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Research report

Early Maladaptive Schemas among patients diagnosed with bipolar disorder

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ABSTRACT

Background: Bipolar disorder is associated with a variety of cognitive features that seem to play a role in affective symptoms. Schema theory may serve as a unifying theory that would explain many of these features. This study is an exploratory investigation of schema theory's Early Maladaptive Schemas (EMSs) among individuals diagnosed with bipolar disorder.
Methods: A sample of 74 participants with bipolar disorder and 99 mixed clinical controls (46 with unipolar depression and 53 with anxiety disorders) completed the Young Schema Questionnaire and comparison measures. Associations were investigated using univariate and multivariate analyses. Mean scores were compared with previously established benchmarks.
Results: Participants with bipolar disorder demonstrate elevated scores on most EMSs, many at an intermediate position between nonclinical and mixed clinical control groups. When controlling for depression, participants with bipolar disorder exceed those with unipolar depression on *Approval-Seeking/Recognition-Seeking* and *Entitlement/Grandiosity*. Bipolar group membership is predicted by high scores on *Approval-Seeking/Recognition-Seeking* and low scores on *Emotional Inhibition* and *Abandonment*.
Limitations: Women were overrepresented. Axis II traits were not assessed, nor were manic symptoms in the mixed clinical sample.
Conclusions: Bipolar disorder is associated with a general activation of the EMSs. *Approval-Seeking/Recognition-Seeking* and *Entitlement/Grandiosity* seem to be particularly high, while *Emotional Inhibition* and *Abandonment* seem to be typically low. These EMS are highly consistent with characteristics of the bipolar spectrum. By demonstrating the activation of the EMSs, this study suggests that the EMS component of schema theory may be applied to bipolar disorder. Future research should explore how EMSs might interact with life events to trigger affective symptoms and, ultimately, the applicability of schema therapy to bipolar disorder.

1. Introduction

Bipolar disorder is a chronic mental health condition characterized by cycles of depression and mania (American Psychiatric Association [APA], 2001). Patients with Bipolar I Disorder experience an average of 15.9 depressive episodes and 14.7 manic episodes over the course of their lives, for some 30 lifetime relapses (Schaffer et al., 2006). Patients are also faced with substantial residual or inter-episode symptoms (Benazzi, 2004; Paykel et al., 2006), complex comorbidity (Schaffer et al., 2006; Sublette et al., 2009), high suicidality (Judd and Akiskal, 2003), high service utilization (Das Gupta and Guest, 2002; Stensland et al., 2007) and reduced overall quality of life (Brissos et al., 2008).

While it is widely accepted that the bipolar spectrum has a strong genetic and biological basis (e.g., Potash and DePaulo, 2000; Tsuchiya et al., 2003), numerous psychosocial factors have also been shown to impact both initial onset and episode recurrence. Among these factors, the occurrence of recent life events has been studied as a possible trigger of bipolar affective symptoms (for a review, see Johnson, 2005).

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Table 1
The 18 Early Maladaptive Schemas (EMS).

Early Maladaptive Schema (EMS)	Brief description
1. Abandonment	The belief that significant others will leave
2. Mistrust/Abuse	The belief that others will lie or take advantage
3. Emotional Deprivation	The feeling that adequate emotional support is not available
4. Defectiveness/Shame	The belief that one is flawed or worthless
5. Social Isolation/Alienation	The feeling of separation from others
6. Dependence/Incompetence	The feeling one is unable to take care of oneself
7. Vulnerability to Harm or Illness	The belief that catastrophe is impending
8. Enmeshment/Undeveloped Self	The fusion of identity with a significant other
9. Failure	The belief one is inadequate compared to others
10. Entitlement/Grandiosity	The belief that one is superior to and more deserving than others
11. Insufficient Self-Control/Self-Discipline	The belief that one cannot restrain emotions or impulses
12. Subjugation	The feeling that one's own needs are less important than those of others
13. Self-Sacrifice	The focus on meeting the needs of others at the expense of one's own
14. Approval-Seeking/Recognition-Seeking	The heightened need for approval/recognition from others
15. Negativity/Pessimism	The pervasive focus on negative aspects of life
16. Emotional Inhibition	The constriction of emotional expression
17. Unrelenting Standards/Hypercriticalness	The perfectionist drive to achieve
18. Punitiveness	The belief that mistakes warrant punishment

One study found that a full 90% of bipolar participants reported high stress factors in the 3 months prior to onset, while 82% reported that such events had occurred in the 3 months prior to their most recent relapse (Bidzińska, 1984). Goal-attainment life events would appear to be a specific ingredient in the buildup to mania, while negative events would appear to raise the risk of depression (Johnson et al., 2008a; Johnson et al., 2000).

The cognitive vulnerability–stress model attempts to explain the connection between life events and affect. According to this model, the bipolar cognitive style of goal striving and perfectionism, combined with a series of dysfunctional attitudes, may interact with the biological vulnerability inherent to the bipolar spectrum to trigger bipolar affective symptoms (Alloy et al., 2006). If this is the case, identifying and correcting dysfunctional cognitive styles could be key to reducing the affective symptoms triggered by life events. A number of dysfunctional cognitive styles have been identified in bipolar disorder, notably including pessimism and a contradictory pattern of self-esteem (Knowles et al., 2007), ruminative processing of positive and negative affect (Johnson et al., 2008b), active rejection of advice (Mansell and Lam, 2006), feelings of superiority (Gilbert et al., 2007), hypersensitivity to criticism (Miklowitz et al., 2005), and more. These cognitive particularities may provide clues to the relationship between cognitive style, life events and affective symptoms.

One cognitive-based theory that has gained much ground in psychopathology in recent years is schema theory (Young et al., 2003). Schema theory is consistent with Beckian theory, i.e., that early experiences shape individuals' beliefs about themselves, the world and others, which then go on to influence behavior in adulthood. However, what schema theory adds is a broader conception of the developmental origins of the cognitive biases seen among people with severe psychopathology, notably patients with characterological problems who have difficulty identifying, accessing and changing their cognitions and emotions.

According to schema theory, individuals who face toxic, maladaptive experiences in early childhood tend to develop a series of Early Maladaptive Schemas (EMSs) that are coherent with these experiences (Young et al., 2003). An EMS, as defined by schema theory, is a broad, pervasive theme or pattern relating to the individual and his or her relationships with others. It is made up of memories, emotions, cognitions and bodily sensations. EMSs are initially developed during childhood, but continue to be elaborated over the course of a lifetime. Indeed, EMSs remain with people long after childhood and affect the way they interact with the world around them. Young et al. (2003) have identified 18 different EMSs to date, each with its own proposed origin and long-term impact. The EMSs are divided into five umbrella categories known as schema domains, bringing together the EMSs that are believed to frequently develop together. The 18 EMSs are presented in Table 1.

One of the advantages of schema theory is that it goes hand in hand with schema therapy (Young et al., 2003). Schema therapy was developed to treat patients with complex, chronic psychological problems who fail to make sufficient gains in traditional cognitive therapy. It has shown great promise as a treatment approach for personality disorders (Giesen-Bloo et al., 2006; Gude and Hoffart, 2008). Moreover, the degree of EMS change over a course of schema therapy has been shown to predict symptom relief (Nordahl et al., 2005). The success that schema therapy has shown with personality disorders raises hope that this form of psychotherapy could be useful for clienteles having other chronic disorders with a cognitive component, such as bipolar disorder.

Some have suggested that schema theory and schema therapy may be applied to bipolar disorder (Ball et al., 2003; Newman et al., 2002). Noting that people with bipolar disorder report high levels of childhood abuse and adversity, which are believed to be the cause of EMSs, Newman et al. (2002) suggested that EMSs may complicate the course of bipolar spectrum disorders. Specifically, they may interact with the biologically based emotional dysregulation characteristic

of bipolarity, intensifying the reaction to stressful life events and leading to affective symptoms. However, the test of this interaction is limited to one study that added a truncated introduction to the schema model to traditional cognitive therapy (Ball et al., 2006). Though the treatment produced better outcome than treatment as usual, EMS scores are not reported and the authors make no mention of the treatment's impact on EMSs, limiting the conclusions that can be drawn from the study. However, in the absence of studies attesting to the presence of EMSs and the theoretical fit between bipolar disorder and schema theory, a full trial of schema therapy for patients with bipolar disorder would be premature.

A single study has presented EMS scores for the bipolar spectrum (Nilsson et al., 2010). A small sample of 25 participants with bipolar disorder was compared to 31 participants with borderline personality disorder and 29 student controls. Results showed that, even in a small sample, those with bipolar disorder scored statistically significantly higher than student controls on *Insufficient Self-Control* and showed a trend toward higher scores on *Approval-Seeking/Recognition Seeking*, *Entitlement/Grandiosity*, *Self-Sacrifice*, *Subjugation*, *Enmeshment*, *Failure*, *Social Isolation*, *Mistrust/Abuse* and *Abandonment*. Although 14 of 18 EMSs were statistically significantly lower in the bipolar group than the borderline personality group, there was no significant difference between the bipolar and borderline personality disorder groups for *Failure*, *Enmeshment*, *Self-Sacrifice*, and *Entitlement/-Grandiosity*. Given the significant and near-significant differences in a small sample and the lack of multivariate analyses to detect the essential EMSs in the bipolar spectrum, the study opened the door to a more thorough examination of EMSs in bipolar disorder.

Based on the cognitive findings for bipolar disorder and the growing popularity of schema theory, we first examined the EMSs among individuals deemed at risk of developing a bipolar disorder (Hawke et al., 2011). In that study, individuals at risk of a bipolar disorder were found to have overall higher EMS scores than those deemed not at elevated risk. They also showed high scores specifically on the *Entitlement/Grandiosity* and *Insufficient Self-Control* EMSs, as well as low scores on *Emotional Inhibition*. *Entitlement/Grandiosity* is a logical finding for the bipolar spectrum, given the high confidence observed among these individuals (Johnson and Jones, 2009; Johnson et al., 2005). *Insufficient Self-Control/Self-Discipline* also fits with the bipolar spectrum, which is characterized by considerable affective intensity and impulsivity (Carver and Johnson, 2009; Johnson and Jones, 2009). The low activation of the *Emotional Inhibition* EMS is also a logical finding, given the emotional responsiveness of bipolar disorder (Johnson et al., 2007). These findings provided a preliminary confirmation of the general fit between schema theory and the soft bipolar spectrum. The next step in the pairing of schema theory and the bipolar spectrum is the examination of the EMSs of individuals diagnosed with bipolar disorder.

2. Objective and hypotheses

The present study is an investigation of the applicability of schema theory to bipolar disorder. Based on the cognitive, affective and symptom profiles of the bipolar spectrum, it was hypothesized 1) that individuals with bipolar disorder would have globally higher EMS scores and 2) that a bipolar spectrum profile would emerge, composed of EMSs reflecting the characteristics of bipolar disorder: activation of the *Entitlement/Grandiosity* and *Insufficient Self-Control/Self-Discipline* EMSs, as well as the non-activation of *Emotional Inhibition*. The remaining EMSs were examined on an exploratory basis.

3. Methods

3.1. Participants

A clinical sample of 74 patients with bipolar disorder (65.3% female: age $M = 43.0$ years, $SD = 12.0$) was recruited from the following sources: 1) patients beginning cognitive behavioral therapy or psychoeducation for bipolar disorder on an outpatient basis in a psychiatric hospital or community mental health center ($N = 37$), 2) out-patients referred to the study by their treating psychiatrists ($N = 21$), and 3) members of community support organizations for individuals with bipolar disorder ($N = 16$). The inclusion criteria were: 1) referral to the study or treatment site between fall 2009 and summer 2011; 2) the presence of a primary diagnosis of bipolar disorder (type I, type II, NOS) posed by a psychiatrist and/or a general practitioner; for participants not recruited directly through their treating psychiatrists, diagnosis was confirmed by a validated diagnostic interview (Mini-International Neuropsychiatric Interview, MINI.; Sheehan et al., 1998) (source 1) or the self-report Mood Disorders Questionnaire (MDQ; Hirschfeld et al., 2000) (source 3); 3) informed consent to the use of clinical data for research purposes; 4) 18 years of age or older. The only exclusion criterion was the presence of acute symptoms requiring immediate intervention (e.g., suicide risk).

A mixed clinical control group (MCC) of 99 patients (70.1% female; age $M = 36.7$ years, $SD = 13.0$) was retained for comparison purposes. This sample consisted of the secondary analysis of data from consecutive out-patients with unipolar depression or anxiety disorders, beginning cognitive-behavioral therapy at one of two CBT out-patient clinics for mood or anxiety disorders, one in a psychiatric hospital and the other in a university counseling center. Inclusion criteria for this sample included 1) the presence of a depressive or anxiety disorder as confirmed using the MINI diagnostic interview (Sheehan et al., 1998); 2) referral to one of the two sites between fall 2007 and spring 2011; 3) informed consent to the use of data for research purposes; 4) 18 years of age or older. Exclusion criteria were the presence of a bipolar disorder or acute symptoms requiring immediate intervention.

3.2. Procedure

Participants completed a series of self-report questionnaires in pencil and paper format. Questionnaires included the Young Schema Questionnaire — Short Form 3 (YSQ-S3; Young, 2005) to establish schema scores, the Beck Depression Inventory — 2nd Edition (BDI-II; Beck et al., 1996) and the Altman Self-Rating Mania Scale (ASRM; Altman et al., 1997) to establish current mood state. The MCC group completed the YSQ-S3 and the BDI-II as part of the regular pre-treatment assessment procedure. The ASRM was not administered to the majority of clinical controls and was therefore not used in analyses of control group data. The study was approved by a university-affiliated ethics review board.

3.3. Measures

3.3.1. Young Schema Questionnaire — Short Form 3 (YSQ-S3; Young, 2005; Young et al., 2005)

The YSQ-S3, developed in conjunction with schema theory and schema therapy, consists of 90 items making up 18 EMS scales, with 5 items per EMS. Each item is a statement based on an EMS as defined by schema theory. Respondents are asked to rate the degree to which they agree with the statements on a Likert scale (1–6). The mean score for each EMS is calculated, a higher score representing higher endorsement of the EMS. Though the YSQ is evolving as schema theory develops, validation results on various versions of the questionnaire have largely supported the instrument's relevance as a measure of EMSs (Lee et al., 1999; Rijkeboer and van den Bergh, 2006).

3.3.2. Beck Depression Inventory — II (BDI-II; Beck et al., 1996)

The BDI-II is a highly validated self-report measure of depressive symptoms experienced during the past week (Beck et al., 1996). It consists of 21 multiple choice questions based on the DSM-IV criteria for depression. The total score provides an indication of the severity of depressive symptoms and can be used to rate symptoms as minimal, mild, moderate or severe based on established norms. The BDI-II has a strong internal consistency ($\alpha = .91$) and test–retest reliability ($r = .93$ at 1 week). Scores are correlated with clinician evaluations of depression using the Hamilton Depression Rating Scale ($r = .71$). The French-language version has similar psychometric characteristics (Beck et al., 1998).

3.3.3. Altman Self-Rating Mania Scale (ASRM; Altman et al., 1997)

The ASRM is a 5 item self-report scale used to measure current manic or hypomanic symptoms. The items are presented in the form of multiple choice questions rated from 0 to 4 based on symptom severity. The total score ranges from zero to 20, a higher score indicating a greater degree of (hypo) manic symptoms. With a cutoff of six, the ASRM has a sensitivity of 93% and a specificity of 33% (Altman et al., 2001). It is also significantly correlated with clinician-rated mania scores based on the Clinician-Administered Rating Scale for Mania ($r = .34$). The instrument has been adapted and validated for a French Canadian population with satisfactory results (Hawke et al., 2009).

3.3.4. Mini International Neuropsychiatric Interview 5.0 (MINI; Sheehan et al., 1998)

All participants in the MCC sample and participants with bipolar disorder from Source 1 were diagnosed using the MINI, a validated semi-structured interview compatible with DSM-IV criteria. The MINI has demonstrated good convergence with SCID-I diagnoses for most disorders, as well as specificity of .88 or higher for all subscales and sensitivity of .70 or higher for most subscales. The MINI was selected for its demonstrated psychometric properties and clinical utility as a brief, practical patient interview.

3.3.5. Mood Disorders Questionnaire (MDQ; Hirschfeld et al., 2000)

The MDQ is a self-report screening tool that identifies a lifetime history of bipolar disorder based on the symptoms of (hypo)mania. It is made up of 13 symptom items (yes/no), one item regarding the co-occurrence of symptoms, and one item on the impairment caused by the symptoms. The endorsement of seven or more of the symptom items, combined with a positive response for co-occurrence and moderate to severe impairment, suggests the presence of a bipolar disorder with a sensitivity of .73 and specificity of .90. The French-language version employed in the current study has been validated, with satisfactory results (Weber Rouget et al., 2005). The MDQ was employed in the current study to confirm the bipolar status of participants recruited through the community support organizations (Source 3).

3.4. Analyses

Mean EMS scores were calculated for the bipolar sample and complete descriptive statistics were examined. Participants with bipolar disorder were compared with nonclinical norms presented in Hawke and Provencher (submitted for publication) and the mixed clinical control group using non-parametric Mann Whitney's U due to extremely unequal sample sizes. Non-parametric pairwise comparisons were calculated using the rank difference test proposed by Siegel and Castellan (1988). Pearson product–moment correlations were calculated between EMSs and BDI-II/ASRM symptom scores for bipolar participants to establish the association of schemas with mood state. To examine the clinical significance of EMS scores, a clinical cutoff score (c-criterion) was determined using the nonclinical and mixed clinical control groups as recommended by Jacobson and Truax (1991). The proportion of participants in the bipolar group classified into the clinical group was calculated.

With a view to exploring the specificity of EMSs to bipolar disorder, the MCC group was then divided into two subsamples — the first diagnosed with unipolar depression and the second with anxiety disorders. The EMS scores of participants with bipolar disorder were compared with the depressed and anxious groups using ANOVAs. Square root transformations were applied to six EMSs (see Table 4) to provide normal distributions (skewness and kurtosis values <1). Since BDI-II data was available for the MCC, but not ASRM data, and since EMSs were found to be correlated highly correlated with the BDI-II, but not the ASRM, one-way ANOVAs were repeated while controlling for BDI-II depression.

Logistic regression was then used to predict group membership between the MCC and bipolar samples. Due to the high number of variables and limited sample size, a manual stepwise approach was taken. Initial exploratory models were conducted, containing the EMSs grouped in their respective schema domains, for five exploratory models. EMSs contributing at $p<.10$ were retained as possible predictors and entered together in a final model. Goodness of fit was evaluated using two indices: 1) Pearson's chi-square, whereby a significant result indicates a good model fit; and 2) the Hosmer–Lemeshow goodness of fit index, whereby a non-significant result indicates a good model fit. The significance of individual predictors was assessed using the Wald test.

Statistical analyses were conducted using SPSS version 13. The FDR correction was used to control the type 1 error inflation (Narum, 2006). The FDR-corrected alpha for 18 tests (one per EMS) is 0.014.

4. Results

Mean EMS scores for participants with bipolar disorder are presented in Table 2. Also presented are mean scores and comparisons with mixed clinical controls (MCC) and nonclinical controls (NC) drawn from Hawke and Provencher (submitted for publication). For 11 EMSs and the YSQ-S3 total score, participants with bipolar disorder are situated between MCC and NC groups. All three groups are also different for the *Approval-Seeking/Recognition-Seeking* EMS, the highest scores being reported by the bipolar sample. For *Enmeshment* and *Insufficient Self-Control*, mean scores for the bipolar group are equivalent to MCC and higher than NC. In contrast, the bipolar group is equivalent to NC and lower than MCC for *Emotional Inhibition*, *Unrelenting Standards/Hypercriticalness* and *Punitiveness*. All groups reported equivalent scores for *Entitlement/Grandiosity*.

The correlation between EMS scores and the symptoms of depression and mania in the bipolar sample are presented in Table 3. Depressive symptoms were present in the sample, the mean being in the "mild depression" range (BDI-II: $M=14.46$, $SD=11.90$). Manic symptoms were minimal, the mean score being well below the cutoff of 6 for mania (ASRM: $M=2.82$, $SD=2.99$). All 18 EMSs and the YSQ-S3 total score were significantly correlated with BDI-II depression. In contrast, neither the YSQ-S3 total score nor any of the 18 EMSs were significantly correlated with ASRM mania, the largest correlation being $r=-.22$, $p=.06$ for *Failure* (all other $ps>.10$).

Table 3
EMS-symptom correlations in bipolar sample.

Early Maladaptive Schemas and domains	BDI-II	ASRM
Disconnection and Rejection		
Emotional Deprivation	.41**	.04
Abandonment	.51**	−.03
Mistrust/Abuse	.55**	−.11
Social Isolation/Alienation	.55**	−.05
Defectiveness/Shame	.59**	−.05
Impaired Autonomy and Performance		
Failure	.53**	−.22
Dependence/Incompetence	.58**	−.03
Vulnerability to Harm or Illness	.56**	.06
Enmeshment/Undeveloped Self	.29*	.04
Other-directedness		
Subjugation	.57**	−.12
Self-Sacrifice	.38**	.16
Approval-Seeking/Rec.-Seeking	.45**	.06
Impaired Limits		
Entitlement/Grandiosity	.51**	.17
Insufficient Self-Control/Self-Disc.	.42**	.03
Overvigilance and Inhibition		
Emotional Inhibition	.47**	.05
Unrel. Standards/Hypercriticalness	.40**	.06
Negativity/Pessimism	.58**	−.01
Punitiveness	.40**	−.10
YSQ-S3 total score	.68**	−.01

** $p<.01$.
* $p<.05$.

To move beyond mean scores and consider the clinical significance of EMSs activated in the bipolar sample, the c-criterion was used to suggest the clinical significance of the EMSs of individual participants with bipolar disorder (Jacobson and Truax, 1991). Results show that over half (56.8%) of participants with bipolar disorder report a YSQ-S3 total score resembling the distribution of scores in the MCC group. For the

Table 2
Descriptive statistics and comparisons of mean EMS scores of patients with bipolar disorder, confirmed non-clinical controls and mixed clinical controls.

Early Maladaptive Schemas	Bipolar	Non-clinical controls	Mixed clinical controls			Group differences	Clinically significant
	$N=74$	$N=595$	$N=99$	$\chi^2(2)$	p		(%)
Disconnection and rejection							
Emotional Deprivation	2.34 (1.23)	1.66 (0.84)	2.52 (1.22)	75.61	<.001	NC<BP<MCC	47.3
Abandonment	2.54 (1.07)	1.88 (0.80)	2.94 (1.19)	88.14	<.001	NC<BP<MCC	56.8
Mistrust/Abuse	2.32 (1.18)	1.77 (0.76)	2.40 (1.01)	46.65	<.001	NC<BP<MCC	41.9
Social Isolation/Alienation	2.86 (1.20)	2.20 (0.96)	3.04 (1.08)	67.06	<.001	NC<BP<MCC	55.4
Defectiveness/Shame	2.12 (1.20)	1.38 (0.60)	2.24 (1.13)	105.95	<.001	NC<BP<MCC	48.6
Impaired Autonomy and Performance							
Failure	2.16 (1.21)	1.59 (0.72)	2.49 (1.13)	81.57	<.001	NC<BP<MCC	45.9
Dependence/Incompetence	2.05 (0.85)	1.50 (0.57)	2.24 (0.90)	98.25	<.001	NC<BP<MCC	62.2
Vulnerability to Harm or Illness	2.16 (1.02)	1.65 (0.67)	2.45 (0.95)	82.20	<.001	NC<BP<MCC	58.1
Enmeshment/Undeveloped Self	2.06 (0.97)	1.43 (0.58)	2.08 (0.86)	86.80	<.001	NC<BP=MCC	58.1
Other-directedness							
Subjugation	2.41 (1.15)	1.71 (0.66)	2.59 (1.02)	90.08	<.001	NC<BP<MCC	51.4
Self-Sacrifice	3.32 (1.10)	2.87 (0.95)	3.45 (1.14)	31.99	<.001	NC<BP<MCC	45.9
Approval-Seeking/Rec.-Seeking	2.94 (0.97)	2.44 (0.83)	2.74 (0.95)	26.89	<.001	NC<MCC<BP	63.5
Impaired Limits							
Entitlement/Grandiosity	2.54 (0.91)	2.41 (0.76)	2.46 (0.81)	0.52	.77	n/a	43.2
Insufficient Self-Control/Self-Disc.	2.51 (1.02)	1.97 (0.66)	2.47 (0.92)	45.71	<.001	NC<BP=MCC	64.9
Overvigilance and Inhibition							
Emotional Inhibition	2.35 (1.07)	2.28 (0.97)	2.82 (1.08)	23.47	<.001	NC=BP<MCC	33.8
Unrel. Standards/Hypercriticalness	3.27 (0.99)	3.14 (0.92)	3.45 (0.91)	8.80	.01	NC=BP<MCC	43.2
Negativity/Pessimism	2.77 (1.38)	1.93 (0.83)	2.96 (1.10)	94.83	<.001	NC<BP<MCC	52.7
Punitiveness	2.60 (0.95)	2.31 (0.72)	2.69 (0.89)	20.81	<.001	NC=BP<MCC	47.3
YSQ-S3 total score	2.52 (0.79)	2.00 (0.49)	2.67 (0.63)	118.88	<.001	NC<BP<MCC	56.8

Table 4
Comparisons of EMS scores of patients with bipolar disorder, unipolar depression or anxiety disorders, with and without controlling for depressive symptoms.

Early Maladaptive Schemas	BP	UP	ANX	Uncontrolled			Controlled for BDI-II		
	$N=74$	$N=46$	$N=53$	$F(2,170)$	p	Pairwise	$F(2,168)$	p	Pairwise
Disconnection and Rejection									
Emotional Deprivation	2.34 (1.23)	3.00 (1.22)	2.11 (1.06)	7.53	<.001	BP = ANX < UP	2.58	.08	
Abandonment	2.54 (1.07)	2.93 (1.15)	2.94 (1.24)	2.65	.07		2.21	.11	
Mistrust/Abuse[a]	2.32 (1.18)	2.63 (1.03)	2.19 (0.96)	2.41	.09		1.05	.35	
Social Isolation/Alienation	2.86 (1.20)	3.42 (0.96)	2.70 (1.07)	5.81	.004	BP = ANX < UP	1.59	.21	
Defectiveness/Shame[a]	2.12 (1.20)	2.45 (1.10)	2.06 (1.14)	2.11	.13		1.61	.20	
Impaired Autonomy and Performance									
Failure[a]	2.16 (1.21)	2.63 (1.07)	2.37 (1.18)	3.18	.04		.37	.67	
Dependence/Incompetence	2.05 (0.85)	2.40 (0.92)	2.09 (0.86)	2.59	.08		.41	.67	
Vulnerability to Harm or Illness[a]	2.16 (1.02)	2.46 (0.81)	2.44 (1.06)	2.31	.10		1.78	.17	
Enmeshment/Undeveloped Self[a]	2.06 (0.97)	2.13 (0.92)	2.03 (0.82)	.16	.86		.75	.48	
Other-directedness									
Subjugation	2.41 (1.15)	2.83 (1.01)	2.38 (0.99)	2.76	.07		.77	.46	
Self-Sacrifice	3.32 (1.10)	3.63 (1.12)	3.30 (1.15)	1.41	.25		.17	.85	
Approval-Seeking/Rec.-Seeking	2.94 (0.97)	2.70 (0.98)	2.77 (0.94)	.99	.37		4.29	.015	UP < BP = ANX[b]
Impaired Limits									
Entitlement/Grandiosity[a]	2.54 (0.91)	2.41 (0.71)	2.51 (0.88)	.28	.76		5.45	.005	UP < BP = ANX[c]
Insufficient Self-Ctrl./Self-Disc.	2.51 (1.02)	2.58 (0.88)	2.37 (0.94)	.67	.52		1.65	.20	
Overvigilance and Inhibition									
Emotional Inhibition	2.35 (1.07)	3.10 (1.09)	2.59 (1.02)	6.99	.001	BP = ANX < UP	.44	.64	
Unrel. Standards/Hypercrit.	3.27 (0.99)	3.35 (0.77)	3.54 (1.01)	1.27	.28		2.80	.06	
Negativity/Pessimism	2.77 (1.38)	3.08 (1.01)	2.86 (1.17)	.89	.41		2.17	.12	
Punitiveness	2.60 (0.95)	2.66 (0.84)	2.73 (0.93)	.31	.73		3.54	.03	
YSQ-S3 total score	2.52 (0.79)	2.80 (0.52)	2.55 (0.69)	2.58	.08		2.12	.12	

Note. BP = bipolar sample; UP = unipolar depression subsample; ANX = anxiety disorder subsample.
[a] Test on square root transformation of variable.
[b] BP vs. UP, $p=.012$; BP vs. ANX, $p=.49$.
[c] BP vs. UP, $p=.004$; BP vs. ANX, $p=1.00$.

individual EMSs, proportions range from a low of 33.8% of participants endorsing *Emotional Inhibition* at clinically significant levels to a high of 64.9% for *Insufficient Self-Control*. Participants in the bipolar disorder group rated an average of 9.2 EMSs ($SD=5.7$) at clinically significant levels based on NC and MCC group scores.

Given the heterogeneity of the MCC group, this sample was then broken down into subsamples for further analysis in attempt to examine the specificity of EMSs to bipolar disorder (Table 4). In the MCC group, 46 had a primary diagnosis of a unipolar mood disorder, and 53 an anxiety disorder. For the YSQ-S3 total score and 15 of 18 EMSs, scores were equivalent across the three groups. In three cases (*Emotional Deprivation*, *Social Isolation*, *Emotional Inhibition*), individuals with bipolar disorder presented scores equivalent to those of the anxiety disorder group and inferior to those of the unipolar depressed group.

Since EMSs were strongly correlated with depressive symptoms, group comparisons were repeated controlling for BDI-II depression. ANCOVA results reveal that the group differences emerging without statistical control disappeared. In one case, *Entitlement/Grandiosity*, participants with bipolar disorder scored higher than those with unipolar depression when controlling for depressive symptoms. The same effect was observed for *Approval-Seeking/Recognition-Seeking*, coming in just shy of FDR-corrected significance at $p=.015$. Pairwise comparisons reveal that participants with bipolar disorder scored significantly higher on this EMS than individuals with unipolar depression ($p=.012$).

Logistic regression was conducted to identify the EMSs that predict group membership (bipolar versus MCC) while controlling for the other EMSs. After five exploratory models (see Analyses section), the final regression model consisted of *Emotional Inhibition*, *Approval-Seeking/Recognition-Seeking* and *Abandonment* as predictor variables. Results show that these three EMSs significantly predicted group membership: Pearson's $\chi^2(3)=18.79$, $p<.001$, Nagelkerke $R^2=.14$. The goodness of fit of the model was further supported by a non-significant Hosmer-Lemeshow's chi-square: $\chi^2(8)=11.70$, $p=.17$. *Approval-Seeking/Recognition-Seeking* ($p=.004$, $OR=1.78$, 95% *CI*: 1.20–2.64) positively predicted bipolar status, while *Emotional Inhibition* ($p=.018$, $OR=.67$, 95% *CI*: .48–.94) and *Abandonment* ($p=.020$, $OR=.67$, 95% *CI*: .48–.94) were negative predictors.

5. Discussion

This study aimed to explore the presence of the Early Maladaptive Schemas (EMSs) among patients diagnosed with bipolar disorder. Results showed a strong main effect: patients with bipolar disorder have higher mean EMS scores than a non-clinical control group, while many endorse EMSs at clinically significant levels. The search for EMSs specific to bipolar disorder was less conclusive. In most cases, the bipolar group scored similar to participants with unipolar depression or anxiety disorders. When controlling for depressive symptoms, two EMSs appear to be particularly elevated among the bipolar group: *Entitlement/Grandiosity* and *Approval-Seeking/*

Recognition Seeking. High *Approval-Seeking/Recognition-Seeking* scores also predicted bipolar group membership, as did low levels of *Emotional Inhibition* and *Abandonment*.

The main effect of higher EMS scores as a whole reflects the high levels of dysfunctional attitudes and other models of cognitive schemata found in various studies (e.g., Goldberg et al., 2008; Reilly-Harrington et al., 2010; Scott et al., 2000; Thomas et al., 2009). These studies have suggested that bipolar disorder is associated with a cognitive vulnerability similar to that of unipolar depression. That conclusion appears to extend to the Early Maladaptive Schema model. The overall EMS activation may also reflect a general psychopathology effect. Given the extremely high rate of comorbidity in bipolar disorder and its negative impacts on the evolution of the bipolar disorder (El-Mallakh and Hollifield, 2008; McElroy et al., 2001; Merikangas et al., 2007), general psychopathology would also appear to be an important aspect of bipolarity and a key treatment target to improve outcome.

However, results show more than just a general activation of the EMSs as a whole. Specific effects were also found for a number of EMSs that fit with the characteristics of bipolar disorder. Participants with bipolar disorder demonstrated higher scores on two EMSs when controlling for depressive symptoms: *Approval-Seeking/Recognition-Seeking* and *Entitlement/Grandiosity*. *Approval-Seeking/Recognition-Seeking* was also a positive predictor of bipolar disorder status. With items such as "Having money and knowing important people make me feel worthwhile" and "I feel that what I have to offer is of greater value than the contributions of others," these EMSs recall the frequent comparisons of social rank and sense of superiority among individuals with bipolar disorder, as well as grandiosity as a diagnostic criteria of mania (APA, 2001; Gilbert et al., 2007). *Approval-Seeking/Recognition-Seeking* may also be related to the goal-striving activities that are characteristic of bipolar disorder and have been shown to precede affective symptoms, as individuals may strive to achieve their goals to obtain recognition from others (Nusslock et al., 2007).

On the other hand, *Emotional Inhibition* and *Abandonment* were negative predictors of bipolar status, while participants with bipolar disorder scored equivalent to nonclinical controls on *Emotional Inhibition*. With items such as "I control myself so much that many people think I am unemotional or unfeeling," this EMS appears to be in stark contrast with the affectivity and impulsivity associated with bipolarity (Cuellar et al., 2009; Swann et al., 2009). Low scores on *Abandonment* ("I need other people so much that I worry about losing them") may reflect anti-dependency beliefs demonstrated in bipolar disorder (Lam et al., 2004).

Though the current study does not determine whether the elevated EMSs are a premorbid vulnerability factor or a cause of the illness, results can be compared to a previous study examining EMSs among nonclinical respondents considered to be at high risk of developing a bipolar disorder (Hawke et al., 2011). That study found a similar main effect: a higher YSQ-S3 total score in the at-risk group compared to individuals not at elevated risk of bipolar disorder. Specific activation was also found in that study for *Entitlement/Grandiosity,* as well as low activation of *Emotional Inhibition.* The concordance between the studies suggests that these effects may indeed represent a cognitive vulnerability factor for bipolarity, as much prior to the onset of illness as after the diagnosis has been made. That study also identified *Insufficient Self-Control/Self-Discipline* as a key EMS. This EMS showed a strong main effect in the current study, but not a specific effect when compared to the MCC subsamples. Given these ambiguous results, this EMS should be considered in future studies.

This general activation of EMSs and constellation of specific EMSs that appear consistent with the characteristics of bipolar disorder confirm that the cognitive findings for bipolarity can be extended to the Young schema model. Based on the emerging schema profile, it is now time to explore how EMSs might affect the cognitive appraisal of life events among people with bipolar disorder and how they influence whether a given life event triggers bipolar affective symptoms. Viewed through the lens of the event-congruency hypothesis (e.g., Hammen et al., 1985), the concordance between an individual's EMSs and life stressors might trigger affective symptoms. If it can be demonstrated that individuals with high EMSs are more vulnerable to relapse when a life-event triggers their personal EMS profile, this would justify trials of schema therapy as a means of reducing vulnerability to relapse (Young et al., 2003). If schema therapy could reduce EMSs as it has for patients with other disorders, it may be possible to reduce the cognitive and affective reactivity to life events, and thereby reduce vulnerability to event-triggered affective symptoms and relapses. Developing a better understanding of the cognitive vulnerability factors associated with bipolar disorder and bipolar affective symptoms will make it possible to better target treatment initiatives to improve the outcome and lives of people affected by bipolar disorder.

This study has certain limitations. First is the lack of ASRM data for the mixed clinical control group. Though statistical control for mania does not appear necessary in the current sample due to minimal manic symptoms, the effect of mania on EMSs should be explored in future studies. The sample consists of a majority of females, while bipolar disorder is present in equal proportions among women and men (Schaffer et al., 2006). In addition, Axis II traits were not examined in the current study. Future studies should investigate Axis II traits in association with EMSs in the bipolar spectrum.

In sum, this study suggests that schema theory may be applied to bipolar disorder. This is suggested by high scores on the majority of EMSs, as well as specific effects notably for the *Entitlement/Grandiosity*, *Approval Seeking-Recognition Seeking* and *Emotional Inhibition* EMSs. These findings are promising in the quest to better understand the relationship between cognitive schemas and the symptoms of bipolar disorder. Future research should examine the interaction between EMSs and life events to trigger affective symptoms and, ultimately, the effectiveness of schema therapy as a treatment option for this complex clientele.

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Conflict of interest

None to report.

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