. Two of the more generally important for the purposes of this thesis are striving expectation and causal attribution. Briefly stated, striving expectation strongly influences the reallocation of resources to control systems for specific goals/aversions, generally following an inverted-U curve (Fishbach & Finkelstein, 2012). One example is a person who believes they can very easily obtain a job, or that obtaining a job is nearly impossible. In either case, he/she is unlikely to expend much effort in the pursuit, because the expectation is relatively inflexible. A person who believes that obtaining a job will be moderately difficult, however, is likely to expend greater effort on the goal. Causal attribution impacts the target and nature of, and affect associated with, a behavioral response (Donovan & Williams, 2003). Returning to our example, a person who believes the source of their moderate difficulty is another person's doing will experience anger, rather than simple approach activation. In the case of attribution, psychosis may play a role due to misattribution of internal stimuli to external causes (Shergill, Samson, Bays, Frith, & Wolpert, 2005), such as when job interviews that are unsuccessful due to "bizarre" behavior are mistakenly attributed to personal animosity.

Affect

The exact relationship between affect and action is a subject of longstanding and vigorous debate. It has been proposed that the affect *is* the error signal, evolved to

control self-regulatory processes. It is also possible, however, that the emotion is the subjective experience of an underlying error signal, or a subjective experience of the physiological reaction to the error signal, evolved to trigger increased conscious cognitive control and facilitate learning. It is even conceivable that the emotion is a subjective experience merely correlated with the error signal and associated physiological response, but generated independently of them (Lowe, 2011). Given the abundant evidence for non-conscious self-regulatory behavior (Bargh & Huang, 2009), the problem of overlapping affective responses to multiple concurrent goals, and other issues, it seems clear that *conscious* affective experiences, at least, cannot be the fundamental control signals of self-regulatory behavior. This thesis will follow Baumeister (2007) in assuming that affect shapes behavior indirectly, rather than directly. Because it is these conscious affective experiences that are of interest in the context of this thesis, “affect” will be used to refer to those subjective experiences, which will be assumed to be correlated with, rather than causes of, contemporaneous self-regulatory behavior.

Affect is influenced by two dynamic, self-regulatory factors that are central to this thesis. These are the interaction between the state of motivational arousal and the perceived proximity of motivationally salient stimuli, and changes in the predicted value of rewarding or aversive stimuli (as discussed above). In states of low motivational arousal, the proximity of motivationally salient stimuli is unimportant, and the change in *predicted value* of the stimuli dominates affective experience. In states of high motivational arousal, however, the situation is reversed, and proximity

of the stimuli accounts for more of the relevant affect (Smith et al., 2011).

Different affects are specific, or differentially responsive, to different motivational systems and control processes. The generalized system for approach-to-reward generates a positive activating affect, liveliness, associated with a function of relative goal/aversion expectancy and absolute goal/aversion proximity (Smith et al., 2011). The system also generates a negative, deactivating affect, sadness, in association with the same mechanism (Carver, 2004). It is important to note, however, that disengaging from an approach goal appears to result in sadness only in the absence of a substitute reward expectancy (Wrosch, Scheier, Carver, & Schulz, 2003), which may be quite different from the goal it replaced (Bargh & Shalev, 2011).

Chronic sadness may occur in the face of unobtainable goals from which an individual is unable to disengage, notably in the case of significant self-loss or “spoiled identity” (Roos, 2002, p. 55), such as the loss of vocational prospects often experienced by people with schizophrenia (Hochman et al., 2005). The specialized approach-to-reward system dedicated to attachment/separation distress generates a positive deactivating affect, security (Gilbert et al., 2008), and a negative activating affect, separation panic (Panksepp & Watt, 2011), that also occurs in a less intense and apparently more sustained form, loneliness (Panksepp, 1998, loc. 9756).

The system for approach-to-challenge generates negative activating affect, anger/frustration (Panksepp & Watt, 2011), which may be two intensities of a single affect, a single affect interpreted differently depending on causal attribution, or two separate affects triggered by different causal attributions. Frustration/anger is likely to

occur in the case of reversible goal blockage (Dutton, 2010), the imposition of aversive/avoidant stimuli (e.g., Trost, Vangronsveld, Linton, Quartana, & Sullivan, 2011), or the prevention of escape from such stimuli (Berkowitz, 2010). Anger is dampened by low social standing (Allan & Gilbert, 2002) and intensified by perceived injustice (Wranik & Scherer, 2010), the latter of which may operate as a surrogate for social standing: being on the 'right side' of social norms. Thus perceived injustice is important to other-directed, but not self-directed, anger (Ellsworth & Tong, 2006), since there is no possibility of social status differential in the latter. When anger is felt towards an object of higher social standing, or one that is otherwise inaccessible or unassailable, it may be displaced towards a more vulnerable object (Fernandez & Wasan, 2010). Anger can also be directed at inanimate objects, probably by brief personalization (Berkowitz, 2010). The approach-to-challenge system does not appear to generate a deactivating affect.

The system for threat avoidance generates one negative, activating affect in association with active avoidance of an immediate threat, fear, and a second such affect, anxiety, in association with increased vigilance in response to a potential threat (Fiddick, 2011). The same system also generates a deactivating affect, relief (Carver, 2009), that may also occur in a less intense and more sustained form, quiescence (Gilbert et al., 2008). Chronic anxiety is likely to manifest in the presence of unavoidable potential threat (Delgado et al., 2009), and despair may occur in the prolonged presence of inescapable immediate threat (Tronson et al., 2008).

The avoidance system for contaminant avoidance generates a single activating

affect, disgust (Toronchuk & Ellis, 2007), and may also generate relief as a deactivating affect. In contrast to the threat-avoidance system, unavoidable exposure to perceived contaminants does not appear to be linked to despair, hopelessness, or learned helplessness (de Jong, Andrea, & Muris, 1997), and is primarily managed by desensitization.

Social emotions involve greater cognitive involvement than the simple affects, because they require some theory of mind and/or schema of social norms to generate necessary conceptions of other people's reactions to the controlled behavior (Takahashi et al., 2004). This appears to be more important for negative than positive social emotions (e.g., guilt vs. pride), possibly because negative social emotions involve individual behavior in conflict with social norms and therefore require drawing a mental contrast between self and other perspectives, while positive social emotions involve individual behavior concordant with social norms (Takahashi et al., 2008). It appears, however, that shame is associated with a decrease in social value relative to expected value, typically due to a violation of disgust-related norms, while guilt is typically due to a violation of anger-related norms (Giner-Sorolla & Espinosa, 2011), and embarrassment is apparently caused by loss in social value not related to either anger or disgust. Pride is associated with a relative increase in social value, typically due to norm-consistent achievement (Gruenewald et al., 2007).

Response

The response selector compares appraisals of the ability to modify the environment to bring the stimulus input in line with the reference input, versus the

ability to bring the reference input in line with the stimulus input, versus the ability to directly manage the affective impact of the error signal (Nicholls, Polman, & Levy, 2010). Based on the results of these comparative appraisals, and the organism's tolerance for affective distress (Leyro, Zvolensky, & Bernstein, 2010), the response initiates one or more styles and specific means of coping with the affective signal.

Six different coping styles are considered in this thesis. Modifying the external environment in order to change a control outcome has been known by several names, including "changing the situation" on the Cybernetic Coping Scale (Guppy et al., 2004). Because "the situation" could be interpreted to include internal factors, this mode of coping will be referred to as "environmental modification". Whether or not environmental modification is attempted depends on environmental modification self-efficacy, or the belief that one's environmental modification skills/capabilities will suffice to successfully modify the environment and obtain a better outcome. When low environmental modification self-efficacy suggests that this is not the case, other forms of coping will be preferred (Nicholls, Polman, Levy, & Borkoles, 2010). One example of environmental coping might be switching psychiatrists to secure greater attention to side effects.

Three of these alternative coping styles will be referred to as accommodative, avoidant, and devaluative, following the Cybernetic Coping Scale (Edwards & Baglioni, 1993). Accommodative coping adjusts reference values to reduce input-reference differences and associated negative affect. One example of accommodative coping might be a person with a long-standing, pre-onset goal of a career as a litigator

who shifts vocational goals, post-onset, to the closely related but less demanding and prestigious work of a paralegal. Avoidant coping avoids the perception of approach/avoidance stimuli so as not to invoke approach/avoidance control systems and their attendant affect. Although avoidant coping can, and perhaps should, be viewed as including experiential avoidance (Boulanger, Hayes, & Pistorello, 2010), the Cybernetic Coping Scale's focus on attentional avoidance will be adopted in this thesis. Examples of avoidant coping can range from distracting oneself from auditory hallucinations to avoiding human contact to minimize exposure to external stigma. Devaluative coping attempts to reduce control affect by downplaying the magnitude/importance of goals and/or aversions, one example of which might be a person convincing him/herself that marriage is unimportant to manage the negative affect associated with a broken engagement.

The fourth coping style, named "symptom reduction" on the Cybernetic Coping Scale (Edwards & Baglioni, 1993), will be referred to as "cathartic" coping to avoid possible confusion with psychiatric treatment. Cathartic coping attempts to reduce the negative affect associated with suboptimal control system functioning by physical activity, including self-expression. One example of cathartic coping might be abusing a vulnerable partner to vent anger generated by an unrelated individual or situation. One additional coping type, sometimes identified as benefit finding, positive reappraisal, or meaning-based coping (Carver et al., 1989), will be referred to here using the more general term of reevaluative coping. Reevaluative coping attempts to reduce negative affect by reappraising aversions as goals, or by

identifying approach goals contained within aversions. One example is the identification of areas of personal growth arising in the course of recovery from psychiatric disability.

Although perceived/expected coping type efficacy (which may include both coping type self-efficacy and perceived coping type-situation match) will determine coping selection, actual coping efficacy will determine the extent to which environmental modification succeeds in modifying the environment, and/or other coping types succeed in more directly regulating undesirable affect. Coping behavior selection will be generally adaptive to the extent that generate environmental modification responses are used in response to changeable control environments and accommodative, devaluative, avoidant, and cathartic responses are used either in response to unchangeable control, or to manage excess negative affect experienced while environmental modification is underway. Coping styles are likely to be maladaptive to the extent that this does not occur (Chesney, Neilands, Chambers, Taylor, & Folkman, 2006). When coping self-efficacy appraisals match actual coping efficacy, environmental modification will be applied where it can succeed and not where it is bound to fail. Correspondingly, other coping styles will be used when environmental modification would fail or requires an extended period to succeed, and in proportion to their likelihood of success at regulating emotional distress. This fit between context and coping approach simultaneously maximizes goal approach and aversion avoidance and minimizes affective distress. When coping self-efficacy appraisals do not correspond with reality, selected coping styles will lead to relatively

low approach/avoidance functioning and relatively high affective distress (Vitaliano, DeWolfe, Maiuro, Russo, & Katon, 1990).

Control Hierarchy

Control systems commonly occur in hierarchical networks, in which the outputs of lower-level systems function as the stimulus inputs of systems at the next higher level, potentially for many nested layers. Conversely, higher-level systems manage the behavior of systems at the next lower level by passing down changes in reference inputs (Jagacinski & Flach, 2003). These same relationships are believed to apply to psychological control systems, although experimental evidence is largely limited to lower-level elements of the proposed hierarchy: simple goal-directed tasks involving basic motor control (e.g., Bourbon & Powers, 1999).

Powers (1973) originally proposed a hierarchy of nine, specific levels of psychological control hierarchy, with a top level of “control system concepts” (p. 54) along the lines of identity construal. Following Powers’ general approach, Carver & Scheier (1998) argued that top-level controls were inherently superordinate to all lower levels, although conscious attention would shift to lower-level systems for purposes of problem-solving when their poor performance threatened higher-level goals (p. 241), or to down-regulate negative affect driven by poorly performing top-level systems (p. 242). Even setting aside more recent, dual-system views of these phenomena (Carver & Scheier, 2009), it seems likely that the relationships between control systems are more nuanced than originally proposed. One reason for this is that lateral interactions between controls at top hierarchical levels almost certainly play an

important role in controlled behavior, particularly as they relate to approach and avoidance motivations involving the same system concept, which cannot easily be accounted for in terms of fixed, hierarchical relationships (Scholer & Higgins, 2011). Another consideration is that individual differences related to concrete versus abstract cognitive styles may result in the ongoing dominance of more concrete, lower-level controls relative to more abstract, higher-level system concepts. For the purposes of this thesis, it is probably safe to accept Elliott's general observation that "any goal may be a subgoal to another goal if it represents a more precise aim that is meant to help accomplish a broader aim" (2009, p. 66). One example of a goal hierarchy might be the motor control involved in pushing a button, in the course of dialing a phone, to order nicotine patches, to stop smoking, to prevent cardiac disease, to avoid physical disability, to differentiate oneself from a chronically unemployed father held in contempt by one's mother.

Intra-Striving Conflict

Intra-striving conflict involves ambivalent goal objects (Emmons, 1986) that are experienced as simultaneously rewarding and aversive due to co-activation of both the approach and avoidance motivational systems, such that an individual regards the same object "both positively and negatively at the same time...both wanting and at the same time not wanting the same goal object" (Gebhardt, 2007, p. 133). Unlike inter-striving conflict (Cavallo & Fitzsimons, 2012, pp. 267-268), intra-striving conflict necessarily involves opposing approach and avoidance motivations, since approach-approach or avoidance-avoidance relationships within the context of a

single goal object are intrinsically reinforcing/facilitating. Intra-striving conflict is positively correlated with negative affect, somatization, anxiety, and depression, and negatively correlated with positive affect (Emmons & King, 1988). The classic example of intra-striving conflict is probably substance dependence, in which the substance in question is associated with both compelling desires and powerful aversions.

Intra-striving conflict/ambivalence has been studied in laboratory settings (Aupperle, Sullivan, Melrose, Paulus, & Stein, 2011) as well as *in vitro*. In the latter setting, there has been a particular focus on ambivalence in close relationships, where relational closeness activates both approach goals of intimacy and connection, and avoidance aversions of rejection and interpersonal conflict (Gable & Impett, 2012), with implications for both self-regulation and attachment theories (C. DeWall et al., 2012; Mikulincer, Shaver, Bar-On, & Ein-Dor, 2010).

Relating Recovery to Self-Regulation Theory

From the self-regulatory framework proposed here, a number of self-regulatory interpretations of Andresen's stages and processes suggest themselves.

Moratorium stage - "A time of withdrawal characterized by a profound sense of loss and hopelessness" (Andresen et al., 2006, p. 973): This first stage of Andresen's model can be understood as the functional equilibrium at the nadir of the self-regulatory spiral, that point at which the interactions between an individual's self-system, goal/aversion system, and environment are least likely to produce positive approach or avoidance outcomes. The sense of loss reflects chronic sadness generated

by the ongoing failure to make progress towards meaning saturated approach goals. Hopelessness reflects the negative striving expectations learned from failed approach and avoidance functioning, and leads to withdrawal from goal-directed behavior that is not expected to produce rewards. This includes withdrawal from social behavior/engagement that is not expected to produce social rewards.

Awareness stage – “Realization that all is not lost, and that a fulfilling life is possible” (p. 973): This stage appears to be characterized by improved approach expectancies, although the causes of those improvements are not specified.

Preparation stage – “Taking stock of strengths and weaknesses regarding recovery, and starting to work on developing recovery skills” (p. 973): This stage appears to be characterized by goal setting and planning, with development of skills and resources required to implement those plans. Approach expectancies continue to improve, this time with an implicit causality.

Rebuilding stage – “Actively working towards a positive identity, setting meaningful goals and taking control of one’s life” (p. 973): The rebuilding stage appears to represent a transition from an emphasis on goal planning in Stage 3 to a focus on goal pursuit in Stage 5.

Growth stage – “Living a full and meaningful life, characterized by self-management of the illness, resilience and a positive sense of self” (p. 973): The growth stage involves the continued use of rebuilt skills, capabilities, and resources toward self-regulatory ends, likely with a growing focus on approach, and implicitly with enhanced coping skills and increased goal system complexity, resulting in

improved resilience.

The process of *finding and maintaining hope* (Andresen et al., 2006, p.973) subsumes the constructs of optimism, hopefulness, hope of others, inspiration, role models, others' belief in self, personal agency, and hope for the future (Andresen et al., 2011, p. 35). From a control theory/self-regulatory perspective, optimism and hopefulness can be understood as positive approach/avoidance expectancies, or a general inclination towards such expectancies in the absence of negative, reward/aversion-specific expectancies. Hope for the future is presumably the same construct in a relatively distant timeframe. Hope of others and others' belief in self can be understood as information concerning expectancies held by others that positively influence one's own approach/avoidance expectancies. Role models are another type of expectancy information that impacts approach/avoidance expectancies. Personal agency can be understood as the expected efficacy of control response, particularly in terms of environmental modification.

The process of *reestablishing identity* (Andresen et al., 2006, p.973) subsumes the constructs of restructured sense of self, self-redefinition, acceptance of illness, self-acceptance, meaning of illness, overcoming stigma, integrated sense of self, taking stock of self, internal inventory, self-knowledge, and relationship with illness (Andresen et al., 2011, p. 35). From a control theory/self-regulatory perspective, restructured sense of self and self-redefinition can be seen as disengagement from and replacement of top-level rewards/aversions that have proven resistant to self-regulatory efforts over an extended period. Taking stock of self, internal inventory,

and self-knowledge can be understood as the processing of discrepancies between high-level approach/avoidance input values and comparator values; they probably also imply a drop in avoidant coping. Self-acceptance may represent the downward adjustment of top-level approach/avoidance comparator values (accommodative coping), with acceptance of illness representing the same process as it relates to health-specific comparator values. Meaning of illness is best understood as a form of reevaluative coping. Integrated sense of self may be understood as reductions in top-level inter-striving conflict and increased inter-striving facilitation, which may (in some cases) involve reductions in identity/striving complexity. Relationship with illness may involve reducing the meaning saturation of adversely affected health strivings.

The process of *finding meaning* (Andresen et al., 2006, p.973) subsumes the processes of purpose in life, meaningful work, spirituality, change in values, change in attitudes, change in goals, intrinsic values, self-worth, and meaning in the illness (Andresen et al., 2011, p. 35). From a control theory/self-regulatory perspective, self-worth, purpose in life, meaningful work, spirituality, and (probably) intrinsic values can be understood as high-level approach goals. Meaning in the illness can be understood as the effective application of reevaluative coping to adversely affected health strivings. Change in values and change in goals can be understood as accommodative coping and/or disengagement from and replacement of intractable approach goals. Change in attitudes could refer to devaluative, reevaluative, and/or accommodative coping.

The process of *taking responsibility for one's life* (Andresen et al., 2006, p. 973) subsumes the constructs of responsibility for recovery, empowerment, self-determination, willingness, determination, attitude, self-management of illness, willingness to take risks, building independence, and discard patient role (Andresen et al., 2011, p. 35). From a control theory/self-regulatory perspective, empowerment, self-determination, self-management of illness, and building independence appear to represent high-level autonomy goals, with the possible involvement of opposing dependency aversions. Determination may refer to an increase in sustained, goal-directed effort. The willingness to take risks, (probably) general willingness, and (possibly) attitude can be understood as shifts in motivational balance moving from an avoidance focus toward an approach focus.

The Larger Potential of Self-Regulation Theory

The potential value of self-regulation theory to the field of psychiatric rehabilitation lies in its potential to provide a unifying framework for a body of seemingly disparate psychological theory, and the possible utility of that framework for advancing psychiatric rehabilitation practice. The ultimate extent of this potential is not clear, but in several areas, at least, the work is already underway.

The Possible Selves Theory proposed by Markus and Nurius in 1986 (Markus & Nurius, 1986) was contextualized 20 years later as one element of self-discrepancy regulation between a perceived actual self (control circuit input value) and a (control reference value) future self (Hoyle & Sherrill, 2006; vanDellen & Hoyle, 2008). Possible Selves have been drawn upon to better understand negative expectancy biases

(Huston, 1991) and avoidant coping (Penland, Masten, Zelhart, Fournet, & Callahan, 2000) in depression, as well as in earlier work on recovery from psychiatric disability (Bellamy, 2005).

Eminent attachment theorist and researcher Mario Mikulincer has proposed a control systems model of adult attachment (p. 29), the foundation of which is explicitly based on what “Powers (1973) called feedback-control processes,” and “Carver and Scheier’s (1981, 1990, 1998) feedback-control theory” (Mikulincer & Shaver, 2007), p. 220. Attachment has been studied in relation to social anxiety (Parade, Leerkes, & Blankson, 2010), addiction treatment and recovery (Flores, 2001, 2006), and recovery from psychosis (Drayton, Birchwood, & Trower, 1998; Mulligan & Lavender, 2010).

Several years earlier, Mikulincer proposed an integrative model of human learned helplessness that draws heavily from the same sources, as they relate to “the process of coping with the person-environment mismatch created by uncontrollable failure” (Mikulincer, 1994), loc. 496. Learned helplessness has been used to guide both theoretical models (Bougarel, Guitton, Zimmer, Vaugeois, & Yacoubi, 2011) and treatment (Pryce et al., 2011) of depression.

Jeffrey Vancouver and colleagues have drawn from self-regulation/control theory to illuminate aspects of self-efficacy not accounted for in social cognitive theory, such as the curvilinear relationship between self-efficacy and performance (Vancouver, More, & Yoder, 2008). Self-efficacy has been implicated in return to work among people with mental illness (Lagerveld, Blonk, Brenninkmeijer, &

Schaufeli, 2010) as well as recovery from serious psychiatric disability (Mancini, 2007).

The preceding references are intended to be neither comprehensive, nor conclusive. They merely highlight a few areas in which self-regulation/control theory is integrating areas of research of theoretical and applied importance to Psychiatric Rehabilitation. A review of the literature failed to identify an integrating framework of psychological recovery from serious mental illness capable of grounding future research into the theory and practice of Psychiatric Rehabilitation. Self-regulation and control theory appear to provide such a framework.

Chapter III

METHOD

Participants

Study participants comprised 116 adults diagnosed with a serious mental illness (schizophrenia, schizoaffective disorder, bipolar disorder, major depressive disorder) who acknowledged having a mental illness and could report at least one psychiatric diagnosis, read aloud the English-language instructions for the Stages of Recovery Instrument (STORI) (Andresen et al., 2006), and who were not obviously intoxicated. Participants were recruited in several different service settings affiliated with the Center for Urban Community Services (CUCS) that were expected to serve a range of individuals at different stages of psychiatric recovery. These settings included a transitional housing programs located in Harlem and lower Manhattan; a street outreach team operating in Harlem; a licensed Community Residence (CR/SRO) and an Assertive Community Treatment (ACT) team located in the Bronx; and 13 permanent supportive housing sites located in the Bronx, Brooklyn, and Manhattan.

The average age of participants was 52.5 years (± 9.30), ranging from 28 to 74 years. Sixty-three of the 116 participants (54%) were male and 53 (46%) were female. Fifty-seven (51%) were black, 36 (32%) were white, and 18 (17%) identified as

multiracial or of other race. Twenty-one of the participants (18%) were of Hispanic origin. Almost all participants (112, or 97%) spoke English as their primary language, and the remaining 4 (3%) were primarily Spanish-speaking. Thirty-six participants (32%) reported a highest completed grade less than a high school diploma or GED, 41 (37%) reported completing high school or receiving a GED, and 35 (31%) reported completing at least one year of formal education beyond the high school/GED level.

The most common qualifying psychiatric diagnoses were Bipolar Disorder (43 participants, 37%) and Major Depressive Disorder (40 participants, 34%). Twenty-five participants (22%) reported diagnoses of Schizophrenia, and 13 (11%) reported diagnoses of Schizoaffective Disorder.

Procedures

Data Collection

Interested candidates were screened for eligibility on weekday afternoons and evenings, and were compensated \$5 immediately upon completing the screening, which took less than five minutes per candidate. The reading component of the screening required that participants read aloud the instructions to the STORI assessment. Candidates able to report at least one current psychiatric diagnosis and read aloud from the STORI instructions were oriented to the study and asked to demonstrate ability to give informed consent by correctly answering three, multiple-choice questions on their rights as research participants.

Candidates who demonstrated the ability to give informed consent were

offered an additional \$15 to complete the study assessment battery. Consenting participants were asked to sign an acknowledgement of informed consent before completing the assessment battery that same evening. The assessment battery was administered in small groups of no more than six individuals, which were conducted on weekday evenings and lasted approximately one to 1.25 hours.

Instruments

Characteristics

The characteristics questionnaire included self-reported primary language, psychiatric diagnosis, age when first experienced psychiatric symptoms, birth month and year, sex, race, Hispanic origin, and education level.

Cybernetic Coping Scale (CCS-23)

The Cybernetic Coping Scale comprises five coping factors: environmental modification, accommodation, devaluation, avoidance, catharsis, and reevaluation. Edwards and Baglioni validated the original 40-item CCS in the U.S. with MBA students (1993) and proposed a 20-item short version based on their results. Brough, O'Driscoll, and Kalliath validated the 20-item CCS in New Zealand with employees of 24 large financial, retail, manufacturing, management, tourism, and service organizations, and proposed a 14-item version (2005). Guppy et al. validated the CCS in the UK with samples of social service employees, working university students, uniformed police officers, and police officer recruits; Guppy et al. proposed the 15-item version of the CCS used here, which includes three items for each coping type construct (2004). An additional three items were added from Carver, Scheier, and

Weintraub's COPE scale (1989)'s to measure reevaluative coping, and five exploratory items targeting hypothesized re-attributive and re-calculative coping types were also added. None of these three added subscales will be used in this thesis.

As shown on Table 2, Cronbach's alpha for the CCS subscales (.69-.80) in the present study were lower than those reported by Brough and colleagues (.73-.87; 2005), and substantially lower than those reported by Edwards et al. (.78-.95; 1993). This may be related to the different respondent populations: Edwards and colleagues assessed students in a U.S. MBA program, and Brough et al. analyzed data from currently employed New Zealanders with 5.3 years average job tenure.

Table 2
CCS Psychometrics

Subscale (N=116)	Cronbach's alpha for standardized values	Mean inter-item correlation	Mean item score (SD)
Cathartic	.69	.42	1.89 (1.04)
Devaluative	.80	.57	1.71 (1.13)
Avoidant	.72	.46	1.96 (1.11)
Environmental Modification	.69	.43	1.87 (1.02)
Accommodative	.78	.54	1.98 (1.11)

Cybernetic Coping Self-Efficacy Scale (CCSES-23)

The CCSES was developed for use in this thesis (Levitt, 2012) by applying the design of Chesney et al.'s (2006) Coping Self-Efficacy Scale (CSES) to the contents of the CCS, described above. The CSES was validated by Chesney et al. in the U.S. with HIV+ men with depressed mood (2006). It was validated in the UK with athletes by Nicholls, Polman, Levy, and Borkoles (2010), and with adults recruited in a range of community settings by Colodro, Godoy-Izquierdo, and Godo (2010). Language implying uncertainty of outcome ("try to", "make an effort to",

etc.) on the CCS was removed from all CCSES items, in order to measure efficacy, rather than effort. As with the CCS, scores for each of the CCSES factors are obtained by averaging the responses for each factor's three-item subscale, and data from the five exploratory items will not be used.

As shown in Table 3, values of Cronbach's alpha for the CCSES (.69-.84) in the present study were slightly higher than those for the CCS from which it was derived. Although one subscale (cathartic coping self-efficacy) fell marginally below the common .70 cut-off, it was considered adequate to retain for a three-item, self-report subscale in the population under study.

Table 3
CCSES Psychometrics

Subscale (N = 116)	Cronbach's alpha for standardized values	Mean inter-item correlation	Mean item score (SD)
Cathartic	.69	.43	1.84 (.93)
Devaluative	.81	.59	1.68 (1.00)
Avoidant	.77	.53	1.55 (.94)
Environmental Modification	.76	.52	1.75 (.96)
Accommodative	.84	.63	1.86 (1.00)

It was expected that greater self-efficacy in a coping style would correspond to greater use of that style, resulting in correlations between pairs of corresponding CCS and CCSES subscales, though without drawing any inferences about causal direction. This proved to be the case in the present study, as shown in Table 4, with the one interesting exception that Avoidant Self-Efficacy was not significantly related to frequency of Avoidant Coping.

Table 4
CCSES x CCS Subscale Correlations

(N = 116)		CCS Cathartic	CCS Devaluative	CCS Avoidant	CCS Environmental Modification	CCS Accommodative
CCSES	r	.33	.19	.03	.16	.19
Cathartic	p	<.01**	.04*	.72	.09	.04*
CCSES	r	.14	.38	.11	.19	.23
Devaluative	p	.13	<.01**	.24	.04*	.02*
CCSES	r	.18	.30	.14	.19	.24
Avoidant	p	.06	.01**	.13	.05*	<.01**
CCSES Environ.	r	.26	.25	.08	.30	.25
Modification	p	<.01**	<.01**	.38	<.01**	<.01**
CCSES	r	.31	.30	.13	.34	.40
Accommodative	p	<.01**	.01**	.17	<.01**	<.01**

* $\alpha = .05$

** $\alpha = .01$

Cybernetic Affect and Social Emotion Scale (CASES-38)

The CASES-38 was developed for this thesis, drawing items from existing affect/emotion measures (Gilbert et al., 2008; Lubin & Whitlock, 2002; Rafaeli & Revelle, 2006; Watson & Clark, 1999), informed by word frequency-of-use data obtained from the English Lexicon Project (Balota et al., 2007). Subscales include Anger/Frustration (four items), Anxiety (two items), Disgust (two items), Fear (three items), Loneliness (two items), Pride (two items), Quiescence (two items), Relief (two items), Sadness (two items), Security (two items), and Guilt/Shame (three items).

Exploratory subscales designed to test hypothesized affects: Caring (two items), Enjoying (two items), and Wanting (two items) were also included, with a final item (“Loved”) to be tested for possible inclusion in the Security subscale. None of the data from these items will be used in this thesis. The scale asks respondents to

report how much they experienced each of 34 affects and four social emotions over the previous week, selecting from responses “not at all”, “somewhat”, “quite a bit”, “very much”, and “extremely”. The measure’s introductory script encourages respondents to report their actual feelings, without consideration of what they “should” or “shouldn’t” feel. This addressed issues that arose during piloting of the Guilt/Shame subscale and possibly the Anger/Frustration and/or Fear subscales, as well.

The CASES was piloted iteratively, testing different possible affect terms with a series of small, ethnically and racially diverse groups of predominantly homeless and/or recently hospitalized people diagnosed with serious mental illness. As a result of that process, all terms of more than three syllables (e.g., “energetic”, “desperation”), were eliminated from consideration, as were terms of three syllables (e.g., “defeated”, “dejected”) when suitable alternatives were available. Terms with confusing secondary meanings (e.g., “warm”) were also eliminated, as were common diagnostic terms (e.g., “anxious”) and terms likely to be associated with involuntary treatment (e.g., “depressed”). In the absence of over-riding considerations, terms with higher English Lexicon Project (ELP) frequency-of-use (HAL) ratings were chosen over those with lower ratings. HAL ratings are the natural log of the frequency with which a word appears in the Hyperspace Analogue to Language database of more than 130 million words gathered across 3000 online newsgroups in 1995; the HAL scale ranges from 0 (for words with no instances in the database) to 16.96 (for “the”, with 23,207,800 instances). All selected items but one scored $\ln. HAL \geq 7.00$ in

frequency of use. Where no close synonyms of core affective adjectives survived the initial selection and testing process, noun forms of the core terms were included in the relevant subscales (e.g., “frustrated” and “frustration”). One term (“calm”) was dropped from the three-item Quiescence subscale due to particularly low inter-correlations with the other two items and concerns regarding the underlying construct.

Subscales for Anxiety, Fear, Loneliness, Quiescence, and Security with simple, frequently-used terms were extracted directly from related subscales of established measures. Three Fear items and two Loneliness items were extracted from the Fear and Sadness subscales of the Positive and Negative Affect Schedule – Expanded Form (PANAS-X), respectively (Watson & Clark, 1999). Two Quiescence and two Security items were extracted from the Relaxed and Safe/Content subscales of the Activation and Safe/Content Affect Scale, respectively (Gilbert et al., 2008). Two Anxiety items were extracted from the High Tense Arousal cluster of the Motivational States Questionnaire (MSQ) (Rafaeli & Revelle, 2006).

No acceptable subscales for Anger/Frustration, Disgust, Guilt/Shame, Pride, Relief, or Sadness could be located within previously published affect measures. Novel subscales for these affects were iteratively designed, piloted, and ultimately tested during the final pilot, which included thirty-seven respondents living in a partial-hospitalization program in New York City (Levitt, 2012). Two respondents were excluded when it became clear that they were unable to meaningfully participate, due to severe language barriers and cognitive impairment in one case, and profound cognitive impairment and/or intoxication in the other. Immediately

following the pilot, all of the remaining 35 respondents confirmed that they were familiar with all terms on the scale. In five instances multiple responses to a single item caused that item to be dropped for the relevant respondent, reducing n for the affected subscale. Item numbers, inter-item correlation, and English Lexicon Project natural log (ln). HAL frequency-of-use ratings are reported below:

Anger/Frustration ($n = 35$), four items; ln HAL 8.37 to 9.51; average inter-item correlation = .50.

Disgust ($n = 35$), two items; ln HAL 7.56 and 7.37; inter-item correlation = .42.

Guilt/Shame ($n = 32$), three items; ln of HAL 8.00 to 9.43; average inter-item correlation = .52.

Pride ($n = 35$), two items; ln of HAL 9.02 and 9.72; inter-item correlation = .67.

Relief ($n = 35$), two items; ln of HAL 9.11 and 7.53; inter-item correlation = .52.

Sadness ($n = 35$); ln of HAL 9.75 and 7.11: inter-item correlation = .46.

Despite their brevity, 11 of the 12 CASES affect subscales had Cronbach's alphas $> .70$ (range .75-.87) for the present study. The Security subscale alpha, as shown on Table 5, was only .65, but the inter-item correlation (IIC) was still .49 (higher than three of five subscales on the underlying CCS) and the subscale was retained. Inter-item correlations on the other subscales were obviously even higher, ranging from .55 to .76.

Table 5
CASES Psychometrics

Subscale (N = 116)	Cronbach's alpha for standardized values	Mean inter- item correlation	Mean item score (SD)
Anger/Frustration	.88	.65	1.62 (1.17)
Anxiety	.77	.63	1.65 (1.15)
Disgust	.77	.62	1.41 (1.23)
Fear	.88	.71	1.32 (1.20)
Guilt/Shame	.79	.55	1.11 (1.08)
Liveliness	.80	.66	1.90 (1.17)
Loneliness	.75	.60	1.68 (1.23)
Pride	.80	.66	1.97 (1.29)
Quiescence	.87	.76	1.91 (1.14)
Relief	.77	.62	1.94 (1.16)
Sadness	.81	.68	1.56 (1.13)
Security	.65	.49	2.22 (1.11)

The CASES structure was also supported by the pattern of correlations among the subscales. The average IIC for all CASES subscale items included in this study was .283. The average IIC for all negative affect subscale items was .485, and the average for all positive affect items was .483, yielding an average of averages of .484, indicating that the scale's positive-negative dimension discriminated effectively between items. The average IIC for positive social affect was .664, the average IIC for positive avoidance affect was .621, and the average IIC for positive approach affect was .478; the average IIC for negative social affect was .553, the average IIC for negative avoidance affect was .570, and the average IIC for negative approach affects was .552. This yields an average of averages of .573, indicating that the scale's motivational system typology added discriminatory value beyond the positive-negative dimension. The IIC average of averages for the 12 affect subscales was .636, indicating that these narrowly drawn affective constructs added discriminatory value

beyond both the positive-negative dimension and motivational system structure.

Bivariate correlations were inspected between all affect subscales, revealing nine negative affect pairs and three positive affect pairs with $r \geq .600$. The items for each of these pairs were merged and the combined IIC average was compared to the average of averages for the separate affect subscales. In every case, the IIC for two subscales was greater than the merged IIC for those same subscales, suggesting that no pair of affect subscales could be combined without a loss of precision.

Goal and Aversion System Questionnaire (GASQ)

The Goal and Aversion System Questionnaire includes the GASQ Goals and Threats Sheet, the GASQ Goal Sheets, and the GASQ Threat Sheets, which were developed and piloted for this thesis (Levitt, 2012). The GASQ's conceptual core was initially suggested by the literature on Markus' Possible Selves theory (1986), the connection between Possible Selves and self-regulation made by Hoyle and Sherrill (2006), and Higgins' Self-Discrepancy Theory (1985) as modified by Ogilvie (1987). The measure's specific design was initially influenced by Hardin and Lakin's Integrated Self-Discrepancy Index (2009). The final version of the GASQ, however, reflects a self-regulatory framework peculiar to this thesis and differs substantially from any known measures.

On the Goals and Threats Sheet, items one through three and five through seven establish target goals and aversions for the Goal Sheets and Threat Sheets that follow. These items are also intended to support qualitative analysis of goal and aversion types. Items four and eight are intended to measure approach and avoidance

focus, respectively.

One Goals Sheet is completed for each goal reported on the Goals and Threats Sheet. The first item on the sheet is intended to measure subjective goal proximity, a significant predictor of reward response under conditions of high physiological arousal (Smith et al., 2011). The second, fourth, and sixth items are intended to measure relative reward expectancy, the critical value in reward-based temporal difference learning (Sutton, 1988) and the dominant predictor of reward response under conditions of low physiological arousal (Smith et al., 2011). Item three is intended to measure goal self-efficacy and item number five is intended to measure subjective goal probability. Item 7 is a single item adopted from Emmons' (1986) Striving Assessment Scale (SAS), that was validated as an independent measure of intra-striving conflict (or ambivalence) by Emmons (1986) and Klinger, Barta, and Maxeiner (1980). Goal Sheet scores are obtained by calculating the average of all responses to the relevant items on all completed Goal Sheets.

One Threats Sheet is completed for each aversion reported on the Goals and Threats Sheet. The first item on the sheet is intended to measure subjective aversion proximity, which is assumed to be the dominant predictor of avoidance response (Smith et al., 2011). The second, fourth, and sixth items are intended to measure relative aversion expectancy, which is assumed to be the critical value in aversion-based temporal difference learning (Sutton, 1988). Item three is intended to measure aversion self-efficacy and item number five is intended to measure subjective aversion probability. Item 7 is a single item adapted from Emmons' (1986) Striving

Assessment Scale (SAS), that was validated as an independent measure of intra-striving conflict (or ambivalence) by Emmons (1986) and Klinger et al. (1980).

Threat Sheet scores are obtained by calculating the average of all responses to the relevant items on all completed Threat Sheets.

On the GASQ Goals and Threats Sheet approach focus item for the present study, four participants (3%) reported they were not at all approach focused, 13 (11%) were somewhat approach focused, 29 (25%) were quite a bit approach focused, 43 (37%) were very much approach focused, and 27 (23%) were extremely approach focused. One hundred and six participants (91%) reported and completed GASQ Goal Sheets for three approach goals, seven participants (6%) reported two approach goals, and two participants (2%) reported one approach goal. One participant (1%) denied any approach goals and was consequently unable to complete the GASQ Goal Sheet.

As intended, the GASQ Goals and Threats Sheet elicited a wide range of goals and aversions. Goals ranged from the very concrete and short-term (e.g. “Get package ready to bring to post office”) to abstract and open-ended (e.g. “Have a pure heart”). Goal content areas included physical health, mental health, daily living activities, spirituality (e.g., “To have a personal relationship with god”), romantic relationships (e.g., “Trying to have sex or make love to my boyfriend”), family (e.g., “Restoring my relationship with my kid”), employment, entrepreneurship (e.g., “To make plenty of money selling my custom jewelry”), training (e.g., “Getting my electrician license”), housing, fitness, sobriety, and many more. Aversions also ranged from the concrete and immediate (e.g., “Not pulling through my surgery”) to the more abstract

and subjective (e.g., “Living in mediocrity/stagnation”), and covered a similarly large range of content areas.

On the GASQ avoidance focus item, nine participants (8%) reported that they were not at all avoidance focused, 17 (15%) were somewhat avoidance focused, 33 (29%) were quite a bit avoidance focused, 30 (26%) were very much avoidance focused, and 26 (23%) were extremely avoidance focused. Eighty-five participants (73%) reported and completed the GASQ Threats Sheet on three fears/dangers, 17 (15%) reported two fears/dangers, and seven (6%) reported one fear/danger. The remaining seven participants (6%) denied any present fears/dangers and were unable to complete the GASQ Threats Sheet.

As described above, 115 participants completed at least one GASQ Goals Sheet. Those participants’ Subjective Goal Proximity scores covered the full range from 0 to 4, with a mean of 1.95 and a standard deviation of .98. Absolute Goal Expectancy scores also ranged from 0 to 4, with a mean of 1.71 and a standard deviation of .84; Cronbach’s alpha for the standardized constituent items was .77, and the average inter-item correlation (IIC) was .63. Relative Goal Expectancy scores ranged from 0 to 4, with a mean of 2.29 and a standard deviation of .71; Cronbach’s alpha was .83 and the IIC was .61. Intra-Goal Conflict scores ranged from 0 to 3.67, with a mean of .74 and a standard deviation of .93.

At least one GASQ Threats Sheet was completed by 109 participants. Their Subjective Aversion Proximity scores covered the full range from 0 to 4, with a mean of 1.66 and a standard deviation of 1.03. Absolute Aversion Expectancy scores ranged

from 0 to 4, with a mean of 1.68 and a standard deviation of .92; Cronbach's alpha was .72 and the IIC was .53. Intra-Aversion Conflict scores also ranged from 0 to 4, with a mean of .87 and a standard deviation of 1.11.

One variable pair, Absolute Goal Expectancy and Subjective Goal Proximity, was correlated at $r \geq .60$ in the present study. Upon inspection, the correlations between the single item for Subjective Goal Proximity and the two items of Absolute Goal Expectancy ($r = .70$, $r = .82$) was found to be greater than the correlation between those items. To maximize parsimony and reduce the threat of multicollinearity, goal proximity was combined with the two Absolute Goal Expectancy items into a composite variable, Absolute Goal Expectancy/Proximity, which was used in the remaining analyses. The composite variable's scores ranged from 0 to 4, with a mean of 1.79 and a standard deviation of .85; Cronbach's alpha was .88 and IIC was .71. As shown in Table 6, following this modification, no pair of GASQ variables was correlated at $r \geq .60$. It is interesting to note that the avoidance variables Absolute Aversion Expectancy and Subjective Aversion Proximity, unlike their approach counterparts, were not strongly correlated ($r = -.23$), reflecting the expected asymmetry of the approach and avoidance motivational systems.

Table 6
GASQ Variable Correlations

		Approach focus	Avoidance focus	Subjective aversion proximity	Absolute aversion expectancy	Intra-aversion conflict	Absolute goal expectancy/proximity	Relative goal expectancy	Intra-goal conflict
Approach focus	r	1	.39**	.18	.21*	-.06	.47**	.31**	.01
	p		<.01	.06	.03	.54	<.01	<.01	.93
	N	116	115	109	109	109	115	115	115
Avoidance focus	r	.39**	1	.33**	.04	.03	.34**	.05	.14
	p	<.01		<.01	.71	.74	<.01	.62	.13
	N	115	115	109	109	109	114	114	114
Subjective aversion proximity	r	.18	.33**	1	-.23*	.05	.17	.04	.00
	p	.06	<.01		.02	.58	.08	.70	.98
	N	109	109	109	109	109	108	108	108
Absolute aversion expectancy	r	.21*	.04	-.23*	1	.17	.41**	.18	.24**
	p	.03	.71	.02		.08	<.01	.06	.01
	N	109	109	109	109	109	108	108	108
Intra-aversion conflict	r	-.06	.03	.05	.17	1	.05	-.03	.57**
	p	.54	.74	.58	.08		.61	.77	<.01
	N	109	109	109	109	109	108	108	108
Absolute goal expectancy/proximity	r	.47**	.34**	.17	.41**	.05	1	.58**	.17
	p	<.01	<.01	.08	<.01	.61		<.01	.08
	N	115	114	108	108	108	115	115	115
Relative goal expectancy	r	.31**	.05	.04	.18	-.03	.58**	1	.01
	p	<.01	.62	.70	.06	.77	<.01		.90
	N	115	114	108	108	108	115	115	115
Intra-goal conflict	r	.01	.14	.00	.24**	.57**	.17	.01	1
	p	.93	.13	.98	.01	<.01	.08	.90	
	N	115	114	108	108	108	115	115	115

* $\alpha = .05$ ** $\alpha = .01$

Stages of Recovery Instrument (STORI)

The Stages of Recovery Instrument was developed by Andresen, Caputi, and Oades to measure the process of recovery from psychiatric illness (2006). The STORI comprises 50 items distributed across 10 thematic groups and five stages of recovery. The measure has been validated by Andresen, Caputi, and Oades in Australia with adults diagnosed with schizophrenia (2006), and adults diagnosed with serious psychiatric illness (2010). The instrument's validity and test-retest reliability were

further supported by a U.K. replication study (Weeks et al., 2011). Data from the Australian and U.K. studies suggested partially overlapping three-factor structures rather than the expected five factors, but the study sample sizes were very small ($N = 94$ and $N = 50$, respectively) for factor analysis of a 50-item instrument, particularly at the lower end of the stage model ($n = 15$ and $n = 20$, respectively, for stage1+stage2+stage3).

A brief scale also developed by Andresen and colleagues and based on the same five-stage model of recovery has been validated in an Australian study ($N = 281$) with adults with psychotic disorders (Andresen et al., 2010), and a Japanese version of the brief scale has been validated in a Japanese study ($N = 223$) with people living with long-term mental illness (Chiba et al., 2010). A structured interview pilot study developed by Andresen's group has provided additional support for the five-stage model (Wolstencroft et al., 2010).

Given the weight of the current evidence, Andresen et al. recommend retaining the qualitatively-supported five-stage structure pending further research (2011, p. 118), and their recommendation was followed here. An abbreviated, 30-item version of the STORI is currently being tested (Puschner et al., 2010), but psychometric data was not available in time to consider the new version for use in this thesis.

The STORI Stage distribution for the present study was as follows: 1 = 8 (7%), 2 = 9 (8%), 3 = 8 (7%), 4 = 38 (33%), 5 = 53 (46%). The distribution of recovery stages fell between those reported by Andresen et al. (2006) and Weeks et al.

(2010). The proportions of Stage 1, Stage 3, and Stage 4 participants were similar across all three studies, but the present study's proportions of Stage 2 and Stage 5 participants fell between the widely separated values reported by Andresen and Weeks. Cronbach's alpha was $> .80$ for all five subscales, and $IIC \geq .38$ (Table 7).

Table 7
STORI Psychometrics

STORI Stage (N = 116)	Cronbach's alpha for standardized values	Mean inter-item correlation	Mean response (SD)	Score range
Stage 1	.86	IIC = .38	1.63 (1.10)	0-5
Stage 2	.86	IIC = .39	2.98 (1.12)	0-5
Stage 3	.90	IIC = .47	3.18 (1.18)	0-5
Stage 4	.88	IIC = .42	3.54 (1.02)	.5-5
Stage 5	.92	IIC = .53	3.53 (1.14)	.5-5

Correlations between STORI stage scores (see Table 8), differed from those in Andresen and colleagues (2006) and were similar to those reported by Weeks, et al (2010), in that Stage 1 scores were not significantly correlated with either Stage 2 or Stage 3 scores, and were negatively correlated with Stage 4 as well as Stage 5 scores.

Table 8
STORI Stage Score Correlations

N = 116		Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Stage 1	r	1	.17	.00	-.24**	-.46**
	p		.07	1.0	<.01	<.01
Stage 2	r	.17	1	.89**	.70**	.42**
	p	.07		<.01	<.01	<.01
Stage 3	r	.00	.89**	1	.80**	.53**
	p	1.0	<.01		<.01	<.01
Stage 4	r	-.24**	.70**	.80**	1	.72**
	p	<.01	<.01	<.01		<.01
Stage 5	r	-.46**	.42**	.53**	.72**	1
	p	<.01	<.01	<.01	<.01	

* $\alpha = .05$ ** $\alpha = .01$

Independent Variables

Stage of recovery: Stage of recovery is defined as the highest-scored stage subscale

on the STORI.

Dependent Variables

Absolute Aversion Expectancy: Absolute Aversion Expectancy is defined as the mean of all responses to items 3 and 5 on the GASQ Threat Sheets.

Absolute Goal Expectancy: Absolute Goal Expectancy is defined as the mean of all responses to items 3 and 5 on the GASQ Goal Sheets.

Absolute Goal Expectancy/Proximity: Absolute Goal Expectancy/Proximity is defined as the mean of all responses to items 1, 3, and 5 on the GASQ Goal Sheets.

Anger/Frustration: Anger/Frustration is defined as the mean of responses to the Angry, Frustrated, Anger, and Frustration items on the CASES-38.

Anxiety: Anxiety is defined as the mean of responses to the Nervous and Tense items on the CASES-38.

Approach Focus: Approach Focus is defined as the response to item 2 on the GASQ Goals and Threats Sheet.

Avoidance Focus: Avoidance Focus is defined as the response to item 4 on the GASQ Goals and Threats Sheet.

Coping Frequency: Coping Frequency is defined as the mean of responses to all items on the CCS-23.

Coping Self-Efficacy: Coping Self-Efficacy is defined as the mean of responses to all items on the CCSES-23.

Disgust: Disgust is defined as the mean of responses to the Disgust and Disgusted

items on the CASES-38.

Environmental Modification Coping Ratio: Environmental Modification Coping

Ratio is defined as the mean of responses to CCS-23 items 5, 8, and 13, divided by the mean of responses to all other CCS-23 items.

Fear: Fear is defined as the mean of responses to the Afraid, Scared, and Frightened items on the CASES-38.

Guilt/Shame: Guilt/Shame is defined as the mean of responses to the Ashamed, Guilty, and Embarrassed items on the CASES-38.

Intra-Aversion Conflict: Intra-Aversion Conflict is defined as the mean of all responses to item 7 on GASQ Threat Sheets.

Intra-Goal Conflict: Intra-Goal Conflict is defined as the mean of all responses to item 7 on GASQ Goal Sheets.

Liveliness: Liveliness is defined as the mean of responses to the Excited and Lively items on the CASES-38.

Loneliness: Loneliness is defined as the mean of responses to the Alone and Lonely items on the CASES-38.

Pride: Pride is defined as the mean of responses to the Pride and Proud items on the CASES-38.

Quiescence: Quiescence is defined as the mean of responses to the Peaceful and Relaxed items on the CASES-38.

Relative Goal Expectancy: Relative Goal Expectancy is defined as the mean of all responses to items 2, 4, and 6 on the GASQ Goal Sheets.

Relief: Relief is defined as the mean of responses to the Relief and Relieved items on the CASES-38.

Sadness: Sadness is defined as the mean of responses to the Sad and Sadness items on the CASES-38.

Security: Security is defined as the mean of responses to the Safe and Secure items on the CASES-38.

Subjective Goal Proximity: Subjective Goal Proximity is defined as the mean of all responses to item 1 on the Goal Sheets.

Subjective Aversion Proximity: Subjective Aversion Proximity is defined as the mean of all responses to item 1 on the Threat Sheets.

Table 9
Variable Definitions and Sources

Variable Name	Variable Definition	Variable Source
Stage of recovery	Extent to which a person has recovered from a psychiatric disability.	The highest-scored stage subscale on the STORI.
<i>Intra-Striving Conflict</i>		
Intra-Goal Conflict	Degree to which goal approach conflicts with aversion avoidance, as reflected in the anticipated intensity of negative affect if/when goals are attained.	The mean of all responses to item 7 on GASQ Goal Sheets.
Intra-Aversion Conflict	Degree to which aversion avoidance conflicts with goal approach, as reflected in the anticipated intensity of negative affect if/when aversions are avoided	The mean of all responses to item 7 on GASQ Threat Sheets.
<i>Approach Focus</i>	Self-reported focus on pursuit of approach goals.	The response to item 2 on the GASQ Goals and Threats Sheet.
<i>Approach Functioning</i>		
Absolute Goal Expectancy/Proximity	Self-reported absolute proximity and likelihood of reaching approach goals.	The mean of all responses to items 1, 3, and 5 on the GASQ Goal Sheets.
Relative Goal Expectancy	Self-reported goal proximity, goal efficacy, and likelihood of reaching goals relative to expectations for same.	The mean of all responses to items 2, 4, and 6 on the GASQ Goal Sheets.
<i>Approach Affect – Positive</i>		
Liveliness	Positive, activating affect associated with relative goal/aversion expectancy and absolute goal/aversion proximity.	The mean of responses to the Excited and Lively items on the CASES-38.
Pride	Positive, activating social emotion associated with increase in perceived social value relative to expected value.	The mean of responses to the Pride and Proud items on the CASES-38.
Security	Positive, deactivating affect associated with relative goal/aversion expectancy and absolute goal/aversion proximity specific to attachment goals.	The mean of responses to the Safe and Secure items on the CASES-38.
<i>Approach Affect – Negative</i>		
Anger/Frustration	Negative, activating approach affect associated with reversible goal blockage, imposition of aversive / avoidant stimuli, or prevention of escape from such stimuli.	The mean of responses to the Angry, Frustrated, Anger, and Frustration items on the CASES-38.
Loneliness	Negative, activating affect inversely associated with relative goal/aversion expectancy and absolute goal/aversion proximity specific to attachment goals.	The mean of responses to the Alone and Lonely items on the CASES-38.
Sadness	Negative, deactivating approach affect inversely associated with relative goal/aversion expectancy and absolute goal/aversion proximity.	The mean of responses to the Sad and Sadness items on the CASES-38.
<i>Avoidance Focus</i>	Self-reported focus on avoidance of aversions.	The response to item 4 on the GASQ Goals and Threats Sheet.
<i>Avoidance Functioning</i>		
Absolute Aversion Expectancy	Self-reported likelihood of avoiding aversions.	The mean of all responses to items 3 and 5 on the GASQ Threat Sheets.
Subjective Aversion Proximity	Self-reported proximity to aversions.	The mean of all responses to item 1 on the Threat Sheets.
<i>Avoidance Affect – Negative</i>		
Anxiety	Negative, activating avoidance affect associated with vigilance in response to a potential threat.	The mean of responses to the Nervous and Tense items on the CASES-38.
Disgust	Negative, activating avoidance affect associated with active avoidance of perceived contaminants.	The mean of responses to the Disgust and Disgusted items on the CASES-38.
Fear	Negative, activating avoidance affect associated with active avoidance of an immediate threat.	The mean of responses to the Afraid, Scared, and Frightened items on the CASES-38.
Guilt/Shame	Negative, activating social emotion(s) associated with decrease in perceived social value relative to expected value.	The mean of responses to the Ashamed, Guilty, and Embarrassed items on the CASES-38.
<i>Avoidance Affect – Positive</i>		
Quiescence	Positive, deactivating avoidance affect inversely associated with Absolute Aversion Expectancy.	The mean of responses to the Peaceful and Relaxed items on the CASES-38.
Relief	Positive, deactivating avoidance affect inversely associated with Subjective Aversion Proximity.	The mean of responses to the Relief and Relieved items on the CASES-38.
<i>Self-Regulatory Skills</i>		
Coping Self-Efficacy	Self-reported ability to effectively use common coping techniques.	The mean of responses to all items on the CCSES-23.
<i>Self-Regulatory Habits</i>		
Coping Frequency	Self-reported frequency of using common coping techniques.	The mean of responses to all items on the CCS-23.
Environmental Modification Coping Ratio	Self-reported ability to effectively use environmental modification coping relative to other common coping techniques.	The mean of responses to CCS-23 items 5, 8, and 13, divided by the mean of responses to all other CCS-23 items.

Data Analysis (including power analysis)

The planned MANOVA analysis included 22 dependent continuous variables

and two dependent ordinal variables (goal and threat focus) that were treated as continuous, for a total of 24 dependent variables. Two of these 24 variables were combined following psychometric analysis, as described below, and the actual MANOVA included 23 dependent variables. The MANOVA analysis included STORI stage of recovery as an independent, ordinal, five-level variable. Based on pilot data (Levitt, 2012), the mean global η^2 of the MANOVA was estimated to be .40. G*Power (Faul, 2010) estimated that a total sample of $N = 65$ is required to obtain .95 power at $\alpha = .01$ for a global multivariate test of a one-way, five-level MANOVA with 24 dependent variables and an effect size of $\eta^2 = .40$.

Previously collected data suggested that the distribution of participants' stage of recovery would be extremely uneven, approximately 1:2:2:6:8 from Stage 1 to Stage 5 (Andresen et al., 2003; Weeks et al., 2011; Levitt, 2012), and that dependent variable means for groups separated by two recovery stages would differ by approximately one standard deviation (Levitt, 2012). There were six between-group comparisons ($1 \leftrightarrow 3$, $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, $3 \leftrightarrow 5$) separated by at least two such stages. At power = .80 and $\alpha = .05$, PASS statistical power software (Hintze, 2011) estimated the following required sample sizes for univariate comparisons between those groups:

$1 \leftrightarrow 3$: Stage 1 = 13, Stage 3 = 26; $1 \leftrightarrow 4$: Stage 1 = 5, Stage 4 = 30; $1 \leftrightarrow 5$: Stage 1 = 3, Stage 5 = 24.

$2 \leftrightarrow 4$: Stage 2 = 11, Stage 4 = 33; $2 \leftrightarrow 5$: Stage 2 = 5, Stage 5 = 20.

$3 \leftrightarrow 5$: Stage 3 = 11, Stage 5 = 44.

Given the expected 1:8 sample ratio between Stage 1 and Stage 5, and 1:4 ratio between Stage 2, Stage 3, and Stage 5, total sample size was expected to be very sensitive to the number of Stage 5 participants necessitated by the number of required participants at Stage 1 to Stage 3. Accordingly, the 1↔3 comparisons, which would require 13 Stage 1 and 26 Stage 3 (and thus 104 Stage 5) participants, were dropped from the planned analyses. The minimum group samples required for the remaining five inter-group comparisons were Stage 1 = 5, Stage 2 = 11, Stage 3 = 11, Stage 4 = 33, and Stage 5 = 44.

In order to provide adequate statistical power for the planned analyses, this thesis used the latter minimum sample size of $N = 104$. Except where otherwise noted, all statistical analyses were conducted using IBM SPSS Statistics, release 19.0.0.1.

Planned analyses

Simple regressions of linear relationships between recovery and self-regulation

Independent variable: STORI stage of recovery.

Dependent variables: approach focus, intra-goal conflict, absolute goal expectancy, relative goal expectancy, subjective goal proximity, liveliness, security, pride, anger/frustration, sadness, loneliness, avoidance focus, intra-aversion conflict, relative aversion expectancy, absolute aversion expectancy, subjective aversion distance, quiescence, relief, fear, anxiety, disgust, guilt/shame, coping self-efficacy, and environmental modification coping ratio.

MANOVA test of between-group relationships between recovery and self-

regulation

Independent variable: STORI stage of recovery.

Dependent variables: approach focus, intra-goal conflict, absolute goal expectancy, relative goal expectancy, subjective goal proximity, liveliness, security, pride, anger/frustration, sadness, loneliness, avoidance focus, intra-aversion conflict, relative aversion expectancy, absolute aversion expectancy, subjective aversion distance, quiescence, relief, fear, anxiety, disgust, guilt/shame, coping self-efficacy, and environmental modification coping ratio.

***t* tests of between-group relationships between recovery and self-regulation**

Independent variable: STORI stage of recovery

Dependent variables: approach focus, intra-goal conflict, absolute goal expectancy, relative goal expectancy, subjective goal proximity, liveliness, security, pride, anger/frustration, sadness, loneliness, avoidance focus, intra-aversion conflict, relative aversion expectancy, absolute aversion expectancy, subjective aversion distance, quiescence, relief, fear, anxiety, disgust, guilt/shame, coping self-efficacy, and environmental modification coping ratio.

Chapter IV

RESULTS

Tests of Hypotheses

As described in the Method section, Absolute Goal Expectancy and Subjective Goal Proximity were combined into a composite variable, Absolute Goal Expectancy/Proximity, leaving 23 dependent variables with hypothesized relationships to STORI stage of recovery. Raw mean scores for the dependent variables by stage of recovery, with 95% confidence intervals, are presented in Table 10. Variables in this and following tables are grouped by self-regulatory component, sub-grouped (where relevant) by positive vs. negative affect, and sorted alphabetically within groups or (where present) sub-groups.

As described above, the distribution of recovery stage was expected to be heavily weighted towards the higher stages, in an estimated ratio of 1:2:2:6:8 from Stage 1 to Stage 5. In the present study's sample of 116 respondents, this would have translated to a distribution of roughly 6:12:12:37:49. The actual sample, with a distribution of 8:9:8:38:53, was even more heavily weighted in the expected direction, although the Stage 1 group was slightly larger than expected.

Table 10
Values of Dependent Variables x STORI Stage

DV	Stage 1 Mean	Stage 2 Mean	Stage 3 Mean	Stage 4 Mean	Stage 5 Mean
<i>Intra-Striving Conflict</i>					
Intra-Goal Conflict, N = {7, 9, 8, 38, 53}	0.39	1.22	1.38	0.53	0.75
Intra-Aversion Conflict, N = {7, 9, 8, 37, 48}	1.29	1.26	0.92	0.65	0.90
<i>Approach Focus</i> , N = {8, 9, 8, 38, 53}	2.13	2.22	2.50	2.68	2.81
<i>Approach Functioning</i>					
Absolute Goal Expectancy/Proximity, N = {7, 9, 8, 38, 53}	1.40	1.99	1.97	1.66	1.88
Relative Goal Expectancy, N = {7, 9, 8, 38, 53}	1.8	2.6	2.25	2.14	2.41
<i>Approach Affect - Positive</i>					
Liveliness, N = {8, 9, 8, 38, 53}	1.56	1.94	1.75	1.76	2.06
Pride, N = {8, 9, 8, 38, 53}	1.5	1.83	1.88	1.53	2.41
Security, N = {8, 9, 8, 38, 53}	2.06	2.00	1.94	1.86	2.59
<i>Approach Affect - Negative</i>					
Anger/Frustration, N = {8, 9, 8, 38, 53}	2.50	2.02	1.69	1.68	1.36
Loneliness, N = {8, 9, 8, 38, 53}	3.06	2.28	2.5	1.46	1.4
Sadness, N = {8, 9, 8, 38, 53}	2.81	1.78	1.94	1.63	1.24
<i>Avoidance Focus</i> , N = {7, 9, 8, 38, 53}	1.71	2.78	2.75	2.42	2.41
<i>Avoidance Functioning</i>					
Absolute Aversion Expectancy, N = {7, 9, 8, 37, 48}	1.02	1.46	2.16	1.4	1.95
Subjective Aversion Proximity, N = {7, 9, 8, 37, 48}	2.00	1.67	1.56	1.77	1.55
<i>Avoidance Affect - Negative</i>					
Anxiety, N = {8, 9, 8, 38, 53}	2.69	1.94	1.63	1.88	1.28
Disgust, N = {8, 9, 8, 38, 53}	2.56	1.89	1.31	1.55	1.06
Fear, N = {8, 9, 8, 38, 53}	1.79	1.78	1.46	1.50	1.03
Guilt/Shame, N = {8, 9, 8, 38, 53}	1.71	1.85	1.25	1.24	0.77
<i>Avoidance Affect - Positive</i>					
Quiescence, N = {8, 9, 8, 38, 53}	1.19	2.28	1.75	1.58	2.23
Relief, N = {8, 9, 8, 38, 53}	1.19	2.11	2.31	1.86	2.04
<i>Self-Regulatory Skills</i>					
Coping Self-Efficacy, N = {8, 9, 8, 38, 53}	1.48	1.43	1.90	1.70	2.07
<i>Self-Regulatory Habits</i>					
Coping Frequency, N = {8, 9, 8, 38, 53}	2.04	1.61	2.36	2.04	1.90
Env. Mod. Coping Ratio, N = {8, 9, 8, 38, 51}	0.97	0.99	0.97	1.04	0.98

Shapiro-Wilk tests were run on the 23 dependent variables to check normality, revealing 15 DVs with non-normal distributions. Given the preponderance of non-normal DVs, and the clustered (indeed ordinal) nature of STORI stage of recovery, clustered robust regression (Stata/IC 13.0, 2013) was used in place of standard linear regression to test the study's 23 hypothesized relationships.

Tables 11 through 16 show the results of these robust regressions, organized by self-regulatory component. Table 11 presents the results for intra-striving conflict,

Table 12 shows approach focus and approach functioning, Table 13 displays approach affect, Table 14 shows avoidance focus and avoidance functioning, Table 15 presents avoidance affect, and Table 16 contains self-regulatory skills and self-regulatory habits. As can be seen in these tables, eight of the 23 dependent variables (Approach Focus, Anger/Frustration, Loneliness, Anxiety, Disgust, Fear, Guilt/Shame, and Coping Self-Efficacy) were significantly related to stage of recovery at $\alpha = .01$, and two more DVs (Sadness and Absolute Aversion Expectancy) were found to have significant relationships at $\alpha = .05$. Given that simple chance would only be expected to produce 1.15 significant results for 23 tests of significance at $\alpha = .05$ (versus 10 in this case), and 0.23 such results at $\alpha = .01$ (versus eight in this case), multi-test error does not meaningfully threaten these findings, even given the between-DV correlations. The tests include significant results from variables in five of the nine self-regulatory components included in the study (approach focus, approach affect, avoidance functioning, avoidance affect, and self-regulatory skills), and provide considerable support for the proposed model.

Table 11

Tests of Linear Hypotheses: Stage of Recovery Predicting Intra-Striving Conflict

DV	n	t	R ²	b	95% CI	p
Intra-Goal Conflict	115	-0.35	.00	-.03	[-.30,.23]	.74
Intra-Aversion Conflict	109	-1.77	.01	-.10	[-.24,.05]	.15

Table 12

Tests of Linear Hypotheses: Stage of Recovery Predicting Approach Focus and Functioning

DV	n	t	R ²	b	95% CI	p
Approach Focus	116	16.52	.04	.18	[.15,.21]	<.01**
Absolute Goal Expectancy /Proximity	115	0.88	.01	.16	[-.11,.21]	.43
Relative Goal Expectancy	115	0.93	.01	.07	[-.14,.28]	.41

** $\alpha = .01$

Table 13

Tests of Linear Hypotheses: Stage of Recovery Predicting Approach Affect

DV	n	t	R ²	b	95% CI	p
Liveliness	116	2.64	.01	.10	[-.01,.20]	.06
Pride	116	2.50	.04	.22	[-.03,.47]	.07
Security	116	1.91	.04	.18	[-.08,.43]	.13
Anger/Frustration	116	-9.67	.07	-.25	[-.32,-.18]	<.01**
Loneliness	116	-6.73	.15	-.39	[-.55,-.23]	<.01**
Sadness	116	-4.62	.12	-.32	[-.51,-.13]	.01**

* $\alpha = .05$ ** $\alpha = .01$

Table 14

Tests of Linear Hypotheses: Stage of Recovery Predicting Avoidance Focus and Functioning

DV	n	t	R ²	b	95% CI	p
Avoidance Focus	115	0.20	.00	.02	[-.29,.33]	.85
Absolute Aversion Expectancy	109	3.04	.05	.18	[.02,.34]	.04*
Subjective Aversion Proximity	109	-2.50	.01	-.08	[-.16,.01]	.07

* $\alpha = .05$

Table 15

Tests of Linear Hypotheses: Stage of Recovery Predicting Avoidance Affect

DV	n	t	R ²	b	95% CI	p
Anxiety	116	-5.32	.10	-.29	[-.45,-.14]	<.01**
Disgust	116	-7.20	.10	-.32	[-.45,-.20]	<.01**
Fear	116	-5.15	.05	-.21	[-.33,-.10]	<.01**
Guilt/Shame	116	-5.57	.10	-.28	[-.41,-.14]	<.01**
Quiescence	116	1.62	.03	.17	[-.12,.46]	.18
Relief	116	1.30	.01	.10	[-.15,.35]	.32

** $\alpha = .01$

Table 16

Tests of Linear Hypotheses: Stage of Recovery Predicting Self-Regulatory Skills and Habits

DV	n	t	R ²	b	95% CI	p
Coping Self-Efficacy	116	4.89	.06	.16	[.07,.25]	<.01**
Coping Frequency	116	-0.20	.00	-.01	[-.16,.14]	.85
Env. Mod Coping Ratio	114	0.95	.00	.00	[-.02,.03]	.95

** $\alpha = .01$

As described above, Shapiro-Wilk tests revealed 15 DVs with non-normal distributions. In the absence of a multivariate equivalent to robust regression, these were recoded into trichotomous variables prior to the MANOVA analysis, with the lowest quartile of values coded as 0, the middle two quartiles coded as 1, and the

highest quartile coded as 2 (Streiner, 2002). The affected DVs were: Intra-Goal Conflict, Intra-Aversion Conflict, Approach Focus, Relative Goal Expectancy, Anger/Frustration, Liveliness, Loneliness, Sadness, Absolute Aversion Expectancy, Subjective Aversion Proximity, Disgust, Fear, Guilt/Shame, Coping Self-Efficacy, and Environmental Modification Coping Ratio. Following these transformations, no DVs were identified as non-normal by Shapiro-Wilk.

The resulting MANOVA was significant, with the multivariate effect of recovery stage accounting for a substantial portion of the variance among the dependent variables ($F(92,328) = 1.45$, Pillai's Trace = 1.16, $p = .01$, partial eta squared = .289). Box's Test did not reveal any inequalities in covariance across groups (Box's $M = 376.20$, $F(276,18130) = .94$, $p = .75$), which was a potential issue due to the large differences in group size. Between-subjects tests revealed significant effects of STORI stage on nine of 23 DVs, as shown in Table 17: Intra-Goal Conflict, Relative Goal Expectancy, Pride, Security, Loneliness, Absolute Aversion Expectancy, Anxiety, Guilt/Shame, and Quiescence.

These nine variables, which included items from five of the nine self-regulatory components (inter-striving conflict, approach functioning, approach affect, avoidance functioning, and avoidance affect), were then subjected to t tests between non-adjacent STORI stages, in accordance with the analytic plan.

Table 17
MANOVA: Stage of Recovery Predicting Self-Regulatory Variables

DV	F	df	Partial Eta Squared	P
Intra-Goal Conflict ¹	2.45	4,101	.09	.05*
Intra-Aversion Conflict ¹	0.72	4,101	.03	.58
Approach Focus ¹	1.36	4,101	.05	.25
Absolute Goal Expectancy/Proximity	1.04	4,101	.04	.39
Relative Goal Expectancy ¹	3.31	4,101	.12	.01**
Liveliness ¹	0.28	4,101	.01	.89
Pride	2.65	4,101	.10	.04*
Security	3.04	4,101	.11	.02*
Anger/Frustration ¹	1.78	4,101	.07	.14
Loneliness ¹	4.37	4,101	.15	<.01**
Sadness ¹	2.36	4,101	.09	.06
Avoidance Focus	0.59	4,101	.02	.67
Absolute Aversion Expectancy ¹	3.41	4,101	.12	.01**
Subjective Aversion Proximity ¹	0.59	4,101	.02	.67
Anxiety	3.13	4,101	.11	.02*
Disgust ¹	2.31	4,101	.08	.06
Fear ¹	1.47	4,101	.06	.22
Guilt/Shame ¹	2.67	4,101	.10	.04*
Quiescence	2.85	4,101	.10	.03*
Relief	0.76	4,101	.03	.55
Coping Self-Efficacy ¹	1.36	4,101	.05	.25
Coping Frequency	0.92	4,101	.04	.45
Env. Mod. Coping Ratio ¹	0.17	4,101	.01	.95

* $\alpha = .05$ ** $\alpha = .01$

¹Trichotomized variable

As shown in Tables 18 and 19, Loneliness was the variable most consistently differentiated by STORI stage, with lower stages of recovery associated with greater loneliness, and significant results on four of five between-stage comparisons. Among the other approach variables, Relative Goal expectancy yielded significant results on a single between-stage *t* test, and Intra-Goal Conflict, Pride, and Security failed to yield significant results on any planned *t* tests. Among the avoidance variables, Guilt/Shame yielded significant results on two tests, Anxiety and Quiescence each

yielded significant results on a single test, and Absolute Aversion Expectancy failed to yield any significant results.

Table 18

Results of Planned t Tests: Approach

DV	Stage 1 x Stage 5			Stage 1 x Stage 4			Stage 2 x Stage 5			Stage 2 x Stage 4			Stage 3 x Stage 5		
	t	df	p	t	df	p	t	df	p	t	df	p	t	df	p
Intra-Goal Conflict ¹	-0.83	58	.41	-0.02	43	.98	0.87	60	.39	1.96	45	.06	1.25	59	.22
Relative Goal Expectancy ¹	-2.06	58	.04*	-0.67	43	.50	.29	60	.78	1.84	45	.07	-1.06	59	.29
Pride	-1.86	59	.07	-0.06	44	.96	-1.26	60	.21	0.69	45	.49	-1.11	59	.27
Security	-1.23	59	0.22	0.34	44	.74	-1.6	60	.11	0.40	45	.69	-1.64	59	.11
Loneliness ¹	3.95	59	<.01**	3.63	44	<.01**	2.37	60	.02*	1.88	45	.07	2.46	59	.02*

* $\alpha = .05$ ** $\alpha = .01$ ¹Trichotomized variable

Table 19

Results of Planned t Tests: Avoidance

DV	Stage 1 x Stage 5			Stage 1 x Stage 4			Stage 2 x Stage 5			Stage 2 x Stage 4			Stage 3 x Stage 5		
	t	df	p	t	df	p	t	df	p	t	df	p	t	df	p
Absolute Aversion Expectancy ¹	-1.38	53	.17	-0.17	42	.87	-1.24	55	.22	0.09	44	0.93	1.65	54	.11
Anxiety	3.10	59	<.01**	1.87	44	.07	1.62	60	.11	0.17	45	.87	1.31	59	.21
Guilt/Shame ¹	2.69	59	<.01**	1.30	44	.20	3.13	60	<.01**	1.67	45	.10	0.63	59	.53
Quiescence	-2.49	59	.02*	-0.91	44	.37	.13	60	.90	1.66	45	.11	-1.15	59	.25

* $\alpha = .05$ ** $\alpha = .01$ ¹Trichotomized variable

Post Hoc Analyses

As shown in Table 10, every significant variable in the MANOVA showed substantial absolute movement either from Stage 1 to Stage 2 or from Stage 4 to Stage 5. For four of these nine variables (Anxiety, Loneliness, Quiescence, and Relative Goal Expectancy), the single largest improvement occurred in the shift from Stage 1 to Stage 2 recovery, with the other five variables' sharpest improvements split between the Stage 2-to-3 (Absolute Aversion Expectancy and Guilt/Shame), Stage 4-to-5 (Pride and Security), and Stage 3-4 (Intra-Goal Conflict) shifts. Unfortunately,

this means that there was not a single case in which a DV's largest between-stage difference was covered by a planned *t* test! Given this mismatch, together with the sample's recovery stage distribution, it was clearly a mistake to omit adjacent-stage comparisons, and particularly the Stage 4 x Stage 5 *t* tests, from the study's analytic design. To correct this oversight, the omitted between-stage *t* tests were run for the nine variables with significant results in the MANOVA. As shown in Tables 20 and 21, seven of these nine variables showed significant Stage 4 x Stage 5 differences: Absolute Aversion Expectancy, Anxiety, Guilt/Shame, Pride, Relative Goal Expectancy, Quiescence, and Security. Considering all *t* tests, both planned and unplanned, Absolute Aversion Expectancy, and Loneliness each yielded significant results on four of 10 tests; Guilt/Shame and Quiescence yielded significant results on three of 10; Anxiety and Relative Goal Expectancy yielded significant results on two of 10; and Intra-Goal Conflict, Pride, and Security each yielded significant results on a single *t* test.

Table 20
Results of Post Hoc *t* Tests: Approach

DV	Stage 1 x 2			Stage 1 x 3			Stage 2 x 3			Stage 3 x 4			Stage 4x5		
	t	df	p	t	df	p	t	df	p	t	df	p	t	df	p
Intra-Goal Conflict	-1.37	14	.19	-1.56	13	.14	-0.34	15	.74	2.30	44	.03*	-1.60	89	.11
Relative Goal Expectancy ¹	-1.79	14	.10	-0.82	13	.43	1.09	15	.29	0.43	44	.67	-2.67	89	<.01**
Pride	-0.52	15	.61	-.56	14	.58	-0.07	15	.95	0.75	44	.46	-3.36	89	<.01**
Security	0.10	15	.92	.18	14	.86	0.13	15	.90	0.21	44	.84	-3.37	89	<.01**
Loneliness ¹	1.95	15	.070	1.66	14	.12	-0.22	15	.83	2.01	44	.05*	1.02	89	.31

* $\alpha = .05$ ** $\alpha = .01$

¹Trichotomized variable

Table 21

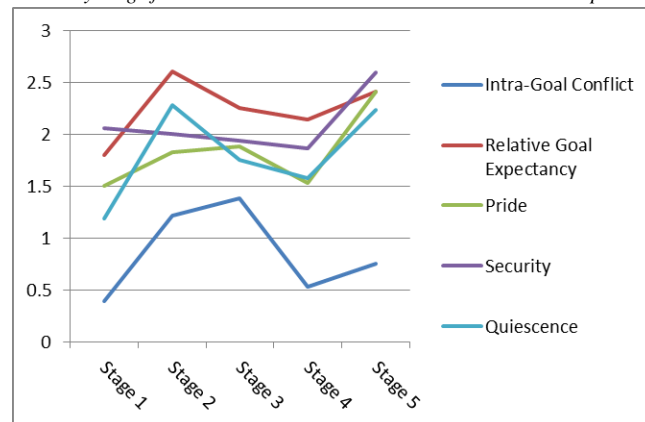
Results of Post Hoc t Tests: Avoidance

DV	Stage 1 x 2			Stage 1 x 3			Stage 2 x 3			Stage 3 x 4			Stage 4x5		
	t	df	p	t	df	p	t	df	p	t	df	p	t	df	p
Absolute Aversion Expectancy ¹	-0.21	14	.84	-2.96	13	.01**	-2.44	15	.03*	3.05	43	<.01**	-2.25	83	.03*
Anxiety	1.37	15	.19	2.03	14	.06	0.90	15	.39	-0.66	44	.51	2.5	89	.01**
Guilt/Shame ¹	-0.27	15	.79	1.72	14	.11	2.01	15	.06	-0.70	44	.49	2.40	89	.02*
Quiescence	-2.21	15	.04*	-1.37	14	.193	1.12	15	.28	0.40	44	.69	-2.69	89	<.01**

* $\alpha = .05$ ** $\alpha = .01$ ¹Trichotomized variable

Inspection of the dependent value means shown in Table 10 suggested that, with the exception of Environmental Coping Ratio, at least some of the dependent variables without significant linear relationships to stage of recovery might instead be related to the IV by cubic functions ($y = ax^3 + bx^2 + cx + d$). Attempts to fit cubic curves did produce significant results for five of these 13 variables (Figure 4): Intra-Goal Conflict ($F(3,111) = 2.73, p = .04$), Relative Goal Expectancy ($F(3,111) = 2.87, p = .05$), Pride ($F(3,112) = 4.13, p < .01$), Security ($F(3,112) = 3.96, p = .01$), and Quiescence ($F(3,112) = 4.09, p < .01$).

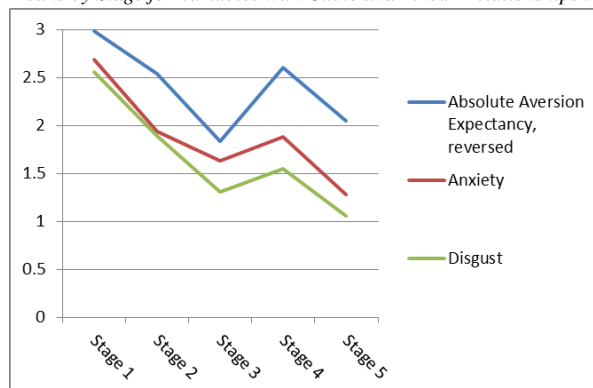
Figure 4

Means by Stage for Variables with Cubic but not Linear Relationships to Stage of Recovery

Given that the probability of Type I error would be expected to produce 0.6 significant results for 12 tests of significance at $\alpha = .05$ (versus five here), and 0.12 such results at $\alpha = .01$ (versus three here), experiment-wise error does not substantially threaten these findings. The tests include a significant result for one more of the study's nine self-regulatory components (intra-striving conflict), leaving only two such components (avoidance focus and self-regulatory habits) with no significant results. What appear to be cubic functions could, of course, also be accounted for by discontinuous, stage-based functions. In either case, however, these results strongly suggest that the variables in question are related to stage of recovery by *some* function.

A visual inspection of the stage means (see Figure 5) for three other variables that were already found to have a significant linear relationship with recovery stage (Table 14) suggested that cubic functions might better account for the variables' behavior. This was confirmed when cubic functions were fit to Absolute Aversion Expectancy ($F(3,105) = 3.74, R^2 = .10, p = .01$), Anxiety ($F(3,112) = 5.08, R^2 = .12, p < .01$), and Disgust ($F(3,112) = 4.66, R^2 = .11, p < .01$).

Figure 5
Means by Stage for Variables with Cubic and Linear Relationships to Stage of Recovery



Environmental Coping Ratio did not produce significant results on either the tests of hypotheses or the planned MANOVA, and in fact appeared to be entirely unrelated to stage of recovery (see Tables 10 and 13). This was quite surprising, given the critical role differences and shifts between environmental and self-directed coping were thought to play in the proposed framework. To test one possible explanation, a new environmental coping *self-efficacy* ratio was calculated in the same manner as the original ratio, but using data from the CCSES rather than the CCS. A Shapiro-Wilk test found that the new ratio was not normally distributed, and it was accordingly converted to a trichotomous variable as described above. The ratio means for Stage 2 through Stage 5 were very similar (0.56, 1.13, 0.95, 0.89, 0.97), and a robust, clustered regression run on the raw data by stage of recovery was non-significant ($t = 0.81, p = .464$). An ANOVA run on the transformed variable by stage of recovery, however, yielded significant results ($F(4,111) = 2.713, p = .034$), with detectable differences between Stage 1 and Stage 2 ($p = .002$), Stage 1 and Stage 4 ($p = .012$), and Stage 1 and Stage 5 ($p = .012$).

Extent to which hypotheses were or were not supported

Approach affect

Positive

Stage of recovery will be positively related to positive approach affects: regression results narrowly failed to support hypotheses for Liveliness and Pride ($p \leq .07$) and failed to support hypotheses for Security by a somewhat larger margin (p

= .13).

Positive approach affects will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5: MANOVA results supported hypotheses for Pride and Security, but not Liveliness. Results of *t* tests supported hypotheses for Pride (Stage 1 x Stage 5, Stage 4 x Stage 5) and Security (Stage 4 x Stage 5).

Negative

Stage of recovery will be negatively related to negative approach affects: regression results supported hypotheses for all variables (Anger/Frustration, Loneliness, and Sadness).

Negative approach affects will be significantly greater for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5: MANOVA results supported hypotheses for Loneliness, narrowly failed to support hypotheses for Sadness ($p = .06$), and failed to support hypotheses for Anger/Frustration by a somewhat larger margin ($p = .14$). Results of *t* tests supported hypotheses for Loneliness (Stage 1 x Stage 5, Stage 1 x Stage 4, Stage 2 x Stage 5, Stage 3 x Stage 4, Stage 3 x Stage 5).

Avoidance focus

Stage of recovery will negatively related to Avoidance Focus: Regression results failed to support hypothesis.

Avoidance Focus will be significantly lower for respondents in higher than lower stages of recovery for stage pairs 1 ↔ 4, 1 ↔ 5, 2 ↔ 4, 2 ↔ 5, and 3 ↔ 5:

MANOVA results failed to support hypothesis.

Avoidance functioning

Stage of recovery will be positively related to Absolute Aversion Expectancy: regression results supported hypothesis.

Absolute Aversion Expectancy will be significantly lower for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$: MANOVA results supported hypotheses. Results of t tests supported hypotheses (Stage 1 x Stage 3, Stage 2 x Stage 3, Stage 3 x Stage 4, Stage 4 x Stage 5).

Stage of recovery will be negatively related to Subjective Aversion Proximity: regression results marginally failed to support hypothesis ($p = .07$).

Subjective Aversion Proximity will be significantly lower for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$: MANOVA results failed to support hypotheses.

Avoidance affect

Positive

Stage of recovery will be positively related to positive avoidance affects (Quiescence and Relief): regression results failed to support hypotheses for both variables.

Positive avoidance affects will be significantly greater for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$: MANOVA results supported hypotheses for Quiescence, but not Relief.

Results of *t* tests supported hypotheses for Quiescence (Stage 1 x Stage 5, Stage 1 x Stage 2, Stage 4 x Stage 5).

Negative

Stage of recovery will be negatively related to negative avoidance affects (Anxiety, Disgust, Fear, and Guilt/Shame): regression results supported hypotheses for all variables.

Negative avoidance affects will be significantly lower for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$: MANOVA results supported hypotheses for Anxiety and Guilt/Shame, marginally failed to support hypotheses for Disgust, and failed to support hypotheses for Fear. Results of *t* tests supported hypotheses for Anxiety (Stage 1 x Stage 5, Stage 3 x Stage 5) and Guilt/Shame (Stage 1 x Stage 5, Stage 2 x Stage 5, Stage 3 x Stage 5).

Self-regulatory skills

Stage of recovery will be positively related to Coping Self-Efficacy (self-reported ability to utilize specific coping behaviors): regression results supported hypothesis.

Coping Self-Efficacy will be significantly greater for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$: MANOVA failed to support hypothesis.

Self-regulatory habits

Stage of recovery will be positively related to Coping Frequency: regression

results failed to support hypothesis.

Coping Frequency will be significantly greater for respondents in higher than lower stages of recovery for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$:

MANOVA results failed to support hypothesis.

Stage of recovery will be positively related to Environmental Modification Coping Ratio: regression results failed to support hypothesis.

Environmental Modification Coping Ratio will be significantly greater for stage pairs $1 \leftrightarrow 4$, $1 \leftrightarrow 5$, $2 \leftrightarrow 4$, $2 \leftrightarrow 5$, and $3 \leftrightarrow 5$: MANOVA results failed to support hypothesis.

Chapter V

DISCUSSION

Principal Analyses

Despite limitations discussed below, the present study has succeeded in generating four original and important findings. The first of these is the strong evidence offered that the proposed self-regulatory model does, in fact, provide a solid framework for the study of recovery from psychiatric disability. The second finding involves the pattern of change in the dependent self-regulatory variables. The third concerns the relative impact of the different stage transitions. The fourth finding relates to the relationships between recovery, coping self-efficacy, and coping behavior. This thesis also confirms one finding from an earlier study, using the GASQ and STORI measures with a new sample.

The present study proposed a self-regulatory model of recovery from psychiatric disability, and selected 23 representative variables from nine self-regulatory components to test that proposition. Ten of these 23 variables generated significant results on linear tests of hypotheses (three of these were better represented by cubic functions), showing an overall relationship between recovery and the variables in question. An additional five variables generated significant results on post hoc tests for cubic relationships, and nine variables generated significant results on a

planned MANOVA and stage-wise post-tests, demonstrating stage-specific relationships between recovery and these variables. In all, 15 of 23 dependent variables were found to have a significant relationship to stage of recovery. These variables included items from seven of the study's nine self-regulatory components: one of two intra-striving conflict variables, the sole approach focus variable, one of two approach functioning variables, five of six approach affect variables, one of two avoidance functioning variables, five of six avoidance affect variables, and the sole self-regulatory skills variable. Only avoidance focus and self-regulatory habits were not found to have any significant relationship to stage of recovery. Of the eight dependent variables for which no significant relationship with stage of recovery was found, only Environmental Modification Coping Ratio seemed clearly unrelated to stage of recovery. Even in that case, however, a significant relationship was found, post hoc, for a related variable: environmental modification coping self-efficacy ratio. All ten significant linear relationships were in the predicted direction, as were 24 of 25 significant between-stage comparisons, and the relationships between the lowest and highest stages were as expected in four of the five variables with significant cubic relationships.

Further research is obviously required, but this initial study has produced strong support for the proposed model. The present thesis has established that the stage of recovery from psychiatric disability is strongly related to both positive and negative simple affect and social emotions that are associated with both the approach and avoidance motivational systems. These relationships are stronger for the negative

approach affects associated with loss of reward (Loneliness and Sadness), avoidance affect associated with threat vigilance (Anxiety) and exposure to contamination (Disgust), and for avoidance-related social emotion (Guilt/Shame). There are somewhat weaker relationships between stage of recovery and affect associated with activation in response to challenge (Anger/Frustration) or imminent threat (Fear). The study has provided strong support for relationships between stage of recovery and approach focus, as well as self-reported self-regulatory skills. It has also generated significant support for relationships between stage of recovery and intra-striving conflict, approach functioning, and avoidance functioning. Given that only one of 23 dependent variables seems wholly unrelated to stage of recovery, and that the significant relationships are overwhelmingly in the predicted directions, it is fair to say that the proposed model is strongly supported by the balance of evidence, and the burden has shifted to anyone who would argue that self-regulation theory does not provide a suitable framework for understanding recovery from psychiatric disability.

Two of the exceptions to the expected patterns noted above are at least as interesting as the patterns, themselves. Chief of these is Intra-Goal Conflict, which had a significant cubic relationship with stage of recovery, but (contrary to expectations) showed an absolute *increase* from Stage 1 to Stage 5, and an apparent sharp rise from an unexpected minimum at Stage 1 to a maximum around Stages 2 and 3. There are many possible explanations, but it seems likely that Stage 1 Moratorium may serve the key function of reducing stress due to intra-striving conflict by minimizing (fruitless) approach activity. If so, readiness to accept an

increased level of intra-striving conflict might be a prerequisite for emerging from moratorium, and/or one mechanism of the transition to Stage 2 Awareness might be improved (contingent) future expectancies that shift the decisional balance toward enduring increased intra-striving conflict. It is also interesting to note that Intra-Aversion Conflict yielded no such relationship and actually appears to trend in the opposite direction, which underscores the importance of distinguishing between approach and avoidance activity.

The other interesting exception is that there was no significant relationship found between stage of recovery and the prevalence of environmental modification coping - not even the hint of such a relationship - nor was any significant relationship detected between Coping Frequency and stage of recovery. A significant relationship was found, however (post hoc) between stage of recovery and environmental modification coping *self-efficacy*. If this is not merely an artifact of the data set, it would appear that coping habits (at least in this population) are relatively inelastic in the face of environmental change (whether internal or external). Rather than adapt coping styles to improve self-regulation, it appears that people recovering from psychiatric disabilities may be dependent on improving their existing coping techniques until pre-existing patterns are once again effective

Another potentially important finding is the significantly and clearly non-linear pattern of change across stages of recovery in the key self-regulatory variable of Absolute Aversion Expectancy, in which improvement between Stage 1 and Stage 3 recovery is followed by a setback from Stage 3 to Stage 4, and then further

improvement from Stage 4 to Stage 5. This pattern may be echoed in some or all of the variables with cubic relationships to stage of recovery shown in Figures 4 and 5.

Although it is not, to the author's knowledge, explicitly stated in the relevant literature, there seems to be a common understanding among Psychiatric Rehabilitation consumers, practitioners, and researchers that recovery is a subjectively good thing. Setbacks are understood to occur, and are presumably not enjoyable, but forward/upward progress is assumed to be a positive experience. The present study, however, suggests a surprisingly different picture. As people with psychiatric disabilities emerge from Stage 1 moratorium and despair through Stage 2 hope and awareness to Stage 3 preparation for change, their status does improve sharply. The expectancy that threats and fears will be successfully avoided doubles, while anxiety, disgust, and guilt/shame drop precipitously. During the same period, the expectancy that positive goals will be realized increases by half, accompanied by marked improvements in pride and quiescence. As people move from Stage 3 preparation to Stage 4 rebuilding, however, the situation changes, perhaps because Stage 4 rebuilding truly is where "the hard work of recovery takes place" (Andresen et al., 2003, p. 591). The expectancy of avoiding threats and fears drops again, albeit not to Stage 1 levels, possibly accompanied by reversals in some self-regulatory variables with cubic relationships to stage of recovery. In at least one important respect, therefore, the move from Stage 3 to Stage 4 recovery appears to be a *negative experience*. It is not until one reaches the growth and meaning of Stage 5 recovery that the process becomes unambiguously positive. Recovery has frequently been

described as a “non-linear” phenomenon, but, to the author’s knowledge, no theoretical account has shown why this should be the case. Perhaps the explanation lies in the negative self-regulatory activity associated with movement from Stage 3 to Stage 4 recovery that is reported here.

As mentioned in the previous chapter, the single largest improvement for six of the nine dependent variables in the MANOVA with significant results occurred in the shift from Stage 1 to Stage 2 recovery, with the other four variables’ sharpest improvements split between three other stage shifts. This suggests that the initial move from moratorium to awareness represents the greatest subjective improvement for people recovering from psychiatric disability, at least in this sample. It also provides some empirical support for philosophical and/or service emphases on “softer” psychological constructs over more concrete behavioral goals, since it is changes in the former that comprise the Stage 1-to-2 transition, and that are presumably driving these large, positive shifts. Unfortunately, the importance of the Stage 1-to-2 transition also accentuates the present study’s inadequate statistical power on *t* tests between lower stages of recovery, since the stage shift of greatest import involves the smallest sample subgroups.

Finally, the strong, negative relationship of the Loneliness subscale to stage of recovery tends to support an earlier finding by Roe et al. (2011). It is also interesting to note that Security was no lower among Stage 1 respondents than among respondents in Stages 2, 3, or 4. Given the small Stage 1 sample, this could simply be reflect an unrepresentative sampling of that stage, but it could also indicate that the

broad disengagement thought to typify Stage 1 moratorium is at least temporarily adaptive in providing a sense of security for people taking refuge in that stage. An alternative, or supplemental, interpretation might be that the residential service programs where this research was conducted, which are reputed to be of generally high quality, softened the negative impact of early recovery on secure affect.

At present, it appears that recovery from psychiatric disability most likely does entail an upward spiral of approach focus, approach/ avoidance functioning, positive approach and avoidance affect and social emotions, and self-regulatory skills, accompanied by reductions in negative approach and avoidance affect and social emotions. The present thesis is merely a preliminary study, and any firm conclusions must await the results of further research. Nonetheless, the outline of a staged, self-regulation model of recovery from psychiatric disability has already begun to emerge.

Stage 1 – Moratorium

In pre-recovery moratorium, Intra-Goal Conflict is at its lowest point, presumably because the individual has few approach goals still active, and goals with high ambivalence were likely among the first abandoned. This withdrawal from approach activity is to be expected, given the stage's poor Relative Goal Expectancy, and is reflected in the stage's extremely low levels of Approach Focus. The abandonment of and /or failure to make expected progress toward approach goals is associated with the stage's high level of Sadness, and ongoing failure to satisfy attachment-specific needs is reflected in the extremely high levels of Loneliness. In this context, there are very few opportunities to enhance social value, and Pride is

very low. Security, on the other hand, is a (relative) bright spot, as the individual's general withdrawal does succeed in creating some sense of a safe harbor. Avoidance system activity is equally affected, if not more so. Absolute Aversion Expectancy is extremely low, and the inescapable potential threats and noxious exposures this represents lead to very high levels of anxiety and disgust, as well as high levels of raw fear. Where the hazards involve social devaluation, they drive similarly heightened levels of Guilt/Shame. In such a hostile environment, Quiescence is predictably very low, as are the levels of Relief, given how little there is to be relieved about. The stage's overall degree of approach and avoidance dysfunction most likely is both driven by, and drives, the low levels of Coping Self-Efficacy, and the relative self-efficacy for environmental modification is even lower. Some proportion of these chronic failures of approach and avoidance activity are still perceived as potentially correctable, and some of that proportion is attributed to conscious agents, resulting in the stage's high levels of Anger/Frustration.

Stage 2 – Awareness

In second-stage Awareness, Relative Goal Expectancy rises considerably, opening up new avenues of possible approach activity. Intra-Goal Conflict spikes as the individual contemplates reengaging a range of approach goals, although Approach Focus remains low. Pride increases somewhat with the renewed awareness of actual or potential social value, but Sadness and Loneliness remain high. Absolute Aversion Expectancy improves in the Awareness stage, and anxiety and disgust decline accordingly, and Quiescence nearly doubles from Stage 1 levels. Fear remains high,

however. Guilt/Shame does, as well, and may even increase, possibly as the awareness of potential gains reawakens internalized stigma regarding the present (unrecovered) state. Coping Self-Efficacy remains low, in general, although the relative self-efficacy for environmental modification rises. Anger declines substantially, perhaps as hope replaces blame, whether of self or others.

Stage 3 – Preparation

Intra-Goal Conflict continues to increase in the Preparation stage, and there is a modest rise in Approach Focus, as well. Relative Goal Expectancy, on the other hand, loses some of its Stage 2 gains, perhaps because preparatory efforts serve as reminders of the challenges to come. Pride and Security remain essentially stable, while sadness and loneliness may increase slightly. On the avoidance side, Absolute Aversion Expectancy continues to show strong improvement, while Anxiety, Disgust, Fear, and Guilt/Shame drop to new lows. Quiescence loses some ground from Stage 2 levels, but Coping Self-Efficacy shows marked improvement.

Stage 4 – Rebuilding

As described above, the Rebuilding stage appears to involve a general retrenchment across several self-regulation variables, possibly in reaction to recovery efforts running up against real world obstacles. There is some progress: Intra-Goal Conflict drops to almost Stage 1 levels and Approach Focus increases slightly to a new maximum, while Sadness declines and Loneliness drops sharply. Relative Goal Expectancy, however, continues the decline it began in Stage 3, and Pride and Security lose some of their earlier gains. Absolute Aversion Expectancy drops back to

Stage 2 levels and Anxiety and Disgust both increase accordingly, while Quiescence falls back, although Fear and Guilt/Shame are essentially unchanged from the previous stage. Coping Self-Efficacy drops slightly relative to Stage 3 and Anger/Frustration remains unchanged.

Stage 5 – Growth

The fifth and final recovery stage is, perhaps unsurprisingly, universally positive in self-regulatory terms. Intra-Goal Conflict increases slightly over Stage 4 levels, but remains well below Stages 2 and 3. Approach Focus, Pride, and Security are at their highest levels, and Relative Goal Expectancy is up from Stage 4 and close to its Stage 2 maximum. Sadness, Loneliness, and Anger/Frustration are all at their lowest levels. Absolute Aversion Expectancy is increased from Stage 4 and not far below its Stage 3 maximum. Anxiety, Disgust, Fear, and Guilt/Shame are all at their lowest levels, in most cases by a substantial margin, while Quiescence is essentially returned to its Stage 2 maximum and Coping Self-Efficacy is at its highest level.

Implications for Practice

Implications of the Present Thesis

If it is generally true that people recovering from psychiatric disabilities may be dependent on improving their existing coping techniques until pre-existing patterns are once again effective, this could be taken to suggest either that service providers should focus on accelerating existing improvements in coping self-efficacy, that they should work to foster adaptive shifts in coping style that are unlikely to occur without such assistance, or possibly both.

Similarly, if negative self-regulatory activity associated with movement from Stage 3 to Stage 4 recovery generally accounts for its “non-linear” nature, one would expect to find reversals or setbacks occurring disproportionately at this point in the recovery process. In this case, educational interventions to help manage Stage 4 expectations, with services to support the Stage 3-to-4 transition, might well reduce that painful non-linearity.

If it is generally true that the initial move from moratorium to awareness represents the greatest subjective improvement for people recovering from psychiatric disability, this constitutes a serious argument for services that address the (re)development of key psychological constructs, even over more concrete behavioral goals. Since it is changes in the former that comprise the Stage 1-to-2 transition, and that are presumably driving the large, positive shifts in self-regulatory variables, these constructs should presumably occupy a privileged position in service design and resource allocation.

If it is generally true that Security is no lower in Stage 1 moratorium than in early and mid-recovery, this would suggest that “non-recovery” may be more adaptive than is commonly assumed in the recovery literature, a beneficial or even necessary stage of safety and security for people experiencing the onset of serious mental illness. It is possible that “prematurely” renewing goal-seeking behavior could undermine a (temporarily) adaptive sanctuary. In this case, service providers might be well-advised to exercise caution when pressing (or even encouraging?) clients in early stages of recovery to aggressively pursue a recovery agenda.

Implications of the Self-Regulation/Control Theory Literature

Beyond practical implications arising directly from the present thesis, self-regulation theory has any number of potentially important implications for rehabilitative and recovery-oriented practice. Bringing the powerful tools of self-regulation theory to the attention of rehabilitation and recovery-oriented practitioners and researchers was and is the primary goal of this thesis, and will hopefully prove to be a lasting contribution to the field of Psychiatric Rehabilitation. It will no doubt take years of work by multiple research teams to fully explore the practical applications in this area, but a few speculative suggestions are offered below.

Automaticity

Overlearning and error-free learning may be helpful in automatizing adaptive behaviors, post-onset, and relinquishing behaviors that are no longer adaptive.

Example: Refusal skills training uses overlearning to instill drug refusal as an automatic response to social pressure for use of illegal drugs, replacing the equally automatic compliance with such pressure demonstrated by many people with comorbid substance abuse and serious mental illness (Bellack, Bennett, & Gearon, 2007).

Control Affect

Helping an individual to recognize the approach/avoidance functioning that underlies specific distressing or rewarding affects may increase motivation to work on these functional areas. Similarly, noting the dominant affects experienced may help to inform an individual's or service provider's focus on particular approach and/or

avoidance activities.

Example: A person experiencing chronic insecurity may mistakenly believe this is an avoidance-related affect analogous to fear or anxiety, rather than a signal of insecure or inadequate attachment. Helping the person to correct this misimpression may help him/her to effectively address the real roots of the negative affect.

Control Hierarchy

Helping an individual to understand the hierarchical relationships between his/her various goals and aversions may be a common prerequisite of effectively supporting his/her recovery process.

Example: A seemingly unachievable work goal, such as becoming an astronaut, may actually be subordinate to a higher-level identity and/or social goal(s), such as being courageous or being perceived as an adventuresome person. In this situation, a more realistic lower-level goal, such as being a volunteer firefighter, or a deck hand, may be identified that also satisfies the superordinate identity goal(s) equally well.

Coping

It may be important to help some individuals understand that both indirect/environmental modification coping and direct/emotional coping are equally valid and adaptive under different circumstances. Helping people to recognize when efforts to modify their environments are likely to be successful and how to directly manage their negative affect when this is not the case, or when environmental modification will require a sustained effort in the presence of negative affect, may be

effective in improving approach/avoidance functioning, reducing negative affect, and enhancing positive affect.

Example: An individual with an excessively critical supervisor at work and a noisy, intimidating, and chronically inebriated upstairs neighbor at his/her residence may be best served by attempting to modify the supervisor's behavior by raising the issue in supervision, while the negative affect attributable to the inebriated neighbor is dealt with by avoidant and cathartic coping.

Expectancy

Expectancies of failure or success of aversion avoidance and goal pursuit will profoundly affect the effort allocated to those behaviors. Because approach behavior appears to involve selection and commitment processes to a much greater degree than aversion avoidance, outcome expectancies will have a particularly large impact on the effort invested in goal pursuit. Strongly positive expectancies are likely to result in low expended effort as greater effort will appear unnecessary, while strongly negative expectancies will have the same result as greater effort will be deemed futile.

Moderate expectancies of success, combined with high self-efficacy, will result in higher effort and (all else being equal) better outcomes.

Example: A person who has tried and failed to get a job in the 15 years since the onset of his/her illness is likely to have extremely low expectancies of success, largely attributable to low topical self-efficacy, and is therefore less likely to expend a great deal of effort in yet another (unsuccessful) attempt to gain employment. A person who has an unbroken record of successful employment prior to very recent

onset of a serious mental illness may have extremely high expectancies of success in finding a job, and be equally unlikely to invest substantial effort in a task whose success is a foregone conclusion. In both these cases, it may be advisable for service providers to push towards the middle of the U-curve, helping the person in question to view finding employment as a challenging but achievable goal for which their own effort is likely to determine the outcome.

Goal-Aversion Balance

When a goal and an aversion occur in close alignment this results in mutually reinforcing approach and avoidance motivation and, most likely, improved outcomes. In almost any case where an individual is predominantly driven by avoidance motivation, it should be beneficial to explore potentially well-aligned approach goals. In some cases, it may also be advisable to explore well-aligned aversions, although this approach should be used with caution due to the intrinsic costs of high avoidance motivation.

Example: An individual who wants to stop smoking to avoid the aversive threat of lung cancer should always be encouraged to visualize complementary approach goals such as attractive white teeth and smooth skin. It is less clear, however, whether an individual who wants to stop smoking in order to be more attractive should be encouraged to think about the threat of cancer if he/she fails.

Implementation Planning

Where approach behavior is concerned, goal selection is frequently followed by implementation planning, which facilitates goal-directed behavior and results in

improved goal outcomes. Implementation planning is already a core element of Psychiatric Rehabilitation practice, so this element of self-regulation theory validates existing practice more than it suggests any modifications. Ongoing research in this area may, however, support attempts to improve the efficacy of implementation planning in the Psychiatric Rehabilitation context.

Example: A person with a goal of losing 20 pounds is more likely to succeed if he/she makes a detailed exercise plan, identifies replacements for high-calorie foods, sets a target timeline for intermediate weight goals, and identifies likely temptations to break his/her exercise and diet regimens and develops goal-promoting ways to handle those temptations.

Meaning Saturation

It is important to help an individual identify any meaning-saturated goals and/or aversions in their striving self-systems. Since the centrality of these strivings renders them highly resistant to change, they will likely best be addressed relatively late in the recovery process, and finding ways to work around, rather than resolve, them may be critically important in earlier stages. It will also be important to help individuals understand the ways in which any top-level, meaning-saturated strivings relate to lower-level goals and aversions, in order to compensate for any negative impact of behavior change related to lower-level strivings on the status of meaning-saturated goals and/or aversions.

Example: For a person who has dreamed his/her entire life about becoming a physician and only recently discovered that the role may no longer be possible, the

physician identity is likely to be so saturated with meaning that it is almost absolutely resistant to any significant change. Rather than even attempt to address this issue, a provider might first help the individual develop new and unrelated social or recreational goals to form the basis of an independent striving structure that could eventually serve as a base from which the person can eventually tackle divesting from the physician identity.

Striving Complexity

Striving complexity refers to the number of distinct goals or aversions (commonly goals) constituting a person's goal/aversion system. Individuals may do well with a single goal if they are making, or seem likely to make, steady progress towards that goal, and deliberate simplification of the striving system may even be appropriate in some cases. Where individuals have a single, dominant goal or aversion towards which progress is less certain, however, providers may profitably encourage development of greater striving complexity as a buffer against extremes of approach/avoidance functioning and associated spikes in negative affect.

Example: Imagine a person with an eighth-grade education, living on the street, whose only goal is to open a vegan restaurant in NYC. Because efforts in this area are unlikely to yield quick results, a provider would encourage the person to increase their striving complexity by adopting additional goals with better short-term prospects. Now imagine the same person, with goals to get a job, buy a home, win a prestigious research award, and build a recording studio for classical musicians. Since effort directed towards getting a job is much more likely to yield rapid results than

effort directed towards the other goals, a provider might encourage this individual to reduce his/her striving complexity and focus on a single goal. In this case, the affective volatility associated with heavy reliance on a single control circuit would likely be outweighed by the superior average approach functioning.

Striving Conflict & Facilitation

When helping an individual to select or prioritize specific goals, it is important to select combinations that maximize mutual facilitation and minimize motivational conflict.

Example: Imagine a person with goals that include marrying and having children, completing the last two years of a Bachelor's degree in psychology, moving from NYC to Iowa, getting a job, renting an apartment, joining a church, buying a car, and competing in the NYC Marathon. Although all of these goals are presumably achievable and all can coexist, some clearly fit together better than others. Getting a job and joining a church can be accomplished equally well in NYC or Iowa. Completing a degree and running a marathon are much easier in NYC, however, though renting an apartment and buying (and insuring and parking) a car are easier in Iowa. Helping the individual to construct a mutually facilitating goal structure will give him/her the greatest possible chance of achieving his/her goals.

Limitations and Need for Further Research

The present thesis has several significant weaknesses, including one that was unexpected (or of unexpected severity), and others that were both foreseen and implicit in the design. The first of these is a selection bias that resulted in a relatively

older sample (mean age = 52 years) with a correspondingly long duration of psychiatric illness. The latter issues include the need to explore inter-relationships between self-regulatory variables in the context of recovery from psychiatric disability, and the inability to reliably differentiate between stage and trait differences using a cross-sectional design.

Due to the present study's selection bias favoring older and "more recovered" individuals (both logically assumed and confirmed by the distribution of STORI stages), it could be fairly characterized as a study of recovery in late illness, and perhaps even a study of "late recovery." Any replication study should include participants with more recent onsets of psychiatric symptoms, which will presumably also mean an overall younger sample. The ideal solution would be to conduct a prospective study using an ultra-high risk cohort, which would also permit prospective capture and analysis of the "anti-recovery" self-regulatory downward spiral. Failing the ideal, a design that recruited participants at onset, first hospitalization, or perhaps first discharge, would be a strong alternative. At a minimum, the recruitment plan for any replication should include strategies to increase the proportions of younger and "less-recovered" participants.

One important incentive for such a replication is to capture more participants at lower stages of recovery, increasing statistical power for between-group comparisons at the lower stages, given that the importance of such comparisons grows the more our model deviates from simple linear relationships. Such a study would also afford an opportunity for planned tests of apparently cubic relationships

revealed by post hoc tests in the present study, and would also provide the power needed to analyze some of the many potentially important relationships that self-regulation theory implies should exist between the self-regulatory variables originally included in, and omitted from, this thesis.

In addition to the need for replication with a considerably larger sample, the study needs to be repeated with a minimum of two assessments conducted several months apart. With the cross-sectional design of the current study, it could be legitimately argued that every relationship between stage of recovery and the dependent variables is actually attributable to correlations with stable traits that are unintentionally captured in the STORI responses. The only way to be certain that the STORI (and hence the rest of the study) is truly capturing changes in recovery over time is to use a well-constructed, longitudinal design.

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Appendices

What is your primary language?

What is your current psychiatric diagnosis? {Do you have any other current psychiatric diagnoses?}

How old were you when you first started experiencing symptoms?

Interviewer: _____ **Date:** _____

Location: _____ **Start time:** _____ **Stop time:** _____

Birth month: _____

Birth year: _____

Sex: _____

Race: _____

Hispanic origin: **Yes** **No**

Highest grade completed in school: _____

Directions:

GOALS are the things you are determined to have *in* your life. They can be about the kind of person you *want* to be, or ways you *want* to act, look, or feel. They can also be about *good* places, things, roles, activities, or relationships.

What three goals were you most focused on during the past week?

First goal: _____

Second goal: _____

Third goal: _____

During the past week, how much were you focused on reaching your goals?

Not at all	Somewhat	Quite a bit	Very much	Extremely
0	1	2	3	4

DANGERS and **FEARS** are the things you really need to keep *out of* your life. They can be about the kind of person you *never* want to be, or ways that you *don't* want to act, look, or feel. They can also be about *bad* places, things, roles, activities, or relationships.

What three dangers/fears were you most focused on during the past week?

First danger/fear: _____

Second danger/fear: _____

Third danger/fear: _____

During the past week, how much were you focused on getting away from dangers/fears?

Not at all	Somewhat	Quite a bit	Very much	Extremely
0	1	2	3	4

How close did you feel to reaching your first goal over the past week?

Not at all close to goal	Somewhat close to goal	Quite close to goal	Very close to goal	Extremely close to goal
0	1	2	3	4

Did you feel closer or further from that goal than you expected?

Much closer than expected	Somewhat closer than expected	About the same	Somewhat further than expected	Much further than expected
4	3	2	1	0

How well did your efforts to reach that goal work over the past week?

Didn't work at all well	Worked somewhat well	Worked quite well	Worked very well	Worked extremely well
0	1	2	3	4

Did your efforts to reach that goal work better or worse than you expected?

Much better than expected	Somewhat better than expected	About the same	Somewhat worse than expected	Much worse than expected
4	3	2	1	0

Over the past week, how sure were you that you would reach that goal?

Not at all sure	Somewhat sure	Quite sure	Very sure	Extremely sure
0	1	2	3	4

Were you feeling more or less sure that you would reach that goal?

Much more sure	Somewhat more sure	About the same	Somewhat less sure	Much less sure
4	3	2	1	0

How *unhappy* will you be if you reach that goal?

Not at all unhappy	Somewhat unhappy	Quite unhappy	Very unhappy	Extremely unhappy
0	1	2	3	4

How close did you feel to reaching your second goal over the past week?

Not at all close to goal	Somewhat close to goal	Quite close to goal	Very close to goal	Extremely close to goal
0	1	2	3	4

Did you feel closer or further from that goal than you expected?

Much closer than expected	Somewhat closer than expected	About the same	Somewhat further than expected	Much further than expected
4	3	2	1	0

How well did your efforts to reach that goal work over the past week?

Didn't work at all well	Worked somewhat well	Worked quite well	Worked very well	Worked extremely well
0	1	2	3	4

Did your efforts to reach that goal work better or worse than you expected?

Much better than expected	Somewhat better than expected	About the same	Somewhat worse than expected	Much worse than expected
4	3	2	1	0

Over the past week, how sure were you that you would reach that goal?

Not at all sure	Somewhat sure	Quite sure	Very sure	Extremely sure
0	1	2	3	4

Were you feeling more or less sure that you would reach that goal?

Much more sure	Somewhat more sure	About the same	Somewhat less sure	Much less sure
4	3	2	1	0

How *unhappy* will you be if you reach that goal?

Not at all unhappy	Somewhat unhappy	Quite unhappy	Very unhappy	Extremely unhappy
0	1	2	3	4

How close did you feel to reaching your third goal over the past week?

Not at all close to goal	Somewhat close to goal	Quite close to goal	Very close to goal	Extremely close to goal
0	1	2	3	4

Did you feel closer or further from that goal than you expected?

Much closer than expected	Somewhat closer than expected	About the same	Somewhat further than expected	Much further than expected
4	3	2	1	0

How well did your efforts to reach that goal work over the past week?

Didn't work at all well	Worked somewhat well	Worked quite well	Worked very well	Worked extremely well
0	1	2	3	4

Did your efforts to reach that goal work better or worse than you expected?

Much better than expected	Somewhat better than expected	About the same	Somewhat worse than expected	Much worse than expected
4	3	2	1	0

Over the past week, how sure were you that you would reach that goal?

Not at all sure	Somewhat sure	Quite sure	Very sure	Extremely sure
0	1	2	3	4

Were you feeling more or less sure that you would reach that goal?

Much more sure	Somewhat more sure	About the same	Somewhat less sure	Much less sure
4	3	2	1	0

How *unhappy* will you be if you reach that goal?

Not at all unhappy	Somewhat unhappy	Quite unhappy	Very unhappy	Extremely unhappy
0	1	2	3	4

How close did that first danger/fear feel to you over the past week?

Fear was not at all close	Fear was somewhat close	Fear was quite close	Fear was very close	Fear was extremely close
0	1	2	3	4

Did that danger/fear feel closer or further than you expected?

Much closer than expected	Somewhat closer than expected	About the same	Somewhat further than expected	Much further than expected
4	3	2	1	0

How well did your efforts to get away from that danger/fear work over the past week?

Didn't work at all well	Worked somewhat well	Worked quite well	Worked very well	Worked extremely well
0	1	2	3	4

Did your efforts to get away from that danger/fear work better or worse than you expected?

Much better than expected	Somewhat better than expected	About the same	Somewhat worse than expected	Much worse than expected
4	3	2	1	0

Over the past week, how sure were you that you would get away from that danger/fear?

Not at all sure	Somewhat sure	Quite sure	Very sure	Completely sure
0	1	2	3	4

Were you feeling more or less sure than before that you would get away from that danger/fear?

Much more sure	Somewhat more sure	About the same	Somewhat less sure	Much less sure
4	3	2	1	0

How *unhappy* will you be if you get away from that danger/fear?

Not at all unhappy	Somewhat unhappy	Quite unhappy	Very unhappy	Extremely unhappy
0	1	2	3	4

How close did that second danger/fear feel to you over the past week?

Fear was not at all close	Fear was somewhat close	Fear was quite close	Fear was very close	Fear was extremely close
0	1	2	3	4

Did that danger/fear feel closer or further than you expected?

Much closer than expected	Somewhat closer than expected	About the same	Somewhat further than expected	Much further than expected
4	3	2	1	0

How well did your efforts to get away from that danger/fear work over the past week?

Didn't work at all well	Worked somewhat well	Worked quite well	Worked very well	Worked extremely well
0	1	2	3	4

Did your efforts to get away from that danger/fear work better or worse than you expected?

Much better than expected	Somewhat better than expected	About the same	Somewhat worse than expected	Much worse than expected
4	3	2	1	0

Over the past week, how sure were you that you would get away from that danger/fear?

Not at all sure	Somewhat sure	Quite sure	Very sure	Completely sure
0	1	2	3	4

Were you feeling more or less sure than before that you would get away from that danger/fear?

Much more sure	Somewhat more sure	About the same	Somewhat less sure	Much less sure
4	3	2	1	0

How *unhappy* will you be if you get away from that danger/fear?

Not at all unhappy	Somewhat unhappy	Quite unhappy	Very unhappy	Extremely unhappy
0	1	2	3	4

How close did that third danger/fear feel to you over the past week?

Fear was not at all close	Fear was somewhat close	Fear was quite close	Fear was very close	Fear was extremely close
0	1	2	3	4

Did that danger/fear feel closer or further than you expected?

Much closer than expected	Somewhat closer than expected	About the same	Somewhat further than expected	Much further than expected
4	3	2	1	0

How well did your efforts to get away from that danger/fear work over the past week?

Didn't work at all well	Worked somewhat well	Worked quite well	Worked very well	Worked extremely well
0	1	2	3	4

Did your efforts to get away from that danger/fear work better or worse than you expected?

Much better than expected	Somewhat better than expected	About the same	Somewhat worse than expected	Much worse than expected
4	3	2	1	0

Over the past week, how sure were you that you would get away from that danger/fear?

Not at all sure	Somewhat sure	Quite sure	Very sure	Completely sure
0	1	2	3	4

Were you feeling more or less sure than before that you would get away from that danger/fear?

Much more sure	Somewhat more sure	About the same	Somewhat less sure	Much less sure
4	3	2	1	0

How *unhappy* will you be if you get away from that danger/fear?

Not at all unhappy	Somewhat unhappy	Quite unhappy	Very unhappy	Extremely unhappy
0	1	2	3	4

Cybernetic Coping Scale

Over the past week, when things weren't going well for you, or when you were having problems, how often did you do the following:

1. I tried to let off steam

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

2. I told myself the problem was unimportant

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

3. I tried to turn my attention away from the problem

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

4. I tried to relieve my tension somehow

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

5. I tried to change the situation to get what I wanted

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

6. I told myself the problem wasn't so serious after all

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

7. I made an effort to adjust my expectations

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

8. I focused my efforts on changing the situation

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

9. I told myself the problem wasn't such a big deal after all

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

10. I tried to keep my mind off the problem

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

11. I tried to just get it off my chest

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

12. I tried to adjust my expectations to meet the situation

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

13. I worked on changing the situation to get what I wanted

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

14. I tried to avoid thinking about the problem

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

15. I tried to adjust my own standards

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

16. I tried to grow as a person as a result of the experience.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

17. I tried to tell myself that the problem was not my fault.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

18. I tried to tell myself that I could handle the problem.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

19. I tried to tell myself that the problem was not anybody's fault.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

20. I tried to tell myself that I was going to succeed.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

21. I tried to see it in a different light, to make it seem more positive.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

22. I tried to tell myself that I was up to the challenge.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

23. I looked for something good in what was happening.

Did not use at all	Used a little	Don't know	Used pretty often	Used very often
0	1	2	3	4

Cybernetic Coping Self-Efficacy Scale

When things aren't going well for you, or when you're having problems, how confident are you that you can do the following.

When things aren't going well for you, how confident are you that you can:

1. Let off steam

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

2. Tell yourself the problem is unimportant

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

3. Turn your attention away from the problem

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

4. Relieve your tension somehow

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

5. Change the situation to get what you want

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

6. Tell yourself the problem isn't so serious after all

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

7. Adjust your expectations

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

8. Change the situation

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

9. Tell yourself the problem isn't such a big deal after all

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

10. Keep your mind off the problem

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

11. Just get it off your chest

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

12. Adjust your expectations to meet the situation

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

13. Make the situation better

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

14. Avoid thinking about the problem

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

15. Adjust your own standards

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

16. Try to grow as a person as a result of the experience

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

17. Tell yourself that the problem is not your fault

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

18. Tell yourself that you can handle the problem

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

19. Tell yourself that the problem is not anybody's fault

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

20. Tell yourself that you're going to succeed

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

21. See it in a different light, to make it seem more positive

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

22. Tell yourself that you're up to the challenge

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

23. Find something good in what is happening

Not at all confident	Somewhat confident	Quite confident	Very confident	Completely confident
0	1	2	3	4

Below is a list of ways that most people feel at one time or another. Please circle the number closest to how much you felt these ways over the past week. Don't worry if you think you *should* or *shouldn't* have certain feelings, just say how you really felt.

0	1	2	3	4
not at all	somewhat	quite a bit	very much	extremely

1. Wanting	0	1	2	3	4
2. Sad	0	1	2	3	4
3. Proud	0	1	2	3	4
4. Frightened	0	1	2	3	4
5. Caring	0	1	2	3	4
6. Alone	0	1	2	3	4
7. Excited	0	1	2	3	4
8. Afraid	0	1	2	3	4
9. Safe	0	1	2	3	4
10. Angry	0	1	2	3	4
11. Delighted	0	1	2	3	4
12. Guilty	0	1	2	3	4
13. Joyful	0	1	2	3	4
14. Disgust	0	1	2	3	4
15. Relief	0	1	2	3	4
16. Frustrated	0	1	2	3	4
17. Lively	0	1	2	3	4
18. Embarrassed	0	1	2	3	4
19. Liking	0	1	2	3	4

Below is a list of ways that most people feel at one time or another. Please circle the number closest to how much you felt these ways over the past week. Don't worry if you think you *should* or *shouldn't* have certain feelings, just say how you really felt.

0	1	2	3	4
not at all	somewhat	quite a bit	very much	extremely

20. Desiring	0	1	2	3	4
21. Sadness	0	1	2	3	4
22. Pride	0	1	2	3	4
23. Lonely	0	1	2	3	4
24. Calm	0	1	2	3	4
25. Tense	0	1	2	3	4
26. Loved	0	1	2	3	4
27. Scared	0	1	2	3	4
28. Secure	0	1	2	3	4
29. Ashamed	0	1	2	3	4
30. Relaxed	0	1	2	3	4
31. Anger	0	1	2	3	4
32. Peaceful	0	1	2	3	4
33. Disgusted	0	1	2	3	4
34. Relieved	0	1	2	3	4
35. Frustration	0	1	2	3	4
36. Loving	0	1	2	3	4
37. Nervous	0	1	2	3	4
38. Enjoying	0	1	2	3	4

The "STORI"

The following questionnaire asks about how you feel about your life and yourself since the illness. Some of the questions are about times when you don't feel so good. Others ask about times when you feel quite good about life.

If you find some of the questions upsetting, and you need to talk to someone – please take a break and talk to a friend or support person.

The questions are in groups of five.
Read all five questions in a group, and then answer those five questions.
Circle the number from 0 to 5 to show how much each statement is true of you now.
Then move on to the next group.

When you choose your answer, think about how you feel now, not how you have felt some time in the past. For example:

Q.38 says "I am beginning to learn about mental illness and how I can help myself."
Q.39 says "I now feel fairly confident about managing the illness."

If you are now fairly confident about managing the illness, you would give a higher score to Q.39 than you would to Q.38, which says you are just *beginning* to learn.

The questions are about how you feel about your life *on the whole* these days.
Try not to let things that might be affecting your mood just at the moment affect your answers.

STORI

Read all 5 questions in Group 1, then answer those five questions.

Circle the number from 0 to 5 that shows how much each statement is true of you *now*.

Then move on to Group 2, and so on.

When you choose your answer, think about *how you feel now*, not how you have felt in the past.

Group 1		<i>Not at all true now</i>			<i>Completely true now</i>		
1	I don't think people with a mental illness can get better.	0	1	2	3	4	5
2	I've <i>only recently</i> found out that people with a mental illness can get better.	0	1	2	3	4	5
3	I am <i>starting</i> to learn how I can help myself get better.	0	1	2	3	4	5
4	I am working hard at staying well, and it will be worth it in the long run.	0	1	2	3	4	5
5	I have a sense of "inner peace" about life with the illness now.	0	1	2	3	4	5

Group 2		<i>Not at all true now</i>			<i>Completely true now</i>		
6	I feel my life has been ruined by this illness.	0	1	2	3	4	5
7	I'm <i>just starting</i> to realize my life doesn't have to be awful forever.	0	1	2	3	4	5
8	I have <i>recently</i> started to learn from people who are living well in spite of serious illness.	0	1	2	3	4	5
9	I'm starting to feel <i>fairly</i> confident about getting my life back on track.	0	1	2	3	4	5
10	My life is really good now, and the future looks bright.	0	1	2	3	4	5

Group 3		<i>Not at all true now</i>			<i>Completely true now</i>		
11	I feel like I'm nothing but a sick person now.	0	1	2	3	4	5
12	Because others believe in me, I've <i>just started</i> to think maybe I can get better.	0	1	2	3	4	5
13	I am <i>just beginning</i> to realize that illness doesn't change who I am as a person.	0	1	2	3	4	5
14	I am <i>now beginning</i> to accept the illness as part of the whole person that is me.	0	1	2	3	4	5
15	I am happy with who I am as a person.	0	1	2	3	4	5

Group 4		<i>Not at all true now</i>			<i>Completely true now</i>		
16	I feel as though I don't know who I am any more.	0	1	2	3	4	5
17	I have <i>recently begun</i> to recognise a part of me that is not affected by the illness.	0	1	2	3	4	5
18	I am <i>just starting</i> to realise that I can still be a valuable person.	0	1	2	3	4	5
19	I am learning new things about myself as I work towards recovery.	0	1	2	3	4	5
20	I think that working to overcome the illness has made me a better person.	0	1	2	3	4	5

Group 5		<i>Not at all true now</i>			<i>Completely true now</i>		
21	I'll never be the person I thought I would be.	0	1	2	3	4	5
22	I've <i>just begun</i> to accept the illness as part of my life I'll have to learn to live with.	0	1	2	3	4	5
23	I am <i>starting</i> to figure out what I am good at and what my weaknesses are.	0	1	2	3	4	5
24	I'm <i>starting</i> to feel that I am making a valuable contribution to life.	0	1	2	3	4	5
25	I am accomplishing worthwhile and satisfying things in my life.	0	1	2	3	4	5

Group 6		<i>Not at all true now</i>			<i>Completely true now</i>		
26	I am angry that this had to happen to me.	0	1	2	3	4	5
27	I'm <i>just starting</i> to wonder if some good could come out of this.	0	1	2	3	4	5
28	I am <i>starting</i> to think about what my special qualities are.	0	1	2	3	4	5
29	In having to deal with illness, I am learning a lot about life.	0	1	2	3	4	5
30	In overcoming the illness I have gained new values in life.	0	1	2	3	4	5

Group 7		<i>Not at all true now</i>			<i>Completely true now</i>		
31	My life seems completely pointless now.	0	1	2	3	4	5
32	I am <i>just starting</i> to think maybe I can do something with my life.	0	1	2	3	4	5
33	I am <i>trying</i> to think of ways I might be able to contribute in life.	0	1	2	3	4	5
34	These days I am working on some things in life that are personally important to me.	0	1	2	3	4	5
35	I am working on important projects that give me a sense of purpose in life.	0	1	2	3	4	5

Group 8		<i>Not at all true now</i>			<i>Completely true now</i>		
36	I can't do anything about my situation.	0	1	2	3	4	5
37	I'm <i>starting</i> to think I could do something to help myself.	0	1	2	3	4	5
38	I am <i>starting to</i> feel more confident about learning to live with the illness.	0	1	2	3	4	5
39	Sometimes there are setbacks, but I come back and keep trying.	0	1	2	3	4	5
40	I look forward to facing new challenges in life.	0	1	2	3	4	5

Group 9		<i>Not at all true now</i>			<i>Completely true now</i>		
41	Others know better than I do what's good for me.	0	1	2	3	4	5
42	I want to <i>start</i> learning how to look after myself properly.	0	1	2	3	4	5
43	I am <i>beginning</i> to learn about mental illness and how I can help myself.	0	1	2	3	4	5
44	I now feel <i>reasonably</i> confident about managing the illness.	0	1	2	3	4	5
45	I can manage the illness well now.	0	1	2	3	4	5

Group 10		<i>Not at all true now</i>			<i>Completely true now</i>		
46	I don't seem to have any control over my life now.	0	1	2	3	4	5
47	I want to <i>start</i> learning how to cope with the illness.	0	1	2	3	4	5
48	I am <i>just starting</i> to work towards getting my life back on track.	0	1	2	3	4	5
49	I am <i>beginning</i> to feel responsible for my own life.	0	1	2	3	4	5
50	I am in control of my own life.	0	1	2	3	4	5