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APPLICATION OF THE STATES-OF-MIND MODEL WITH RATIONAL EMOTIVE BEHAVIOR THEORY

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APPLICATION OF THE STATES-OF-MIND MODEL WITH RATIONAL EMOTIVE BEHAVIOR THEORY

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ABSTRACT

APPLICATION OF THE STATES-OF-MIND MODEL WITHIN RATIONAL EMOTIVE BEHAVIOR THEORY

Lina Cherkasova

Understanding the role of positive and negative cognitions in psycho-emotional adjustment is essential to improve the effectiveness of CBT practice. Schwartz and Garamoni (1986; 1987) proposed a model for the dynamic relationship of negative and positive cognitions based on the golden-section hypothesis or the optimal balance: The States-Of-Mind Model (SOM). The model proposes an asymmetrical balance of positive and negative cognitions represented numerically by the golden-section ratio of .62 positive to .38 negative cognitions [positive cognitions / (positive + negative cognitions)]. To date, the SOM model has mainly been assessed with measures of automatic thoughts or self-statement, which represent more surface structure cognitions that are close to a person's emotional experience (DiGiuseppe, David, & Venezia, 2016). The model has not been used with more enduring trait like cognitive measures such as dysfunctional attitudes, irrational beliefs, or schema. The current study tested the validity of the States-of-Mind model (SOM) with irrational and rational beliefs of Ellis' Rational Emotive Behavior Therapy (REBT: Ellis 1994).

This study tested the SOM ratios using REBT framework by analyzing survey data from 221 participants on their self-reports of Rational and Irrational Beliefs (RBs/IBs), psychopathology and life satisfaction. Past research on the SOM has supported the presence of psychopathology in individuals whose ratios are lower than the

optimal golden-section proportion of .62 (Kendal, Howard & Hayes, 1989; Michelson, Schwartz & Marchione, 1991). Replicating past research, lower belief SOM ratios in this study were linked to higher levels of psychopathology. However, the optimal balance set point of .62 was not confirmed. Our research findings support the original formulation of Schwartz and Garamoni's work in that individuals balance their cognitive states asymmetrically, but the asymmetry index was higher than the theorized optimal ratio of .62. Implications for future research and the practice of school psychology are discussed.

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Chapter I

Introduction

The study tested the validity of the States-of-Mind model (SOM) with irrational and rational beliefs of Ellis' Rational Emotive Behavior Therapy (REBT: Ellis 1994). The SOM model is an integrative model of positive and negative cognitions based on the golden-section hypothesis, information processing theory, personal construct theory, and cognitive-behaviorism (Schwartz & Garamoni, 1989). The model proposes that individuals balance their cognitions asymmetrically within an internal computation system that is represented optimally by the golden-section ratio of .62 positive to .38 negative cognitions [positive cognitions / (positive + negative cognitions)]. The golden-section balance of negative and positive cognitions is theorized to support optimal information processing where negative cognitions are especially salient against a mostly positive cognitive backdrop (Schwartz & Garamoni, 1989). Based on the model, sustained deviation from the golden-section balance, in either positive or negative direction, represent the presence of psychological and emotional maladjustment (Schwartz & Garamoni, 1989).

Past research on the SOM has supported the presence of psychopathology in individuals whose ratios are significantly lower than the optimal golden-section proportion of .62 (Kendal et al., 1989; Michelson et al., 1991); however, research has not found support for maladjustment within the upper limits of positive proportions (McDermut & Haaga, 1994). On the contrary, a linear relationship was found between increasing positive ratios and measures of adjustment (Amsel & Fichten, 1998; Friedman, 2000).

The SOM has mainly been assessed with measures of automatic thoughts or self-statement, which represent more surface structure cognitions that are close to a person's emotional experience (DiGiuseppe et al., 2016). The model has not been used with more enduring trait-like cognitive measures, such as dysfunctional attitudes, irrational beliefs, or schema. I hypothesize that by assessing stable cognitive constructs, such as irrational (IBs) and rational beliefs (RBs) within the REBT framework, we will find support for the SOM golden-section (optimal balance) hypothesis. Moreover, REBT's focus on the evaluative nature of cognitions fits in with the original formulation of the golden-section hypothesis within personal construct theory, which focused on measuring binary judgments and evaluations rather than negative and positive cognitions (Benjafield & Adams-Webber, 1976; Lefebvre, 1985).

To test the golden-section hypothesis within the REBT framework, we will apply the SOM ratios to data of an adult sample who have completed the DRLG Short Form (DiGiuseppe et al., 2020) of the Attitude and Beliefs Scale-2 (ABS-2: DiGiuseppe et al., 2018). The DRLG was developed specifically to assess irrational and rational beliefs within the REBT framework (DiGiuseppe, et al., 2018). The SOM ratios derived from the DRLG were tested within the paradigm of the model and correlated with measures of psychological dysfunction and adjustment.

The SOM model is important in applied psychology as well as the practice of school psychology because of the model's ability to conform to any assessment tool that delineates between positive and negative constructs. The SOM can be applied to measure dichotomous cognitions, affect, personality traits, or beliefs. The use of ratios allows for the application of tracking treatment outcomes across not only assessment tools but also

types of interventions. The utilization of the SOM paradigm with psychotherapeutic treatment could yield information into the mechanism of change as well as styles of information processing (Schwartz & Garamoni, 1989). The current study will extend research with the SOM and its application across psychotherapeutic settings.

Chapter II

Literature Review

Why cognitions matter in the application of psychotherapeutic treatments

The target of most cognitive psychotherapies is cognitions, thoughts, attitudes, scheme, or beliefs that are inherently private experiences (Lubinski & Thompson, 1993). As private events, thoughts, beliefs, and attitudes can only be measured indirectly (DiGiuseppe et al., 2016). Despite this difficulty of measurement, the field of cognitive behavior therapy (CBT) has a burgeoning amount of research on the efficacy of psychotherapeutic interventions. Today CBT is considered the gold standard in psychotherapy because of the amount of research supporting its efficacy and effectiveness (David et al., 2018). CBTs have been shown affective on par with pharmacological interventions in treating many psychopathologies, most notably anxiety and mood disorders (Chiang, et al., 2017; Franklin, et al., 2015; Heuzenroeder, et al., 2004; Kennard, et al., 2008).

In order to improve symptoms of anxiety or mood disorder, CBT therapists work to adjust their patients' negative cognitions, which are theorized to lead to distressing emotions and maladaptive behaviors (DiGiuseppe et al., 2018). Negative (contributing) and positive (protective) cognitions are seen as important aspects of the way people organize and process information (Schwartz & Garamoni, 1989). Understanding the role of positive and negative cognitions in psychological adjustment is essential to improve the effectiveness of CBT practice. Research in this area has shown a clear link of negative automatic thoughts and cognitive errors to psychopathology and corresponding positive cognitions to well-being (Beck, 1963; Beevers et al., 2007; Chakhssi, et al.,

2018; Teasdale, 1983) and the relationship of IB to disturbance and RBs to well-being (David, Christea, & Hoffman, 2018).

The idea of considering positive and negative cognitions simultaneously was formally introduced in the late 1980s by Schwartz and Garamoni's SOM model (1986, 1989). They attempted to understand whether there is a dynamic relationship between contributory (e.g., I'm worthless) and protective (e.g., I matter) cognitions when considering the improvement of symptoms documented in CBT research.

The States of Mind Model (SOM)

The SOM model proposes that individuals balance their positive and negative cognitions asymmetrically within an internal computation system represented with a ratio [positive cognitions / (positive + negative cognitions). The computation for the ratio and the chosen 'cut-off' point of optimal balance was inspired by the research of Benjafield and Adams-Webber's golden-section hypothesis, which applied the concept of the 'divine proportion' and the Pythagorean notion of human internal balance to the study of cognitive evaluation (1976). The 'divine proportion' is defined in mathematics as a point on a line that divides the line so that the proportion of the smaller segment is to the larger segment as the larger segment is to the whole, or roughly that the larger portion is 62% of the whole. The Pythagorean notion of human internal balance proposed the idea of perfect equilibrium, which is reached by the optimal tension of opposites within one body.

Schwartz and Garamoni theorized that asymmetry in the computational balance must exist within the human cognitive experience to allow a person to optimally identify important negative events, which might prove detrimental to their well-being, against the

backdrop of mostly positive mental events. Subsequently, they hypothesized that psychopathology arises when the internal computational system for information processing sustains a prolonged shift from the optimal cognitive balance. For example, the SOM model would help identify that in depression, the overwhelming number of negative cognitions drowns out positive events or that in mania, the lack of negative thoughts minimizes the existence of short-comings. Overall, the idea of internal cognitive balance is an intriguing and unique way to conceptualize cognitive information processing as well as the mechanism of cognitive and behavioral change within CBT treatment.

Background research that influenced the conceptualization of the SOM

The golden-section hypothesis assumes a central role in the SOM model. The golden-section hypothesis was first proposed in the work of Benjafield and Adams-Webber. Benjafield and Adams-Webber (1976) combined the golden-section proportion with the Pythagorean notion of balance in human experience to formulate the golden-section hypothesis. The golden-section is more famously known as the golden ratio (both are the same mathematical concept only inversely calculated). The golden-section has been extensively studied since the ancient Greek mathematician, Euclid, and fittingly designated as the 'divine proportion.' The golden-section can be found in our everyday life aesthetically as the proportion of books, TV screens, buildings, much of art, and movie images (Benjafield & Adams-Webber, 1976). The second idea, essential to the golden-section hypothesis, is the doctrine of the ancient Greek philosopher, Pythagoras. Within the Pythagorean theory, the human body was thought to maintain a perfect proportion of dichotomous tendencies (Benjafield & Adams-Webber, 1976). Pythagoras,

as described by Plato, held a belief that human experience was kept in a state of balance through constant tension between pairs of opposites. Both the Pythagorean doctrine of opposites and the golden-section are ideas of a tangible, perfect balance. In combining these ideas, the golden-section lends a numerical value, and therefore a testable anchor to the Pythagorean concept of a perfect balance of opposites within the human experience.

Benjafield and Adams-Webber (1976) tested the golden-section hypothesis by experimentally assessing the spontaneous balance of dichotomous choice. The authors replicated a repertory grid task, first introduced in the work on personal construct by George Kelly (1955). The repertory grid task consists of role titles (e.g., Self, Mother, Father, etc.) that are judged by the subject on dimensions of dichotomous adjectives (e.g., bold-timid, active-passive, etc.). The dichotomous adjectives are scored 0 for the negative pole and 1 for the positive pole. Within a line segment between 0 and 1, the golden-section falls at the value of .618. Benjafield and Adams-Webber used this procedure in five studies. All five studies used university students to perform the repertory grid task. In each study, participants chose the positive adjective to evaluate themselves and others with a probability between 61% and 63%. The authors concluded that individuals tend to organize their judgment by approximating the golden-section ratio of .62 positive evaluations to .38 negative evaluations. Thus, the golden-section hypothesis represented the mathematically defined, perfect balance of the human evaluation process, and the dichotomous judgment of the self and others. The authors supposed that the asymmetrical balance of evaluations was an evolutionary adaptation, allowing the individual to pay special attention to negative events.

Following Benjafield and Adams-Webber, Vladimir A. Lefebvre (1985) sought mathematical support for the golden-section hypothesis that human evaluative cognitions operate within a mechanism of dichotomized choice with a balance of choosing the positive pole 62% of the time. Lefebvre used computer and mathematical models of ethical choice and found evidence that the constant appeared whenever an evaluative choice between poles was present regardless of what was the subject or object of the evaluation. According to Lefebvre, the explanation for the constant in the data supported the existence of a computation mechanism at the base cognitive processes engaged in evaluation.

Testing the SOM hypothesis in CBT

Schwartz and Garamoni's SOM research investigated whether the golden-section could be detected as the optimal balance of negative and positive cognitions. To test this hypothesis, Schwartz and Garmoni (1986) evaluated the SOM model against aggregated data from 27 meta-analyses of CBT outcome studies. The majority of the included studies utilized self-statement questionnaires to measure positive and negative cognitions. The model to test the golden-section hypothesis within CBT consisted of five categories of ratio indices. The indices were meant to serve as a discriminatory tool between people of varying psychological adjustment. The dialogic indices tested were positive dialogue with a .62 ratio (ranging .56 to .68) that reflected the golden section ratio and presumably the healthiest balance; the internal dialogue of conflict had symmetrical balance and therefore a .50 ratio (ranging .45 to .55); the negative dialogue had a ratio of .38 (ranging .32 to .44). The positive and negative monologue indexes were also tested with ranges of .69 or higher and .37 or lower, respectively.

The results of the model analyses supported the SOM model but not the exact set index boundaries. As defined by clinically significant scores on measures of psychological adjustment, dysfunctional cases had an average ratio of .45. Moreover, significant differences were noted for several variables between dysfunctional cases and participants within the positive dialogue range (.56 to .68). These findings supported the supposition that negative cognitions were a feature of depressed and anxious individuals. Overall, the study found a relationship between an individual's functioning to the quantity of positive versus negative cognitions. Individuals who were functioning better indicated higher SOM ratios. At the same time, those who suffered clinically significant distress had SOM ratios within the negative dialogue range. However, the SOM hypothesis stated that ratios above the golden section value of .62 would indicate psychological distress, and this was simply not the case. On the contrary, SOM ratios within the positive monologue range (>.69) were linked to psychological adjustment and well-being.

Despite somewhat unfavorable findings, a series of studies have appeared that test the SOM model using Beck's (Beck & Haight, 2014) constructs of negative automatic thoughts and positive automatic thoughts. SOM was repeatedly supported as an indicator of the severity of psychopathology in children and adults. The results of the model analysis also supported the distinction between healthy and unhealthy SOM ratios. Overall, emotionally distressed children and adults were found to report significantly more negative cognitions than the controls (Hogendoorn et al., 2012; Ronan & Kendal, 1997; Kendall et al., 1989).

The SOM ratios was reported to distinguish between normal and distressed children, predicting performance or treatment outcomes, and enable tracking of incremental progress as well as provide information on the mechanism of change by considering positive, negative cognitions and their relationship to each other. Anxious children were found to have more negative thoughts than controls, and conversely had fewer positive thoughts than controls, resulting in lower SOM ratios than controls (Hogendoorn et al., 2012). Additionally, children identified as anxious had SOM ratios in the internal dialogue range with an average value ranging from .45 to .47 in both anxiety specific and depression specific content measures while control subjects' SOM scores ranged, on average, between .63 and .65, in both content areas (Ronan & Kendal, 1997).

Research on the SOM was consistent in illustrating the utility of the SOM ratios for predicting performance or treatment outcomes. Arnkoff et al. (1992) found SOM ratios to be a stronger predictor of anxiety over self-efficacy measures in a sample of graduate students before the oral examination. Investigation of whether SOM ratios would predict the psychotherapeutic change in a sample of depressed patients found that SOM ratios in pre-treatment positively predicted outcomes beyond the presence of personality disorder, educational achievement, and severity of depression (Baggett, 1994). In study of a large sample of undergraduates found that the ratio predicted the difference in the severity of symptoms beyond consideration of exclusively negative or exclusively positive cognitions, providing further support for the predictive value of SOM ratios in the application of treatment (Wong, 2010).

When used to track treatment progress, SOM ratios were successful in indicating individuals who had improved. Additionally, higher SOM ratios were linked to better

overall outcomes. For example, Schwartz and Michelson (1987) tracked the changes in the SOM ratio throughout the treatment of patients with agoraphobia. In pre-treatment, the average SOM ratio for all patients was .437, falling into the negative dialogue range. By mid-treatment, patients' average SOM ratio rose to .66, and to .70 at 3-month follow up. Similar results were found when investigating the shift of SOM ratios in subjects with agoraphobia before, during, and after treatment. Patients with agoraphobia were functioning better with higher than expected SOM ratios (.62 or positive dialogue) at the end of CBT treatment (Michelson et al., 1991). The treatment group was further divided into high-end state and low-end state groups based on the overall level of improvement gauged by a decrease in symptoms. The high-end state group's symptoms decreased by 3 - 4 points, while low-end state group's symptoms decreased by 0-2 points. At follow-up, the high-end state group had, on average, a ratio of .817, and the low-end state group had on the average ratio of .69. Both groups had improvements to the SOM ratio within the positive monologue range, which is higher than the expected .62 optimal balance ratio. When investigating a group of depressed patients in treatment, similar results were found with successful treatment linked to high SOM ratios. Schwartz et al. (2002) divided their sample of depressed patients into two groups according to whether the individual's depression remitted following treatment. At the start of the study, both groups had, on average, a SOM ratio of .35. Individuals who experienced a substantial reduction in symptoms following treatment had on average SOM of .74. Subjects who did not attain significant remission of depression had on average SOM of .41.

However, in predicting treatment progress, the maladaptive quality of high SOM ratios was repeatedly unsupported. For example, non-anxious children were found to

have SOM's on average of .80, while anxious children ranged from .67 to .70 (Hogendoorn et al., 2012). These findings disputed the optimal balance hypothesis, at least in a sample of children as both anxious and healthy children in this sample had SOM ratios within the positive monologue range (>.69). In another case, a college student sample participating in a public speaking class reported SOM ratios averaging .82 on the measure of self-efficacy when in a supportive situation, which was an unexpected finding if an optimal ratio of .62 were to be found (Davison et al., 1991).

Kendall et al. (1989) found partial support for the SOM model when examining SOM ratios of normal, depressed, and hypomanic adult subjects. Two sets of these three groups were used in the study for cross-validation. The subjects in both normal groups were found to fall within the positive dialogue range (M = .63 and M = .64). The subjects in both depressed groups scored in the negative dialogue range (M = .45 and M = .42). The evidence supported the SOM model in differentiating between normal and depressed subjects. Conversely, the expectation of hypomanic subjects reporting ratios well above normal subjects was not found. Both groups of hypomanic subjects scored within the positive dialogue range, the same as the normal subjects. Thus, the hypothesis that higher SOM end states were maladaptive was unsupported.

The SOM negative dialogue index (ranging .32 to .44) was repeatedly supported as an indicator of psychopathology in adults and at least one child sample (Kendall, Howard, & Hays, 1989; Schwartz & Garamoni, 1986; Ronan & Kendall, 1997), but the hypothesis that ratios above .68 correspond to maladaptive states was not confirmed. Conversely to the optimal balance hypothesis, successful remission of symptoms of depression or anxiety were accompanied by SOM ratios within the positive dialogue

range to well into the positive monologue range. Together, the research on the SOM ratio pointed to a linear relationship between increased protective cognitions and improved psychological well-being.

Without the affirmation of the optimal balance hypothesis by identifying psychological distress within the positive monologue range (> .69) as predicted, the SOM hypothesis. Verifying a nonlinear relationship between positive ratios (>.68) and adaptation or adjustment is the single most important tenet of the SOM model. The SOM negative dialogue index (ranging .32 to .44) was supported in several studies as an indicator of psychopathology (Kendall et al., 1989; Schwartz et al., 2002; Ronan & Kendall, 1997), but the hypothesis that ratios above .68 correspond to maladaptive states was not confirmed.

Schwartz (1992) acknowledged the incongruences of the optimal balance view with evidence in the research. Schwartz proposed that ratios approaching the positive monologue range were protective for patients from potentially slipping back into a negatively skewed cognitive balance. Schwartz updated the model in 1997 to include additional categories and new set points. The refinements necessitated by research findings moved the indexes of what a balanced ratio was originally (.62) to a range of .63 to .90 (Schwartz, 1997). Schwartz reformulated Balanced State of Mind Model (BSOM) identifies .62 ratio as a subnormal function with two new designations: .72 ratio as normal functioning and .81 as optimal functioning. The reformulated BSOM is comprised of seven qualitatively distinct categories. Negative SOM ratios remained consistent, as research supported SOM's ability to differentiate between the severity of psychopathology. With the BSOM, Schwartz essentially abandoned the golden-section

ratio as an indicator of optimal balance in favor of the golden-section ratio as a cut-off point between individuals experiencing distress and those who are functioning normally.

Research studies with the BSOM continued to find further support for the functionality of high positive ratios. A study of 292 introductory psychology students found evidence for the protective factor of high SOM ratios (Bruch, 1997). The study found that individuals who endorsed predominantly positive cognitions were less likely to be adversely affected by negative life events. In a sample of French college students, higher SOM ratios (> .69) were associated with lower levels of depression and anxiety, with 70% of the sample falling within the positive monologue range (Alsaleh et al., 2015). Moreover, no presence of a curvilinear relationship between SOM ratio and an individual's adaptation on various criterion measures was found, suggesting that even extremely positive states-of-mind are adaptive (Amsel & Fichten, 1998).

Results from several studies suggested that the lower band within the positive monologue index was adaptive; however, it was acknowledged that the *nature* of cognitions assessed to play a role in the breakdown of the balance hypothesis (Schwartz, 1993). Of note, this analysis utilized situation and context-dependent measures like much of the research on the SOM. Eighteen out of the twenty-seven studies included in the original 1986 meta-analysis were studies assessing self-statements. Automatic thoughts and self-statements are contextually and situationally dependent, unlike attitudes, schema, or beliefs (Beck et al., 1983) and might not be representative of an underlying cognitive mechanism. On the surface of situational and contextual dependent responses, individuals may very well function better in the realm of positive bias. However, it is possible that the positive bias, detectable on the surface, is not reflective of an underlying

cognitive process, best captured with stable cognitive constructs such as attitudes, schema, or beliefs.

Evaluating SOM using More stable cognitive constructs, embedded within Ellis' REBT

Schwartz and Garmoni (1989) hypothesized that the golden-section balance is operating as a stabilizing cognitive-affective self-regulatory system. A possible barrier to the SOM in the detection of the golden-section ratio in past research could be the focus on assessing self-statements rather than more stable cognitive constructs. SOM has mainly been assessed with measures of automatic thoughts or self-statement, which represent more surface structure cognitions that are close to a person's emotional experience (DiGiuseppe et al., 2016). They have not been used with more enduring cognitive constructs, such as, dysfunctional attitudes, irrational beliefs, or schema. Additionally, the studies that preceded the SOM theory in testing the golden-section hypothesis were measuring evaluative components in judgment and thought rather than self-statements (e.g., Benjafield and Adams-Webber's character evaluation and judgments; Lefebvre's ethical evaluations). REBT's focus on the evaluative nature of cognitions fits in with the original formulation of the golden-section hypothesis, which focused on measuring binary judgments and evaluations (Benjafield & Adams-Webber, 1976; Lefebvre, 1985). One might find good support for the SOM golden-section hypothesis within an REBT framework by examining stable, evaluative aspects of beliefs rather than self-statements.

In 1958, Abelson and Rosenberg (1958) introduced the terms "hot and cold" cognitions to differentiate between cognitive constructs. They theorized that internal states (e.g., cognitions, beliefs etc.) are of two types: ones that process facts from the

outside world, which they termed cold cognitions, and those that form evaluations of what is happening in the outside world, which they called hot cognitions. The differentiation of knowledge-based and evaluation-based thoughts lends itself to different assessments. As mentioned above, measurements of automatic thoughts or self-statements might not capture deep cognitions that are likely to be related to evaluative or 'hot" cognitions and be more sensitive to perceived facts that are not evaluations.

SOM paradigm was applied to affective/emotional states. Findings with affect mirrored the results of positive and negative cognition studies. SOM ratios were effectively adapted to measures of affect where the quantity or ratio of positive and negative affective states would coincide with psychopathology. Garamoni et al. (1991) found that affective ratio of 39 depressed males balanced at the same level as cognitions of depressed patients with a ratio in the negative dialogue range of .35. Normal controls in this study averaged an affect ration of .78. Garmoni et al. (1992) examined the shift in affective and cognitive SOM ratios of 32 depressed patients receiving CBT treatment. The sample was divided into two groups, responders and non-responders which was determined by independent clinical ratings. The two groups did not differ on any demographic characteristics or the severity of symptoms before treatment. The pre-treatment affective ratio for both groups was .34. The average affective ratio for responders was .65, while the average affective ratio for non-responders was .35, indicating no change from pre-treatment. These findings reflected a similar pattern within affective ratios as was found in the ratios for thoughts of individuals in psychotherapeutic treatment.

All cognitive psychotherapies generally hold theoretical underpinning about how humans' processing of information on their emotions and behavior (DiGiuseppe et al., 2016). Ellis' REBT approaches the change process in psychotherapy by focusing on replacing more stable, hot cognitions, or irrational beliefs with rational beliefs and getting the individual to practice their newly formed rational beliefs. Within the REBT framework, the focus is on targeting the evaluative component of the cognitions as the primary driver of emotional and behavioral upset (DiGiuseppe & Doyle, 2019), and as such, the assessment measures in REBT tap into evaluative, deep "hot" cognitions.

Chapter III

Research Questions

In the current study, we will examine the SOM model within the REBT framework. We hypothesize that by assessing stable cognitive constructs, such as IBs and RBs within the REBT framework, we might find support for the SOM golden-section (optimal balance) hypothesis. To test the golden-section hypothesis within the REBT framework, we applied the SOM ratios to data on an adult sample who have completed the DRLG, a measure irrational and rational beliefs within the REBT framework (DiGiuseppe et al, 2018). The SOM ratios derived from the DRLG were tested within the paradigm of the model and correlated with measures of psycho-emotional dysfunction and adjustment.

We hypothesize that:

1. ***1.*** RB and IB SOM ratios will replicate previous findings of differentiating between healthy and unhealthy subjects, as indicated by self-reports of psychological distress.
2. ***2.*** IBs will have a strong positive correlation with measures of disturbance; and will have a weak negative correlation with measures of life satisfaction.
3. ***3.*** RBs will have a strong positive correlation with measures of life satisfaction and will have a weak negative correlation with measures of psychological distress.

4. IB and RB SOM ratios will replicate findings from previous research in that the ratios higher predictive value of psychological distress and life satisfaction beyond either IBs or RBs alone.

5. We hypothesize that there will be a curvilinear relationship between belief SOM ratios and measures of life satisfaction and psychological distress.

Chapter IV

Methods

Participants

Participants in this study were collected via an online survey. The survey was distributed through social groups on a social media outlet (Facebook) and the Amazon Mechanical Turk (MTurk) platform. The total sample consisted of 258 participants between the ages of 18 to 84 years old. The percentage of participants within each age range is reported in Figure 1. The sample was relatively evenly split between males (44.3%) and female participants (55.2%) (N= 212, Missing 46, 17.8%). The sample was well educated, with 72.7 percent earning a four-year college degree or higher. Figure 2 lists the percentage of participants in each category of educational attainment. The sample ethnicity was largely Caucasian (73.6%); all ethnicities are reported in Figure 3.

Participants were largely residing within the United States (59.5 %), with two percent residing in South America and India, and thirty-eight percent choosing not to give their location. In terms of marital status, most of the sample was in a relationship (15.6%) or married (53.3%). Single participants made up the third-largest group (24.5%), and the remainder of the sample was either divorced/separated (4.2%), widowed (2.4%), or chose not to respond (17.8%). We did not recruit participants from any clinical sample; however, we recognize that any sample recruited non-clinical group will have a certain proportion that are receiving mental health services. Therefore, participants were also asked of their treatment status, with nine percent indicating that they were participating in psychotherapy and four percent indicating participation in a drug/alcohol dependence

treatment. In terms of psychotropic medication, ten percent (23 individuals) of participants indicated that they were currently prescribed psychotropic medication.

Figure 1

Demographics: Age. (*n* = 220)

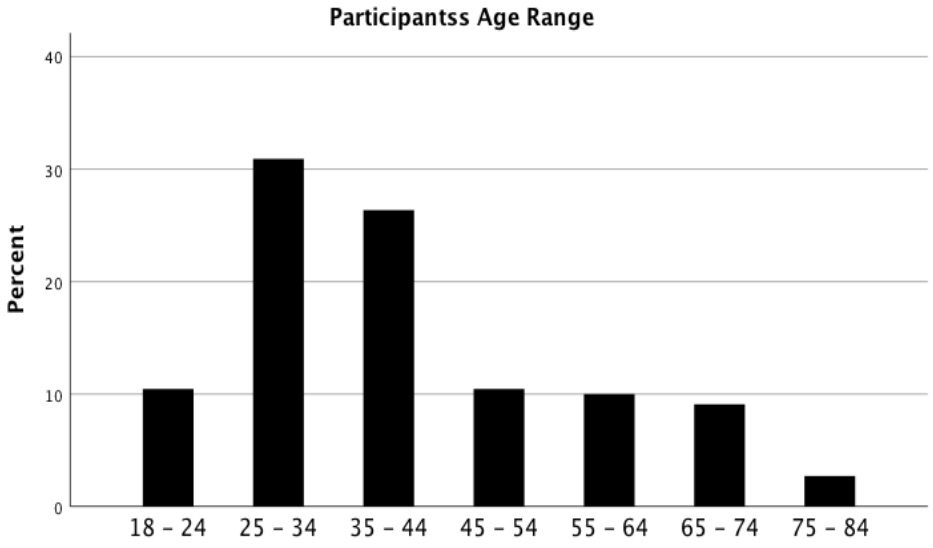


Figure 2

Demographics: Ethnicity. (*n* = 212)

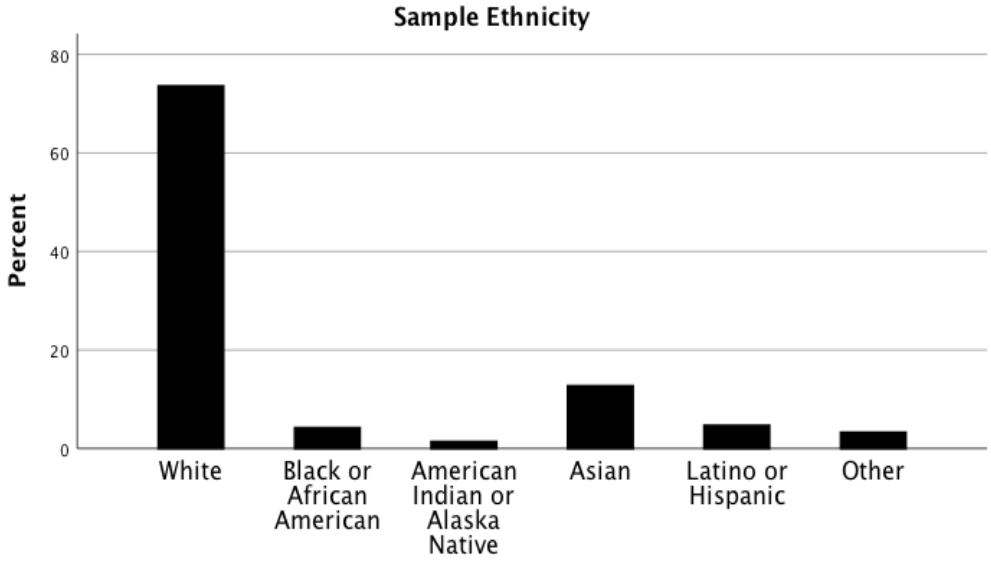
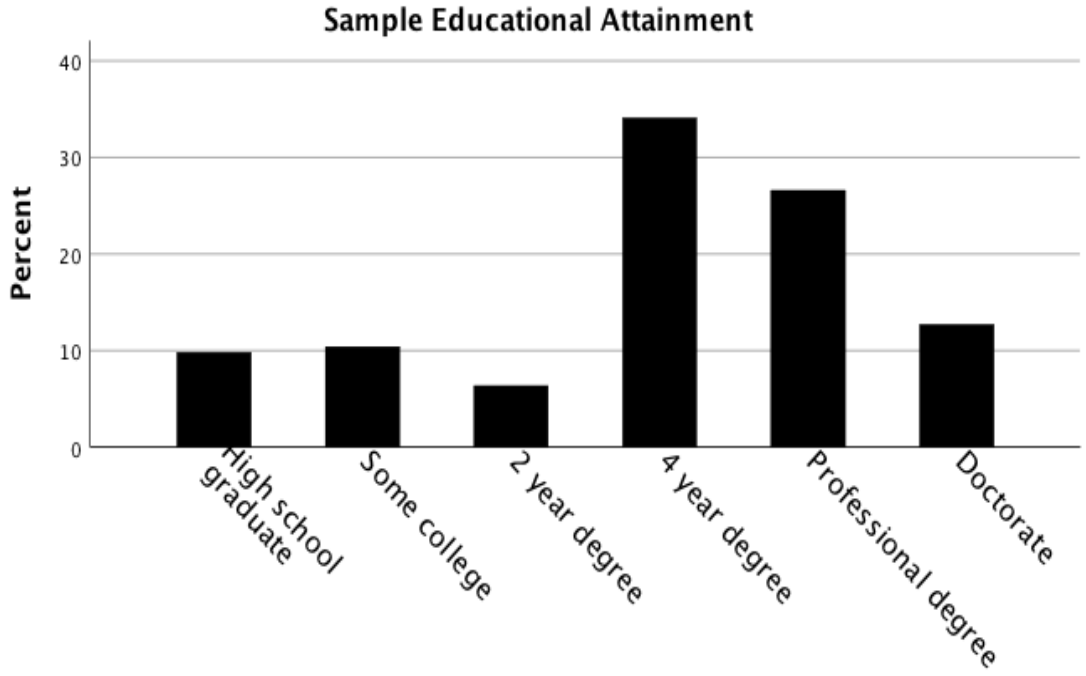


Figure 3

Demographics: Educational Attainment. (*n* – 173)



Chi-square test of independence was performed to examine whether samples from the two sources differed on any demographic measures. A total of 221 participants fully completed the demographic data with 86 participants from the MTurk pool and 132 participants from the Facebook pool. The two samples did not differ on measures of gender, $X_2(3, n = 221) = 6.64$, $p = .08$; ethnicity, $X_2(6, n = 221) = 9.07$, $p = .17$; education, $X_2(6, n = 221) = 5.95$, $p = .43$; country, $X_2(77, n = 221) = 71.95$, $p = .64$; marital status, $X_2(5, n = 221) = 7.36$, $p = .19$. The samples did however differ in age, $X_2(7, n = 221) = 22.40$, $p < .01$, with MTurk participants being overall younger (92% of the sample younger than 54 years-of-age) than Facebook participants (70.4% of the sample younger than 54 years-of-age).

Procedure

Data for this study were collected from two sources, first the distribution of an electronic survey via social media, and second by recruiting on for participants on MTurk. The social media outlet allowed for the survey to be posted to mental health disorder support groups and other nonclinical communities on Facebook and as well as larger communities to capture the greatest variance of well-being and psychopathology. Our participants were recruited via Facebook groups (e.g., Depression Support, Mental Illness Awareness, Its an Aquarius Thing). The pages' administrators were sent a private message asking for permission to post a survey link. When permission was granted, the administrator of the page was sent a written introduction to the study as well as the link to the survey, which they were free to post on the page. Social media sites, such as Facebook, have been shown as an effective and ethical recruitment tool (Kosinski et al., 2015). Participants reached through social media completed the survey at will. Two hundred and five participants began the survey via social media outlet of which one-hundred seventy-two were retained. In order to retain a survey completed via Facebook, the participant must have completed at least one section of the survey. A section of the survey demarcates a scale. Additionally, each participant's responses were evaluated for missing data. It was judged that a 3-4 percent of missing data within each section of the survey were permissible. The missing data was treated through mean substitution methods.

MTurk is a crowdsourcing marketplace that makes it possible to reach participants for tasks, such as, survey participation. Each MTurk participant was awarded a small fee for their time. To test for inattentive responders, a validity question

was embedded within the survey as recommended by Oppenheimer et al. (2009). All responses of participants who failed the attention check were removed from the data set. One hundred eighty-two people opened the survey on MTurk, and eighty-six were retained.

Measures

The electronic survey consisted of several measures, including demographic information, DRLG – short form, Psychiatric Diagnostic Screening Questionnaire, and Satisfaction with Life Scale.

The DRLG is an abbreviated version of the *Attitudes and Belief Scale -2* (DiGiuseppe, Raptis, Gorman, Agiurgioaei-Boie, Agiurgioaei, Leaf, & Robin, 2020) that assessed RBs and IBs reflecting the most recent theory of Ellis' Rational Emotive Behavior Therapy (REBT: Ellis 1994). The DRLG – short form was developed by DiGiuseppe, Robin, Leaf, and Gorman (2020). The DRLG – short form consists of 24 items within a 4 x 2 x 3 matrix. The measure consists of 4 irrational cognitive process subscales measuring Demandingness (DEM), Frustration-Intolerance (FI), Awfulizing AWF), and Self-Condemnation (SC), and four rationally worded cognitive process subscales measuring Non-Demanding Preferences (NDP), Frustration Tolerance (FT), Realistic Negative Evaluations(RNE), and Self-Acceptance. Each of these eight subscales consists of three items, one from each context domains of achievement, affiliation, and comfort.

The DRLG has excellent internal consistency and correlates significantly with a measure of psychopathology (DiGiuseppe, Raptis, Gorman, Agiurgioaei-Boie, Agiurgioaei, Leaf, & Robin, 2020). Confirmatory Factor Analysis for an 8-factor model

matches the 8 subscales mentioned above. A hierarchical model – has the four irrational scales load on to a second-order irrationality factor, and the four rationally worded subscales loading on to a rationality second-order factor. Thus, the DRLG short form yields a Total Irrationality and Total Rationality score and eight subscales. DRLG – short form has shown good to excellent internal consistency and concurrent validity with measures of mental health.

Amsel and Fichten (1998) recommend that when calculating SOM ratios, a scale for deriving ratios must have a value of zero to capture the broadest possible range of ratios between 0 and 1. The DRLG scoring already included a zero point and thus reflects the broadest possible range for belief SOM ratios within this sample.

The Belief SOM ratio for each participant was calculated by dividing their total rationality score by the total score [rational belief / (rational+ irrational beliefs)]. Indexes from the original formulation of the SOM hypothesis were used to compare belief SOM ratios to previous research. Average SOM ratios were calculated for the entire sample. Additionally, the sample was grouped based on PDSQ scale cut-offs scores within the depression and generalized anxiety indexes. Participants endorsing more symptoms than the cut-off score for each index were grouped as 'unhealthy,' while participants endorsing fewer symptoms than the cut-off score were grouped as 'healthy.' Average SOM ratios were calculated for each group within the two indexes: depression and anxiety.

The *Psychiatric Diagnostic Screening Questionnaire* (PDSQ: Zimmerman & Mattia, 2001) is a self-report screening assessment of psychiatric disorders. The PDSQ was developed to screen for the most common psychological disorders found in

outpatient mental health settings. The measure consists of 126 questions assessing symptoms within five diagnostic areas: eating disorder, mood disorders, anxiety disorders, substance use disorders, and somatoform disorders with an additional 6-item psychosis screener. The PDSQ has shown excellent internal consistency, test-retest reliability, concurrent validity, and discriminant validity (Zimmerman & Mattia, 2001).

The *Satisfaction with Life Scale* (SWLS: Diener, Emmons, Larsen, and Griffin, 1985) is a self-reported measure of global life satisfaction. SWLS consists of 5-items using a 1 through 7 Likert scale. The total score is calculated by summing all the 5 items. The total score can fall into one of six categories: highly satisfied, high score, average score, slightly below average score, dissatisfied, and extremely dissatisfied. SWLS has been shown to have excellent internal consistency, test-retest reliability, and convergent validity (Pavot, Diener, Colven & Sandvik, 1991).

The participants completed a demographic questionnaire that asked them to identify their age range, gender, level of educational attainment, and the country/state of their residence. Participants were also asked about their marital status and the gender of their partner. Additionally, participants volunteered whether they were currently in treatment with the option to provide the type of treatment, cause of treatment, and whether they were prescribed psychotropic medication. The demographic information of the sample is reported above. Additionally, twenty-three participants provided their positive treatment status, with eight participants report the type and cause of treatment. One hundred and eighty-nine participants reported that they were not in treatment, and 47 participants chose not to respond. Twenty- five participants volunteered that they were

currently taking psychotropic medication with one hundred eighty-six participants reporting no psychotropic medication. Forty-seven participants chose not to reply.

Chapter V

Results

The sample was reviewed for means (M) and standard deviations (SD), reported in Table 1, on belief SOM ratio, Rationality and Irrationality total scores, as well as variables of psychological stress (PDSQ Total score) and life satisfaction (SWLS Total Score). When compared to mean total scores of a clinical sample (M = 35.7, SD = 22.01) the sample was relatively free of psychological disorders $t(226) = -7.71$, $p < .01$ (M = 23.4, SD = 24) (Perkey, Sinclair, Blais, Stein, Neal, Pierson, and Slavin-Mulford, 2018). When compared to mean total scores of the validation sample (M = 23.5, SD = 6.4), the sample was just as satisfied with life, $t(258) = -1.4$, $p = .16$ (M = 22.8, SD = 7.8) (Diener, et.al.,1985). Similarly, the sample mean for rational beliefs total score was higher (M = 34.1, SD = 9.3) than the sample mean for irrational beliefs total score (M = 18.5, SD = 12.3).

Table 1
Descriptive Statistics for Belief SOM ratio, Rationality, and Irrationality Total Scores, Variables of Psychological Stress, and Life Satisfaction.

Variables	Mean	SD
SOM ratio	.66	.21
RB total score	34.1	9.4
IB total score	18.5	12.3
PDSQ total score	23.4	24.0
SWLS total Score	22.8	7.7

Note: RB = DRLG Rational beliefs; IB = DRLG Irrational beliefs; PDSQ = Psychiatric Diagnostic Screening Questionnaire (Normative sample M = 35.7)(n=226); SWLS = Satisfaction with Life Scale (Normative sample M = 23.5).

To determine the internal consistency of the DRLG-short form for this sample, Cronbach's Alpha was calculated. The analysis indicated DRLG – short form to possess a high level of internal consistency for this sample ($\alpha = .95$). The sample mean for belief SOM ratio was $M = .66$, $SD = .21$, falling within the positive dialogue range of the originally theorized range for optimal functioning.

The belief SOM ratios were consistent in differentiating between participants experiencing psychological distress and those who did not report psychological distress. SOM ratio dependently identified participants who met criteria for elevated symptoms of depression (PDSQ-Depression > 9) and anxiety (PDSQ-Anxiety >7) with an average belief SOM ratio falling within the negative dialogue range to conflict range (Depression M = .46, SD = .15; Anxiety M = .50, SD = .19). While participants without symptoms (below clinical cut-off), evidenced belief SOM ratios within the normal range (Depression M = .74, SD = .18; Anxiety M = .71, SD = .20). When examining total psychological distress scores (PDSQ Total Score) SOM ratios reflected a similar split between participants with subclinical to clinical psychological distress (T score >60). Participants reporting clinical levels of psychological distress had on average SOM ratios within negative dialogue range (M = .44, SD .13). On the other hand, participants reporting sub-clinical psychological distress had SOM ratios within the positive dialogue range (M = .69, SD = .20). Interestingly, when examining the range of SOM ratio scores for total psychological distress markers, participants reporting clinical levels of psychological distress ranged between .08 and .65. In contrast, those without significant psychological distress ranged from .04 to 1.00 SOM ratio values. The difference in range for the two groups may be indicative of higher levels of irrationality present for the

participants with lower SOM ratios (as in the index of negative dialogue or internal dialogue of conflict).

To test our second and third hypotheses, we correlated rational and irrational beliefs to the measures of psychological stress (PDSQ), and life satisfaction (SWLS) reported in Table 2. Self-reported psychological stress was significantly positively correlated to irrational beliefs, r (226) = .65, $p < .01$. Self-reported psychological stress was significantly negatively correlated to rational beliefs, r (226) = -.47, $p < .01$. Conversely, self-reported life satisfaction was significantly positively correlated to rational beliefs, r (258) = .52, $p < .01$, and significantly negatively correlated to irrational beliefs, r (258) = -.43, $p < .01$.

Table 2
Correlations Between Rational and Irrational Beliefs with Measures of Psychological Stress and Life Satisfaction.

Measures	1	2	3	4
1. RB	-			
2. IB	-.70**	-		
3. PDSQ	-.47**	.65**	-	
4. SWLS	.52**	-.43**	-.41**	-

Note: RB = DRLG Rational beliefs; IB = DRLG Irrational beliefs; PDSQ = Psychiatric Diagnostic Screening Questionnaire; SWLS = Satisfaction with Life Scale.
*** Correlation is significant at the 0.01 level (2-tailed).*

To test our fourth hypothesis, we entered belief SOM ratios with total irrational beliefs score and total rational belief scores into a hierarchal regression to determine incremental validity of belief SOM ratio, irrational beliefs ,and rational beliefs in predicting psychological well-being (SWLS Total Score) and psychological distress (PDSQ Total Score). The results of the hierarchal multiple regression of predicting

psychological well-being are described in Table 3. Rational beliefs were a significant predictor of life satisfaction and explained 28% of the variance, $F(2, 257) = 50.00$, $p < .0005$, $R^2 = .28$. Belief SOM ratios did not add predictive value beyond rational beliefs ($\beta = .35$, $p = .42$). Similarly, irrational beliefs did not add predictive value above rational beliefs ($\beta = .11$, $p = .36$). The results of the hierarchal multiple regression analysis of predicting psychological distress are described in Table 4. Irrational beliefs were a significant predictor of psychological distress and explained 42% of the variance, $F(2, 225) = 81.01$, $p < .0005$, $R^2 = .42$. Belief SOM ratios did not add predictive value beyond irrational beliefs ($\beta = .19$, $p = .45$). Rational beliefs did not add predictive value above irrational beliefs ($\beta = -.05$, $p = .78$).

Table *3*
Summary of Hierarchical Regression Analysis of Variables Predicting Life Satisfaction.

		Unstandardized coefficients		*Standardized coefficients*					
Step	*Predictor*	*B*	*SE B*	*β*	*p*	R^2	R^2 *change*	*F*	*p*
1						.25	.25	85.53	.00
	Belief SOM	18.86	2.04	.50	.00				
2						.28	.03	50.00	.00
	Belief SOM	7.37	3.98	.19	.06				
	Rationality	.29	.09	.35	.00				
3						.28	.00	33.28	.73
	Belief SOM	13.12	16.20	.35	.42				
	Rationality	.25	.15	.30	.09				
	Irrationality	.07	.19	.11	.71				

N = 258. *SE = Standard Error. Irrationality = Total irrational belief score on the DRLG short form. Rationality = Total rational belief score on the DRLG short form.*

Table 4
Summary of Hierarchical Regression Analysis of Variables Predicting Psychological Distress (N = 225)

		Unstandardized coefficients		*Standardized coefficients*					
Step	*Predictor*	*B*	*SE B*	*β*	*p*	R^2	R^2 *change*	*F*	*p*
1						.38	.38	137.10	.00
	Belief SOM	-70.18	5.99	-.62	.00				
2						.42	.03	81.01	.00
	Belief SOM	9.66	20.88	.09	.64				
	Irrationality	1.41	.35	.73	.00				
3						.42	.00	53.81	.78
	Belief SOM	21.63	47/74	.19	.65				
	Irrationality	1.54	.58	.80	.01				
	Rationality	-.12	.43	-.05	.78				

N = 225. SE = Standard Error. Irrationality = Total irrational belief score on the DRLG short form. Rationality = Total rational belief score on the DRLG short form.

We also investigated whether the order in which variables were entered into the hierarchal multiple regression analysis would change the significance of the predictive variables. We completed a secondary regression analysis by inputting the variables in reverse order and got the same results with RBs predicting life satisfaction and IBs predicting psychopathology.

To test our final hypothesis, we ran a set of regression models with belief SOM ratios as a predictor of life satisfaction (SWLS Total score). We fit the data to linear, quadratic, and cubic regression and judged the best fit model with the least error (Figure 4). Linear model fit was statistically significant explaining 25% of the variance, $F(1, 256) = 85.53$, $p < .0005$, $R^2 = .25$. The quadratic model fit was statistically significant, explaining 26% of variance, $F(2, 255) = 44.86$, $p < .0005$, $R^2 = .26$, but did not add

explanatory power beyond the linear model (β = -.54, p = .07). The cubic model fit was statistically significant $F(3, 254) = 29.81$, $p < .0005$, $R^2 = .26$ but did not add explanatory power as the best model fit (β = .26, p = .82). We also ran a set of regression models with belief SOM ratios as a predictor of psychological distress (PDSQ Total score). We fit the data to linear, quadratic, and cubic regression and judged the best fit model with the least error (Figure 5). Linear model fit was statistically significant explaining 38% of variance, $F(1, 224) = 137.10$, $p < .0005$, $R^2 = .38$). The quadratic model fit was statistically significant, explaining 38% of variance, $F(2, 223) = 69.10$, $p < .0005$, $R^2 = .38$, but did not carry explanatory power beyond the linear model (β = - .29, p = .30). The cubic model fit was statistically significant, explaining 40 percent of the variance $F(3, 222) = 51.05$, $p < .0005$, $R^2 = .40$, and did add explanatory power beyond the other two models (β = 3.26, p = .002).

Figure 4

Curve Model Fit for the Interaction Between Endorsement of Life Satisfaction and Belief SOM Ratios.

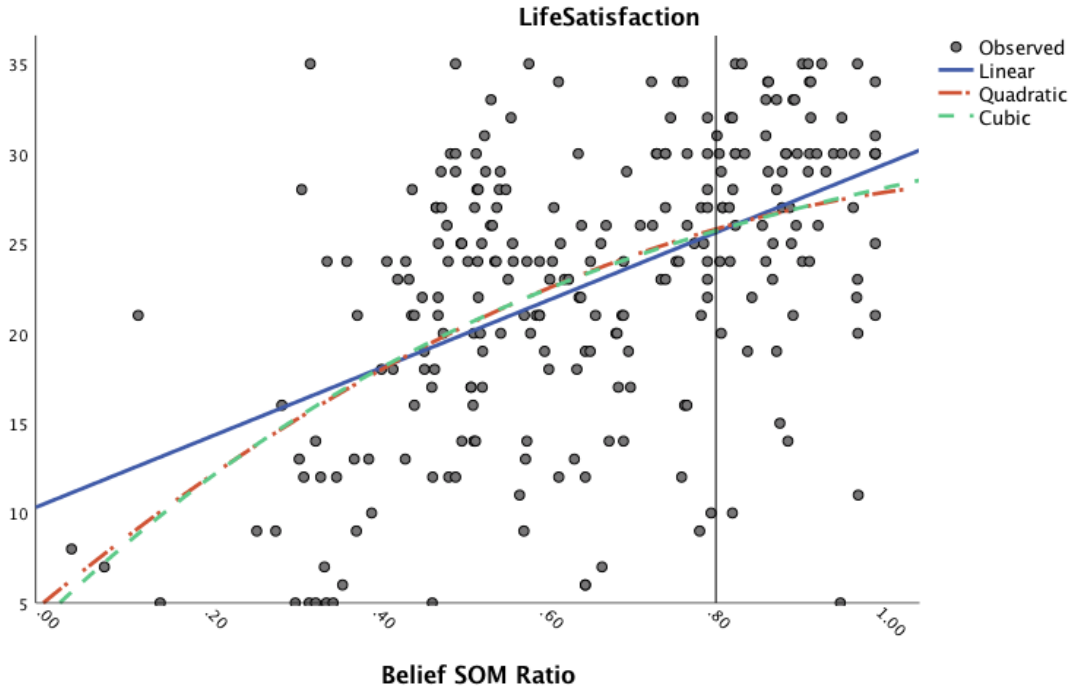
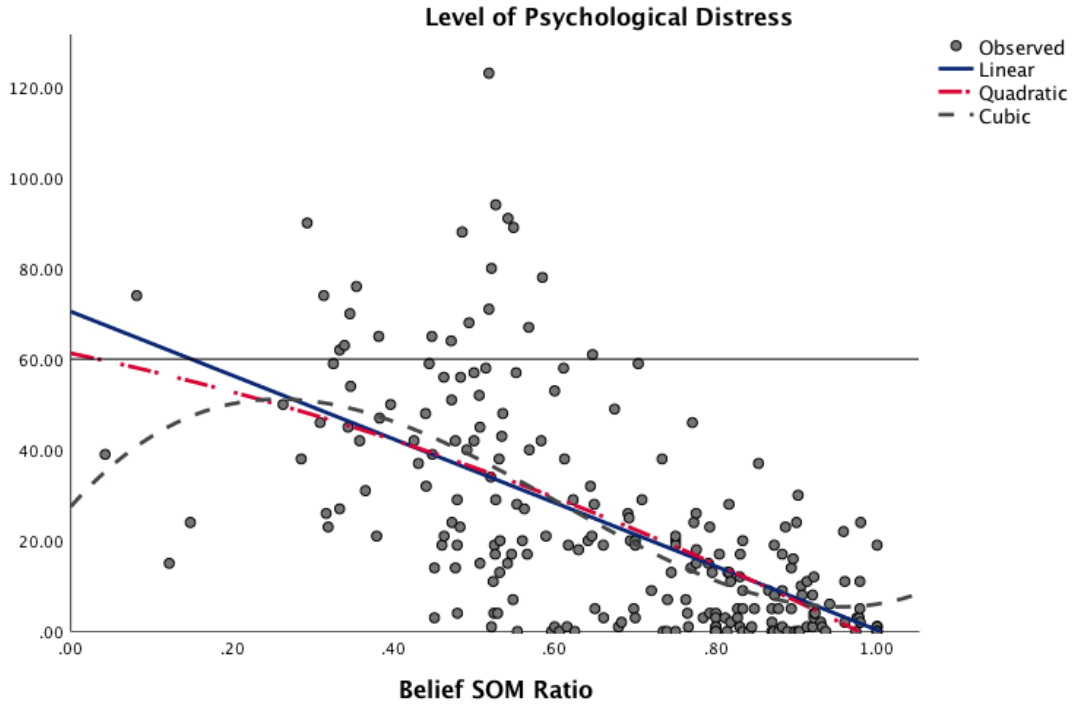


Figure 5

Curve Model Fit for the Interaction Between Endorsement of Psychological Stress and Belief SOM Ratios.



Chapter VI

Discussion

The original 1986 SOM theory proposed that individuals balance their positive and negative cognitions asymmetrically within an internal computation system represented with a ratio [positive cognitions / (positive + negative cognitions) (Schwartz & Garamoni, 1986; Schwartz & Garamoni, 1989). The authors supposed that the asymmetrical balance of evaluations was an evolutionary adaptation, allowing the individual to pay special attention to negative events. However, research on the model established that the optimal ratio first proposed as .62 was incorrect, as many psychologically well-adapted individuals were functioning within higher ranges of the ratio. As a result, Schwartz reformulated the original SOM theory into the Balanced State of Mind Model (BSOM), identifying the .62 ratio as a subnormal function with two new designations: 0.72 ratio as the normal functioning set point, and .81 as the optimal functioning set point. We hypothesized that the optimal ratio was not founded due to characteristics of measurement used in previous research, namely self-statements. Instead, we proposed that the optimal ratio may be found when examining the theory using more stable constructs, such as irrational and rational beliefs embedded within the cognitive therapy of Albert Ellis: Rational Emotive Behavior Therapy (REBT: Ellis 1994). Overall, we found that an optimal ratio was not substantiated when examining the SOM theory within the REBT framework. Our findings indicate individuals predictably experience less psychological distress the more rational and less irrational are their beliefs.

First, it was important for us to establish the relationship rational and irrational beliefs have with measures of psychopathology and well-being in order to relate beliefs to outcomes the same way negative and positive cognitions have been linked to outcomes in past research. For example, previous research had shown a clear link between negative (contributing) cognitions and psychopathology and positive (protective) cognitions and well-being (Beck, 1963; Beevers, Wells, & Miller 2007; Chakhssi, et al., 2018; Teasdale, 1983). This study had found that rational and irrational beliefs are linked to measures of psychological adjustment. Furthermore, the beliefs correlated in the predicted direction. The current investigation demonstrated irrational beliefs to significantly positively correlated to measures of psychopathology and significantly negatively correlated with measures of life satisfaction. While rational beliefs were significantly positively correlated with measures of life satisfaction and significantly negatively correlated to measures of psychopathology. These findings help us link rational and irrational beliefs to measures of psychological adjustment in the same way negative and positive cognitions have been linked to outcome measures in previous research.

Next, we investigated the SOM ratios derived from rational and irrational beliefs. Average SOM ratios for the overall sample fell within the positive dialogue range based on original SOM indices but were different from the optimal ratio balance set point of .62. Since our sample was relatively free of psychological stress and satisfaction with life we would expect the overall sample's mean SOM ratio to reflect the perfect balance hypothesis. However, the sample mean for the SOM ratio was higher. When further investigated, individuals who were more satisfied with life and less plagued by psychological distress had SOM ratios congruent to normal functioning setpoints

proposed within the BSOM. These findings replicate previous research when investigating negative and positive cognitions. As such, our hypothesis was refuted that finding the optimal balance may be resolved by assessing stable cognitive constructs, such as, attitudes and beliefs within the REBT framework. Research has consistently shown, including current investigation, that many healthy individuals have much higher ratios than the hypothesized optimal balance ratio of .62. These findings hold true both when measuring self-statements and when measuring beliefs.

We also noted a specific difference in the range of SOM ratios between individuals endorsing clinical levels of depression and anxiety versus those who reported fewer symptoms. In our sample, participants who endorsed sub-clinical levels of depression and anxiety, on average, endorsed more rational beliefs than irrational beliefs, as represented by higher SOM ratios for this group of participants (positive monologue range). Conversely, participants who endorsed more irrational beliefs than rational beliefs (negative dialogue range) also endorsed clinical levels of psychological distress (depression and anxiety) and had lower SOM ratios than the healthy participants. The same held true of the average SOM ratios when participants were split according to their endorsement of overall psychological distress. As such, belief SOM ratios were able to differentiate between healthy and unhealthy participants. Additionally, these findings support the assertion that negative (contributory) mental states as represented by lower SOM ratios (as in the index of negative dialogue or internal dialogue of conflict) and are linked to higher levels of psychological distress.

Our findings supported previous research in consistently finding SOM ratios to differentiate between unhealthy and healthy groups. Nasby and Russel (1997) reported

that soldiers with PTSD were differentiated from soldiers who did not experience PTSD by their SOM ratios when holding combat exposure and pre- and post-service variables constant. Soldiers with PTSD reported SOMs within the negative monologue range (.35) while non-PTSD counterparts reported SOMs within the positive dialogue range (.68). Moreover, Ronan and Kendall (1997) argued in support of the use of SOM ratios as it distinguished between normal and distressed children, enabling tracking of incremental progress as well as providing information on the mechanism of change by considering positive, negative cognitions and their relationship to each other. As such our findings reaffirm that the SOM ratio may be applied to any number of assessment tools that employ both negative and positive aspects of a content area in order to track treatment progress.

When investigating negative and positive cognitions SOM was consistent in illustrating the utility of the SOM ratios for predicting performance or treatment outcomes. Baggett (1994) investigated whether SOM ratios would predict a psychotherapeutic change in a sample of depressed patients. The study found that SOM ratios in pre-treatment positively predicted outcomes beyond the presence of personality disorder, educational achievement, and severity of depression. Another study of a large sample of undergraduates found that the ratio predicted the difference in the severity of symptoms beyond consideration of exclusively negative or exclusively positive cognitions, providing further support for the predictive value of SOM ratios in the application of treatment (Wong, 2010).

Furthermore, Bruch et al. (1991) examined the predictive power of SOM ratios for a sample of patients with social phobia undergoing CBT. The authors argued for the

SOM as an empirically testable model that enables practitioners and researchers to capture the processes of cognitive shifts in psychotherapy. Accordingly, research supported the dynamic relationship (SOM ratios) of negative and positive cognitions as a stronger predictive of outcome measure than positive and negative cognitions alone.

For this reason, we aimed to investigate whether belief SOM ratios would predict psychological distress or well-being. Conversely, our study found that within the REBT framework, IBs were a stronger predictor of psychological distress than rational beliefs or SOM ratios and RBs were a stronger predictor of life satisfaction. SOM ratios, when compared to IBs and RBs, did not add explanatory power. As such, irrationality has been found as the stronger predictor of psychological distress in our sample and rationality was found as the stronger predictor of life satisfaction. However, our study did not track change over time as did the aforementioned investigation, which may have affected our findings. We propose that the dynamic relationship of contributing and protective elements over the course of treatment may be a stronger predictor of overall outcome, while irrational beliefs may be a stronger predictor as an initial measure of psychological distress. We believe more research is warranted to examine this hypothesis by using SOM ratios derived from beliefs to track treatment progress.

Previous research supported a linear relationship between SOM ratio and an individual's adaptation on various criterion measures, suggesting that even extremely positive states-of-mind are adaptive (Amsel & Fichten, 1998). The current study found the best model fit for a linear relationship between SOM ratios and measures of well-being. Our investigation of the link between belief SOM ratios and psychopathology indicated a linear relationship to have the best model fit. These findings point affirm the

previously support a linear relationship between RBs and IBs outcome measures of life satisfaction and psychological distress. Our lack of finding the curvilinear relationship between psychological well-being and rationality supported previous findings when the SOM model was tested within the CBT theory.

Future Research

Our research findings support the original formulation of Schwartz and Garamoni's (1986, 1989) work in that individuals balance their cognitive states asymmetrically. Research findings of an optimal balance approximating the golden section ratio have been inconsistent. However, the findings of the asymmetry in the balance of individuals' cognitive experience have been consistent. It may be proposed that little negative experience is needed for adaptive salience against the backdrop of mostly positive mental events. And so, the theory does reflect the adaptive quality for the salience of internal negative states against the backdrop of primarily positive internal states.

Overall, SOM has been shown useful in differentiating between levels of severity of symptoms and tracking people's progress in therapy relative to others. Additionally, the SOM possesses concurrent validity useful in distinguishing clinical versus normal groups and can serve to compare groups between therapies and disorders in a standardized way. SOM ratios are a great way to explore the complex relationships between self-reported beliefs or cognitions in the attempt to understand the dynamic relationships of thoughts and beliefs as contributory outcome factors.

Amsel and Fichten (1998) named several advantages for using ratio scores namely that ratios simplify data analysis by avoiding working with positively skewed

distributions and overcomplicated statistical operations while allowing for comparison of different evaluation methods. The authors offered several suggestions to refine the accuracy of SOM by including a zero point on the scale of self-statement inventories or converting existing scores to have a zero value. SOM ratios allow for comparison across methodologies and studies. The authors made a strong argument for reporting both SOM scores and frequencies of valanced statements. The study found that frequencies of valanced thought and SOM ratios yield different information. The authors asserted that different frequencies of negative and positive statements could yield the same overall score, while a ratio score relates the relative balance of positive to negative cognitions or affect serving as a more accurate barometer of change in the valence of cognitions throughout psychotherapeutic treatment.

Understanding the role of positive and negative cognitions in psychological adjustment is an essential aspect of CBT practice. The current study enabled us to explore further the dynamic relationship between irrational and rational beliefs and their interaction with psychopathology. Future research may focus on identifying, particularly where the breakdown from healthy to un-healthy balance begins. By investigating a set cut-off may enable for identification of individuals with a strong need for intervention as well as formalize treatment progress across treatment paradigms. The current investigation's findings are incongruent with previous research of the nonlinear relationship between SOM ratios and well-being. Further exploration of the nonlinear relationship between SOM ratios and measures of well-being is warranted to replicate or refute this finding.

Limitations

The greatest limitation of the current study was the make-up of the sample. The sample underrepresented minority populations when compared to U.S. Census population statistics. The latest U.S. census recorded 60% of the population as Caucasian, 12% as Black, 18 percent as Hispanic, 1% as American Indian, and 6% as Asian (Census Bureau's Community Survey, 2008-2018). Secondly, our sample was relatively well educated. According to the Census Bureau's website, just 32.2 percent of the U.S. population over the age of 18 holds a 4-year college degree or higher. Our sample consisted of 68.3 percent of participants who reported earning a 4-year college degree or higher.

Furthermore, our sample was relatively free of psychological distress and relatively satisfied with life as compared to means from validating studies of these measures. As such, our sample might not be representative of the population in terms of education, ethnic, and racial background, as well as relative well-being. These exceptions may have arisen from sampling bias using social media outlets and MTurk survey participants.

Chapter VII

Implication for the Practice of School Psychology

An estimate of 13 - 20 % of children in the U.S. are effected by mental health disorders (CDC, 2018). The majority of children with mental health disorders do not receive treatment. However, the majority of those children who do receive mental health services, access these services in a school setting (USDHHS, 1999). Some meta-analytic studies have supported the use of counseling and psychotherapy as an effective mental health service for children in schools, with some interventions working better than others (Prout & Prout, 1998; Reese, Prout, Zirkelback & Anderson, 2010; Whiston, Wendi Lee, Rahardja & Eder, 2011). Additionally, school psychologists' training uniquely places them in a position to be able to choose evidence-based counseling and psychotherapy interventions with consideration for student's individual needs, strengths, and weaknesses (Hughes & Theodore, 2009).

Current trends and initiatives in education have highlighted the importance of establishing accountability by empirically evaluating programs and interventions at all levels of service delivery in schools (Dimmitt, 2009). Large caseloads, assignments to multiple schools as well as a focus on identification of children for special education services are all variables constraining school psychologists from engaging in the provision of direct mental health services to students (Hanchon & Fernald, 2013). Efforts to ease the delivery of evidence-based psychotherapeutic treatment may contribute to increasing the school psychologists' role in providing mental health services in school.

One way to ease the burden on school psychologists is to have an assessment tool that can cut across interventions, and specific problems addressed while remaining

empirically accountable for treatment progress. Utilizing the SOM model may provide an assessment system with any tool consisting of dichotomous measurement (i.e. positive-negative thoughts; positive-negative affect; rational-irrational beliefs), which may be sensitive to the constraints within mental health service provision in schools while responsive to the necessity of monitoring treatment.

The current study further established the ability of the SOM model to be applied across measures of cognition, affect, and beliefs when both protective and contributing factors are assessed. The importance of the SOM model in the practice of school psychology is in the model's ability to conform to any assessment tool which delineates between positive and negative poles, whether it measures cognition, affect, or beliefs. Our findings reaffirm that the SOM ratio may be applied to any number of assessment tools that employ both negative and positive aspects of a content area to identify individuals who are experiencing heightened psychological distress. Moreover, SOM ratios can be applied as a tool for tracking treatment progress as the ratio allows for incremental monitoring in the rise of protective cognitions or beliefs (Schwartz & Michelson, 1987; Schwartz et al., 2002).

Limitations remain in the transfer of SOM ratio use with adults to a population of children in school. For example, Hogendoorn et al. found that anxious children reported more negative thoughts than controls, had less positive thoughts than controls, and had lower SOM ratios than controls. Additionally, both positive and negative thoughts predicted anxiety levels in normal children. The study found that non-anxious children had SOM's on average of .80 while anxious children ranged from .67 to .70. Although the study supported the idea that quantities of protective and contributing cognitions

differ between anxious and normal children in particular ways, the exact set points as an average of a group were unclear. Further research is necessary to establish whether the difference in SOM ratios between anxious/depressed children is significantly different from children not experiencing psychological distress.

The current study has aided in reviewing and extending the present research base to bolster future research with the SOM as it is applied both in clinical and school settings. Previous research on SOM ratios when evaluating children has been sparse. Many more studies are necessary to understand the interaction and the dynamic relationship between protective and contributing factors affecting children's psychological balance. The model's ability to conform to different assessment and treatment paradigms must be further explored with samples of healthy and psychologically distressed children within the school setting.

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