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Research report

# Early Maladaptive Schemas in the risk for bipolar spectrum disorders

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ABSTRACT

*Background:* The hypomanic personality style is a risk factor for bipolar spectrum disorders and shares many cognitive and affective features with the bipolar spectrum. Schema theory may serve as a unifying theory that would explain many of these features. This study is an exploratory investigation of Early Maladaptive Schemas (EMSs) in association with the hypomanic personality and bipolar spectrum risk.
*Methods:* A sample of 966 participants completed the Young Schema Questionnaire, the Hypomanic Personality Scale and the Patient Health Questionnaire. Associations were investigated using univariate and multivariate analyses. Participants deemed at risk of developing a bipolar disorder ($N=107$) were compared to low-risk controls ($N=681$).
*Results:* The *Entitlement/Grandiosity* and *Insufficient Self-Control/Self-Discipline* positively predicted the risk of developing a bipolar disorder, while *Emotional Inhibition* negatively predicted risk. High-risk participants demonstrated higher mean scores on all EMSs except *Emotional Inhibition*. These three EMSs, combined with *Vulnerability to Harm or Illness*, significantly predicted group membership.
*Conclusions:* A bipolar spectrum EMS profile was identified, consisting of *Entitlement/Grandiosity*, *Insufficient Self-Control/Self-Discipline* and the absence of *Emotional Inhibition*. These EMSs are highly consistent with characteristics of the bipolar spectrum. This study supports the application of schema theory to the hypomanic personality and bipolar spectrum. Future research should explore the possible interaction between EMSs, life events and affective symptoms and the applicability of schema therapy to the bipolar spectrum.


## 1. Introduction

A hypomanic personality style is characterized by persistently high levels of energy, sociability, confidence, activity and achievement orientation (Akiskal and Akiskal, 2005; Eckblad and Chapman, 1986). While these traits can be positive and adaptive in moderation, the hypomanic personality has also been shown to carry a risk for the development of bipolar disorder (Kwapil et al., 2000) and may be considered part of the continuum of bipolarity known as the soft bipolar spectrum. Bipolar disorder is a severe, chronic mental health condition characterized by cycles of depression and mania or hypomania (American Psychiatric Association, 2001). The hypomanic personality style has been associated with many of the same complications as full bipolar disorder. These include substance use and abuse (Camacho and Akiskal, 2005; Krumm-Merabet and Meyer, 2005), addictive tendencies (Meyer et al., 2007), depression and a broad range of psychosocial impairments (Klein et al., 1996).

People with a hypomanic personality style and soft bipolar spectrum symptoms tend to share a wide range of cognitive, affective and personality characteristics. For example, they

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demonstrate intense affect (Carver and Johnson, 2009) and impulsivity (Carver and Johnson, 2009), both suggestive of the symptoms of bipolar disorder. They also demonstrate dysfunctional attitudes (Alloy et al., 1999), unstable self-esteem (Knowles et al., 2007), signs of grandiosity (Johnson and Jones, 2009), and high goal attainment (MacCabe et al., 2010), all of which can be associated with bipolarity. The life event literature shows that goal-attainment life events tend to trigger (hypo) manic symptoms, while stressful life events trigger depressive symptoms in individuals with or at risk of bipolar disorder (Johnson, 2005). Furthermore, the various character traits appear to interact with life events to trigger bipolar spectrum symptoms (e.g., Alloy et al., 1999; Francis-Raniere et al., 2006; Nusslock et al., 2007).

### 1.1. Schema theory

Jeffrey Young's integrative schema theory proposes that individuals who face toxic, maladaptive experiences in early childhood develop "Early Maladaptive Schemas" (EMSs) coherent with these experiences (Young et al., 2003). An EMS is a broad, pervasive theme or pattern relating to the individual and his or her relationships with others. They are character traits initially developed during childhood that affect the way people interact with the world around them long into adulthood. Schema therapy, the treatment approach associated with the theory, was developed for hard-to-treat cases with a characterological underpinning. Schema therapy has been demonstrated effective for personality disorders, while the degree of EMS change over the course of schema therapy predicts symptom relief (Giesen-Bloo et al., 2006; Nordahl et al., 2005).

Young et al. (2003) have identified 18 different EMSs to date, each with its own proposed origin and long-term impact. For example, among the EMSs is *Entitlement/Grandiosity*. People with this EMS believe they are superior to and more deserving than others. They tend to be controlling, focused on their own needs, and lacking in empathy. People with the *Insufficient Self-Control/Self-Discipline* EMS have difficulty restraining their emotions or impulses and a lack of tolerance for boredom or frustration. They are impulsive, distractible and intense. The full 18 EMSs are presented in Table 1. Though EMSs have been most widely associated with personality disorders, they have also been shown to play a role in various Axis I disorders with characterological underpinnings, including mood disorders (for a review, see Hawke and Provencher, in press). Research has consistently found higher EMS scores among Axis I patients compared to healthy controls. Furthermore, patients tend to present high scores on EMSs that would be theoretically expected to be elevated in the disorder in question. The EMSs have also been shown to be stable over time, not merely a reflection of moment-to-moment symptoms.

**Table 1**
The 18 Early Maladaptive Schemas (EMSs) of the YSQ-3.

| 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 |

### 1.2. Schema theory in the bipolar spectrum

Since schema theory focuses on stable characterological features, and since the bipolar spectrum is associated with shared, stable character traits, schema theory may apply to the bipolar spectrum. EMSs would logically be elevated, since people with bipolar spectrum disorders report extremely high levels of the childhood adversity believed to be the cause of EMSs (e.g., Garno et al., 2005). Indeed, some have suggested that EMSs may complicate the course of illness in bipolar disorder (Ball et al., 2003; Newman et al., 2002). For example, if a life event activates an EMS that is elevated for an individual with a bipolar spectrum disorder, it could be that affective symptoms would then ensue. This effect would be consistent with the event-congruency hypothesis, which has been shown to apply to the symptoms of bipolar spectrum disorders (Francis-Raniere et al., 2006).

Based on the characteristics of the bipolar spectrum, a specific profile of EMSs might be expected. The high confidence observed among these individuals (Johnson et al., 2005; Johnson and Jones, 2009) may be reflected in the *Entitlement/Grandiosity* EMS. *Insufficient Self-Control/Self-Discipline* would also be a likely fit, considering the intense affect and impulsivity (Carver and Johnson, 2009; Johnson and Jones, 2009). *Unrelenting Standards/Hypercriticalness* may be associated with the achievement orientation and goal striving (MacCabe et al., 2010; Nusslock et al., 2007). An EMS that may be rare among people with a hypomanic personality or bipolar spectrum symptoms is *Emotional Inhibition*, characterized by extreme self-control and avoidance of emotional expression that would appear contradictory to the affective instability of the bipolar spectrum (Young et al., 2003).

The test of schema theory in the bipolar spectrum is extremely limited to date. One study added a truncated

introduction to the schema model to traditional cognitive therapy in a diagnosed bipolar sample (Ball et al., 2006). Though the treatment produced better outcome that treatment as usual, EMS scores are not reported and the authors make no mention of the treatment's impact on EMSs. A single study has presented EMS scores for the bipolar spectrum (Nilsson et al., 2010). A small sample of participants with bipolar disorder scored significantly higher than healthy 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*. Given the significant and sub-significant differences in a small sample and the lack of multivariate analyses to detect the essential schemas in the bipolar spectrum, the study opened the door to a more thorough examination of EMSs in the bipolar spectrum. No other studies have attempted to associate Young's schema model with the bipolar spectrum.

### 1.3. Objective and hypotheses

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

## 2. Methods

### 2.1. Participants

A total of 1117 participants completed the study, recruited via an email invitation sent to student and staff mailing lists at a Canadian university in 2010. The study was open to anyone 18 years of age or over. Participants completing the study in the lower 10 percentile for response time (<13.8 min) were excluded from the analysis ($N = 138$) as a conservative precaution against the uncontrolled online testing environment, since extremely rapid completion may suggest lower attention to item content. A further six participants were removed from the sample due to evidence of invalid response patterns (lack of variance), as were seven reporting a past diagnosis of a bipolar disorder, since they could not be considered premorbid. This left a final sample of 966 participants (75% female). Age ranged from 18 to 63, with a mean of 26.8 ($SD = 8.9$). Thirty-eight percent were married or in a common-law relationship, 59% were single, 3% were separated or divorced, .3% were widowed, and 77% were students. To maximize the generalizability of the results and specificity to the bipolar spectrum, participants were retained in the analyses regardless of whether they met criteria for a current disorder or reported a past psychiatric diagnosis other than bipolar disorder.

### 2.2. Procedure

Potential participants receiving the study invitation clicked on a web URL taking them to the study at www.survey-methods.com, then read an information sheet. Those who wished to participate electronically indicated their informed consent, then completed a series of self-report questionnaires. The equivalence of the online vs. pen-and-paper administration of psychometric questionnaires has been demonstrated by multiple studies (e.g., Chuah et al., 2006; Herrero and Meneses, 2006). The online approach was chosen based on the demonstrated validity of the procedure and practical advantages in terms of sample size and broader representativity. As compensation for taking part in the study, participants were offered optional entry into a random draw for a $100 gift certificate. The study was approved by a university-affiliated ethics review board.

### 2.3. Measures

Participants provided basic sociodemographic data, answered a short list of questions regarding their psychiatric histories and completed the following self-report questionnaires, all in their French-language versions.

Young Schema Questionnaire — Short Form 3 (YSQ-S3; Young et al., 2005). The YSQ-S3, developed in conjunction with schema theory and schema therapy, consists of 90 items making up 18 subscales, 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).

Hypomanic Personality Scale — Short Form (HPS-20; Meads and Bentall, 2008). The HPS-20 is a brief version of the Eckblad and Chapman's (1986) Hypomanic Personality Scale (HPS). This true–false questionnaire was developed on the premise that a hypomanic personality is premorbid to bipolar disorder, and hence it serves to identify individuals at risk. In fact, 78% of high scorers on the HPS were shown to meet the criteria for a (hypo) manic episode, vs. zero control participants. The prospective predictive value for bipolar disorder, based on the comparison of high scorers with a low-risk group, has also been demonstrated among middle-class college students (Kwapil et al., 2000). Of the group identified as high risk, 25% met the criteria for a DSM-IV bipolar spectrum disorder 13 years later, compared to zero control participants. The HPS-20 has strong internal consistency (Cronbach's alpha = .80) and is very highly correlated with the 48 item version ($r = .94$) (Meads and Bentall, 2008).

Patient Health Questionnaire (PHQ; Spitzer et al., 1999). The PHQ is the self-report version of the Prime-MD psychiatric screening interview (Spitzer et al., 1994). The form consists of 11 questions and multiple subquestions assessing psychiatric disorders frequently encountered in clinical practice: somatic disorders, depression, anxiety, eating disorders and alcohol abuse. The PHQ has proven comparable to the Prime-MD, with a sensitivity of 75%, specificity of 90% and overall accuracy of 85%.

### 2.4. Analyses

Sequential multiple regression analysis was used to identify the EMSs that predict HPS-20 scores as a continuous measure of bipolar risk. Seven multivariate outliers were deleted from all regression analyses based on leverage values. HPS results were normally distributed. Sociodemographic characteristics (age, gender) were entered into the first block of a sequential regression analysis for the purposes of control, followed by the four hypothesized EMSs in the second block, then the remaining 14 EMSs in the third and final block for exploratory purposes.

Next, the participant group was divided into low and high risk groups based on standard criteria used in previous studies employing the HPS, including those examining the predictive validity of the scale and those studying the correlates of bipolar spectrum risk (e.g., Eckblad and Chapman, 1986; Kwapil et al., 2000; Meyer, 2002). Participants were deemed to be at high risk of developing a bipolar disorder (BP-Risk) if they scored in the top ten percentile of the HPS-20 (scores of 13 or higher). The low-risk control group scored no more than one-half of one standard deviation above the HPS-20 mean (scores of 9 or lower). The dichotomization has the advantage of providing a separate group of individuals at high risk of bipolar disorder to compare and contrast their characteristics with an average group of non-risk individuals. These analyses were included in the study since research has demonstrated the validity of the HPS high risk group, but not the linear relationship between the HPS and bipolar risk across the full range of HPS scores.

Using these two participant groups, independent sample t-tests were used to compare mean EMS scores, first applying log transformations to normalize EMS distributions as needed (skewness and kurtosis values <1). Z-tests were used to compare clinical profiles. Logistic regression was then performed to assess the ability of EMSs to distinguish between the groups. The same sequential approach was used. 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 deciles-of-risk Hosmer–Lemeshow chi-square, whereby a non-significant result indicates a good model fit. The significance of individual predictors was assessed using the Wald test.

All analyses were conducted using SPSS version 18. An overall significance level of $p<.05$ was used, applying the false-discovery rate (FDR) correction to control for type I error inflation, leading to $p<.0143$ per analysis to conclude significance with an 18 EMS model (Narum, 2006). The online testing procedure ensured a complete dataset, with no missing data.

**Table 2**
Final step of the sequential regression of EMSs predicting HPS scores.

| Early Maladaptive Schema | HPS *r* | *B* | *SE B* | *β* | *p* | $sr^2$ |
|---|---|---|---|---|---|---|
| Entitlement/Grandiosity | .47** | 1.94 | .19 | .37 | **<.001** | .28 |
| Emotional Inhibition | .02 | −.80 | .14 | −.20 | **<.001** | −.15 |
| Insufficient Self-Control | .33** | .82 | .18 | .17 | **<.001** | .12 |
| Mistrust/Abuse | .29** | .58 | .19 | .13 | **<.001** | .08 |
| Subjugation | .15** | −.68 | .22 | −.13 | **<.001** | −.08 |
| Self-Sacrifice | .16** | .39 | .13 | .09 | **<.001** | .08 |
| Vulnerability to Harm or Illness | .26** | .48 | .22 | .10 | .03 | .06 |
| Dependence/ Incompetence | .24** | .43 | .24 | .07 | .07 | .05 |
| Age | −.09** | −.02 | .01 | −.05 | .09 | −.05 |
| Enmeshment | .23** | .34 | .22 | .05 | .11 | .04 |
| Defectiveness/Shame | .16** | −.30 | .21 | −.06 | .14 | −.04 |
| Abandonment | .26** | .21 | .16 | .05 | .20 | .04 |
| Negativity/Pessimism | .26** | −.18 | .21 | −.04 | .40 | −.02 |
| Emotional Deprivation | .16** | .12 | .17 | .03 | .47 | .02 |
| Gender | .002 | .10 | .28 | .01 | .71 | .01 |
| Social Isolation | .21** | .06 | .16 | .02 | .72 | .01 |
| Punitiveness | .22** | −.06 | .19 | −.01 | .76 | −.01 |
| Approval Seeking/Rec. Seeking | .28** | −.05 | .17 | −.01 | .78 | −.01 |
| Unrelenting St./ Hypercriticalness | .21** | .02 | .16 | .003 | .92 | .003 |
| Failure | .15** | .01 | .17 | .003 | .93 | .002 |
| Intercept | | | −.34 | .79 | | |
| *Mean* | 7.08 | | | | | |
| *Standard deviation* | 4.17 | | | | $R=.56$ $R^2=.31$, $p<.001$ | |

*Note.* For step 1, $R^2=.01$, $p=.01$; for step 2, $\Delta R^2=.27$, $p<.001$; for step 3, $\Delta R^2=.04$, $p<.001$;
* $p<.0143$ (FDR-corrected alpha).
** $p<.001$.

## 3. Results

Sequential multiple regression analyses were conducted to identify the EMSs predicting bipolar risk (see Table 2). Zero-order correlations show that the HPS-20 was moderately and positively correlated with *Entitlement/Grandiosity* ($r=.47$) and *Insufficient Self-Control* ($r=.33$), more modestly correlated with *Unrelenting Standards/Hypercriticalness* ($r=.21$) and not correlated with *Emotional Inhibition* ($r=.02$). All of the remaining EMSs were significantly correlated with the HPS-20 to varying degrees, suggesting a general distress effect. Regression analysis shows that, after a marginal prediction afforded by age and gender, the four hypothesized EMSs accounted for 27% of the variance of the HPS-20 in step 2, a highly significant prediction: $F_{inc}(4, 952)=86.86$, $p<.001$. Three EMSs made significant contributions in the expected directions: *Entitlement/Grandiosity* ($\beta=.43$, $p<.001$), *Insufficient Self-Control* ($\beta=.20$, $p<.001$), and *Emotional Inhibition* ($\beta=-.17$, $p<.001$). *Unrelenting Standards/Hypercriticalness* did not contribute significantly to the model ($\beta=.03$, $p=.35$). The addition of the remaining 14 EMSs in the third block significantly improved the prediction, explaining an additional 4% of the variance, $F_{inc}(14, 938)=3.98$, $p<.001$. The three EMSs of the previous block remained the strongest contributors to the model, joined by three additional positive predictors (*Mistrust/Abuse*, *Self-Sacrifice*, and subsignificant *Vulnerability to Harm or Illness*) and one negative predictor (*Subjugation*).

**Table 3**
Self-reported clinical profile of control and BP-Risk participant groups.

| | Controls ($N=681$) | BP-Risk ($N=107$) |
|---|---|---|
| Average age (SD) | 27.9 (9.2) | 26.6 (9.2) |
| % Female | 74.6% | 75.7% |
| Has consulted for psychological problems (%) | 36.4 | 45.8 |
| Past psychiatric diagnosis (%) | 10.7 | 17.8 * |
| Depressive disorder | 6.3 | 7.5 |
| Anxiety disorder | 5.1 | 10.3 * |
| Personality disorder | .3 | 2.8 ** |
| Other | 3.4 | 4.7 |
| Current symptom status (% meeting criteria) | | |
| Somatic disorder | 10.1 | 21.5 ** |
| Depressive disorder | 8.1 | 18.7 ** |
| Anxiety disorder | 2.9 | 18.7 ** |
| Eating disorder | 6.9 | 16.8 ** |
| Alcohol abuse | 15.7 | 30.8 ** |
| Any current disorder | 33.3 | 60.7 ** |
| Two or more current disorders | 7.9 | 27.1 ** |

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

Given the strength of the effect for *Entitlement/Grandiosity* and the apparent content overlap between this EMS and certain HPS items, there was some concern that the effect may reflect content overlap. To exclude this possibility, an HPS subtotal was calculated excluding the items reflecting grandiosity. Two raters (authors LDH and MDP) identified the items associated with grandiosity by consensus. The subtotal was comprised of 14 remaining items, most reflecting hypomanic activation and affective instability and none suggestive of grandiosity. The regression analysis was repeated on the new subscale. In the absence of HPS items suggestive of grandiosity, the prediction changed little. The block containing the four hypothesized EMSs explained 22% of the variance of this HPS subscale, $F_{inc}(4, 952)=68.13$, $p<.001$. *Entitlement/Grandiosity* remained the strongest predictor ($\beta=.33$, $p<.001$), still followed by *Insufficient Self-Control* ($\beta=.24$, $p<.001$) and *Emotional Inhibition* ($\beta=-.15$, $p<.001$). The addition of the remaining EMSs predicted an additional 5.4% of the variance. The three above EMSs were joined by *Mistrust/Abuse*, $\beta=.12$, $p=.006$ and subsignificant trends for *Vulnerability to Harm and Illness*, $\beta=.11$, $p=.015$; the negative *Subjugation*, $\beta=-.10$, $p=.02$; *Self-Sacrifice*, $\beta=.08$, $p=.02$; and *Abandonment*, $\beta=.09$, $p=.036$.

### 3.1. High risk vs. controls

Using the standard algorithm for the HPS (see Analyses section), participants were divided into two groups: those at high risk of developing a bipolar disorder (BP-Risk, $N=107$) and non-risk controls ($N=681$). The two groups are described in Table 3. BP-Risk participants were significantly more likely to report a psychiatric diagnosis or meet PHQ criteria for a current disorder. They also met the criteria for a significantly higher number of current disorders, with 27.1% qualifying for two or more (vs. 7.9% of controls).

Mean EMS scores by BP risk category are presented in Table 4. Independent sample t-tests show that BP-Risk participants scored significantly higher than controls on all EMSs except *Emotional Inhibition* ($p=.96$). A very large effect size was observed for *Entitlement/Grandiosity* ($d=1.28$), followed by *Insufficient Self-Control/Self-Discipline* ($d=.70$). Means were then compared with YSQ norms previously established for a mixed patient sample with personality disorders (Rijkeboer and van den Bergh, 2006). Though an imperfect comparison since norms were derived from an earlier 15 EMS version of the questionnaire, they were used to provide a general indication of clinical significance. The c-criterion was employed to determine whether BP-Risk means belonged to a clinical or non-clinical population (Jacobson and Truax, 1991). Results showed that 11 of 15 EMS means were in the range of a clinical population, the exceptions being *Emotional Deprivation*, *Failure*, *Dependence/Incompetence*, and *Subjugation* (norms were unavailable for

**Table 4**
Mean EMS scores by BP risk category, with internal consistency scores, independent sample t-tests and effect sizes.

| Early Maladaptive Schema | Cronbach's | Controls | | BP-Risk | | *t* | *p* | *d* (95% CI) |
|---|---|---|---|---|---|---|---|---|
| | Alpha | *M* | *SD* | *M* | *SD* | | | |
| Emotional Deprivation [a] | .84 | 1.80 | .97 | 2.13 | 1.12 | −3.189 | **.001** | .32 (.11–.40) |
| Abandonment [a] | .85 | 2.05 | .94 | 2.66 | 1.22 | −5.618 | <**.001** | .63 (.40–.70) |
| Mistrust/Abuse [a] | .85 | 1.91 | .89 | 2.46 | 1.00 | −6.241 | <**.001** | .61 (.42–.67) |
| Social Isolation [a] | .86 | 2.37 | 1.08 | 2.93 | 1.19 | −5.091 | <**.001** | .51 (.29–.59) |
| Defectiveness/Shame [a] | .91 | 1.54 | .84 | 1.97 | 1.08 | −5.337 | <**.001** | .50 (.29–.56) |
| Failure [a] | .91 | 1.77 | .93 | 2.11 | 1.19 | −3.329 | <**.001** | .36 (.13–.42) |
| Dependence/Incompetence [a] | .66 | 1.61 | .64 | 2.02 | .93 | −5.382 | <**.001** | .61 (.43–.66) |
| Vulnerability to Harm or Illness [a] | .72 | 1.77 | .77 | 2.30 | 1.01 | −6.005 | <**.001** | .65 (.46–.71) |
| Enmeshment/Undeveloped Self [a] | .69 | 1.50 | .62 | 1.96 | .98 | −6.428 | <**.001** | .68 (.50–.73) |
| Subjugation [a] | .75 | 1.85 | .77 | 2.13 | .95 | −3.161 | **.002** | .35 (.17–.41) |
| Self-Sacrifice | .83 | 2.94 | 1.02 | 3.24 | 1.13 | −2.715 | **.007** | .28 (.07–.36) |
| Emotional Inhibition | .83 | 2.45 | 1.05 | 2.44 | 1.18 | 0.054 | .96 | −.01 (−.23–.07) |
| Unrelenting Standards/Hypercriticalness | .69 | 3.20 | .89 | 3.63 | .96 | −4.613 | <**.001** | .48 (.30–.55) |
| Entitlement/Grandiosity | .58 | 2.41 | .69 | 3.33 | .88 | −12.289 | <**.001** | 1.28 (1.12–1.34) |
| Insufficient Self-Control/Self-Discipline [a] | .75 | 2.12 | .78 | 2.68 | .96 | −6.458 | <**.001** | .70 (.52–.76) |
| Approval-Seeking/Recognition-Seeking [a] | .76 | 2.53 | .83 | 3.09 | 1.07 | −5.166 | <**.001** | .65 (.45–.71) |
| Negativity/Pessimism [a] | .82 | 2.14 | .98 | 2.73 | 1.15 | −5.525 | <**.001** | .59 (.37–.66) |
| Punitiveness [a] | .73 | 2.43 | .79 | 2.91 | .98 | −5.306 | <**.001** | .59 (.41–.65) |

*Note*. FDR-corrected alpha for 18 variables is .0143.
[a] Test on log of variable.

*Approval-Seeking/Recognition-Seeking*, *Negativity/Pessimism* and *Punitiveness*).

To test the ability of the EMSs to classify participants into the two groups, sequential logistic regression analysis was performed. Since neither age nor gender approached significance in the first step ($p = .65$ and $p = .77$ respectively), they were dropped from the analyses. The four hypothesized EMSs were entered into the first block, followed by the remaining 14 EMSs in the second block. Results show that the four hypothesized EMSs significantly predicted group membership, Pearson's $\chi^2(4) = 139.94$, $p < .001$, and Nagelkerke $R^2 = .30$. The goodness of fit of the model was further supported by a non-significant Hosmer–Lemeshow's chi-square: $\chi^2(8) = 3.67$, $p = .89$. Significant contributions were made by *Entitlement/Grandiosity* ($p < .001$; $OR = 4.48$, *95% CI*: 3.12–6.44), *Insufficient Self-Control* ($p < .001$; $OR = 1.65$, *95% CI*: 1.23–2.22), and *Emotional Inhibition* ($p < .001$; $OR = .60$, *95% CI*: .46–.77). *Unrelenting Standards/Hypercriticalness* did not contribute significantly ($p = .80$; OR = 1.04, 95% CI: .78–1.40). The rate of correct classification in the BP-Risk group was modest: 98.5% of controls and 20.2% of BP-Risk participants, for an overall accuracy of 88.1%. The addition of the remaining 14 EMSs improved the classification rate to 97.6% of controls and 26.9% of BP-Risk participants, though the improvement over the four-EMS model fell short of statistical significance ($\chi^2(14) = 23.34$, $p = .055$). The significant EMSs in the final model were *Entitlement/Grandiosity* ($p < .001$; $OR = 4.83$, *95% CI*: 3.20–7.29), *Emotional Inhibition* ($p < .001$; $OR = .54$, *95% CI*: .40–.74), and *Vulnerability to Harm or Illness* ($p = .009$; $OR = 1.83$, *95% CI*: 1.16–2.88), with a subsignificant trend for *Insufficient Self-Control* ($p = .032$, $OR = 1.83$, *95% CI*: 1.03–2.15). Results of the final model are presented in Table 5.

## 4. Discussion

This study explored the applicability of Early Maladaptive Schemas (EMSs) to the hypomanic personality, viewed as a risk factor for the development of bipolar spectrum disorders. Results confirm the general hypothesis that individuals with a hypomanic personality would present higher activation of the majority of EMSs. The specificity hypotheses are partially confirmed. *Entitlement/Grandiosity* was positively associated with the hypomanic personality in all analyses and *Insufficient Self-Control/Self-Discipline* in most, while *Emotional Inhibition* was negatively associated. Other EMSs emerged in some analyses.

*Entitlement/Grandiosity* as a core EMS comes as no surprise, since high confidence suggestive of grandiosity is characteristic of the hypomanic personality (Johnson and Jones, 2009), while grandiosity is a diagnostic criteria of (hypo)mania (APA, 2001). Indeed, the relationship between *Entitlement/Grandiosity* and bipolar risk was remarkably strong and stable across the analyses, even when removing content overlap. In schema theory, people with *Entitlement/Grandiosity* are described as competitive, dominant and selfish, the EMS being the hallmark of narcissism (Young et al., 2003). This competitiveness recalls the goal-striving behaviors in the bipolar spectrum (MacCabe et al., 2010; Nusslock et al., 2007). A domineering and controlling attitude have also been associated with bipolar risk (Taylor and Mansell, 2008). In the only other study to examine EMSs in the bipolar spectrum to date, *Entitlement/Grandiosity* was among those approaching significance ($p = .06$) in a small clinical sample (Nilsson et al., 2010), suggesting that this result might extend to full bipolar disorder.

*Insufficient Self-Control/Self-Discipline* as a second core EMS would also appear to fit with the characteristics of the bipolar spectrum. Impulsivity and intense affect are found in the hypomanic personality (Carver and Johnson, 2009; Johnson et al., 2005; Johnson and Jones, 2009), while both are among the defining characteristics of bipolarity (APA, 2001). Nilsson et al. (2010) found that *Insufficient Self-Control/Self-Discipline* was significantly higher in bipolar patients than controls. The combination of this EMS and the negative effect of *Emotional Inhibition* is of particular note. The *Emotional Inhibition* EMS was consistently a clear exception across the analyses, defying the general activation of EMSs in the BP-risk group while predicting bipolar risk. With this EMS, people show extreme self-control and avoid expressing their emotions

**Table 5**
Logistic regression analysis of BP risk category as a function of EMSs.

| Early Maladaptive Schema | *B* | *SE* | *Wald* $\chi^2$ | *p* | *OR* | 95% CI |
|---|---|---|---|---|---|---|
| Entitlement/Grandiosity | 1.58 | .21 | 56.50 | <**.001** | 4.83 | (3.20–7.29) |
| Emotional Inhibition | −.62 | .16 | 14.90 | <**.001** | .54 | (.40–0.74) |
| Vulnerability to Harm or Illness | .60 | .23 | 6.86 | **.009** | 1.83 | (1.16–2.88) |
| Insufficient Self-Control | .40 | .19 | 4.60 | .03 | 1.49 | (1.03–2.15) |
| Approval Seeking/Rec. Seeking | −.28 | .19 | 2.32 | .13 | .75 | (.52–1.09) |
| Negativity | −.34 | .23 | 2.15 | .14 | .71 | (.45–1.12) |
| Enmeshment | .30 | .22 | 1.93 | .16 | 1.35 | (.88–2.06) |
| Mistrust/Abuse | .26 | .20 | 1.81 | .18 | 1.30 | (.89–1.91) |
| Self-Sacrifice | .13 | .14 | .90 | .34 | 1.14 | (.87–1.49) |
| Subjugation | −.20 | .23 | .79 | .37 | .82 | (.52–1.28) |
| Punitiveness | .15 | .20 | .59 | .44 | 1.17 | (.79–1.72) |
| Abandonment | .12 | .17 | .47 | .49 | 1.12 | (.81–1.57) |
| Failure | −.08 | .19 | .19 | .66 | .92 | (.64–1.33) |
| Unrelenting St./Hypercriticalness | −.07 | .18 | .16 | .69 | .93 | (.66–1.32) |
| Dependence/Incompetence | .10 | .25 | .15 | .70 | 1.10 | (.68–1.78) |
| Defectiveness/Shame | .07 | .22 | .11 | .74 | 1.08 | (.70–1.66) |
| Emotional Deprivation | −.04 | .17 | .05 | .82 | .96 | (.69–1.34) |
| Social Isolation | .02 | .17 | .01 | .91 | 1.02 | (.73–1.43) |
| Constant | −7.00 | .76 | | | | |

*Note*. FDR-corrected alpha is .0143.

(Young et al., 2003). They tend to appear affectively flat, both in positive and negative affect, in contrast with the intense emotion and affective instability that characterize the bipolar spectrum. Combined with the high activation of *Insufficient Self-Control/Self-Discipline*, these two EMSs would appear to suggest the lack of inhibition both from an affective and behavioral standpoint, suggestive both of the affective and behavioral intensity of the bipolar spectrum and of the dysregulation of the behavioral activation system observed in bipolar disorder (Uroševi ć et al., 2008).

Several other EMSs appeared to show some specificity to the bipolar spectrum. Notably, *Vulnerability to Harm or Illness* emerged in multiple analyses. Since this EMS is associated with the vulnerability to anxiety (Welburn et al., 2002; Young et al., 2003), it may reflect the risk for developing comorbid anxiety disorders, which are extremely prevalent in bipolar disorder (Goodwin and Jamison, 2007; Merikangas et al., 2007). This EMS also points to an underlying sense of vulnerability that appears contradictory to goal-striving and grandiosity. However, it may be that these develop as a means of compensating for an underlying sense of vulnerability — and that when goal-striving and grandiosity come together with an uninhibited cognitive, behavioral and affective style, they manifest as bipolar spectrum risk.

Among the other EMSs emerging in some analyses, *Subjugation* was a negative predictor of bipolar risk. This may reflect a refusal to subjugate oneself to another, even when it is healthy to do so, as suggested by the tendency of euthymic bipolar patients to reject advice (Mansell and Lam, 2006). Similarly, results for *Mistrust/Abuse* may reflect the extremely high levels of abuse in the histories of people with bipolar spectrum disorders (Garno et al., 2005). *Self-Sacrifice* is a surprising finding, since its other-focus appears contradictory to bipolar spectrum features such as grandiosity and advice rejection. It may be a chance finding, since it emerged strongly in only the multiple regression analyses. However, since this EMS has been implicated in the vulnerability to unipolar depression and anxiety (e.g., Shah and Waller, 2000; Wright et al., 2009), its possible role in the bipolar spectrum should be further examined.

The *Unrelenting Standards/Hypercriticalness* was expected to be highly endorsed as a reflection of goal-striving behaviors. Though the mean score was higher among BP-Risk participants, this EMS failed to emerge as a predictor of risk. This may be due to a sampling bias. The majority of the sample consisted of university students engaged in goal-striving activities on a daily basis. The sample demonstrated high academic achievement, which is among the risk factors for bipolar spectrum disorders (MacCabe et al., 2010). In fact, the control group in the current study scored substantially higher on this EMS than controls in the study with bipolar patients (Nilsson et al., 2010), suggesting that many participants may have been motivated by their own *Unrelenting Standards/Hypercriticalness* EMS. As such, the high scores on this EMS in the BP-Risk group suggests that it could still be relevant to the bipolar spectrum, while also being relevant to a broader segment of the population.

Though most EMSs were elevated, the strength of the findings for *Entitlement/Grandiosity*, *Insufficient Self-Control/Self-Discipline* and (negatively) *Emotional Inhibition* suggest that these three EMSs make up a core profile for these individuals. *Entitlement/Grandiosity* is associated with narcissism in schema theory, but a different process appears to be at play in the current EMS triad. A recent study examined six different forms of narcissism, all of which were positively predicted by the *Entitlement/Grandiosity* EMS (Zeigler-Hill et al., 2011). However, none of the six forms were either positively predicted by *Insufficient Self-Control* or negatively predicted by *Emotional Inhibition*. Given this lack of fit with any form of narcissism and notable fit with the established character features of the bipolar spectrum, the three-EMS profile emerging from the current study appears to be more specific to bipolarity.

The general activation of the majority of EMSs and specific activation of these three core EMSs have considerable interest both from theoretical and clinical perspectives. The event-congruency hypothesis proposes that the concordance between an individual's cognitive/personality style and life stressors triggers affective symptoms (e.g., Hammen et al., 1985). Preliminary evidence has supported this hypothesis in bipolar disorder for positive and negative events triggering manic and depressive symptoms respectively (Francis-Raniere et al., 2006). If this carries forward to the schema model, schema therapy may be a viable treatment option. Schema therapy has demonstrated success in treating individuals with borderline personality disorder (Giesen-Bloo et al., 2006), a difficult-to-treat condition that has much in common with the bipolar spectrum (Magill, 2004). The success of schema therapy with personality disorders raises hope that it may be useful for other chronic psychological problems with underlying characterological features, such as the bipolar spectrum.

Consider the following example. Bipolar disorder theory suggests that an individual with bipolar spectrum characteristics would be likely to engage in considerable goal-striving activities. The current study suggests that such an individual would also be likely to have *Entitlement/Grandiosity* and *Insufficient Self-Control/Self Discipline* EMSs. Imagine, then, that the individual's goal striving entailed the search for a job beyond his or her real capacities, driven by feelings of *grandiosity*. However, lacking the *self-discipline* to decline a social engagement prior to the interview, the individual arrives unprepared and interviews poorly. When turned down for the position, the expected reaction of disappointment may be intensified by a feeling of *entitlement* to the position and a lack of emotional *self-control*. The interaction between the stressful life event, EMSs and biologically based dysregulation of the behavioral activation system characteristic of the bipolar spectrum (Uroševi ć et al., 2008) may then trigger affective symptoms, whether subclinical, a first episode or subsequent relapse. If this were the case, schema therapy could be a valuable resource, since the reduction of these EMSs may reduce the interaction effect. If, after treatment, the individual were less driven by a sense of grandiosity to seek an unrealistic job position, displayed better self-discipline in the lead-up to an important event and were less prone to sense of entitlement when a goal was thwarted, his or her response to the stressful event may be attenuated and the risk of developing affective symptoms may decline. Of course, a great deal of work remains to confirm this proposed role of EMSs in the relationship between life events and bipolar spectrum symptoms and the possible utility of schema therapy. Nevertheless, the results of

the current study provide a promising first step toward this goal.

This study has certain limitations. First, the sample consists of a majority of females, while bipolar disorder is present in equal proportions among women and men (Schaffer et al., 2006). This raises questions regarding the gender bias, though gender was included as a covariate in the regression analyses. Another limitation is the use of a self-report questionnaire as an indicator of bipolar risk as an extension of the hypomanic personality. It is impossible to identify those who will indeed go on to develop a bipolar disorder. In the absence of a strong biological marker of bipolar risk, a longitudinal study would be necessary to confirm which EMSs were indeed premorbid to a bipolar disorder. In addition, Axis II traits were not examined. Future studies should investigate Axis II traits in association with EMSs in the bipolar spectrum.

In sum, this study suggests that schema theory is a natural fit to describe the hypomanic personality, viewed as a risk factor for bipolar spectrum disorders. This is demonstrated by higher endorsement of the vast majority of EMSs. Of particular note are *Entitlement/Grandiosity* and *Insufficient Self-Control/Self-Discipline*, as well as the low position on *Emotional Inhibition* only apparent when other EMSs are present. These EMSs would appear to make up an EMS profile specific to the hypomanic personality style, all consistent with cognitive and personality characteristics of the bipolar spectrum. These findings are promising in the quest to understand the relationship between character features, cognitive and emotional reactivity and the symptoms of the bipolar spectrum. This study opens the door to a host of future research examining the presence and role of EMSs among individuals diagnosed with bipolar disorder and, ultimately, trials of schema therapy as a treatment option.

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**Conflict of interest**

None to report.

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